ANNUAL REPORT

2022-2023

Chittaranjan National Cancer Institute

37, S P Mukherjee Road Kolkata700026

&

Street Number 299, DJ Block, Action Area I,
Newtown, West Bengal 700160

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Governing Body

Chittaranjan National Cancer Institute, Kolkata

Chairman	**Union Minister of Health & Family Welfare**
Alternate Chairman	Minister of Health & Family Welfare, Govt. of West Bengal
Member	Secretary, Ministry of Health & Family Welfare, Govt. of India or his Nominee
Member	Director General of Health Services, Directorate General of Health Services, Govt. of India, New Delhi
Member	Financial Adviser, Ministry of Health & Family Welfare, Govt. of India, New Delhi
Member	Secretary, Department of Health & Family Welfare, Govt. of West Bengal, Kolkata
Member	Secretary, Finance Department, Govt. of West Bengal, Kolkata
Member	Director of Health Services, Govt. of West Bengal, Kolkata
Member	Director General or his Nominee, Indian Council of Medical Research, New Delhi
Member	Director or his Nominee, Post Graduate Institute of Medical Education & Research, Chandigarh
Member	Director or his Nominee, Institute of Post Graduate Medical Education & Research, Kolkata
Member	Director, Saha Institute of Nuclear Physics, Kolkata
Member	Director, School of Tropical Medicine, Kolkata
Member	Nominee of the Department of Atomic Energy
Member	Director, All India Institute of Hygiene & Public Health, Kolkata
Amendment	
Member	Vice-Chancellor, West Bengal University of Health Services (11th Meeting of the Governing Body, held on 26.04.2005)
Special Invitee	Vice-Chancellor, University of Calcutta, (12th Meeting of the Governing Body, held on 21.08.2010)
Member	Chairman, Standing Finance Committee (10th Meeting of the Governing Body, held on 02.08.2003)
Member	Two Experts in Biological Sciences related to Oncology - one to be nominated by the union Health minister and the other by the State Health Minister
Member	Two Faculty Members of Chittaranjan National Cancer Institute
Member	By rotation to be nominated by the Standing Academic Committee
Member	Director, Chittaranjan National Cancer Institute

Chittaranjan National Cancer Institute

DIRECTOR
Dr. Jayanta Chakrabarti

RESEARCH WING

HOSPITAL WING
M.S., OIC (H) & A.M.O.

Ruplal Nandy Memorial Cancer

Scientific Departments

- Anticancer Drug Development
  (HoD: Dr.J. Chakrabarti)
- Cancer Chemoprevention
  (HoD: Dr. P. Saha)
- Clinical and Translational Research
  (Dr. K K Mukherjee)
- Environmental Carcinogenesis & Toxicology
  (HoD: Dr. S. Mukherjee
- Epidemiology & Biostatistics
  (HoD: Dr.J. Chakrabarti)
- Immunoregulation & Immunodiagnostics
  (HoD: Dr.J. Chakrabarti)
- In Vitro Carcinogenesis & Cellular Chemotherapy
  (HoD: Dr.J. Chakrabarti)
- Neuroendocrinology Experimental Hematology
  (HoD: Dr.J. Chakrabarti)
- Oncogene Regulation
  (HoD: Dr. J. Chakrabarti)
- Pathology & Cancer Screening
  (HoD: Dr.Vilash Nasare)
- Receptor Biology & Tumor Metastasis
  (HoD: Dr. D Sinha)
- Signal Transduction & Biogenic Amines
  (HoD: Dr. N Murmu)
- Viral Associated Human Cancer

- Clinical & Translational Research
  (HoD: Dr. K K Mukherjee)

Ancillary Depts. / Units / Sections

- Central Research Instrumentation Facility
  In-Charge: Dr. S. Ghosh
- Academic Cell & Coordinator:
  Dr. S Mukherjee
- Animal Care & Maintenance
  HoD: Dr. A Rakshit
- Library ALIO
  Mr. S Chakraborty & Mr. G Gorai.
- Computer Section
  In-Charge: G. Gorai
- Maintenance Department
  In-Charge: Dr. A Rakshit

Major Departments

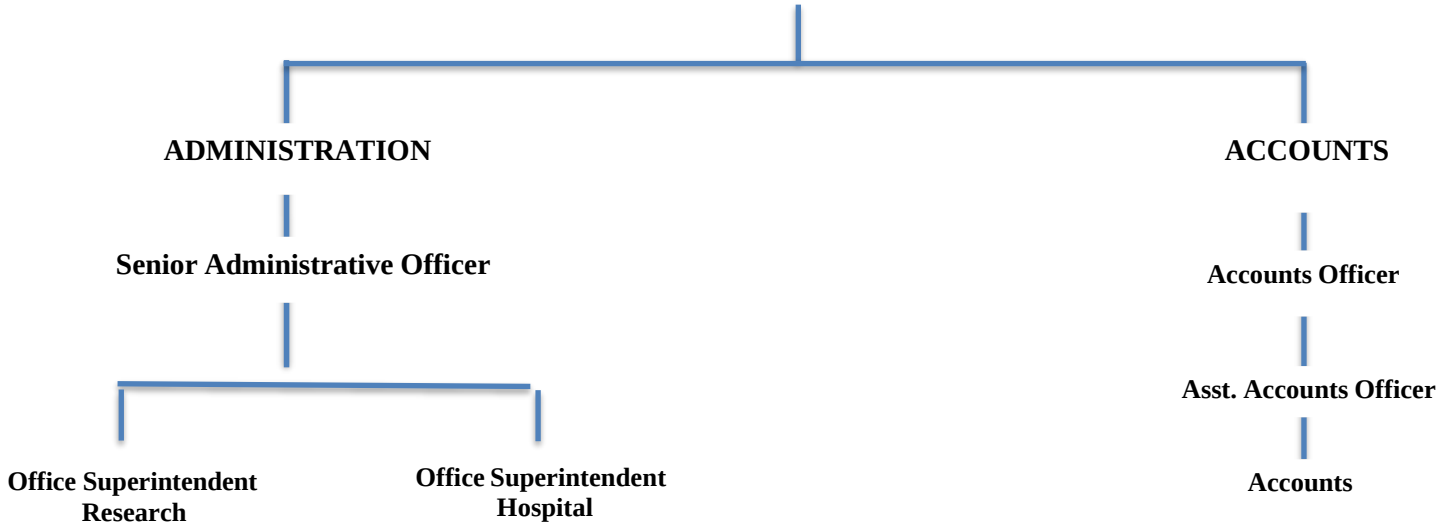
- Anesthesiology
  HoD: Dr. Deepa Chakrabarti
- ENT-Head & Neck Oncology
  HoD: Dr. A Dam
- Gynaecological Oncology
  HoD: R K Mandal
- Medical Oncology
  HoD: Dr. K K Mukherjee
- Paediatric Oncology Section
  Section In-Charge:
  Dr. K K Mukherjee
- Medical Physics
  HoD: Dr. D K Ray
- Pathology
  HoD: Dr. S Hazra
- Radiation Oncology
  HoD: Dr. T Maji
- Radiodiagnosis
  HoD: Dr. S Mazumder
- Surgical Oncology
  HoD: Dr. J Chakrabarti
- Division of Preventive Oncology
  HoD: R K Mandal

Ancillary Depts. / Units / Sections

- Pain & Palliative Care Unit
  HoD: Dr. R K Mandal
- Medical Records
  In-Charge:
  S Chakraborty
- Dietetics
  Dietitian: Ms. P Das Dutta
- Nursing Services
  Asst. Nursing Superintendent
  Ms. M Barui (Mukherjee)
- Rehabilitation Services

Chittaranjan National Cancer Institute

Administrative Set-up



Message from the Desk of the Director, CNCI

Chittaranjan National Cancer Institute has witnessed a phenomenal growth as a Cancer care giver in the last year. This is primarily because the New, Second Campus at Newtown has started to function with all the designated facilities and the existing campus at Hazra had also witnessed a strong foot fall of patients. The Radiotherapy facilities with two High energy Linear Accelerators has also been functional from early this year which has added much strength to the radiation oncology services. Our much-awaited dream to start NMC recognized courses also have been fulfilled, as we have been affiliated to run MD course in Radiation Oncology, Laboratory medicine and Mch Course in Surgical Oncology. CNCI also got accreditation for the Post Basic Diploma on Oncology Nursing course from the Indian Nursing Council. We have also expanded our paramedical training courses by incorporating Diploma courses in Operation Theatre and Critical Care, here at our Institute.

We have received a major boost in the community screening program in the form of Mobile mammography Van, which has already been incorporated in the screening schedule for semi-urban areas.

Our primary aim in the years to come would be to establish ourselves as a frontrunner in the field of Oncology services and research by some short-term goals as

1. Make the Newtown Campus fully functional with the required manpower and infrastructure.
2. Renovation of certain key areas in the existing Campus to match with the present Standards.
3. Construction of Private Cabins, Bone marrow transplant unit and Auditorium inside the premises of the Newtown Campus.
4. Start Medical Post graduate courses in other disciplines like Radiology, Anesthesiology.
5. Focus on goal-oriented Cancer research with special impetus on common cancers in India.
6. Strive for quality and safety with certification by NABH, NABL.

I know, beyond doubt that CNCI fraternity will accomplish the set goals with a great teamwork, as achieved in the past and bring glory to the region…. Nation.

Dr. Jayanta Chakrabarti

Director, Chittaranjan National Cancer Institute

From the Desk of Medical Superintendent, CNCI

Dear Friends and Colleagues!!

A warm Greetings from the Chittaranjan National Cancer Institute (CNCI), Kolkata, an autonomous institute under Ministry of Health and Family welfare and one of the 27 regional cancer centers in India almost touching 75 years of rich history and legacy. The institute was formally inaugurated by Prof. Madam I. Curie on 2 January 1950, as Chittaranjan Cancer Hospital, named after Shri Chittaranjan Das, the famous Freedom Fighter of British dominated India.

In this new decade, the Chittaranjan National Cancer Institute popularly known as CNCI has started its new innings on 7th January 2022 when Shri Narendra Modi Ji, Honourable Prime Minister of India in the august presence of Smt. Mamata Banerjee, Honourable Chief Minister of West Bengal & Dr. Mansukh Mandaviya, Honourable Union Minister for Health & Family Welfare and Chemicals & Fertilizers dedicated the second campus in Rajarhat for catering world class patient service to the entire East of India & other neighbouring SAARC Countries like Bangladesh & Myanmar.

In this new decade, CNCI's new generation too under the able leadership of young and dynamic Director, Dr Jayanta Chakrabarti has taken an oath to become Dreamer and Doer.

The fully functional, second campus of CNCI is a state-of-the-art, 460-bed cancer treatment centre, offering high quality and affordable treatment options to the people in various specialties of oncology.

CNCI has also been successfully participating in Swachh Bharat Mission and Kayakalp audit for the hospital and has come out with flying colours always.

We successfully implemented Quality system audit process for our second Campus hospital and clinical laboratory where we have already received NABH entry level certification for the Hospital as India's First Cancer hospital under the Ministry of Health and Family welfare. We were overwhelmed when we saw Country's Honorable Union Minister for Health & Family Welfare, Shri Dr. Mansukh Mandaviyaji tweeted the news to the Nation with pride. His blessing has strengthened our pledge to serve the mankind as government servant and we are vowed to do so under our able leadership.

We have also completed the final assessment for the Accreditation of NABL as the only Government Hospital of the State, for all the sub-specialties of our Clinical Laboratory of second campus.

While we are waiting for the Accreditation award from NABL, we have initiated Quality system audit process for our first Campus clinical laboratory too and on the process of application to NABL for certification.

CNCI was always a well-known teaching institution for doctors and allied Health care workers. While we are successfully conducting National Board (DNB) recognized post-Graduate medical courses for many years, we have completed first academic year for the National Medical Commission recognized Superspeciality Post Graduate course like MCh (Surgical Oncology) and Speciality Post-Graduate Courses like MD (Laboratory Medicine) and MD (Radiation oncology) at the second Campus. The institute has already started MSc courses for paramedical and is verge of starting Hospital Management courses in collaboration with nationally reputed Deemed University.

We have many dreams to be fulfilled, many work to do to achieve our vision successfully i.e.

- "To be a coveted destination Centre for comprehensive and affordable cancer treatment for all sections of our society with an integrated approach of early Detection, Prevention, Research and Innovation" and One Day…...
- To be an Institute of National Importance

Till then the Leaders of CNCI believe that they have miles to go before they hand-over the mantle to the future generation.

We know that we will Rise collectively ……

Jai Hind

Dr Sankar Sengupta,

Medical Superintendent, Chittaranjan National Cancer Institute

HOSPITAL WING

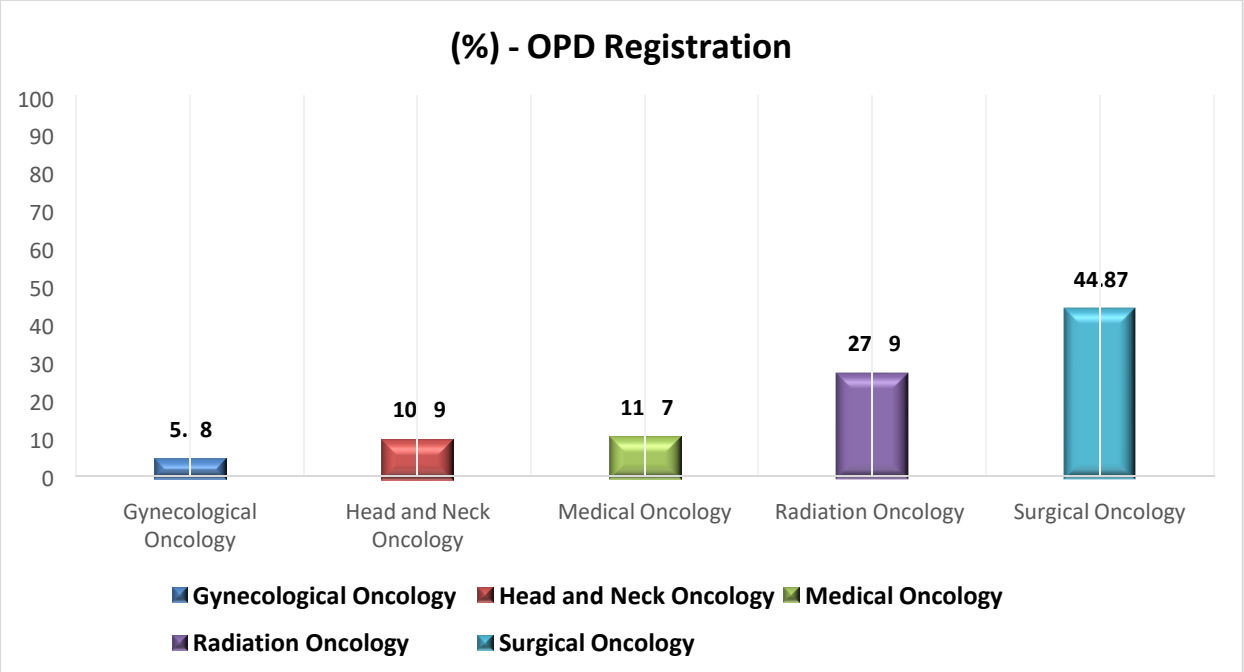
OPD Registration

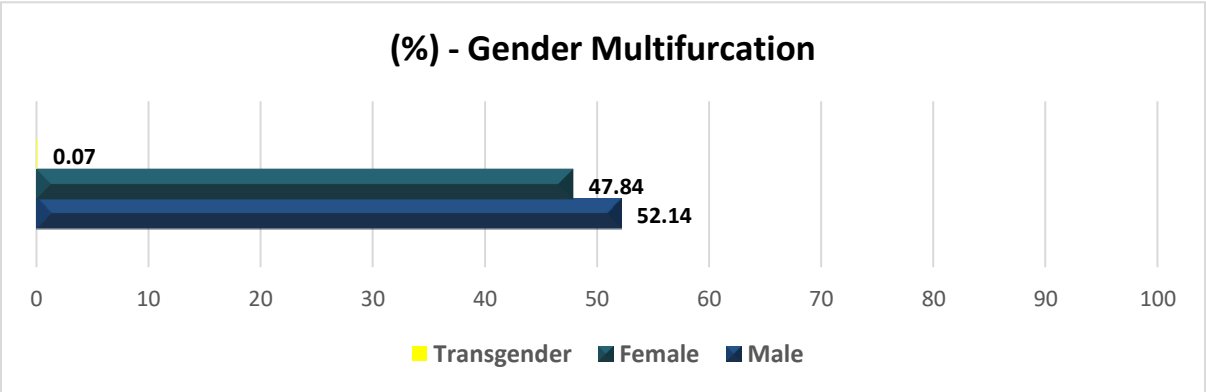
Total **13,881** nos. of new cancer patients registered and **94,371** nos. old patients Follow up for treatment during April 2022 to March 2023.

OPD Registration	
Campus	Frequency
Hazra	**7735**
New Town	**6146**
Total	**13881**

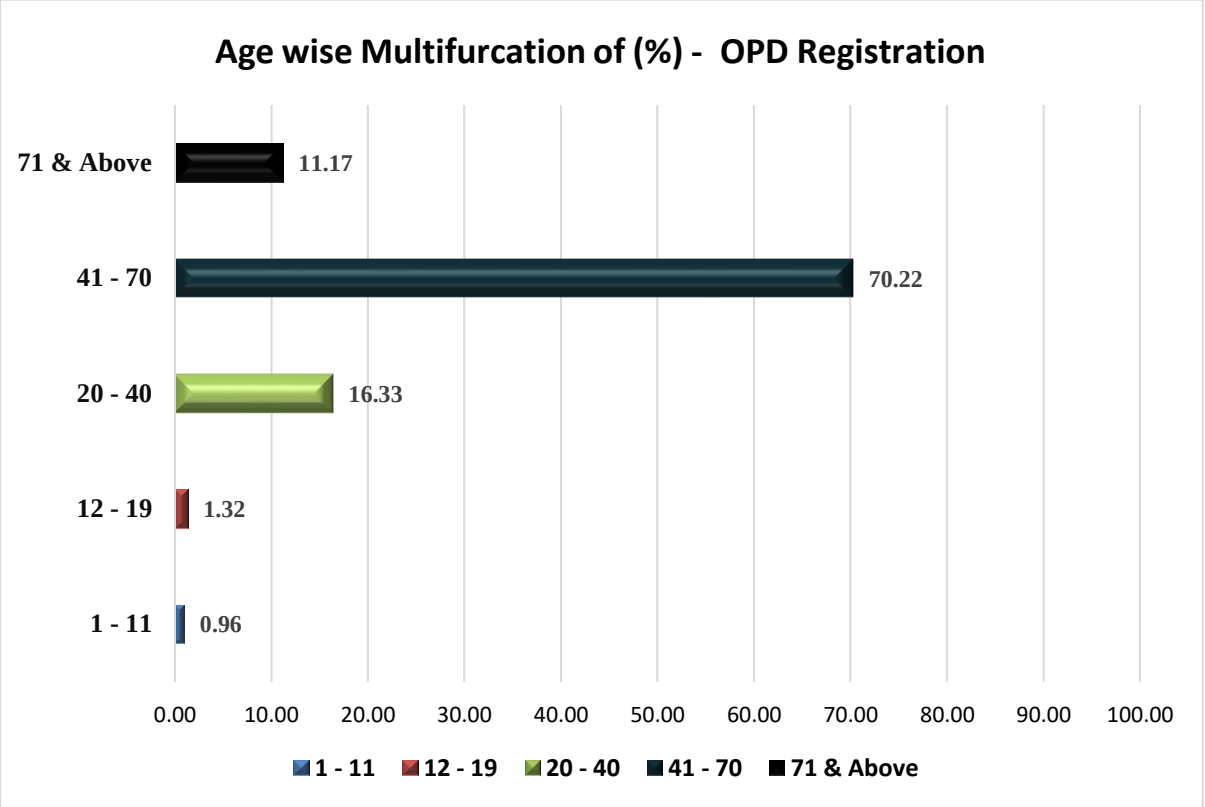
Department wise Precise of Cumulative OPD.

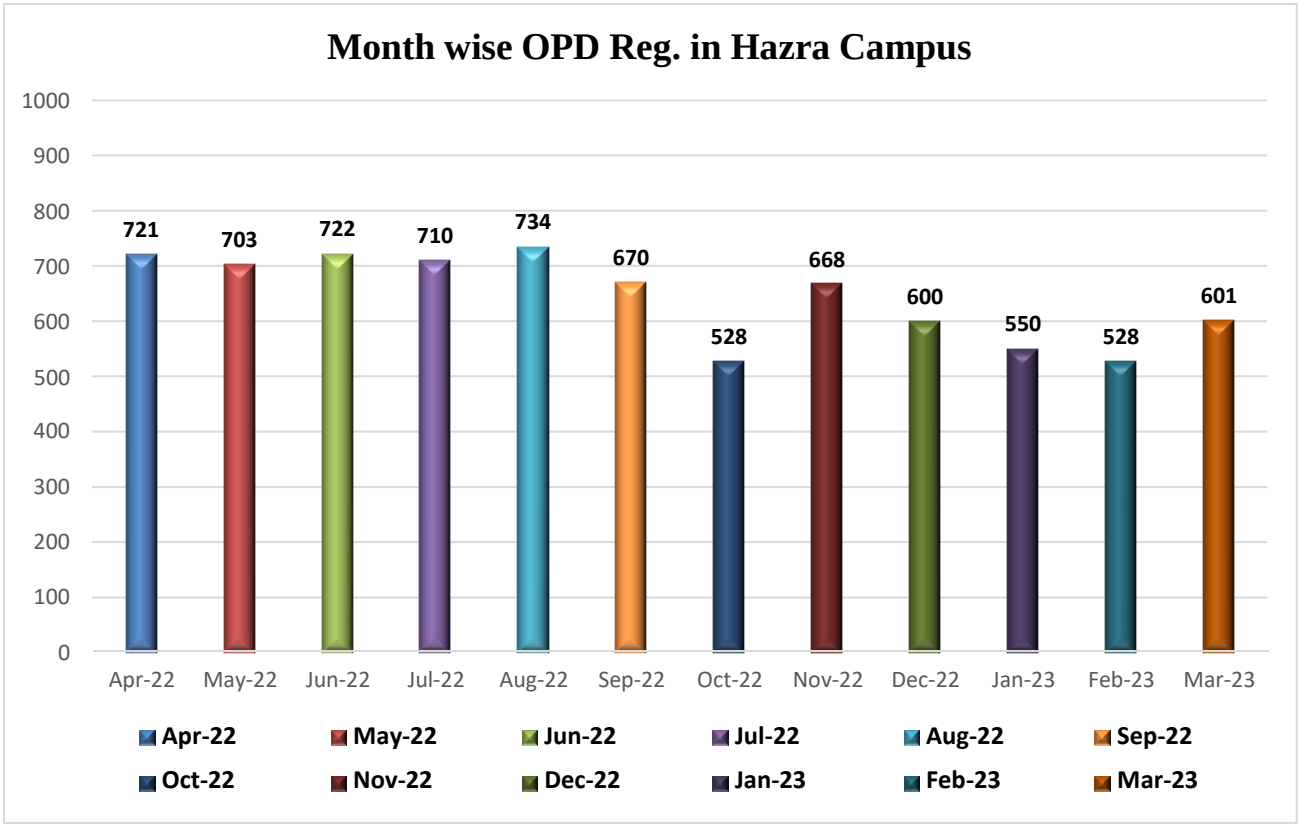
Gynecological Oncology	*Head and Neck Oncology*	*Medical Oncology*	*Radiation Oncology*	*Surgical Oncology*
747	**1470**	**1565**	**3871**	**6228**





Gender Multifurcation	
Particulars	**Frequency**
Female	7238
Male	6642
Transgender	1
Total	13881




Month wise OPD Reg. in Hazra Campus
1000
900
800
700
600
500
400
300
200
100
0
721
703
722
710
734
670
528
668
600
550
528
601
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
Apr-22
May-22
Jun-22
Jul-22
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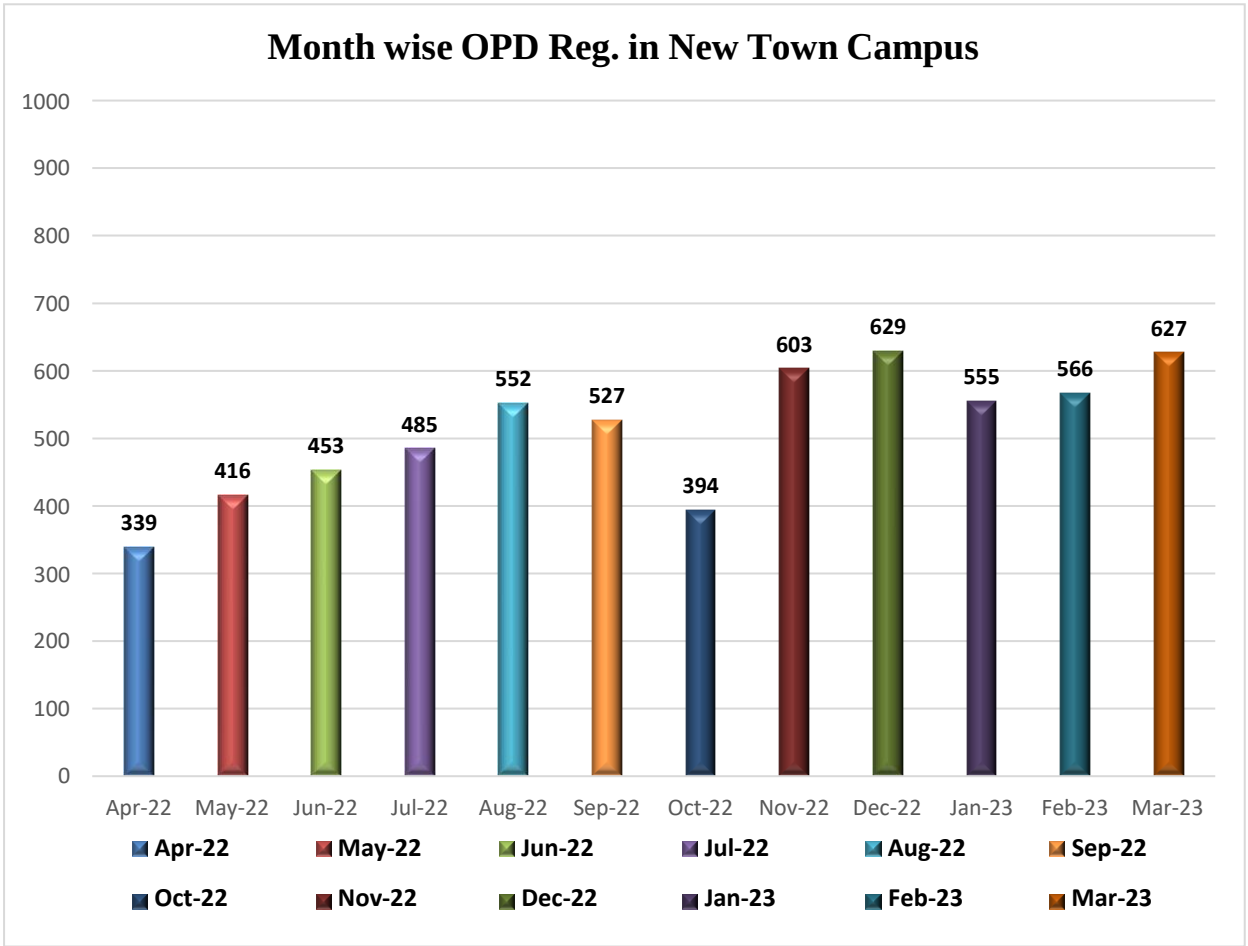
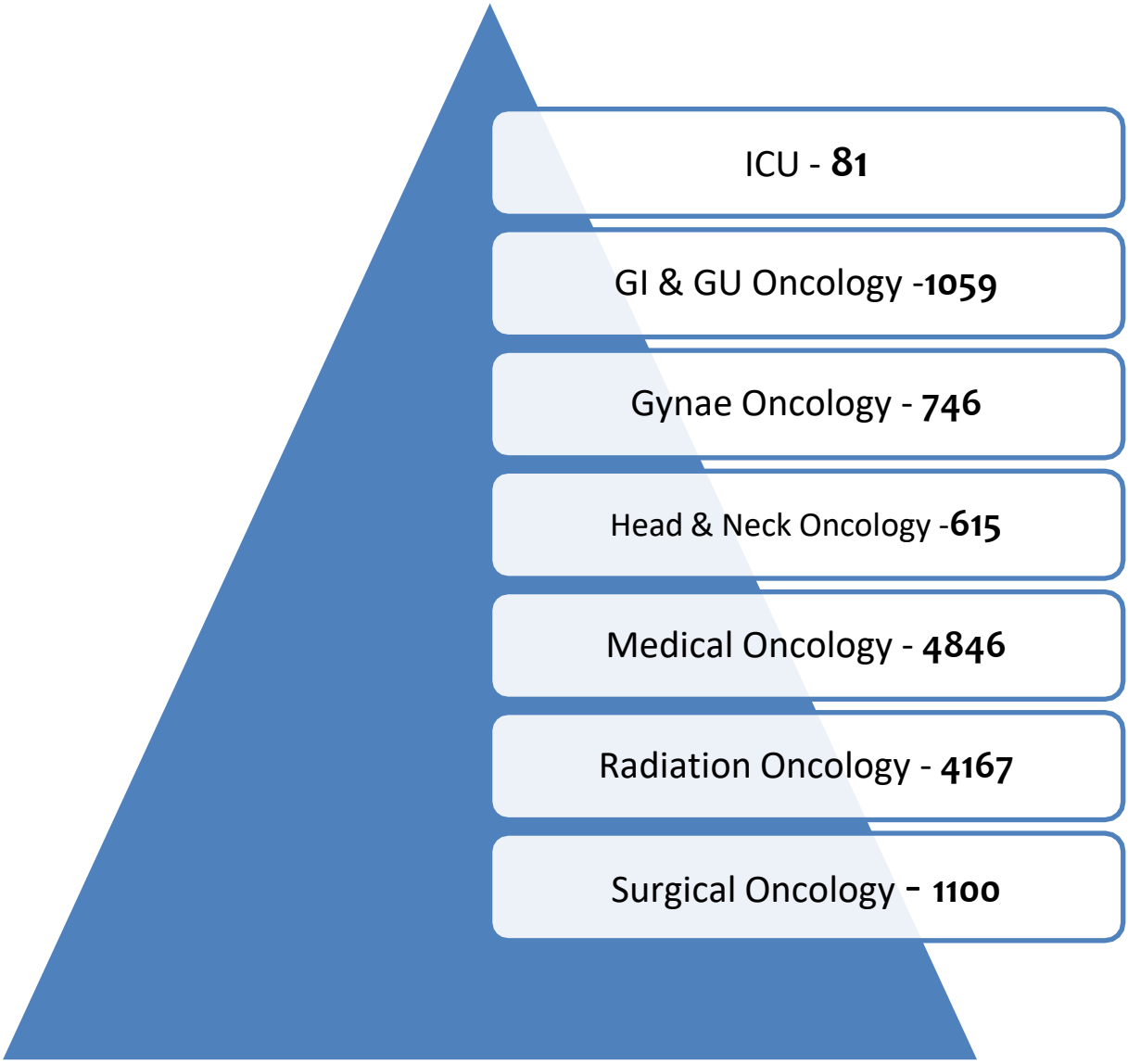
Dec-22
Jan-23
Feb-23
Mar-23

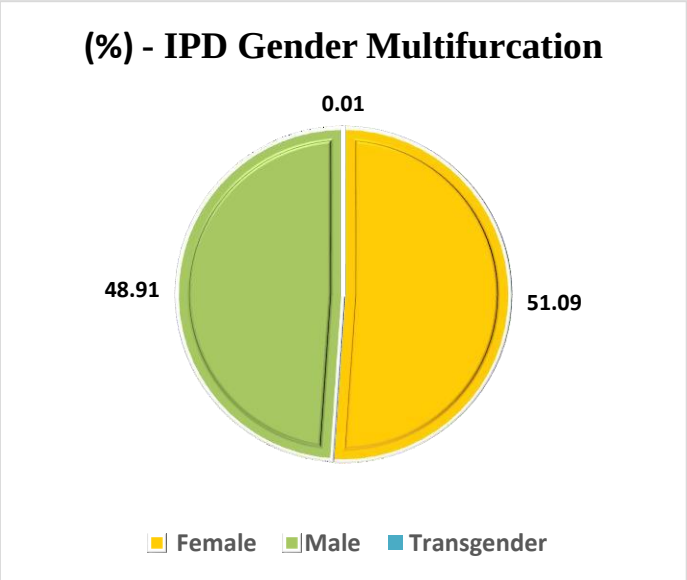

Month wise OPD Reg. in New Town Campus
1000
900
800
700
600
500
400
300
200
100
0
339
416
453
485
552
527
394
603
629
555
566
627
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23

In – Patient Admission

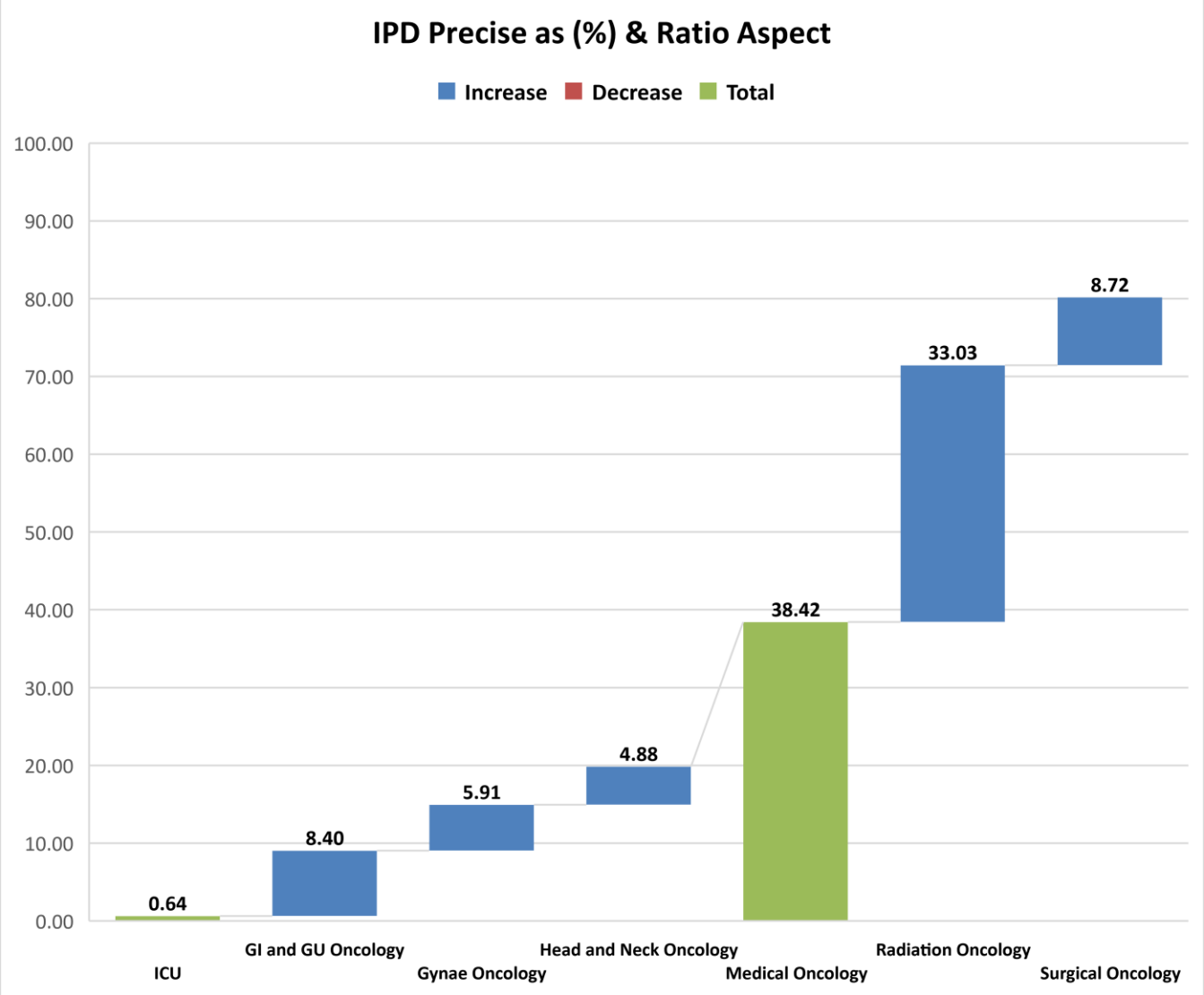
Digitization of in-patient medical records of hospital was started from 2012 for easy retrieval of records. Over one lakh of case records of patients has been scanned for future reference. Total **12614** number of cancer patients admitted for treatment in both campus during 2022-2023.

Department wise IPD Precise in a Graphical Aspect.

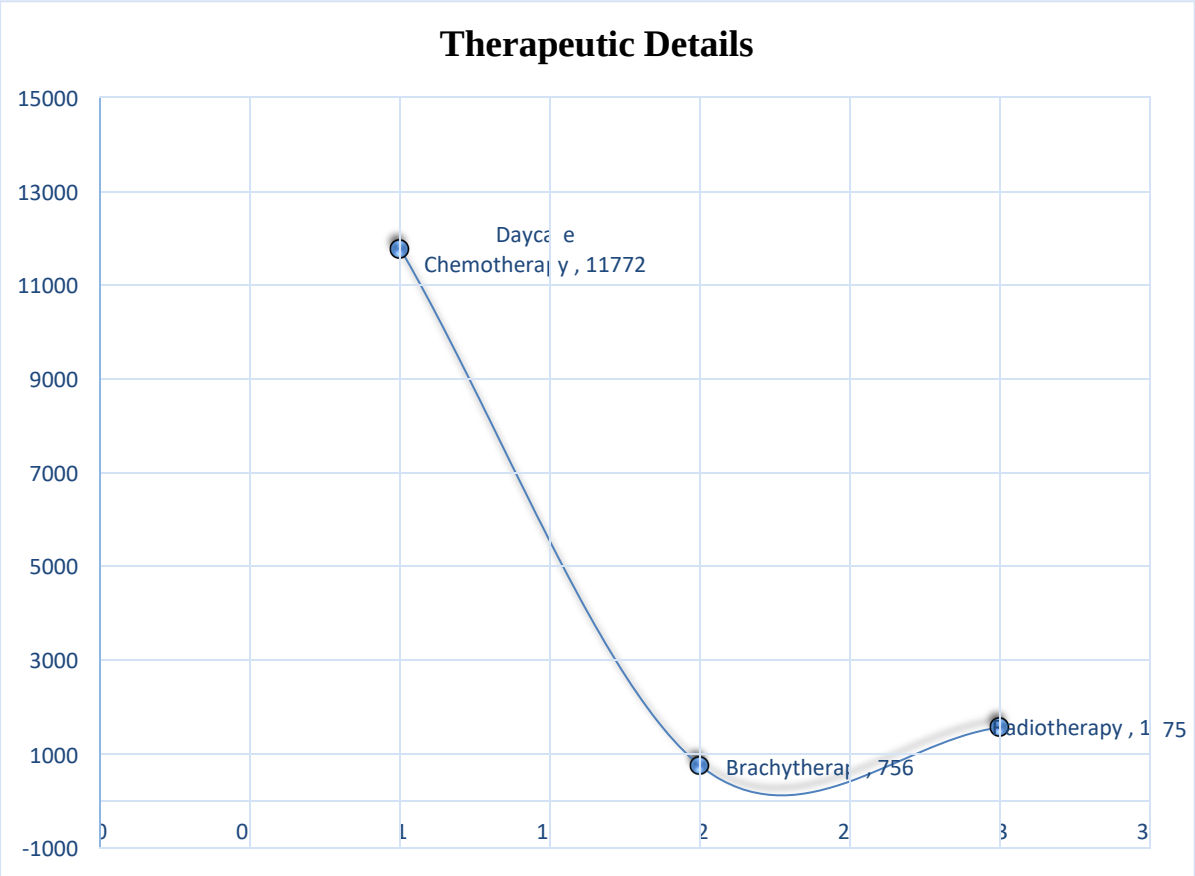


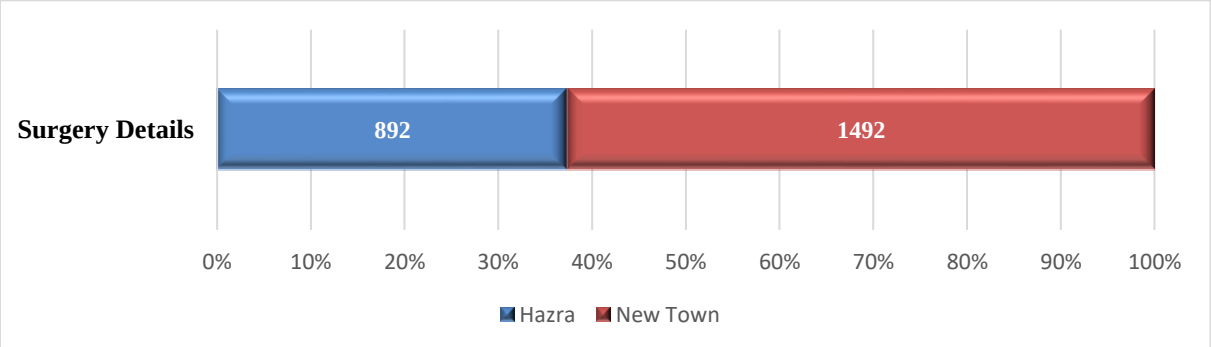


IPD Gender Multifurcation	
Particulars	Frequency
Female	6444
Male	6169
Transgender	1
Total	12614



Therapy Summary





Department with Organ Specific Surgery Details (Hazra Campus 2022 - 2023)

Dept.	Organ Name	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Grand Total
Gynae Oncology	Cervix	4	2	1	3	1	0	0	0	0	0	1	2	**14**
	Ovary	7	6	7	9	9	6	8	13	10	7	7	11	**100**
	Uterus	4	7	3	4	1	4	3	2	5	5	2	3	**43**
	Vulva	0	0	2	0	2	1	1	1	1	1	1	0	**10**
Head & Neck Oncology	Alveolus (Upper/Lower)	0	2	0	0	0	5	3	2	0	3	4	1	**20**
	Buccal Mucossa	11	13	16	7	13	8	9	7	8	5	2	8	**107**
	GBS (Gingivo-Buccal Sulcus)	1	0	0	0	1	0	1	2	0	1	1	2	**9**
	Larynx	0	0	1	1	1	0	1	0	0	2	0	2	**8**
	Maxilla	0	0	0	0	1	0	0	0	0	0	4	0	**5**
	Neck	1	0	0	0	0	0	0	0	0	0	0	0	**1**
	Salivary Gland (Parotid/ Submandibular)	1	0	1	0	0	0	0	0	0	0	0	0	**2**
	Thyroid	1	3	3	1	2	4	1	3	4	4	6	2	**34**
	Tongue	2	4	2	2	2	2	2	4	4	0	7	4	**35**
Surgery Oncology	Breast	23	13	11	15	15	18	13	13	25	24	24	19	**213**
	Colon	1	4	4	6	6	8	4	4	6	3	2	2	**50**
	Esophagus	0	0	0	2	0	1	0	0	0	1	1	0	**5**
	Gall Bladder	2	1	1	3	3	2	2	0	1	2	0	1	**18**
	Kidney	0	3	0	1	0	1	0	0	0	1	2	1	**9**
	Lungs	1	0	0	0	1	1	0	0	0	0	0	0	**3**
	Minor Surgeries	2	0	1	1	0	0	0	2	0	0	0	0	**6**
	Misc	1	1	6	4	4	2	1	0	1	5	6	6	**37**
	Pancreas	0	0	0	0	1	0	0	0	1	3	0	1	**6**
	Penis	1	1	3	2	0	0	3	1	4	1	1	2	**19**
	Prostrate (Orchichetomy)	2	0	0	0	2	1	0	1	1	0	1	1	**9**
	Rectum	4	8	4	5	7	7	1	2	5	2	1	1	**47**
	Soft Tissue (Limbs) Skin & Bones	7	4	4	0	5	4	1	3	3	5	4	3	**43**
	Stomach	4	2	2	4	2	3	3	3	1	5	4	3	**36**
	Urinary Bladder	1	1	0	1	0	0	0	0	0	0	0	0	**3**
	Grand Total	**81**	**75**	**72**	**71**	**79**	**78**	**57**	**63**	**80**	**80**	**81**	**75**	**892**

Department with Organ Specific Surgery Details (New Town Campus 2022 - 2023)

Dept.	Organ Name	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Grand Total
Gynae Oncology	Cervix	0	0	0	5	0	0	0	1	1	2	0	3	**12**
	Ovary	1	2	7	3	1	7	3	5	6	5	4	8	**52**
	Uterus	0	0	3	3	4	4	0	10	2	0	2	4	**32**
	Vulva	1	0	0	1	0	1	1	0	0	2	0	0	**6**
Head & Neck Oncology	Alveolus	5	4	5	6	5	5	4	6	5	4	6	6	**60**
	Buccal Mucosa	6	6	7	5	7	5	4	6	6	10	13	12	**87**
	GBS	1	1	0	1	1	1	0	1	0	1	1	2	**10**
	Larynx	1	0	1	2	1	0	0	1	0	1	0	0	**7**
	Maxilla	0	1	0	0	1	2	0	1	0	2	1	0	**8**
	Salivary Gland (Parotid/Submandibular)	1	0	0	1	0	1	0	0	0	1	0	1	**5**
	Tracheostomy	4	4	4	3	6	3	3	4	4	5	4	4	**48**
	Thyroid	2	3	3	2	1	4	2	3	4	4	5	2	**35**
	Tongue	3	4	2	5	4	3	2	4	3	5	5	5	**45**
Surgery Oncology	Breast	4	5	7	18	18	18	9	28	19	19	20	18	**183**
	Colon	17	3	12	19	18	16	13	21	13	7	8	15	**162**
	Esophagus	1	1	0	0	1	3	0	0	3	4	0	1	**14**
	Gall Bladder	7	2	5	4	6	9	5	7	11	4	5	4	**69**
	Kidney	2	0	1	1	2	1	1	2	4	7	5	1	**27**
	Lungs	0	0	0	3	1	2	1	0	2	0	0	1	**10**
	Minor Surgeries	1	0	1	2	4	3	2	0	1	3	4	3	**24**
	Misc	7	5	0	6	11	6	4	11	6	1	4	9	**70**
	Neck	0	0	1	3	0	2	1	0	2	2	0	1	**12**
	Pancreas	0	3	2	4	6	1	1	1	4	4	5	3	**34**
	Penis	0	0	2	1	0	1	1	3	0	1	1	1	**11**
	Prostrate	1	1	1	6	7	9	1	1	3	6	5	2	**43**
	Rectopheriphal Tumor	0	0	1	0	0	0	0	3	1	0	0	0	**5**
	Rectum	8	8	5	14	12	7	9	7	5	9	4	5	**93**
	Soft Tissue (Limbs) Skin & Bones	13	13	25	27	38	24	20	24	30	32	31	25	**302**
	Stomach	5	5	10	18	17	14	7	13	16	11	13	10	**139**
	Urinary Bladder	1	2	0	5	9	3	1	7	12	13	7	4	**64**
Grand Total		92	73	105	168	181	155	95	170	163	165	153	150	1669

Organ Specific Radiation Details (Hazra Campus 2022 - 2023)

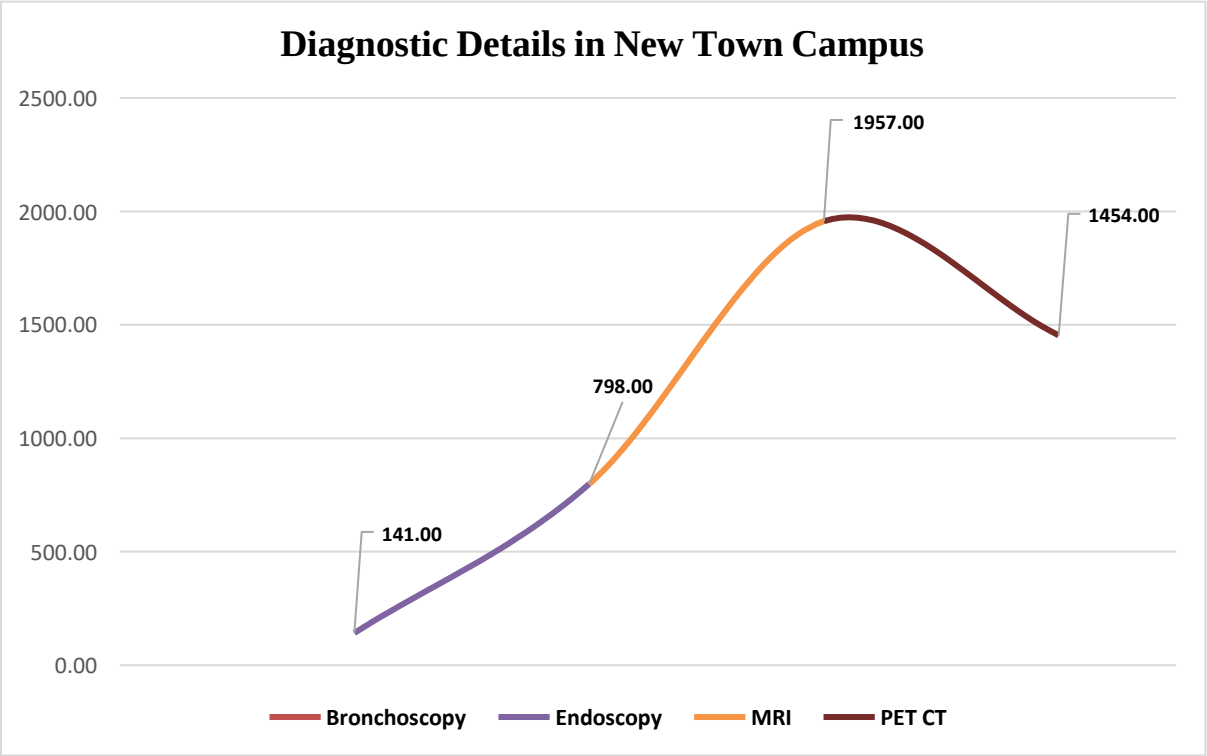
Dept.	Site / Organ Name	Grand Total
External Radiation - **1144**	Breast	**367**
	Head & Neck	**354**
	Lung	**148**
	Skin	**5**
	Thyroid	**6**
	Bone Metastases	**130**
	Brain Metastases	**22**
	Melanoma	**1**
	Miscellaneous	**32**
	Ovary	**1**
	Primary Bone Tumor	**4**
	Primary Tumours Of Central Nervous System	**54**
	Soft Tissue Sarcoma	**15**
	Unknown Primary	**5**
G.I. System - **133**	Esophagus	**22**
	Stomach	**4**
	Colo Rectum	**99**
	Anal Canal	**3**
	Hepatobiliary & Pancreas	**5**
G.U. System - ***261***	Cervix Uteri	**181**
	Endometrium	**21**
	Vulva	**8**
	Vagina	**3**
	Kidney	**9**
	Urinary Bladder	**9**
	Prostate	**30**
Hematological Malignancies - **22**	Lymphoma	**13**
	Myeloma	**3**
	Leukemia	**6**
Grand Total		**1560**

Chittaranjan National Cancer Institute, Hazra Campus (2022 - 2023)

	Particulars	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Total
OPD Profile														
1	*OPD Registration*	***721***	***703***	***722***	***710***	***734***	***670***	***528***	***668***	***600***	***550***	***528***	***601***	7735
2	*OPD Consultation*	**4348**	**4124**	**4519**	**5560**	**5590**	**5555**	**3627**	**5009**	**5365**	**4840**	**4700**	**5410**	58647
3	Head & Neck Oncology	109	113	145	107	138	124	96	147	111	113	116	151	1470
4	Gynecological Oncology	47	56	62	53	28	53	38	48	37	107	108	110	747
5	Medical Oncology	86	102	97	87	89	98	63	84	79	33	26	37	881
6	Radiation Oncology	329	277	296	328	336	267	222	262	253	78	56	59	2763
7	Surgical Oncology	150	155	122	135	143	128	109	127	120	219	222	244	1874
IPD Profile														
8	*Total IPD Admission*	***268***	***359***	***409***	***398***	***450***	***372***	***355***	***421***	***487***	***440***	***402***	***450***	4811
9	*Bed Occupancy Report*	67.25	72.57	69.70	73.33	75.05	60.00	54.25	57.07	69.40	70.80	70.52	70.19	64.67
10	Head & Neck Oncology	20	19	18	14	25	17	18	18	20	17	28	25	239
11	Gynecological Oncology	36	49	51	42	33	25	31	37	45	28	32	48	457
12	Medical Oncology	76	94	89	102	127	115	95	138	153	157	155	168	1469
13	Medical (MO) -> Pediatric Oncology	7	14	13	25	21	19	25	25	19	26	3	1	198
14	Radiation Oncology	58	123	176	148	171	151	125	154	176	159	112	170	1723
15	Surgical Oncology	71	60	62	67	73	45	61	49	74	53	72	38	725
Another Departments														
15	Daycare Chemotheraphy **(No. of Patients)**	333	414	429	446	447	450	424	460	451	448	457	477	5236
16	Brachytherapy **(No. of Patients)**	13	13	19	17	7	0	0	0	0	0	0	0	69
17	Radiotheraphy (LINAC 1 & 2) **(No. of Patients)**	105	109	112	146	101	112	89	92	76	84	85	103	1214
18	OT	81	75	72	71	79	78	57	63	80	80	81	75	892
19	Death	14	16	15	20	21	14	14	23	23	10	13	20	203

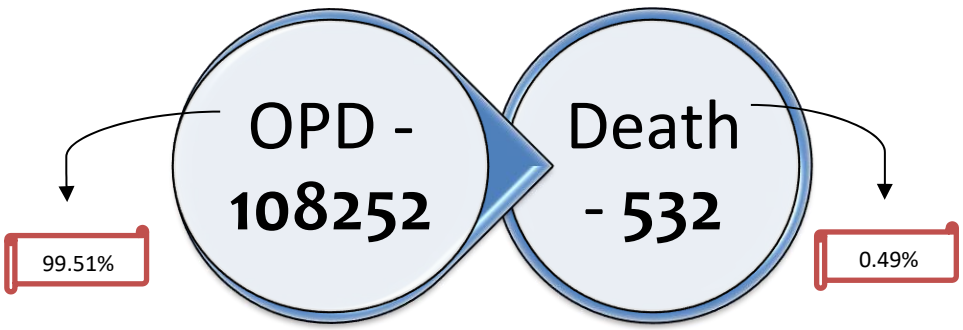
Chittaranjan National Cancer Institute, New Town Campus (2022 - 2023)

	Particulars	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Total
OPD Profile														
1	*OPD Registration*	***339***	***416***	***453***	***485***	***552***	***527***	***394***	***603***	***629***	***555***	***566***	***627***	**6146**
2	*OPD Consultation*	**1941**	**2114**	**2467**	**2498**	**2696**	**2932**	**2464**	**3065**	**3780**	**3830**	**3703**	**4234**	**35724**
3	Medical & Heamato Oncology	27	42	50	68	65	54	58	66	61	73	59	61	**684**
4	Radiation Oncology	56	70	89	85	78	78	60	96	113	110	138	135	**1108**
5	Surgery - Breast and Soft Tissue Oncology	42	51	56	64	80	86	51	76	105	59	68	80	**818**
6	Surgery - GI and GU Oncology	97	134	131	130	162	150	111	182	173	161	152	182	**1765**
7	Surgery - Gynae Oncology	45	35	37	48	51	46	35	54	36	44	39	44	**514**
8	Surgery - Head and Neck Oncology	72	84	90	90	116	113	79	129	141	108	110	125	**1257**
IPD Profile														
9	*Total IPD Admission*	***411***	***483***	***545***	***588***	***550***	***644***	***680***	***711***	***780***	***829***	***778***	***804***	**7803**
10	Bed Occupancy Rate	50.25	56.24	67.07	72.68	67.34	72.32	60.06	75.88	80.11	81.66	90.18	82.74	**71.28**
11	ICU	2	1	6	5	4	10	5	11	14	13	6	4	**81**
12	Medical & Heamato Oncology	107	127	145	200	247	314	343	322	339	343	344	348	**3179**
13	Radiation Oncology	168	199	221	198	140	184	201	217	221	245	228	222	**2444**
14	Surgery - Breast and Soft Tissue Oncology	25	26	24	26	26	28	30	32	40	45	34	39	**375**
15	Surgery - GI and GU Oncology	58	75	77	78	85	62	64	94	112	117	106	131	**1059**
16	Surgery - Gynae Oncology	26	24	40	32	22	18	15	15	22	27	23	25	**289**
17	Surgery - Head and Neck Oncology	25	31	32	49	26	28	22	20	32	39	37	35	**376**
Other Departments														
17	Daycare Chemotheraphy	321	381	412	453	461	542	453	626	631	641	636	979	**6536**
18	Brachytherapy	18	38	33	27	36	89	83	87	65	62	70	79	**687**
19	Bronchoscopy	4	7	11	9	15	14	11	18	17	10	12	13	**141**
20	CT	156	204	246	265	257	329	263	342	421	330	308	411	**3532**
23	Death	20	19	15	26	24	27	30	32	29	41	37	29	**329**
24	Endoscopy	63	47	92	91	76	90	49	43	66	51	62	68	**798**
25	MRI	122	113	126	162	136	184	112	188	253	108	216	237	**1957**
26	OT	71	53	85	153	162	134	85	157	148	137	132	134	**1451**
27	PET CT	156	164	160	155	147	0	0	40	122	115	155	240	**1454**
28	Radiotheraphy	0	0	0	0	0	0	0	0	86	93	85	97	**361**



Death

Also, the data of OPD registration and consultancy against death numerical figure and percentage (%) are shown here:



Department of Anesthesiology and Critical Care

Head of the department: Dr. Shubhra Ray, Specialist Grade I, MD Anesthesiology

In-Charge 2nd campus: Dr. Deepa Chakrabarti, Specialist Grade I, MD Anesthesiology.

Team (including permanent employees, other staff members and students)

Anesthesia team, Hazra Campus

Hazra campus	
Name	**Designation**
Dr. Deepanwita Das	Specialist Gr. II
Dr. Jyoti Gupta	Specialist Gr. II
Dr. Onzima Suba	Specialist Gr. II
Dr. Debasish Jatua	CMO

Anesthesia team, New Town campus

New Town Campus	
Name	**Designation**
Dr. Sayandeep Mandal	Specialist Gr. II
Dr. Dibyadip Mukhopadhyay	Specialist Gr. II
Contractual Faculty	
Dr. Deepasri Chowdhury	Specialist Gr. II
Junior Doctors	
Dr. Ananki Chakrabarti	Senior Resident
Dr. Deepika Kaushik	Senior Resident
Dr. Shushovan Chakrabarti	Senior Resident
Dr. Sabarta Bhattacharya	ICU RMO
Dr. Nairita Sengupta	ICU RMO
Dr. Ashfakullah	ICU RMO
Dr. Koustav Chakrabarti	ICU RMO

Objectives of the department:

1. To provide best patient care for all strata of population undergoing cancer surgeries or requiring critical care support, irrespective of comorbidities or biological differences.
2. To protocolize anesthesia and critical care services at par with recent update national and international guidelines

3. To maintain documentation of day-to-day patient care services to improve quality and formulate better outcomes of patients undergoing major and supra major onco-surgeries

Brief description of the work done during the year (from 1st April 2022 to 31st March 2023):

A. Cases attended (New/Follow ups)

Achievements in Patient Care:

1. Started iron therapy clinic for perioperative anemia optimization
2. ICU beds have increased from 6 to 15 and HDU was opened with a starting capacity of 3 beds
3. Hemodialysis facility was initiated which is continuously giving its benefits to acutely ill patients with renal failure
4. Point of care cardiac biomarker testing has been started in ICU for diagnosis of acute cardiovascular complication in critically ill patients.
5. Performed anesthesia in major or supra major challenging cases like CRS- HIPeC, Orthopedic Onco surgeries and thoracic surgeries
6. Efficient management of very high-risk cancer surgeries with significant cardiac comorbidities with the help of advanced hemodynamic monitoring using artificial intelligence

B. Surgeries/Chemotherapies/Radiotherapies/Pathology Procedure/ Radiology Procedure or any other done

1. Providing Non-operating room anesthesia in various places:

    a. Radiotherapy including children and brachytherapy in adults
    b. Endoscopy Suite including procedures like ERCP
    c. Cath Lab for PTBD and pediatric PICC line
    d. Radiology suite for various procedures under CT and MRI guidance.

C. Projects running – Name of the P.I. → Project Title → Funding agency

1. EPIMOR Study - Efficacy of Epidural Morphine as Sole Analgesic and as an Adjuvant to Local Anesthetic Infusion in Thoracic Epidural In Major Abdominal Onco surgeries- An Observational Study – Principal Investigator: Dr. Deepa Chakrabarti
2. ENCORE study - The Effects of Anesthetic Techniques on Time to Start of Adjuvant Chemotherapy, And Early and Late Outcomes Following Surgery For Colorectal Cancer: A Prospective, Multicenter, International, Observational, Pragmatic Study – Local Principal Investigator: Dr. Deepa Chakrabarti
3. Breast Project - Impact of anesthetic agents on T cell mediated immune response in breast cancer - Principal Investigator: Dr. Deepanwita Das.
    1. Presentation

Dr. Deepasri Chowdhury, SOAPCCON 2022, Mumbai, Topic : EPIMOR study

2. Workshops attended

   Dr. Sayandeep Mandal, Topic: Advanced Hemodynamic Workshop, Mumbai

3. **Publications :03**

D. Other academic activities

TRAINING PROGRAMME

1. Conducted training program by Indian Resuscitation Council – Certificate course of Comprehensive Cardiac Life Support / Basic Life Support for Doctors from Anesthesia, Critical Care and Surgical Departments, Nursing Staff of OT, ICU and Ward and Technician of OT and ICU
2. Conducted Institutional “Basic Life Support” orientation program for all level of nursing and paramedical staff.
3. Conducted Institutional "Compression only life support” workshop for all support staff

NEW COURSES

4. Courses Started:
   A. Diploma in Operation theatre technologies (WBSMF)
   B. Diploma in Critical Care technologies (WBSMF)

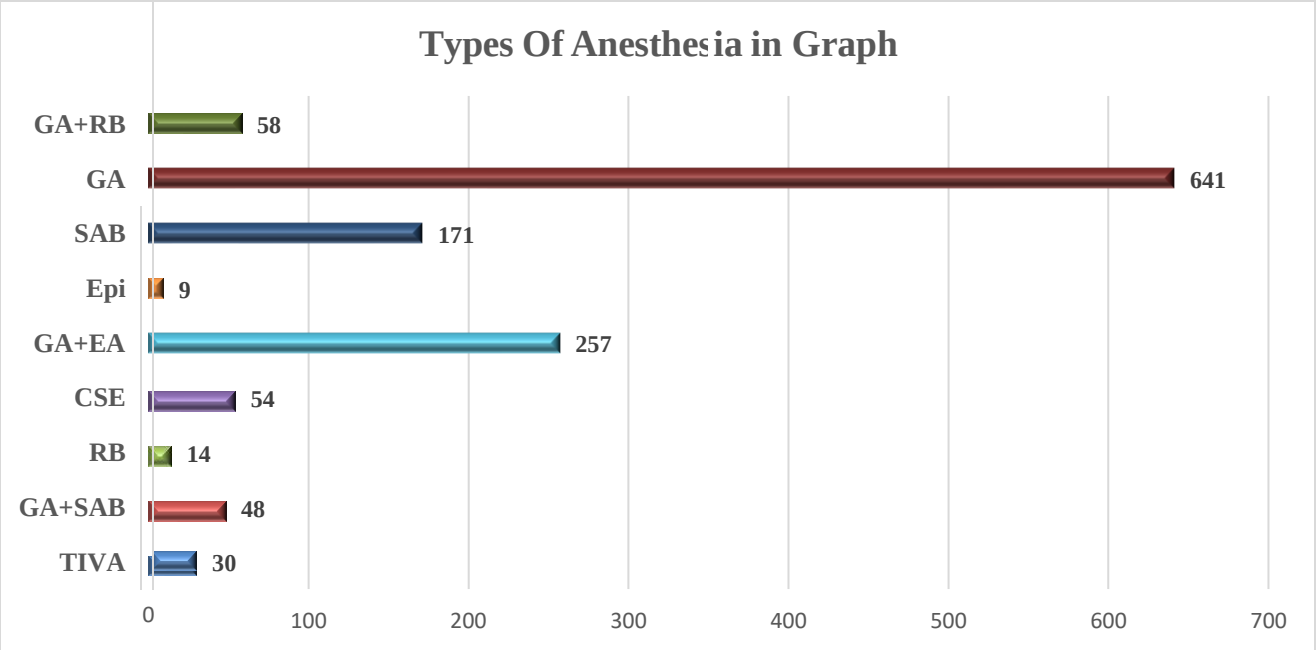
Department wise Precise in New Town Campus: -

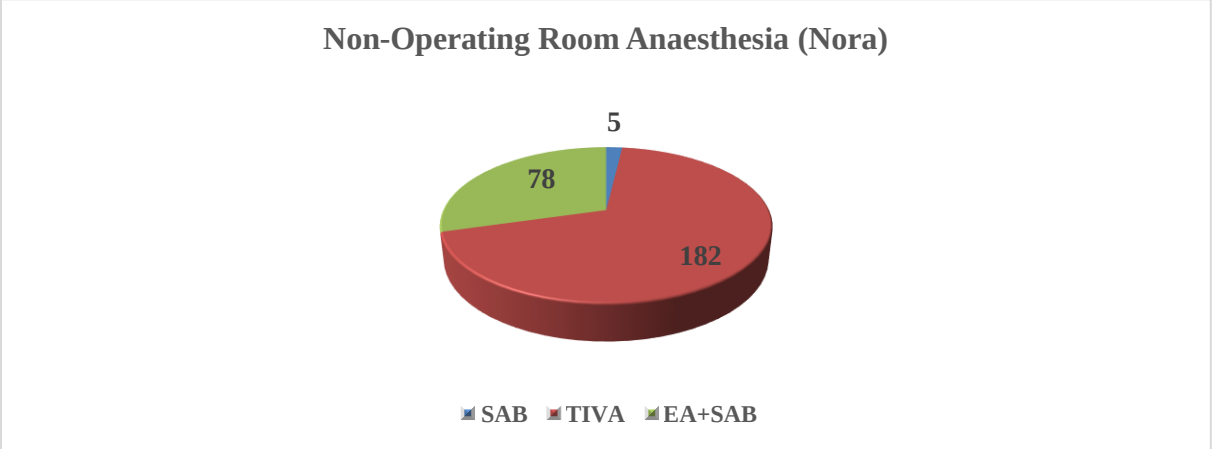
Departments	Nos.	Emergency
Bone and Soft Tissue Oncology	106	59
Brachytherapy	83	
Breast Oncology	192	
Gastrointestinal Oncology	398	
Genitourinary Oncology	130	
Gynecological Oncology	137	
Head and Neck Oncology	260	
Interventional Radiology	182	
Total	1488	
	1547	

Types Of Anesthesia									
Month	TIVA	GA+SAB	RB	CSE	GA+EA	Epi	SAB	GA	GA+RB
Apr-22	1	3	1	5	11	4	15	50	2
May-22	0	1	1	4	13	0	7	47	0
Jun-22	0	1	0	6	20	1	14	70	0
Jul-22	2	4	1	5	18	0	17	60	3
Aug-22	4	2	1	5	18	0	12	52	4
Sep-22	10	3	2	7	28	0	8	45	5
Oct-22	4	1	1	5	15	1	7	35	3
Nov-22	2	3	0	3	25	0	21	51	6
Dec-22	0	2	1	3	34	0	22	68	3
Jan-23	3	8	1	6	22	0	12	69	5
Feb-23	3	10	0	1	28	0	15	45	13
Mar-23	1	10	5	4	25	3	21	49	14
Total	30	48	14	54	257	9	171	641	58
	1282								

Brachy – **78** (SAB) + 5 (EA+SAB) = **83**

Interventional Radiology – **182** (TIVA) = **182**





Department wise Precise in Hazra Campus: -

Month	Head And Neck Oncology	Onco-Surgery	Gynecological Oncology	Rt
Apr-22	10	52	12	
May-22	17	45	14	
Jun-22	19	38	14	
Jul-22	12	55	16	6
Aug-22	16	53	13	2
Sep-22	12	50	12	
Oct-22	10	33	14	
Nov-22	12	33	17	
Dec-22	14	52	18	
Jan-23	12	55	14	
Feb-23	24	44	12	
Mar-23	18	42	16	
Total	**176**	**552**	**172**	**8**

Types Of Anesthesia	
GA	657
GA+EA	124
Regional	116
Sedation	14
Total	**911**

ENT-Head & Neck Oncology

Name of the Department: ENT-Head & Neck Oncology

Head Of Department: Dr Aniruddha Dam, MS, DLO, DNB (Specialist-Grade I)

Departmental Team

Hazra Campus	
Dr. Anup Kr. Bhowmick, MS	**(Specialist Grade I)**
Dr. Rup Kr. Saha, M.B.B.S, DIH, DHA	CMOH & OIC (H)(NFSG)
Dr, Shomes Mozumdar, MS	(Specialist Grade II) (from 22.12.2022)
Dr Ankit Khandelwal, BDS, MDS	(Contractual Dental and Maxillofacial Consultant) (up to March 2023)
Dr. Ishita Sen, MS., MRCS	(Sr. Resident) (from 24.06.2022)
Dr Shilpi Agarwal, MS, Fellow (FHNO)	(Sr. Resident) (02.03.2023)
New Town Campus	
Dr Rajdeep Guha	**(Specialist Grade I)**
Dr. Sukanya Naskar	(Specialist Grade II)
Dr. Samyadipta Dey, M.S.	(Sr. Resident) (up to December 2022)
Dr Zul Karnan Neguive BDS, MDS	(Observer)
Dr Ishita Sinha BDS, MDS	(Observer) (from January 2023)

Clinical activities/objectives of the department:

During the above period, the department continued to provide tertiary care to all categories of head & neck cancer patients. Even though the 2nd Campus of CNCI became operational during this period, routine patient care services in the ENT-Head & Neck Oncology Department at Hazra Campus continued to handle significant number of patients with some spike in the load of oral cancers handled by the department. (*Fig.1 & Fig 2*). Analysis of the surgical cases reveals that a significant number of advanced oral cancers could be offered definitive treatment care due to the availability of better reconstructive options. (**Free Flap** support by Consultant Plastic Surgeons). Departments of Anesthesiology and ITU took up the challenges of such major ablative surgeries with efficient per and post op care. This was a new trend and of much benefit to the patients as previously most of these patients were either referred to 'higher centers' of were given palliative intent treatment options. The Multi-Disciplinary Tumor Board continued twice a week with almost 1500 patients attending the **MDT Board** discussions during this period. Department of Radiation Oncology also gave much support with regard to timely adjuvant Conformal-RT for better post of care with higher patient compliance in addition to handling all other chemo-radiotherapy interventions. During this period there was a shift towards Oral Metronomic Chemotherapy (**OMCT**) for many advanced cases as part of palliative treatment options. In addition to various teaching and clinical discussions, the department held multiple **Intra-Departmental CME** on various subjects in conjunction with the Head & Neck Surgical Oncology department of CNCI 2nd campus.

Fig1: ENT-Head & Neck OPD patient trend (2020-2023)

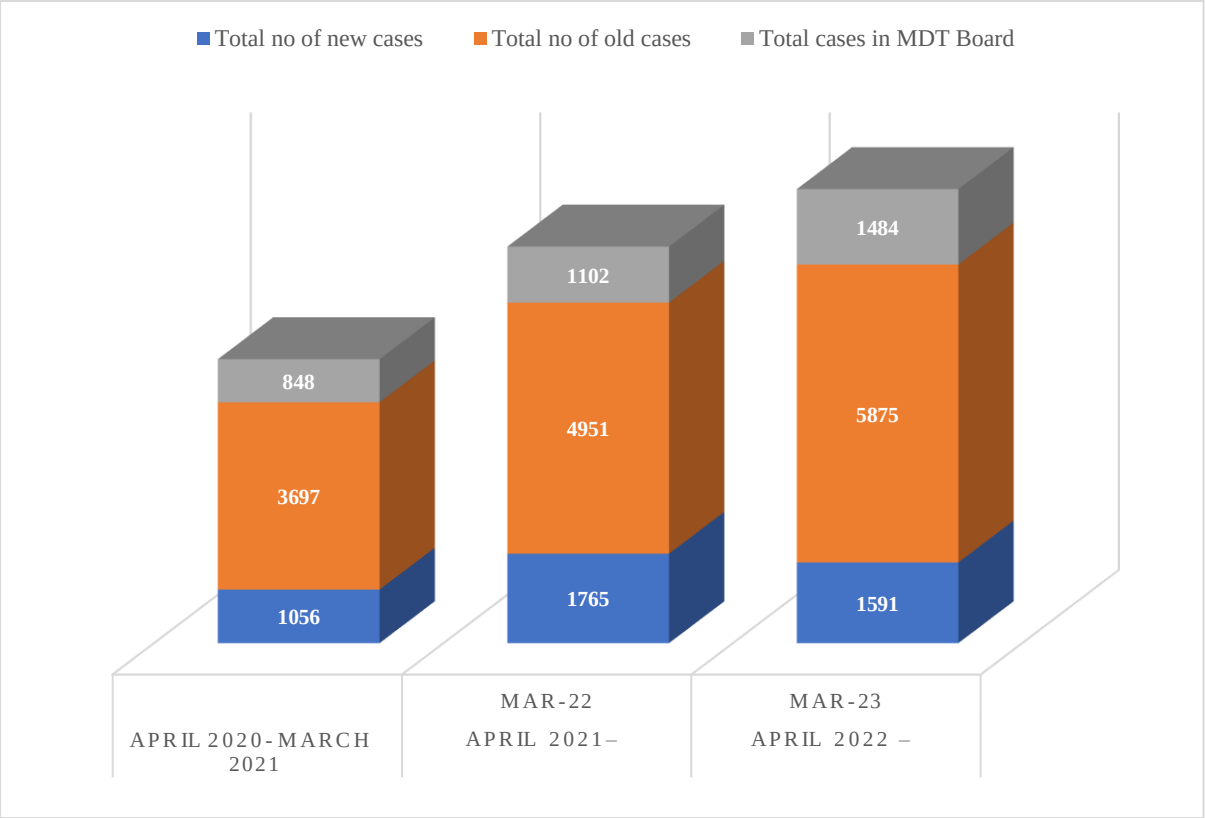


Table 1 Analysis of patients reviewed by the department during this period:

Clinical Workload	Total Numbers
Total number of cases (OLD+ NEW) reviewed by the department:	7466
Total number of NEW CASES attending the department:	1591
Total number of OLD CASES followed up in the department:	5875
Total number of patients attending TUMOR BOARD	1484
Total number of UPFRONT SURGERIES in MDT	305
Total number of ADMISSION	198
Total number of Planned MAJOR SURGICAL Procedures	150
Total number of MINOR SURGICAL Procedures	362
Total number of treatments related (surgical) MORTALITY	2

Fig 2: Anatomical Region Distribution of confirmed cases (MDT Record)

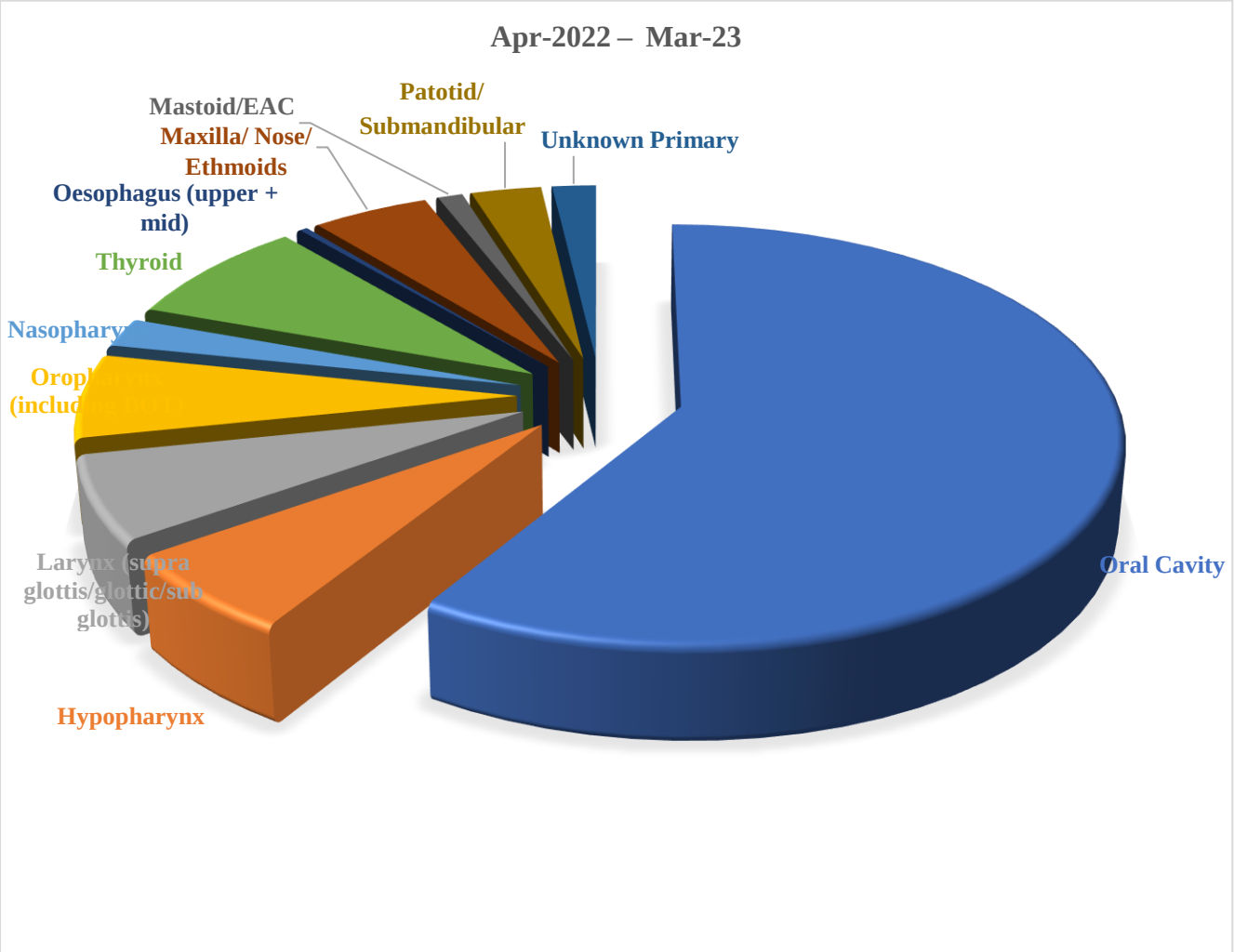


Table 2: Treatment Modalities offered at Multi-Disciplinary Team Board:

Treatment Record	April 22 –March 23
Surgery (with /without RT)	**305**
RT (with / without surgery)	**226**
Ant CT>Assess	**91**
CT-RT	**177**
Palliative	**403**
Further investigation	**154**
Palliative OMCT (July 22-March 23)	**130**
Re-radiation	**6**
Referred to other hospital	**44**

Organ Specific Surgery Details (Hazra Campus 2022 - 2023)

Organ Name	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Grand Total
Alveolus (Upper/Lower)	0	2	0	0	0	5	3	2	0	3	4	1	20
Buccal Mucosa	11	13	16	7	13	8	9	7	8	5	2	8	107
GBS (Gingiva-Buccal Sulcus)	1	0	0	0	1	0	1	2	0	1	1	2	9
Larynx	0	0	1	1	1	0	1	0	0	2	0	2	8
Maxilla	0	0	0	0	1	0	0	0	0	0	4	0	5
Neck	1	0	0	0	0	0	0	0	0	0	0	0	1
Salivary Gland (Parotid/ Submandibular)	1	0	1	0	0	0	0	0	0	0	0	0	2
Thyroid	1	3	3	1	2	4	1	3	4	4	6	2	34
Tongue	2	4	2	2	2	2	2	4	4	0	7	4	35
Grand Total	**17**	**22**	**23**	**11**	**20**	**19**	**17**	**18**	**16**	**15**	**24**	**19**	**221**

Organ Specific Surgery Details (New Town Campus 2022 - 2023)

Organ Name	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Grand Total
Alveolus	5	4	5	6	5	5	4	6	5	4	6	6	60
Buccal Mucosa	6	6	7	5	7	5	4	6	6	10	13	12	87
GBS	1	1	0	1	1	1	0	1	0	1	1	2	10
Larynx	1	0	1	2	1	0	0	1	0	1	0	0	7
Maxilla	0	1	0	0	1	2	0	1	0	2	1	0	8
Salivary Gland (Parotid/Submandibular)	1	0	0	1	0	1	0	0	0	1	0	1	5
Tracheostomy	4	4	4	3	6	3	3	4	4	5	4	4	48
Thyroid	2	3	3	2	1	4	2	3	4	4	5	2	35
Tongue	3	4	2	5	4	3	2	4	3	5	5	5	45
Miscellaneous	0	1	1	0	1	0	0	0	1	0	1	0	5
Grand Total	**23**	**24**	**23**	**25**	**27**	**24**	**15**	**26**	**23**	**33**	**36**	**32**	**310**

Training & Teaching

1. **(FNB) in Head & Neck Oncology:** The department was selected as one of the centres for the 2-year Fellowship of National Board (FNB) in Head & Neck Oncology under the National Board of Examination, New Delhi (NBE) for the period 2023-2027. This accreditation provided a good benchmark for the departmental clinical work and teaching as well as prestige for the Institute.

2. **Officer–in-Charge (OIC (H):** Dr Rup Kumar Saha continued his additional administrative responsibilities of OIC (H) with efficiency and enthusiasm

RESEARCH PROJECTS

1. **Ongoing Extramural Projects (co-investigator Dr. Aniruddha Dam)**
   Title: *Identification of non-invasive microRNA and proteomic biomarkers in plasma for early detection of Head and Neck Squamous Cell Carcinoma in Indian patients*
   Funding: ICMR (PI: Dr. Sankhadeep Dutta)

2. **Continuation of the study (co-investigator Dr. Aniruddha Dam)** *"Integrative multi-omics spatial characterization of oral field cancerization for better informed clinical decisions" (PI* Dr. Biswarup Basu, Dept of Neuroendocrinology, CNCI & Dr. Nidhan Kumar Biswas, Assistant Professor, NIBMG, Kalyani)

3. **Ongoing Institutional JRF Fellowship project**
   Title: *Analysis of non-coding RNA role in deregulation of key cellular pathways associated with HNSCC development*: clinical implications (PI: Dr. Sankhadeep Dutta)

4. **Observational Hospital Based Study: (co-investigator Dr. Anup Kumar Bhowmik)**
   "Outcomes of 3 year follow up with Induction Vs First Line Chemotherapy in Oral Cancer patients (PI Dr. Vilas D. Nasare)

5. **PUBLICATIONS**: NIL

Department of Gynaecological Oncology

Professor and Head of the Department: - Dr. Ranajit Kumar Mandal, MD, DNB, PGDHHM.

Team

Hazra Campus	
Dr. Manisha Vernekar, MS, DNB	**Specialist (Grade II)**
Dr. Dipanwita Banerjee, MS, DPM (Pursuing MCH gyne onco at AIIMS, New Delhi)	**Specialist (Grade II)**
Dr. Sreeya Bose, M.S, DNB	**Project Consultant (preventive oncology) and PhD trainee**
Dr. Arpita Mondal, DGO	**Medical officer**
Dr. Puja Chatterjee, M. S	**Dr. NB SS Trainee**
Dr. Arpan Deb Kanango, M. S	**Dr. NB SS Trainee**
New Town Campus	
Dr. Sunaina Wadhwa	**Specialist (Grade II)**
Dr. Ashima Mukhopadhyay, MD, DNB, DGO, MRCOG, PhD, M Sc	**Senior Resident**
Dr. Bijoy Kar, M.S, DNB	**Dr. NB SS Trainee**
Dr. Megha Nandwani, M.S, DNB	**Dr. NB SS Trainee**

Objectives of the Department

- Diagnostic work up of women with suspected gynecological cancers
- Appropriate management through surgery, chemotherapy and radiation therapy and their combinations
- Screening and early detection of Gynecological cancers
- Palliative treatment for gynecological cancer patients
- Generate trained human resources in early detection and effective management of Gynecological cancers
- To conduct research projects, trials and training workshops in the field of Gynecological Oncology.

Clinical activities of the Department

During the period between 1st April 2022 and 31st March 2023 a total of 1396 new cases were registered in the Department. During the same period a total of 1146 patients attended the OPD for follow up visits.

The total number of patients admitted under the Department for treatment were 215.

During 2022-2023 a total 168 major surgical procedures were performed in the department. The details of the procedures are given in Table 1.

Table 1: List of major surgeries in the department during 2022-2023

Surgical Procedure	Number
Ca Cervix	8
Ovarian Tumour (Borderline/Malignant)	89
Benign Ovarian Tumour	7
Ca Endometrium	32
Benign/Precancer Uterine Tumour	8
Ca Vagina	4
Ca Vulva	5
Cold Knife Conization	3
Laproscopic Surgery	8
Burst Abdomen Repair	1
Colostomy/Ileostomy for Intestinal Obstruction	2
Colostomy Reversal	1
RVF repair	0
Total	168

The total number of minor surgical procedures carried out in the Department was 1196. The details are given in Table 2.

Table 2: The list of minor surgeries in the department during 2022-2023

Procedures	No of cases
Cystoscopy	120
Hysteroscopy + D/C Endometrial Biopsy	6
D/C (Endometrial biopsy/endocervical curettage)	7
Endometrial pipelle sampling	63
Pyometra Drainage	14
Cervical Biopsy	270
LEEP (Loop Electro-surgical Excision Procedure)	64
Thermal ablation	98
Polypectomy + D/C Biopsy	18
Vulval Biopsy	25
Inguinal node biopsy	4
Wound debridement ± Secondary suturing	2
Pleural Tapping	20
Peritoneal tapping	243
Vaginal biopsy	6
Chest drain	7
Urethral biopsy	1
Colposcopy	228
Total	1196

Organ Specific Surgery Details (Hazra Campus 2022 - 2023)													
Organ Name	**Apr-22**	**May-22**	**Jun-22**	**Jul-22**	**Aug-22**	**Sep-22**	**Oct-22**	**Nov-22**	**Dec-22**	**Jan-23**	**Feb-23**	**Mar-23**	**Grand Total**
Cervix	4	2	1	3	1	0	0	0	0	0	1	2	14
Ovary	7	6	7	9	9	6	8	13	10	7	7	11	100
Uterus	4	7	3	4	1	4	3	2	5	5	2	3	43
Vulva	0	0	2	0	2	1	1	1	1	1	1	0	10
Grand Total	**15**	**15**	**13**	**16**	**13**	**11**	**12**	**16**	**16**	**13**	**11**	**16**	**167**

Organ Specific Surgery Details (New Town Campus 2022 - 2023)													
Organ Name	**Apr-22**	**May-22**	**Jun-22**	**Jul-22**	**Aug-22**	**Sep-22**	**Oct-22**	**Nov-22**	**Dec-22**	**Jan-23**	**Feb-23**	**Mar-23**	**Grand Total**
Cervix	0	0	0	5	0	0	0	1	1	2	0	3	12
Ovary	1	2	7	3	1	7	3	5	6	5	4	8	52
Uterus	0	0	3	3	4	4	0	10	2	0	2	4	32
Vulva	1	0	0	1	0	1	1	0	0	2	0	0	6
Grand Total	**2**	**2**	**10**	**12**	**5**	**12**	**4**	**16**	**9**	**9**	**6**	**15**	**102**

Departmental Academic work

- Multidisciplinary tumour board (MDT): conducting weekly MDT in presence of medical oncologists, Radiologists, Radiation oncologists, Pathologists, Palliative care specialists, to discuss different gynecological oncology cases and decision for further management. The data is entered in Redcap software and also discussion done using Redcap. The recommendation and decision are maintained in the software which can be access anytime.
- Grand rounds discussion done weekly regarding the admitted ward patients. The discussions done like course of hospitalization, need for any recommendation and further treatment etc.
- Data maintenance of morbidity and mortality data as per ESGO ovarian cancer operative report, surgical list, surgical photo documentation, any rare cases, cancer related specific complications and its outcome, cancer survivor records, etc
- DNB SS teaching courses has been started for the year 2022-2023 with joining of four PDT students for Dr NB SS (Gynecological oncology). Regular lecture classes, presentations and journal clubs are conducted by the department with involvement of consultants from various departments including medical oncology, radiation oncology, onco-pathology and radiodiagnosis.
- Genetic counselling and testing for hereditary ovarian and breast cancers
- During this Covid 19 pandemic, we have generated departmental email (gynonco@gmail.com) for our patients for regular follow up with reports and also telephonic consultation if required.

Training workshops

1. DNB trainees of broad and super specialties of Gynaecology, Radiotherapy and Surgical Oncology are trained by means of regular seminars, bedside lectures
2. Colposcopy workshops held at CNCI in collaboration with West Bengal Government for master training of various Gynecologists from the state Government service

Date of workshop	Number of patients treated
29-04-22	9
30-04-22	11
11-08-22	12
12-08-22	8
23-08-22	9
24-08-22	14

3. Cervical cancer screening camp along with awareness programme on 8th March 2023 with collaboration of BOGS. Around 65 patients were screened for the cervical cancer.

Research activities in the department

Community Based Cervical Cancer Screening Programs of the Department

Integrated project on Non communicable diseases (IPNCD) (Principal Investigator: Dr. Ranajit Mandal)

1. The project started in May, 2017 to assess the feasibility of a comprehensive non communicable diseases screening approach for women in collaboration with International Agency for Research on Cancer, WHO that includes cervical screening on self-collected vaginal samples. Despite of increasing trend of Covid 19 pandemic and lockdown period, the cancer screening was being continued in different districts in collaboration with various NGOs of the locality. The vaginal smear was obtained by self-sampling by the women themselves. Between April 2022 to March 2023, total 6917 women aged between 30-60 years have been recruited in this project of which 305 women screened positive with HC2. Out of the screen positive women, 228 underwent Colposcopy examination by Artificial Intelligence in the hospital followed by treatment using thermal ablation (98 cases), LEEP (64 cases).

2. **Feasibility and Acceptability of two dose quadrivalent Human papillomavirus vaccine for adolescent girls in rural parts of West Bengal- A pilot study (Principal Investigator- Dr. Dipanwita Banerjee)**

   The HPV vaccination project started in July, 2017 in association with Rotary International Initiative is a community-based HPV vaccine project. The project is the first community-based demonstration project in eastern India to assess the feasibility and acceptability of two dose HPV vaccination in rural population of West Bengal. Total 1664 girls between 9-14 years were recruited in this project (Phase 1 and Phase 2) and received their two-dose vaccination till February, 2021. No serious adverse effects were reported.

Later, the project was continued from 31/10/2021-25/3/2022 with total 953 vaccination done and 89 second dose completion. No side effects reported.

3. A Phase-II/III, Partially Double-blind, Randomized, Active-controlled, Multi-centric Study to Assess the Immunogenicity and Safety of SIIPL's qHPV Vaccine administered Intramuscularly in Healthy Volunteers according to a Two-dose Schedule to Cohort 1 (Girls and Boys Aged 9-14 years) and a Three-dose Schedule to Cohort 2 (Females and Males Aged 15-26 years) as Compared to Merck's HPV6/11/16/18 vaccine (Gardasil®)

4. INTERLACE multicentric RCT (GCIG-CCRN) in cervical cancer. Total 6 patients recruited. All the patients are on follow up.

5. SENTICOL3: International validation study of sentinel node biopsy in early cervical cancer: A GINECO, ENGOT and GCIG study. Two patients recruited till now.
6. SAVE-CERVIX- A multicentric study in collaboration with IARC for evaluation of Artificial Intelligence image recognition in cervical screening in LMICs.

7. PRESCRIP-TEC DBT funded- A multicentric study, The Prevention and Screening Innovation Project Toward Elimination of Cervical Cancer focuses on increasing adoption of cervical cancer screening including direct treatment and follow up for women in resource poor and hard to reach settings. We recruited 1005 subjects last year through 25 camps.

8. WE-CAN- "Women Empowerment-Cancer Awareness Nexus (WE-CAN): An Implementation Research Project pivoted by the Tata Memorial Centre, Mumbai In collaboration with the Ryerson University, Canada, funded by ICMR and CIHR. The project will tentatively start recruitment from September, 2023.
9. Study of Cervical Cancer Prevention through HPV Self-Sampling and Education in India"

Total Publications – 11

Department of Medical Oncology

Head / In-Charge of the Department: - Dr. Kalyan Kusum Mukherjee (MBBS, MD, FCCM, ECMO)

Team

New Town Campus	
Name	**Designation**
Dr. Basab Bagchi , ***MD(Pathology), DM (CLINICAL HAEMATOLOGY)***	**Specialist (Grade I)**
Dr. Chandrani Mallik ***MD, MRCP (RCP, UK), MRCP (Medical Oncology)***	**Specialist (Grade I)**
Hazra Campus	
Dr. Ranti Ghosh **(*MBBS MD DNB (Radiation Oncology) ECMO)***	**Specialist (Grade II)**
Dr. Suman Paul Chowdhury ***(MBBS MD Paediatrics, FNB (Paediatrics Heamato Oncology)***	**Specialist (Grade II)**
Dr. Suman Poddar ***(MBBS DCH, DNB (Paediatrics) FNB (Paediatrics Heamato Oncology)***	**Specialist (Grade II)**
Dr. Shuvam Halder	**Medical Officer (Contractual)**

Objectives of the Department:

- To provide standard of care to paediatric cancer patients.
- Regarding strict adherence of chemo protocol, & high-risk protocols.
- Main limitations in providing standard of care are lack of man power & bed availability.
- Though we successfully run the unit during the past year, we have faced issues like, unavailability of standard medicines and inability to admit all the patients, come to us for treatment due to shortage of beds, hopefully we can serve better to a bigger patient pool once we have our new ward ready.

Treatment Summary

New Registration - **881**

Total OPD (New & Follow up) Cases – **13463**

Total No. of Patient In-Patient - **1469**

Daycare Chemotherapy (No. of Patients) - **5236**

Particulars	Daycare Chemotherapy (No. of Patients)
Apr-22	333
May-22	414
Jun-22	429
Jul-22	446
Aug-22	447
Sep-22	450
Oct-22	424
Nov-22	460
Dec-22	451
Jan-23	448
Feb-23	457
Mar-23	477
Total	**5236**

Paediatric Oncology

Objectives of the Department:

- Paediatric oncology unit is a part of the medical oncology department.
- Aim and objective of this unit is to provide safe and standard care to paediatric cancer patients.
- To provide standard of care to paediatric cancer patients.
- Regarding strict adherence of chemo protocol, & high-risk protocols.
- Main limitations in providing standard of care are lack of man power & bed availability.

Treatment Summary & Brief Description

Total OPD (New & Follow up) Cases – **396**

Total No. of Patient In-Patient - **198**

A) Chemotherapy

Acute B/T lymphoblastic leukemia

- BFM (Modified) 2022 protocol (including intrathecal chemo Rx HR block for PH + ve ALL & High dose methotrexate).

Relapse lymphoblastic leukemia

- BFM REZ 2000 Protocol (Including intrathecal chemo Rx & High dose methotrexate)

Ewing Sarcoma

- Interval compressed chemotherapy protocol

RMS & Non-RMS Soft tissue Sarcoma

- IRS- V & EPSSG Protocol
- 3 weekly VAC IRS V

Osteosarcoma

- OS – 99 Protocol for non-metastatic cases & EUROMOS Protocol T very high dose methotrexate for metastatic cases.
- EURAMOS MAP regimen (HDMTX @ 12 Gm/m^2) IV ovin 4hrs.

Other Procedures

- Lumbar puncture and intrathecal chemo Rx administration.
- Bone marrow aspiration and biopsy.

B) Attended Be SHCON 2023 as faculty, as panellist and Chairperson in various events. Collaborating with the microbiology dept. for development of antibiogram for paediatric oncology unit.

Department of Medical Physics

Head of the Department: **Prof. (Dr.) Dilip Kumar Ray,** Professor & HOD, Ph.D. (JU), M.Sc. (Gold Medalist), Dip. R.P (BARC), AERB Award.

Team- 1 (CNCI, Hazra)

Name of Faculty with Educational Qualification	Designation
Shri Dillip Kumar Misra, M.Sc., Dip.R.P (BARC)	Assistant Professor, Physicist, Radiological Safety Officer (Level-III)
Shri Atanu Kumar, M.Sc., Dip.R.P (BARC)	Assistant Professor, Physicist
Shri Rajib Das, M.Sc., Dip.R.P (BARC)	Assistant Professor, Physicist, Radiological Safety Officer (Level-III)
Shri Bijan Kumar Mohanta, M.Sc., Dip.R.P (BARC)	Assistant Professor, Physicist
Shri Subhabrata Ghosal, M.Sc., Dip.R.P (BARC)	Physicist

Team-2 (CNCI, New Town)

Mrs. Poonam Ray M.Sc., PMDMP (JU)	Consultant Medical Physicist
Mr Sudipta Mandal M.Sc., Dip. R.P. (BARC)	Medical Physicist
Mr Soumen Bera M.Sc., Dip. R.P. (BARC)	Medical Physicist
Mr Sourav Mandal M.Sc., PMDMP (JU)	Medical Physicist

Objectives of the department:

Radiation Treatment planning, accurate and precise dose delivery to patient, radiation dosimetry, dose calculation, Calibration, Quality Assurance, maintenance of the Teletherapy and Brachytherapy machines, procurement and disposal of radioactive sources and finally ensuring radiation safety for the patient, staff and public and implementation of radiation protection rules as per Atomic Energy Regulatory Board guidelines are some of the important functions of the department. The department actively involves in medical physics research, education and training of medical and paramedical courses. International standards of dosimetry are maintained by participating in international IAEA/BARC dose inter-comparison program.

CNCI, Hazra:

This department is equipped with one state of the art Dual Energy Linear accelerator (**ELEKTA Synergy**), one state of the art Low energy Linear accelerator (**Elekta Synergy Platform**) ,One newly installed state of the art Telecobalt machine (Bhabhatron- II, Taw), one Ir-192 HDR after-loading brachytherapy machine (**Integrated brachytherapy unit**) and one state of the art 16 slices CT- Simulator (**Wipro-GE**). The department is equipped with many sophisticated equipment like treatment planning systems TPS (**CMS-XIO, Monaco, Oncentra & Dos iSOFT)**, dosimeters and calibration instruments like Unidos E electrometers, 3-D RFA water

phantom (**MP3-M, PTW**), Patient specific QA like fluence analysis dosimetry system (**2D array & Octavius 4D**), Film dosimetry system etc.

CNCI, Newtown:

This department is equipped with one Ir-192 HDR after-loading brachytherapy unit (**Flexitron, Elekta**), One Brachytherapy Treatment Planning Systems (**Oncentra**), Two Linear Accelarators (**Varian True Beam SVC**), Ten EBRT Treatment Planning Systems (**Eclipse**), Eighteen Scheduling Systems (**ARIA**), Ten Contouring Systems (**Somavision**), and Two SGRT systems (**Vision RT**), One PET-CT simulator. The department is equipped with many sophisticated dosimetry equipment like One RFA (**PTW Beamscan**), Two Portal Dosimetry Systems (**AS-1200**), One fluence analysis dosimetry system (**Octavius 1500 and 1600 SRS),** Ionization Chambers, Well type Chambers, Radiation Survey meters, Pocket Dosimeters etc.

The department is actively involved in commissioning and regulatory dosimetry, data acquisition of various teletherapy machines like Telecobalt and linear accelerators. Treatment Planning and dosimetry verification of state-of-the-art radiotherapy treatment techniques like 3D conformal treatment with Multi leaf collimator (MLC), Intensity Modulated Radiation therapy (IMRT), Image guided Radiation therapy (IGRT), Volumetric Modulated Arc therapy (VMAT) and SBRT treatments. We also involve in Brachytherapy planning like ICRT, ILRT, Surface Mold and Interstitial Implants (Head and Neck, Breast etc). This department is responsible for calibration and Quality assurance of the radiation therapy machines. We are also involved in radiation protection and regulatory requirement for smooth functioning of X-Ray, Mammography and CT-Scan of Radio-diagnosis and PET-CT of Nuclear Medicine department.

Our department runs Post M.Sc. Diploma course in Medical Physics and actively involved in teaching of other courses like MD & DNB Radiotherapy, paramedical courses like DRT (Tech) and DRD (Tech) courses. This department is actively involved in research in Medical Physics also.

Departmental Achievements (from 1st April 2022 to 31st March 2023):

1. AERB license for two Varian True Beam SVC Linear Accelerators
2. Commissioning of two Varian True Beam SVC Linear Accelerators
3. Commissioning of two Surface Guided Radiotherapy (SGRT, by Vision RT) systems (First Time in Eastern India)
4. Commissioning of Respiratory Gating System by Varian
5. Regulatory Clearance from AERB for Mammo-van.

Brief description of the Clinical/Technical work done during the year (from 1st April 2022 to 31st March 2023):

a. CNCI, Hazra Campus

No of External conformal treatment planning	:	532
No of conventional treatment Calculation	:	2079
No of Brachytherapy treatment planning	:	122
No. of Brachytherapy treatment	:	366

b. CNCI, Newtown Campus

No of External conformal treatment planning	:	370
No of conventional treatment Calculation	:	33
No of Brachytherapy treatment planning	:	311
No. of Brachytherapy treatment	:	692

Quality Assurance tests, Radiation protection and e-LORA compliance as per AERB Guidelines of the following machines:

- Four Linear Accelerators,
- Fifteen 3D Treatment Planning Systems,
- Two Brachytherapy Machine,
- Two Brachytherapy Treatment Planning Systems
- One CT-Simulator
- One PET-CT simulator
- Two Mammography
- Seven X-ray machines.
- One Diagnostic CT
- Nuclear Medicine

Academic Activities:

Following academic programs are undergoing in the Department:

- Post M.Sc. Diploma course in Medical Physics in collaboration with Jadavpur University.
- Ph.D. in Medical Physics under Jadavpur University
- Teaching faculty of MD & DNB Radiotherapy.
- Teaching faculty of Ph.D. course.
- Teaching faculty of Diploma in Radio therapeutic Technology (DRT-Tech) and Diploma in Radio-diagnosis Technology (DRD-Tech).
- Internship in Medical Physics.
- Internship in DRT(Tech.)
- Clinical training of DRT (Tech) students from other institutes.

No. of candidates admitted in Post M.Sc. Diploma Course in Medical Physics : 10

No. of candidates passed Post M.Sc. Diploma Course in Medical Physics : 9

No. of Ph.D. Scholar : 2

No. of Medical Physics Interns admitted : 6

No. of candidates admitted DRT-Tech course : 5

No. of candidates passed DRT-Tech course : 3

No. of DRT (Tech) students admitted for internship : 3

Imparted clinical training to Eight (8) DRT (Tech.) trainees from various Govt. Medical Colleges of West Bengal.

DNB Thesis (Co-Guide):

1. A Thesis titled "A Prospective Comparative study between Conventional Fractionated Radiotherapy and Hypo fractionated radiotherapy by using 3-DCRT technique with

respect to toxicity & quality of life in Post-mastectomy Breast Carcinoma'' is completed by DNB student, Dr. Raka Banerjee.

2. A Thesis titled "Concurrent Chemo radiotherapy using Volumetric modulated arc therapy with simultaneous integrated boost to the involved Para Aortic Lymph Nodes in Cervical Carcinoma patients: A Prospective Observational Study'' is completed by DNB student, Dr. Subhan Riyaz Shaikh.
3. A Thesis titled "An Observational study to evaluate thyroid dosimetry and its relation with radiation induced hypothyroidism in Head and Neck cancer patients treated with conformal radiotherapy" is being done by DNB student, Dr Kushal Sen.
4. A thesis titled "A prospective observational study on correlation of Neuro-cognitive function with radiation dose to hippocampus in primary brain tumors" is being done by M.D. student, Dr. Tapas Priyaranjan.
5. A thesis titled "A prospective study on impact on Bone marrow sparing intensity modulated radiotherapy using VMAT technique in patients of locally advanced carcinoma cervix undergoing Chemo-radiation is being done by M.D. student, Dr. Chirantan Saha.
6. A thesis titled 'A Prospective Interventional study assessing the neurocognitive effect in Brain Metastasis Patients receiving Hippocampal Avoidance WBRT with Boost compared to stereotactic Radiosurgery/Fractionated Stereotactic Radiotherapy' by MD student Dr. Souvik Sankar Das.

Conference/Symposium/Workshop/Training (International/National) attended

1. Shri Atanu Kumar had attended the "5th AROI-ESTRO Gyne Teaching course: 3D Radiotherapy with a special emphasis on implementation of MRI/CT based Brachytherapy in Cervical Cancer" from 30/06/2022 to 03/07/2022 held at CIT-Suresh Neotia Centre of excellence for leadership, Kolkata.
2. Shri Bijan Kumar Mohanta had attended the "XXth Annual TMH Radiotherapy Practicum 2022" organized by Tata Memorial Hospital, Mumbai from 2nd September 2022 to 3rd September, 2022.
3. Shri Atanu Kumar had attended the "9th AROI-ESTRO Teaching Course on Advanced Technologies in Radiation Oncology" from 10/11/2022 to 13/11/2022 held at Swabhumi, Kolkata.
4. Shri Bijan Kumar Mohanta had attended the "Master course in Gynecological Brachytherapy" held at Tata Memorial Hospital, Mumbai from 8th December 2022 to 10th December, 2022.
5. Shri Atanu Kumar, Shri Rajib Das, Shri Dillip Kumar Misra and Shri Bijan Kumar Mohanta had attended the "CMPI Refresher Course in Medical Physics" from 25/03/2023 to 26/03/2023 organized by Eastern Chapter AMPI held at Apollo Multispecialty Hospitals, Kolkata

Department of Laboratory Services

PATHOLOGY (Hazra Campus)

Head of the Department: **DR SRABANTI HAJRA** (MD, SPECIALIST GRADE I)

STAFFS OF THE DEPARTMENT

NAME	DESIGNATION
Dr Saunak Mitra Mustafi MD	Specialist Grade- I
Dr Prachi Kukreja, MD	Specialist Grade- II
Dr Smita Gupta , MBBS	Medical Officer (In Charge of Blood Centre)
Dr Kaushambi Chakraborty, MD	Senior Resident
Dr.Diya Roy , MD	Senior Resident
Dr Raya Banerjee	DNB PGT
Dr.Srijita Maji	DNB PGT
Dr.Sumit Kale	DNB PGT
Dr.Shilpi Kar	DNB PGT
Dr.Aiswariya Choudhury	DNB PGT
Mr Govinda Baidya	SSA
Mr Raja Ray	SSA
Mr Bhagwan Mishra	SSA
Mr Indrajit Ghosh	JSA
Mr Somnath Mondal	SSA
Mr Pradip Bala	JSA
Mr Dinabandhu Das	SSA
Mr Jagadish Mondal	JSA
Mr Tapas Debnath	JSA
Mr Debasish Roy Chowdhury	SSA
Mr Krishanu Seth	JSA
Mrs Rakhi Das Majumder	JSA

OBJECTIVES OF THE DEPARTMENT

1. To provide precise histopathological/ cytopathological/ hematological diagnosis for different cases and to provide correct pathological staging of surgical specimen.

2. To provide biochemical, hematological and clinicopathological diagnosis/ follow- up in tumour and non- tumour cases.

3. To provide safe blood (around 3000 units) to indoor and daycare patient of CNCI both campus (Hazra and Rajarhat), Chittaranjan Seva Sadan & Sishu Sadan Hospital.

4. To run DNB pathology course, NBE, Govt. of India.

5. To pursue clinical research work in the field of tumour pathology.

HISTOPATHOLOGY - Total Cases: 2625

Serial	Tissue (Large & Small)	No. Of Cases
1.	Breast	570
2.	Oral Lesion	635
3.	Skin	37
4.	Lymph Node	97
5.	Soft- tissue	49
6.	Thyroid	45
7.	Thymus	0
8.	Lung	98
9.	Larynx	18
10.	Bone	07
11.	Stomach	81
12.	Colo-Rectal	82
13.	Pancreatico- biliary	07
14.	Omentum	15
15.	Salivary gland	32
16.	Ovary	277
17.	Uterus	78
18.	Cervix	406
19.	Kidney & urinary bladder	40
20.	Testis	11
21.	Penis	40
22.	Brain	00
TOTAL		**2625**

CYTOPATHOLOGY - Total Cases: 1121

Serial	Site	No. of Cases Guided & Superficial
1.	Breast	85
2.	Oral Lesion	52
3.	Skin	15
4.	Lymph Node	233
5.	Soft- tissue	35
6.	Thyroid	57
7.	Lung	29
8.	Bone	09
9.	GI Tract	12
10.	Pancreatico- biliary	196
11.	Salivary gland	33
12.	Ovary	45
13.	Kidney & urinary bladder	13
14.	Male genital tract	05
15.	Ascitic fluid	251
16.	Pleural fluid	33
17.	Scrape cytology	18
TOTAL		**1121**

FROZEN SECTION

- **Total Numbers of Frozen Section:- 80**

IMMUNOHISTOCHEMISTRY

We have started immunohistochemistry in our department and reported 5000 cases in last year.

REVIEW CASES

HISTOPATHOLOGY CASES	2247
CYTOPATHOLOGY CASES	666
TOTAL	**2913**

HAEMATOLOGY

The unit of haematology plays a very important role in performing routine haematological tests including TC, DC, Hemoglobin, Platelet, ESR & BT, CT. The unit has been functioning with

sophisticated automated Cell Counter (both 3 Parts and 5 Parts Cell Counters are operational).The Instruments are calibrated annually and performance is checked by running control daily. Haematology Department is performing External quality Control (EQAS) in collaboration with AIIMS Hospital, New Delhi .Beside these activities this unit is also engaged in research work in collaboration with different departments of research wing.

Haematology department is also performing Serology Screening Tests for HbSAg, HCV & HIV 1 and HIV 2 for last 2 years.

Bone Marrow Aspiration Slides (Smears) are stained in the Haematology Department after the aspiration procedure is done in Minor OT /Ward.

1	CBC	23839
2	Hemoglobin & Total count.	2292
3	BT & CT	298
4	Serology	987
5	Bone - marrow	35
6	Malaria parasite	31

- Reactive Serology: HBsAg- 07, HCV- 02, HIV- 04

BIOCHEMISTRY

The unit of clinical biochemistry plays a very important role in performing routine and special biochemical tests. The unit has been functioning with automated sophisticated instrument to perform routine biochemical and electrolyte test of patients attending indoor, outdoor and various clinic in the institute. Beside these activities this unit also engaged in research work in collaboration with different departments of research wing. Clinical biochemistry unit is performing daily internal quality control as well as external quality control (EQAS0 in collaboration with CMC Vellore.

Serial	**Type of Investigation**	**Total No.**
1	Sugar (Glucose)	17983
2	Urea	23585
3	Creatinine	23613
4	LFT (Direct Bilirubin + Alkaline phosphatase + SGOT + SGPT+ Total protein+ Albumin)	21727
11	Electolytes (sodium, potassium & chloride)	21402
12	Phosphate	1554
13	Magnesium	1618
TOTAL NO. OF TEST.		**111482**
TOTAL NO. OF PATIENT		**24224**

BLOOD CENTRE

Blood Bank CNCI attended outdoor voluntary blood donation camp for collecting blood units for the hospital. Collected blood units are processed as per blood control rule before issuing the blood to the patient.

1. Total outdoor blood donation camp attended:	35
2. Total blood collected from outdoor camp:	1667
3. In house blood collected:	141
4. Total blood collected:	1808
5. Blood supplied to the patients:	1795
6. Total number of blood units supplied:	1716
7. Blood Collected from Outside, In House Cross Matched & Issued:	258

Department of Laboratory Services

Campus- **New Town**
Head of the Department: **Dr. Sankar Sengupta**
Team

Name with Educational Qualification	Designation
Microbiology	
Dr. Sankar Sengupta, MBBS, MD	Medical Superintendent, Professor and Head of Laboratory Services
Dr. Subhranshu Mandal, MBBS, MD	Specialist Grade-II, Associate Professor
Biochemistry	
Dr. Garima Chauhan, MBBS, MD	Specialist Grade-II, Assistant Professor
Pathology	
Dr. Srabani Chakrabarti, MBBS, MD	Senior Pathologist
Dr. Dipkana Das, MBBS, MD	Specialist Grade-II Assistant Professor
Dr. Namrata Maity, MBBS, MD	Specialist Grade-II Assistant Professor
Dr. Debanjan Ghosh, MBBS, MD	Specialist Grade-II Assistant Professor
Dr. Rajarshi Aich, MBBS. DNB	Senior Resident
Dr. Sarbasish Hota, MBBS, MD	Senior Resident
Transfusion Medicine	
Dr. Rathindranath Biswas, MBBS, MD	Specialist Grade-II, Assistant Professor
Molecular Laboratory	
Dr. Chandan Mandal, PhD.	Sr. Scientific Officer

Sections of the Department:

Microbiology, Biochemistry, Haematology, Clinical Pathology, Histopathology & Cytopathology, Transfusion Medicine, Molecular Pathology

Objectives of the Department:

Different sections of disciplines of Laboratory Medicine namely:

Clinical Chemistry, Histopathology and Cytopathology, Hematology, Medical microbiology, Clinical Pathology, Immunology, Molecular diagnostics
Blood Banking are present in the department.

All sections interact effectively with allied departments by rendering services in basic and in advanced laboratory investigations. Demonstrate application of laboratory medicine techniques in a variety of clinical settings to solve diagnostic and therapeutic problems. Interact with clinical colleagues during ward round, for other investigations, if necessary, and help in comprehensive decision making in patient's management and follow up. Ensure routine conduct of External Quality Assurance Program & Internal Quality Control Programs and take corrective steps, when needed.

DEPARTMENTAL INFRASTRUCTURE

Department of Haematology & Clinical pathology:

Consists of 6-part cell counter, Flow cytometry, Coagulometer, Urine Analyzer

Department of Histopathology and Cytopathology:

Consist of Tissue processor, Auto Stainer, Microtome, Tissue Embedding Station, Automated Immunohistochemistry Processor and frozen section

Department of Microbiology, Molecular biology & Immunology

Automated state of the art microbial identification system MALDI TOF (first in the state)

Automated blood culture system, Automated Sensitivity

CLASS II A2 Biosafety cabinets, BOD incubator

RT PCR

CBNAAT

Department of Clinical Biochemistry:

Routine chemistry-Autoanalyzer

Fully automated CLIA for Hormones & Tumour Marker

Serum Protein electrophoresis.

Department of Transfusion Medicine:

We provide safe blood transfusion of all patients. Blood donor counselling, motivation and retention of every donor is integral part of voluntary non-remunerated blood donation. Voluntary blood donation, Serology reactive donor counselling and their treatment,

Donor Blood testing: Blood grouping, HIV-I & amp; II, HCV, HBV, Syphilis, Malaria, Irregular antibody screening of all donors in advanced technique. Crossmatch, DCT, ICT, Phenotyping of RBC

Blood components therapy- P.R.B.C., Platelet Concentrate, Fresh Frozen Plasma, Cryoprecipitate ANTI- Hemophilic Factor, Cryo-poor plasma,

Cellular therapy-Platelet Rich Plasma therapy

Hemostasis management through appropriate blood components therapy (Single donor platelet/platelet concentrate, Fresh Frozen Plasma/Cryoprecipitate)

Apheresis product- Single donor platelet (SDP) and Single donor plasma

Therapeutic: Therapeutic Plasma Exchange (TPE), Exchange Blood Transfusion for Neonate and Adult, Therapeutic Leucocytapheresis, Therapeutic Plateletpheresis,

Bone marrow/ Stem cell Transplantation: Bone Marrow / Peripheral stem cell collection, Stem cell preservation and Transfusion.

Special products: Leukodepleted P.R.B.C., Leucoreduced Platelet, Irradiated Cellular blood product.

Special procedure: Cryopreservation of stem cells. Rare RBC antigen cryopreservation.

Clinical activities of the Department:

Department of Transfusion Medicine and Blood Centre	
Procedure/investigation/activities	**Count**
Blood Donation	4077
Blood Donation Camp	3
Single donor platelet (Apheresis)	32
Therapeutic Phlebotomy	6
Autologous Blood Donation	2
Blood Components Preparation	
PRBC	4077
FFP	4077
RDP	3560
Blood Components Issue	
PRBC	3577
FFP	1350
RDP	2600
Blood Grouping Tube Method	5062
Antibody screen	6028
DCT	30

TTI	
HIV	4077
HCV	4077
HbSAg	4077
Syphilis	4077
Malaria Antigen	4077
Crossmatch Gel Technology	4827
Technician training and classes	72
Lecture for Doctors on Hospital Transfusion Policy	2
Nursing class on Bedside Transfusion Practice	2
Blood Donation Awareness and Motivation Program	2

DEPARTMENT OF LABORATORY SERVICES

Departmental Academic & Training Work:

1. Department of Biochemistry participating in EQAS program conducted by CMC Vellore and MHL EQAS.
2. Department of Haematology participating in EQAS program conducted by AIIMS, New Delhi & CMC Vellore.
3. Department of Microbiology participating in EQAS program conducted by IAMM, Sir Gangaram Hospital, New Delhi.
4. Department of Histopathology & Cytopathology participating in EQAS program conducted by RML, Lucknow.
5. Department have got two PGT of MD laboratory medicine through NEET PG Exam
6. Department have got 3 DMLT student from West Bengal State Medical faculty.
7. Department have got 3 MSc MLT student from RKMVERI
8. Deparment of Microbiology has trained 02 interns from various colleges around the Eastern India last year.

Collaborative Research Activities in the Department:

HPV surveillance

Surveillance for Enteric fever in India (SEFI)- Tertiary care surveillance with NICED, KOLKATA

Studies on antimicrobial resistance and molecular subtypes of gram-negative bacilli isolated from sepsis patients admitted in tertiary care hospitals in Kolkata with NICED, KOLKATA

Department of Radiation Oncology

Head of the Department: Dr. Tapas Maji, MD, DNB

Team:

Name	Designation
Medical Faculty	
Dr. Tapas Maji, MD, DNB	Professor and Specialist Grade I (SAG) & Head, Department of Radiation Oncology
Dr. Debarshi Lahiri, MD	Professor and Specialist Grade I, Radiation Oncology, and DNB Course Coordinator
Dr Amitabh Ray, MD, DNB	Associate Professor and Specialist Grade I, Radiation Oncology
Dr. Sayan Kundu, MD, DNB	Assistant Professor and Specialist Grade II, Radiation Oncology
Dr. Koustav Mazumder, DMRT, MD, DNB	Assistant Professor and Specialist Grade II, Radiation Oncology
Dr. Palas De, MD, DNB	Assistant Professor and Specialist Grade II, Radiation Oncology
Dr. Bodhisattwa Dutta, MD	Assistant Professor and Specialist Grade II, Radiation Oncology
Physics Faculty	
Dr. Dilip Kumar Ray, M.Sc. (Gold Medalist), Ph.D (JU), Dip.R.P (BARC), AERB Award	Head, Dept. Of Medical Physics Physicist
Shri Dillip Kumar Misra, M.Sc., Dip.R.P (BARC)	Physicist Radiological Safety Officer
Shri Atanu Kumar, M.Sc., Dip.R.P (BARC)	Physicist
Shri Rajib Das, M.Sc., Dip.R.P (BARC)	Physicist Radiological Safety Officer
Shri Bijan Kumar Mohanta, M.Sc., Dip.R.P (BARC)	Physicist
Mrs. Poonam Ray M.Sc., PMDMP (JU)	Physicist
Mr. Sudipta Mandal M.Sc., Dip.R.P. (BARC)	Physicist
Mr. Soumen Bera M.Sc., Dip.R.P. (BARC)	Physicist
Mr. Sourav Mandal M.Sc., PMDMP (JU)	Physicist
Shri Subhabrata Ghosal M.Sc., Dip. R.P. (BARC)	Physicist

Senior Residents	
Dr. Arya R M, DNB	Senior Resident
Dr. Bitan Pramanik, DNB	Senior Resident
Dr. Rishav Raj, DNB	Senior Resident
Dr. Debjit Ghosh, MD	Senior Resident
Dr. Megha Mahawar, MD	Senior Resident

Objectives of the department:

The goal of the Department is comprehensive management of patients under the department of Radiation Oncology. This includes decision making and implementation of treatment options regarding clinical management of cancer patients including comprehensive multidisciplinary cancer care and participation in the institutional joint tumor boards followed by radiation treatment planning, evaluation, implementation and their follow-up.

The department along with the medical physics team is actively involved in delivery of different radiation modalities including radical, palliative and prophylactic treatments for various tumors.

The Department in the first campus is equipped with one state of the art Dual Energy Linear accelerator (ELEKTA Synergy) with electron beam treatment facility, one low energy (6 MV) Linear accelerator (ELEKTA Synergy platform), a newly installed state of the art Telecobalt machine (Bhabatron-II), one 16 slice CT simulator (Wipro-GE) and one Ir-192 HDR after-loading brachytherapy machine.

In the second campus, the Department is equipped with two state of the art linear accelerators (Varian TrueBeam), and one HDR Brachytherapy (FL exitron).

Description of work done from 1st April 2022 to 31st March 2023:

(1st campus + 2nd campus = total)

Total no. of Radiotherapy inpatient beds 23 + 40 = 63

Total no. of Indoor admissions 1490 + 2444 = 3934

Total no. of OPD attendance 23,320 + 1108 = 24,428

New Patients Who Have Received External Beam Conventional Radiotherapy: 767 + 0 = 767

New Patients Who Have Received External Beam Conformal Radiotherapy: 452 + 361 = 813

New Patients Who Have Received Brachytherapy: 122 + 345 = 467

Number of Daycare procedures 0 + 6536 = 6536

Number of CT-simulation: 557 + 379 = 936

Site-wise distribution of patients that have completed radiation treatment:

Site	Sub Site / Type of Cancer	Number of Patients
Skin		5
Lung		148
Breast		367
Head And Neck		354
Thyroid		6
G.I. System	Esophagus	22
	Stomach	4
	Colo Rectum	99
	Anal Canal	3
	Hepatobiliary & Pancreas	5
G.U. System	Cervix Uteri	181
	Endometrium	21
	Vulva	8
	Vagina	3
	Kidney	9
	Urinary Bladder	9
	Prostate	30
Hematological Malignancies	Lymphoma	13
	Myeloma	3
	Leukemia	6
Primary Tumours of Central Nervous System		54
Soft Tissue Sarcoma		15
Primary Bone Tumor		4
Melanoma		1
Ovary		1
Unknown Primary		5
Bone Metastases		130
Brain Metastases		22
Miscellaneous		32
Total		**1560**

Academic Activities:

Following academic programs are undergoing in the department–

a. DNB Radiotherapy affiliated to National Board of Examinations (NBE), New Delhi.
b. Diploma in Radiotherapeutic Technology (DRT-Tech) and Diploma in Radio-diagnosis Technology (DRD-Tech).
c. Internship in DRT(Tech.)
d. Clinical training of DRT (Tech) students from other institutes.
e. Teaching faculty of Post M.Sc. Diploma course in Medical Physics.
f. Internship in Medical Physics**.**

Theses and Publications:

1. A thesis titled "A prospective comparative study between conventional fractionated radiotherapy and hypo fractionated radiotherapy by using 3D-CRT technique with respect to toxicity and quality of life in postmastectomy breast cancinoma" has been submitted by Dr. Raka Banerjee (Guide: Dr. Tapas Maji, Co- guides: Dr. Debarshi Lahiri, Dr. Dilip Kumar Ray, Mr. Bijan Kumar Mohanta) to the National Board of Examinations in Medical Sciences and has been duly accepted.
2. A thesis titled "Concurrent chemoradiotherapy using volumetric modulated arc therapy with simultaneous integrated boost to the involved para aortic lymph nodes in cervical carcinoma patients: a prospective observational study" has been submitted by Dr. Subhan Riyaz Shaikh (Guide: Dr. Debarshi Lahiri, Co-guides: Dr. Tapas Maji, Dr. Dilip Kumar Ray, Mr. Atanu Kumar) to the National Board of Examinations in Medical Sciences and has been duly accepted.
3. A thesis titled "An Observational study to evaluate thyroid dosimetry and its relation with radiation induced hypothyroidism in Head and Neck cancer patients treated with conformal radiotherapy" (Guide: Dr. Tapas Maji, Co-guides: Dr. Debarshi Lahiri, Dr. Dilip Kumar Ray, Mr. Bijan Kumar Mohanta) is being done by DNB student, Dr Kushal Sen.
4. A thesis titled "A prospective observational study on CT image based adaptive brachytherapy in locally advanced cervical cancer patients" (Guide: Dr. Debarshi Lahiri, Co-guides: Dr. Tapas Maji, Dr. Amitabh Ray, Dr. Palas De, Dr. Koustav Mazumder, Mr. Atanu Kumar) is being done by DNB student Dr. Adhiraj Dandapat.
5. A thesis titled "A prospective observational study on correlation of Neuro-cognitive function with radiation dose to hippocampus in primary brain tumors" (Guide: Dr. Tapas Maji, Co-guides: Dr. Suparna Mazumder, Dr. Debarshi Lahiri, Dr. Palas De, Mr. Bijan Kumar Mohanta) is being done by M.D. student, Dr. Tapas Priyaranjan.
6. A thesis titled "A prospective study on impact on Bone marrow sparing intensity modulated radiotherapy using VMAT technique in patients of locally advanced carcinoma cervix undergoing Chemo-radiation" (Guide: Dr. Debarshi Lahiri, Co-guide: Dr. Tapas Maji, Dr. Suparna Mazumder, Dr. Bodhisattwa Dutta, Mr. Atanu Kumar) is being done by M.D. student, Dr. Chirantan Saha.
7. A thesis titled "A prospective interventional study assessing the neurocognitive effect in brain metastasis patients receiving hippocampal avoidance WBRT with boost compared to stereotactic radiosurgery/fractionated stereotactic radiotherapy" (Guide: Dr. Amitabh Ray, Co-guides: Dr. Tapas Maji, Dr. Dilip Kumar Ray, Dr. Sayan Kundu, Dr. Koustav Mazumdar) is being done by M.D. student Dr. Souvik Sankar Das.

Other academic activities.

1) Dr. Sujan Kumar Ghosh, Dr. Neerajita Paul, Dr. Rupak Sett, and Dr. Shambodeep Chaterjee successfully passed DNB Radiotherapy from this Institute.

Department of Radiodiagnosis

Head of the Department: **Dr. Suparna Mazumdar MD, Professor & Specialist Gr. I**

TEAM

Specialist Gr-I
Dr Rohini Singh
Specialist Gr- II
Dr Surabhi Chakraborty
Contractual Radiologists
Dr. Srabanti Roychoudhury
Supporting Staff (Radiographer)
Mr. Alok Roy, Technician
Mr. Kamal Ghosh, Technician
Mr. Debapratim Das, Technician
Contractual Radiographer
Mr Samrat Chakraborty
Mr Snehashish Maity
Ms Ananya Saha
Mr Subrata Samanta
Mr Mrinal Maity

Objectives

- The department spread out between the two campuses is a vital link providing diagnostic support to all the departments in the two hospital wings, both OPD and IPD. It plays an important role in patient care services and management – both routine and emergency, of new cancer cases as well as those on follow-up by helping in early detection, diagnosis, intervention, prognosis and follow-up

- The department successfully installed all the new equipment and vigorously started radiological diagnostic services in the new second campus at Rajarhat providing essential imaging services in all the modalities including interventional procedures.

Radiography	Work Done
Fluor radiography	
C-Arm procedures	
Mammography	
Ultrasonography	
Guided Interventions	
CT scans	
MRI scans	
Portable X-ray & USG	
Review outside CT/MRI	

List of machines installed (1st & 2nd campus)

- **X-ray** – For general radiography and special procedures
  - ❖ Digital radiography-1
  - ❖ Digital Fluororadiography-1
  - ❖ Mobile digital X-ray -2
  - ❖ Computerized Radiography system -1
- **Ultrasound** (color Doppler) – 4
- **Mammography units**
  - Analogue-1
  - Digital -1
- **128 Slice CT SCAN** - 2.
- **MRI 3T with spectroscopy- 1**

C ARM (high end) – 1

New Installations at 2nd campus this year:

USG unit -1

C- ARM-1

(USG with interventions 1st)

Months	M	F	Abdo/ Pelvis	Breast	Hd/Neck/Chest	FNAC	Biopsy
Apr-22	91	219	118	64	36	80	20
May-22	75	220	98	46	48	58	20
Jun-22	96	296	138	66	53	65	31
Jul-22	82	216	117	66	38	41	24
Aug-22	98	201	106	57	31	56	10
Sep-22	83	238	113	78	50	48	32
Oct-22	72	216	118	76	46	32	14
Nov-22	71	227	122	78	37	33	8
Dec-22	70	230	120	70	30	30	10
Jan-23	83	261	96	117	46	56	10
Feb-23	50	146	64	50	46	20	14
Mar-23	71	235	95	64	70	27	36
Total	**942**	**2705**	**1305**	**832**	**531**	**546**	**229**
	6886						

Computed Tomography Scans (1st)

Months	BX/ FNAC	Patient	H/N	Bod	Total No. Of CT - Scan	Rev Out Side Plate
Apr-22	15	301	126	571	712	30
May-22	4	265	116	493	613	35
Jun-22	15	344	123	674	812	25
Jul-22	13	363	131	710	854	32
Aug-22	2	290	81	631	714	36
Sep-22	6	294	105	589	700	25
Oct-22	5	253	118	505	628	36
Nov-22	5	391	132	850	987	30
Dec-22	7	381	152	783	942	32
Jan-23	9	334	111	677	797	33
Feb-23	8	306	105	647	760	34
Mar-23	8	354	164	669	841	26
Total	**97**	**3876**	**1464**	**7799**	**9360**	**374**

X rays & Mammography (1st)

Months	M	F	CXR	Other	Special Cases	MMG
Apr-22	141	195	284	41	7	52
May-22	126	196	273	52	1	27
Jun-22	143	217	316	65	2	16
Jul-22	202	247	341	56	2	31
Aug-22	139	244	319	26	3	37
Sep-22	161	261	367	91	2	32
Oct-22	100	218	266	56	-	28
Nov-22	114	245	303	71	1	40
Dec-22	150	284	358	64	-	45
Jan-23	166	230	343	60	1	24
Feb-23	122	236	310	63	3	16
Mar-23	158	260	330	101	1	16
Total	**1722**	**2833**	**3810**	**746**	**23**	**364**
	4925					

MRI 2nd Campus

Months	Total No	1st Campus	2nd Campus
Apr-22	113	45	68
May-22	112	46	66
Jun-22	122	47	75
Jul-22	162	63	99
Aug-22	130	52	78
Sep-22	173	66	107
Oct-22	129	47	82
Nov-22	188	65	123
Dec-22	252	86	166
Jan-23	107	45	62
Feb-23	216	79	137
Mar-23	237	93	144
Total	**1941**	**734**	**1207**

Second Campus- All Cases

Cases	Nos.
CT Diagnostic	3768
CT Guided Biopsy	170
CT Guided FNAC	29
CT Plate Review	319
Interventions	69
Mammography	270
Mammography Plate Review	2
MRI Plate Review	97
USG Diagnostic	2257
USG Guided Biopsy	483
USG Guided FNAC	393
X-RAY	4624
Total	**12481**

Training Program

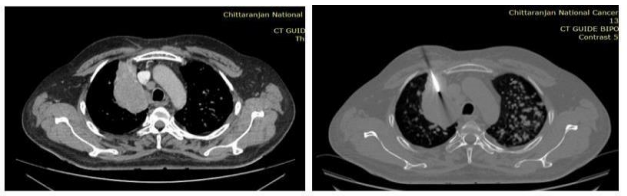
1. DNB / MD/ MCH faculty
2. PhD program faculty
3. DRD (Tech) & DRT (Tech)- these are two-year Diploma courses for paramedical training run under the aegis of West Bengal State Medical Faculty.
4. Clinical Trials: CT imaging review for, breast, lung cancers, & colorectal cancers etc for departments like medical oncology, gynae-oncology
5. Webinar and CME programs

The department performed consistently in both the campuses and maintained the rhythm of work to provide diagnostic support to patients of both outdoor and indoor.

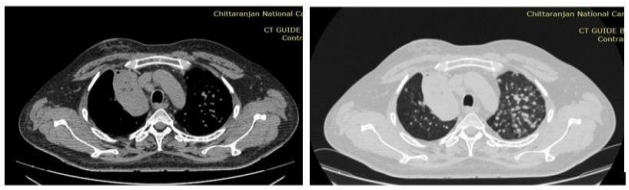
Future plans

- To start postgraduate courses in Radiodiagnosis process for which is already ongoing.

Case 1: Right upper lobe lung mass Biopsy

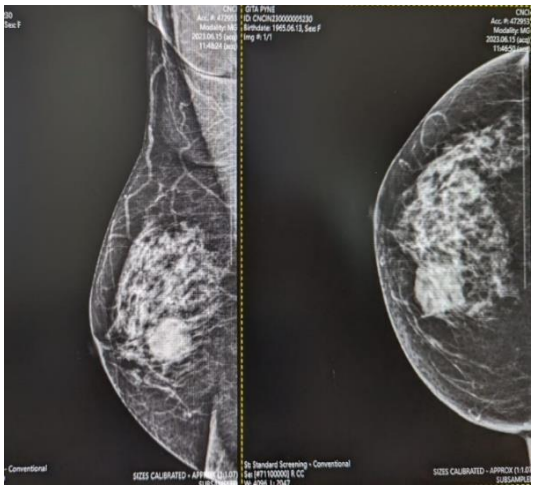


Biopsy needle

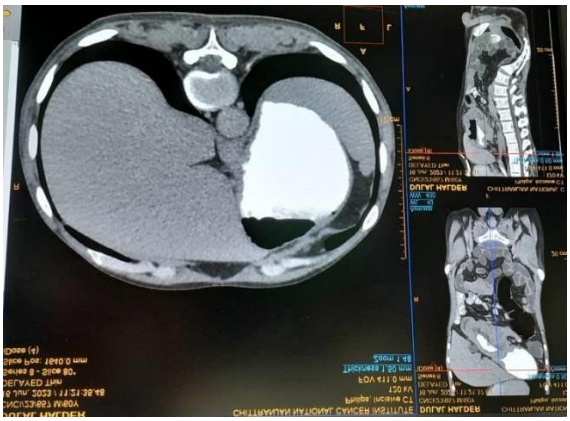


Post biopsy: No Haemorrhage from the right internal mammary artery. No pneumothorax.

Case 2. Digital Mammography



Case 3. Brain tumour MR perfusion



Case 4. Gastric cancer CECT

Department of Surgical Oncology

Head / In-Charge of the Department: DR. JAYANTA CHAKRABARTI

Team (Doctor Faculty with educational qualification)

Name	Designation
Dr. Jayanta Chakrabarti	Director and HOD of Dept. of Surgical Oncology
Hazra Campus	
Dr. Neyaz Alam, M S	Specialist Grade I
Dr. Indranil Ghosh, FRCS	CMO (SHG)
Dr. Partha Nath.	Medical Officer CMO (NFSG)
Dr. Ranveer Singh Rana	Senior Resident
Dr. Arindam Roy	Junior Resident
New Town Campus	
Dr. Durga Prasad Nanda, M S	Specialist Grade II
Dr. Sandip Swarup Mondal	Specialist Grade II
Dr. Sagar Sen	Specialist Grade II
Dr. Abhishek Gangopadhyay	Specialist Grade II
Dr. Souryadip Gupta	Specialist Grade II
Dr. Mizaan Ahmed	Medical Officer
Dr. Sandeep Sahu	DNB Resident
Dr. Imaan Rumani	DNB Resident
Dr. Arnab Adak	MCH Resident
Dr. Surya	MCH Resident

Objectives of the department:

The Department of Surgical Oncology at Chittaranjan National Cancer Institute (CNCI) in Kolkata is a renowned and specialized center for cancer treatment. The department is dedicated to providing comprehensive surgical care to patients with cancer, employing the latest advancements in surgical techniques and technologies.

The surgical oncology team at CNCI consists of highly skilled and experienced surgeons who specialize in the management of various types of cancer. They work collaboratively with other oncology disciplines, such as medical oncology and radiation oncology, to ensure a multidisciplinary approach to cancer care.

The department offers a wide range of surgical procedures for different types and stages of cancer. These include major cancer surgeries, minimally invasive procedures, organ preservation surgeries, and reconstructive surgeries. The surgeons utilize cutting-edge technologies, such as laparoscopy to perform precise and less invasive procedures, promoting faster recovery and reduced post-operative complications.

Apart from surgical interventions, the department also plays a crucial role in cancer diagnosis and staging. Surgeons collaborate with pathologists and radiologists to determine the extent of cancer spread and tailor the treatment plan accordingly. They actively participate in tumor boards and multidisciplinary meetings to discuss complex cases and develop personalized treatment strategies for each patient.

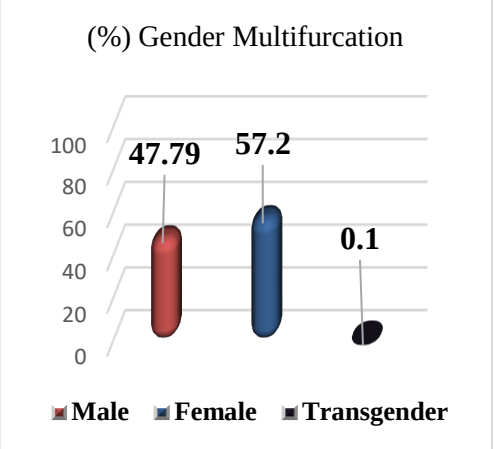
The department at CNCI emphasizes patient-centered care and ensures compassionate support throughout the cancer journey. The surgeons and staff provide comprehensive preoperative and postoperative counseling, addressing the concerns and queries of patients and their families. They strive to enhance the overall well-being of patients, promoting a holistic approach to cancer treatment.

In addition to their clinical expertise, the surgical oncology faculty at CNCI actively engages in research and academic pursuits. They contribute to the advancement of cancer surgery through clinical trials, publication of research findings, and participation in national and international conferences. This commitment to research and education enables the department to stay at the forefront of surgical innovation and deliver state-of-the-art cancer care.

Overall, the Department of Surgical Oncology at Chittaranjan National Cancer Institute, Kolkata, is a leading center for cancer surgery in the region. With its skilled surgeons, multidisciplinary approach, advanced technologies, and patient-centric care, the department continues to make significant contributions to the field of surgical oncology and improve the lives of cancer patients.

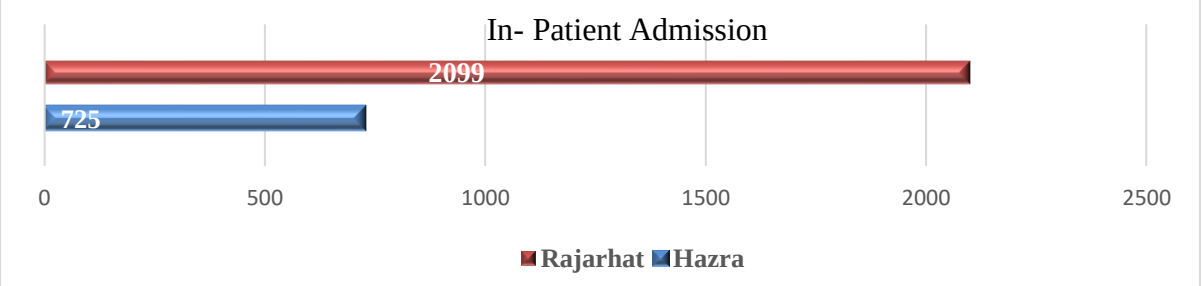
OPD Registration

Registration in Surgical Oncology at Hazra Campus *3254* & Newtown Campus *5148* Total Registration - **8402** nos. of new cancer patients registered and (13528+18248) **31,776** nos. old patients Follow up for treatment during April 2022 to March 2023.



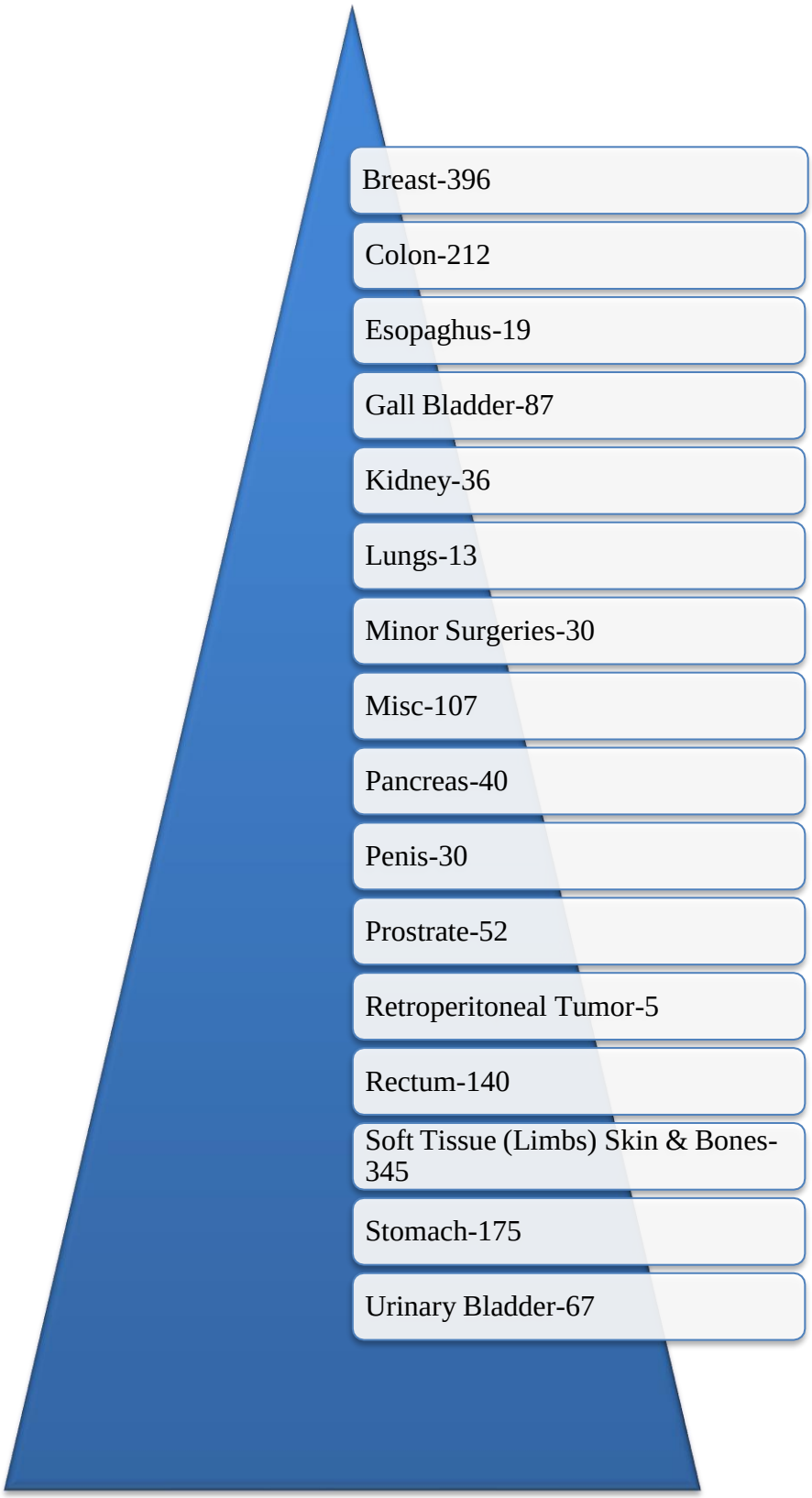
IPD Admission

Total (725+2099) **2824** number of cancer patients admitted for treatment in Surgical Oncology in both campus during 2022-2023.



SURGERY DETAILS

Surgeries at Hazra & New Town Campus - **1754**



Month wise Organ Specific Surgery Details in Hazra Campus

	Organ Name	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Grand Total
Surgery Oncology	Breast	23	13	11	15	15	18	13	13	25	24	24	19	**213**
	Colon	1	4	4	6	6	8	4	4	6	3	2	2	**50**
	Esophagus	0	0	0	2	0	1	0	0	0	1	1	0	**5**
	Gall Bladder	2	1	1	3	3	2	2	0	1	2	0	1	**18**
	Kidney	0	3	0	1	0	1	0	0	0	1	2	1	**9**
	Lungs	1	0	0	0	1	1	0	0	0	0	0	0	**3**
	Minor Surgeries	2	0	1	1	0	0	0	2	0	0	0	0	**6**
	Miscellaneous	1	1	6	4	4	2	1	0	1	5	6	6	**37**
	Pancreas	0	0	0	0	1	0	0	0	1	3	0	1	**6**
	Penis	1	1	3	2	0	0	3	1	4	1	1	2	**19**
	Prostrate	2	0	0	0	2	1	0	1	1	0	1	1	**9**
	Rectum	4	8	4	5	7	7	1	2	5	2	1	1	**47**
	Soft Tissue (Limbs) Skin & Bones	7	4	4	0	5	4	1	3	3	5	4	3	**43**
	Stomach	4	2	2	4	2	3	3	3	1	5	4	3	**36**
	Urinary Bladder	1	1	0	1	0	0	0	0	0	0	0	0	**3**
	Grand Total	**49**	**38**	**36**	**44**	**46**	**48**	**28**	**29**	**48**	**52**	**46**	**40**	**504**

Month wise Organ Specific Surgery Details in New Town Campus

	Organ Name	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Grand
Surgery	Breast	4	5	7	18	18	18	9	28	19	19	20	18	**183**
	Colon	17	3	12	19	18	16	13	21	13	7	8	15	**162**
	Esophagus	1	1	0	0	1	3	0	0	3	4	0	1	**14**
	Gall Bladder	7	2	5	4	6	9	5	7	11	4	5	4	**69**
	Kidney	2	0	1	1	2	1	1	2	4	7	5	1	**27**
	Lungs	0	0	0	3	1	2	1	0	2	0	0	1	**10**
	Minor Surgeries	1	0	1	2	4	3	2	0	1	3	4	3	**24**
	Miscellaneous	7	5	0	6	11	6	4	11	6	1	4	9	**70**
	Pancreas	0	3	2	4	6	1	1	1	4	4	5	3	**34**
	Penis	0	0	2	1	0	1	1	3	0	1	1	1	**11**
	Prostrate	1	1	1	6	7	9	1	1	3	6	5	2	**43**
	Retroperitoneal Tumor	0	0	1	0	0	0	0	3	1	0	0	0	**5**
	Rectum	8	8	5	14	12	7	9	7	5	9	4	5	**93**
	Soft Tissue (Limbs) Skin & Bones	13	13	25	27	38	24	20	24	30	32	31	25	**302**
	Stomach	5	5	10	18	17	14	7	13	16	11	13	10	**139**
	Urinary Bladder	1	2	0	5	9	3	1	7	12	13	7	4	**64**
	Grand Total	**67**	**48**	**72**	**128**	**150**	**117**	**75**	**128**	**130**	**121**	**112**	**102**	**1250**

Publication: 08

Department of Pain Palliative Care

Head of the Department - Dr. Ranajit Kumar Mandal, MD, DNB, PGDHHM, Professor [Specialist Grade I (SAG)].

Team (Faculty)

Dr. Debasish Jatua	Chief Medical Officer & In Charge Department Of Pain & Palliative Care, CNCI
Contractual Medical Officer	
Dr Soumen Pramanik	
Nursing Staff	
N/S Swati Ghosal	

Objectives of the department

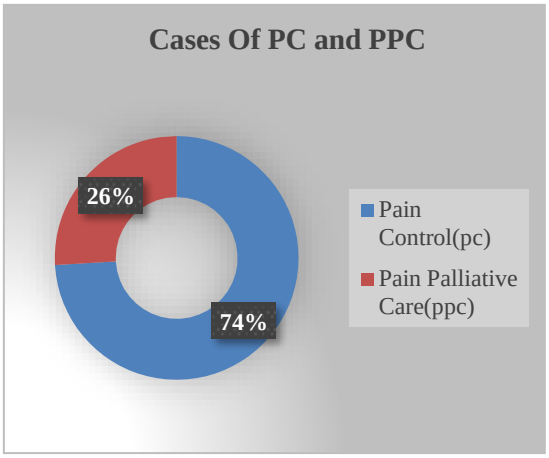
Palliative care improves the quality of life of patients and families who face life-threatening illness, by providing pain and symptom relief, spiritual and psychosocial support to from diagnosis to the end of life and bereavement. Palliative care:

1. Provides relief from pain and other distressing symptoms.
2. Affirms life and regards dying as a normal process.
3. Intends neither to hasten nor postpone death.
4. Integrates the psychological and spiritual aspects of patient care.
5. Offers a support system to help patients live as actively as possible until death.
6. Offers a support system to help the family cope with the patient's illness.
7. Uses a team approach to address the needs of patients and their families, including bereavement counseling, if indicated.
8. Will enhance quality of life, and may also positively influence the course of illness
9. Is applicable early in the course of illness, in conjunction with other therapies that are intended to prolong life, such as chemotherapy or radiation therapy, and includes those investigations needed to better understand and manage distressing clinical complications.

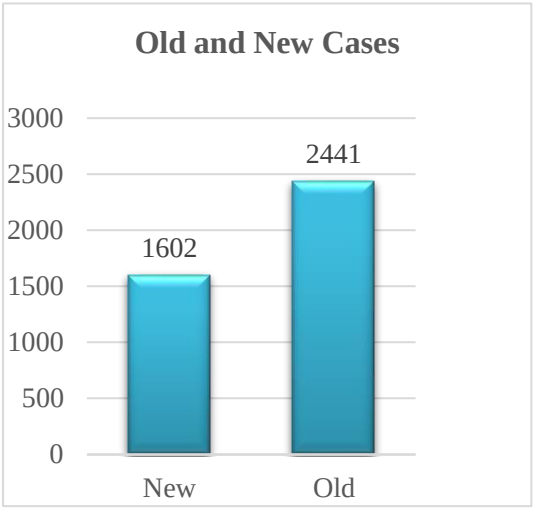
The patients experience pain often at presentation, sometimes during treatment and even during post treatments follow up as a sequential result of the treatment or as a result of treatment failure rather with the further progress of the disease. The efficient and judicious management of pain at any stage thus helps to reduce the pain and improves the QOL of the sufferer. With a well-designed target, the functioning of this Department is continued with the regular supply and distribution of Morphine tablets at free of cost and with all the supportive care (wound care, lymphedema care, psychosocial counseling, Telephonic support and home-based care) as applicable in individual patients at this Institute

Brief description of the work done

The number of new patients attending this Department is gradually increasing. In house patients are also attended on their needs. Approximately 1,49,670 tablets (2.07KG (approx.)) of Morphine [10 mg (SR & IR) & 30 mg-SR] have been supplied to the patients of this Institute during the last one year to meet the challenge of pain management effectively and adequately. Fentanyl patches (25mcg and 50 mcg) and Buprenorphine patches (10mcg) are also distributed to the needy patients free of cost,
Total number of Patients whose Physical pain(pc) were judiciously managed are 2995
Total number of patients who were provided Total palliative Care(ppc) were 1048



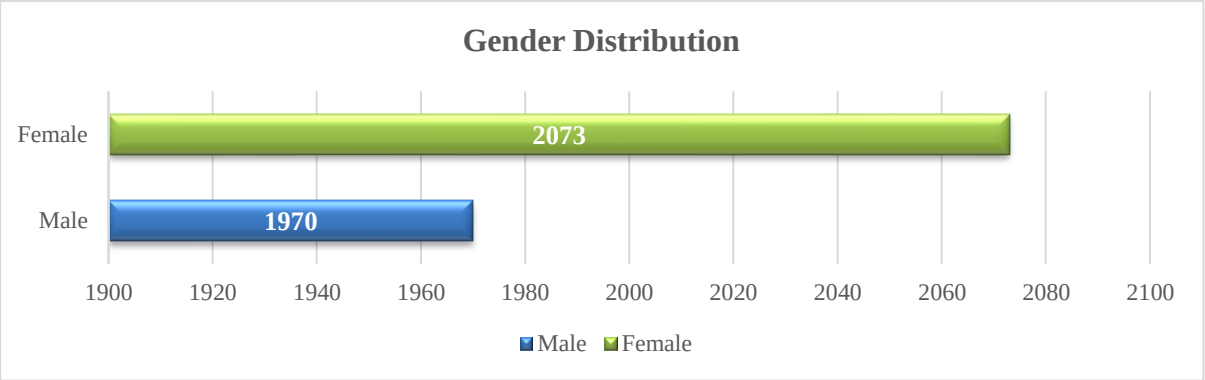
The Departmental OPD is functional 6 days/week. The Department attends to referred indoor cases as and when requested from other Departments both in OPDs & in wards. A total number of **1602** patients have been **newly registered** in the Department during the period between April' 2021 and March' 2022.The Department also have treated **2441** of **old/follow** up patients during the year. Total number of patients during the year is **4043 among which around 19 patients were** referred from other Institutions (like TMH Mumbai, TMC Kolkata, CMC Vellore, ESI Hospital, Kolkata). Total number of OPD patients seen are 4000

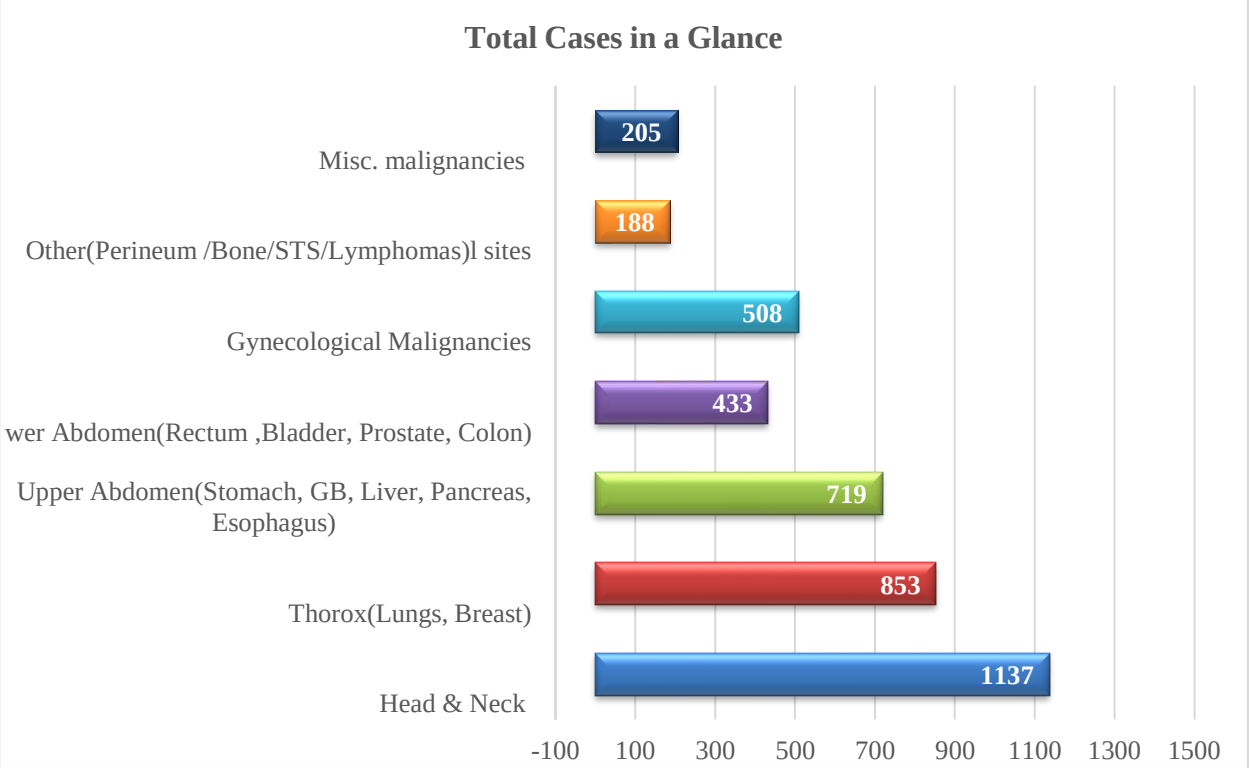


Only Tablet Morphine was supplied against proper prescription to 23 patients of CNCI, Rajarhat campus from OPD of Dept of Pain & Palliative Care, CNCI, Hazra.

The total number of patients who were provided Psychosocial ***Counseling*** *are 1008,* ***Diet Counselling*** *are 26 and* ***General physiotherapy*** *are 105*
Interventional procedures done are:
OMT-39
PERITONEAL TAPPING-19 (with support of Department of Gynecological Oncology)
URINARY CATHETERISATION-9

According to Gender and the site of malignancy the patients are tabulated as below:





Ruma Abedona Hospice, a city-based NGO has started functioning in this institute since June'2013.This NGO helps the patients of this hospital and their care givers with careful and effective counseling as and when required. With the help of this NGO, we have started with home based Palliative care services to the needy and deserving patients free of cost. This organization offers healthy dressings of the wounds of the patients under care of the Palliative care unit effectively under close supervision of the doctors.

The total home-based Palliative care services provided to the needy and deserving patients free of cost are 12 including Bereavement care for 26 families from the period of April 2022 to March 2023 around Kolkata and adjacent area, Hooghly. Approximately ***144*** *patients received* ***Lymphedema Care*** *& 1157 patients were provided comprehensive Wound care between April' 2022 and March' 2023.*

*We are getting the active support of this NGO at this institute OPD twice in a week as a routine. They are also providing the medicines to the poor patients free of cost. Around **157** patients were benefitted from such initiative. Thus, improving the QOL of the patients concerned.*

***CNCI HOSPICE**:*

On February 2022 CNCI Hospice with a capacity of 15 beds is set up in partnership with Ruma Abedona Hospice for providing Hospice & Holistic care to the patients needing End of Life Care /Respite Care/Hospice Care. between April' 2022 and March' 2023 total 205 number of persons received medical management, wound management, Lymphedema training to family caregivers, Bed sore management, Oral care, Ostomy care, Psycho-Socio-Spiritual counseling & Music Therapy at RNMCRC, Chandernagore.
An OPD support is provided at the Hospice for the people living in Hooghly District suffering from Cancer. Total 61 patients were benefitted from this.

Academics:

- *Dr Debasish Jatua gave lecture as Guest Faculty at ESI Institute of Pain Management (under WBUHS) on various aspects of Pain Management & Palliative Medicine after proper permission from Competent Authority of CNCI.*
- Training of Trainee nurses (from other Institute) & PhD fellows of CNCI about BASICS OF PALLIATIVE CARE is continued as before.
- *Clinical Rotation in Pain and Palliative care department of CNCI for fellows from ESI Institute of Pain Management under the aegis of the West Bengal University of Heath Sciences is continued in the Department.*

New Town Campus Pain Palliative Care

- Period: 01-Aug-2022 to 31-Mar-2023
- Total number of OPD patients: 354
- Total number of Interventions: 30

Team Members:

Dr Dibyadip Mukhopadhyay (Specialist Garde II, Critical Care)

Dr Soumen Pramanik (Contractual Medical Officer)

Akash Banerjee (Technician)

Distribution

Sl No.	Intervention	Number of patients
1	Coeliac Plexus Block & Neurolysis	14
2	Ganglion Impar Block & Neurolysis	6
3	Superior Hypogastric Block & Neurolysis	4
4	Stellate ganglion block	4
5	Sphenopalatine ganglion block	1
6	Abdominal Wall Block & Neurolysis	1

Department of Preventive Oncology

Team

Name	Designation
Specialists	
Dr. Ranajit Kumar Mandal, MD, DNB, PGDHHM	**Professor and Head of the Department**
Dr. Sreeya Bose MS, DNB	**Project Consultant (Preventive Oncology)**

Objectives of the Department

- Screening and early detection of Gynecological cancers
- Generate trained human resources in early detection and effective management of pre cancers.
- To conduct training workshops on cervical cancer screening and its management
- Awareness programme on cervical cancer and its management, early diagnosis, importance of HPV vaccination
- Conduct HPV vaccination programme in various districts of the state

Clinical activities of the Department

During the period between 1st April 2022 and 31st March 2023 a total of **6917** women were screened in the form of HPV DNA test and VIA (Visual Inspection with acetic acid) of in various districts of the state. Out of this, 305 women were positive for HPV test. Around 228 women underwent colposcopic evaluation. The colposcopic evaluation is given below in the table 1.

Table 1: The colposcopic findings of screened women during 2021-2022

Findings	Number of cases
Normal	**166**
Low grade lesion	**37**
High grade lesion	**23**
Invasive lesion	**1**
Inadequate	**1**
Total	**228**

During 2022-2023, all the 228 women were managed accordingly. The details of the procedures are given in Table 2.

Table 2: List of procedures during 2022-2023

Procedure	Number
Thermal ablation	**98**
LLETZ/LEEP	**64**
RT	**3**

Table 3: The report of HPE findings during 2022-2023

Procedures	No of cases
Normal	**145**
CIN I	**14**
CIN II	**4**
CIN III	**6**
Squamous cell Carcinoma	**1**
Inadequate	**2**
Not available	**11**

During the period, total 158 screening camps were conducted in 9 districts of state (24 PG (S), 24 PG (N), Purba Mednipur, Paschim Mednipur, Howrah, Kolkata, Hooghly, Bardhaman, Bankura, Nadia).

Departmental Activities

4. Colposcopy training workshops held at CNCI in collaboration with West Bengal Government for master training of various Gynecologists from the state Government service

Date of workshop	Number of patients treated
29-04-23	**9**
30-04-23	**11**
11-08-23	**12**
12-08-23	**8**
23-08-23	**9**
24-08-23	**14**

5. Cervical cancer screening camp along with awareness programme on 4th February 2023(World Cancer Day) with collaboration of BOGS. Around 65 patients were screened for the cervical cancer.
6. Screening of hospital staff and nurses along with awareness programme held on World Cancer Day.
7. Monthly departmental meetings held with the project staff to discuss upcoming project activities and progress.

Research activities in the department

Community Based Cervical Cancer Screening Programs of the Department

Integrated project on Non communicable diseases (IPNCD) (Principal Investigator: Dr. Ranajit Mandal)

8. The project started in May, 2017 to assess the feasibility of a comprehensive non communicable diseases screening approach for women in collaboration with International Agency for Research on Cancer, WHO that includes cervical screening on self-collected vaginal samples. The vaginal samples were obtained by self-sampling method. Between April 2022 to March 2023, total 6917 women aged between 30-60 years have been recruited in this project of which 305 women were screened positive with Cobas or Hybrid Capture. Out of the screen positive women, 228 underwent Colposcopic examination by Artificial Intelligence in the hospital followed by treatment using thermocoagulation (98 cases), LEEP (64 cases).

9. **Feasibility and Acceptability of two dose quadrivalent Human papillomavirus vaccine for adolescent girls in rural parts of West Bengal- A pilot study (Principal Investigator- Dr. Ranajit Mandal)**

The HPV vaccination project started in July, 2017 in association with Rotary International Initiative is a community-based HPV vaccine project. The project is the first community-based demonstration project in eastern India to assess the feasibility and acceptability of two dose HPV vaccination in rural population of West Bengal. Total 1664 girls between 9-14 years were recruited in this project (Phase 1 and Phase 2) and received their two-dose vaccination till February, 2021. No serious adverse effects were reported.
Later, the project was continued from 31/10/2021-25/3/2022 with total 953 vaccination done and 89 second dose completion. No side effects reported.

10. **SAVE-CERVIX**- A multicentric study in collaboration with IARC for evaluation of Artificial Intelligence image recognition in cervical screening in LMICs. We have recruited total 599 patients last year

11. **PRESCRIP-TEC** DBT funded- A multicentric study, The Prevention and Screening Innovation Project Toward Elimination of Cervical Cancer focuses on increasing adoption of cervical cancer screening including direct treatment and follow up for women in resource poor and hard to reach settings. We recruited 1005 subjects last year through 25 camps.

12. **WE-CAN**- "Women Empowerment-Cancer Awareness Nexus (WE-CAN): An Implementation Research Project pivoted by the Tata Memorial Centre, Mumbai in collaboration with the Ryerson University, Canada, funded by ICMR and CIHR. The project will tentatively start recruitment from September, 2023.

13. We also conducted a study in collaboration with Indian Cancer Society from August to October 2022. We have screened 1754 men and women for oral, breast and cervical cancers respectively through 21 camps held in various districts.

Publications - 02

Awareness of cervical cancer screening at the camp

World Cancer Day celebration

The Team Taking Pledge for cervical Cancer Elimination.

Colposcopy Training Workshop

Awareness of health workers and nursing staff at CNCI

Participation at National exhibition at CNCI

Screening in the Community- IPNCD Project

Department of Medical Record

In-Charge of the Department: **SANMOY CHAKRABORTY**

Team		
Name	**Designation**	**Campus**
Mukhtar Mullick	Medical Record Assistant	Hazra Campus
Mautushi Ghosh	Medical Record Assistant	
Himangshi Mandal	Medical Records and Health Information Technician	New Town Campus
Subhankar Bhuinya	Medical Record Assistant	

CNCI, being one of the regional cancer centres of Eastern India, the number of cancer patients visiting the hospital is increasing each day which has a proportional effect on the number of records stored in the Medical Record Department. Also, CNCI receives frequent requests for medical records from various researchers working in the field of cancer research in this institute. Moreover, medical records of cancer patients are unique in nature as compared to medical records of the patients of general hospitals, due to the fact that the history of previous treatments are very useful at the time of subsequent follow-ups or in case of second line treatment for recurrence of cancers and occurrence of cancer in any other primary site, which may occur due to curative treatment of the patient's previous cancer. The medical records of the patients are required to be kept till the natural death, or death due to cancer of the patients. Moreover, even after the death of the patients, records are required for the research purposes. On the contrary, most of the medical records of the patients of general hospitals are required to be kept for few days or months. Only thus, in view of treatment and cancer research, it is necessary to computerize the medical records of cancer patients. Meticulous medical record keeping directly helps in bio-statistics of National Cancer Registration not only in India but also in the world.

OBJECTIVE

1. To assess the current status of the existing facilities with respect to infrastructure components such as scan, upload, structural ability, functional work areas etc.
2. To maintain the medical records of the patients who come for their treatments to the hospital of this institute.
3. To do a Gap Analysis based on the assessment findings.
4. To provide medical records of the patients to the departments related to patients' services and research.
5. It is an official record which digitalizes the health information for improving efficiency, quality of care and it definitely reduces the costs.

6. Understanding patient perspectives for patient centred facilities through a User Perspective Study compromising of both inpatient and outpatient respondents.
7. Consultation with key clinical and support staff to understand provider perspectives on infrastructure requirements for safe and efficient functioning.
8. Enhance public service and cut down on time lags due to want of physical documents and ensure better security and confidentiality of documents.
9. Documenting all information helps mitigate the risk of malpractice. A record that has been well-maintained will be able to reduce liability concerns if a file claim is made from patient' family.

STRATEGIC HIGHLIGHTS

Paper Oriented Source

Paper records are paper-based and kept in folders, that then kept filed into a larger filing system. They can take up too much physical space, and are easier to lose or misfile.
There are two ways to organize these:

Source - Oriented Medical Records

Source-oriented records are those that are grouped together based on point of origin. The physician's notes are filed together, the nursing records kept together, medications, respiratory, lab, physical therapy are kept together as well.

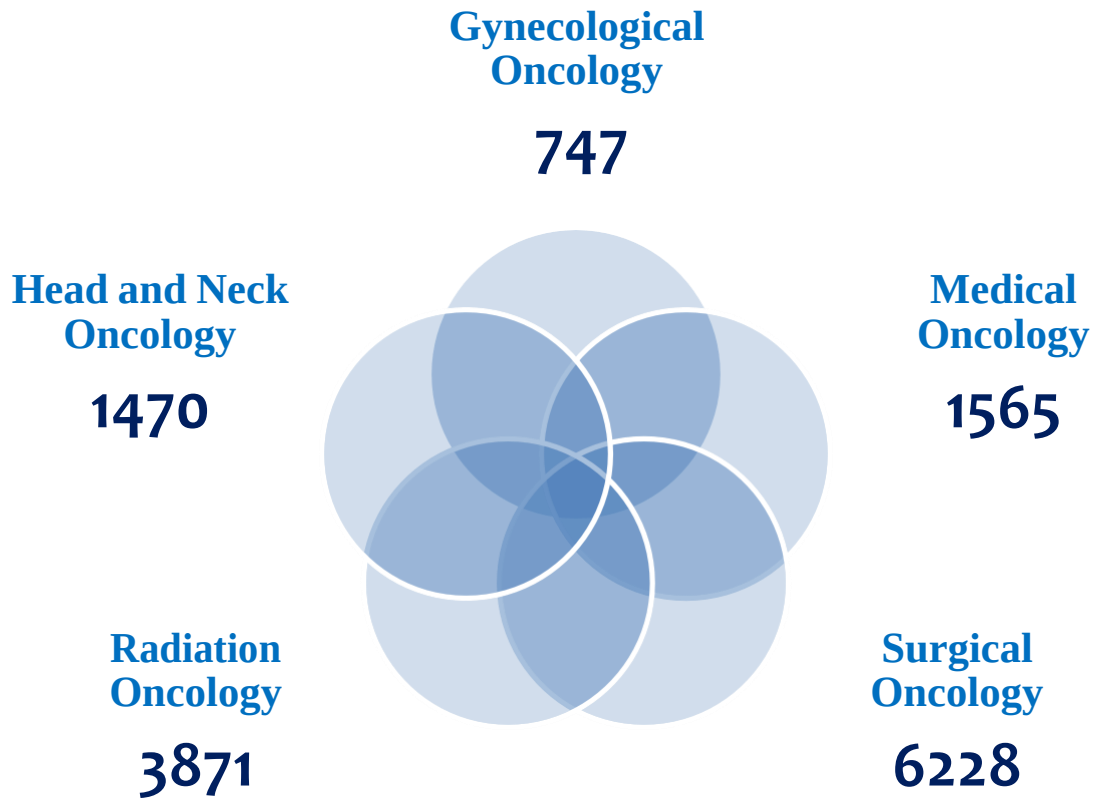
Hybrid Records

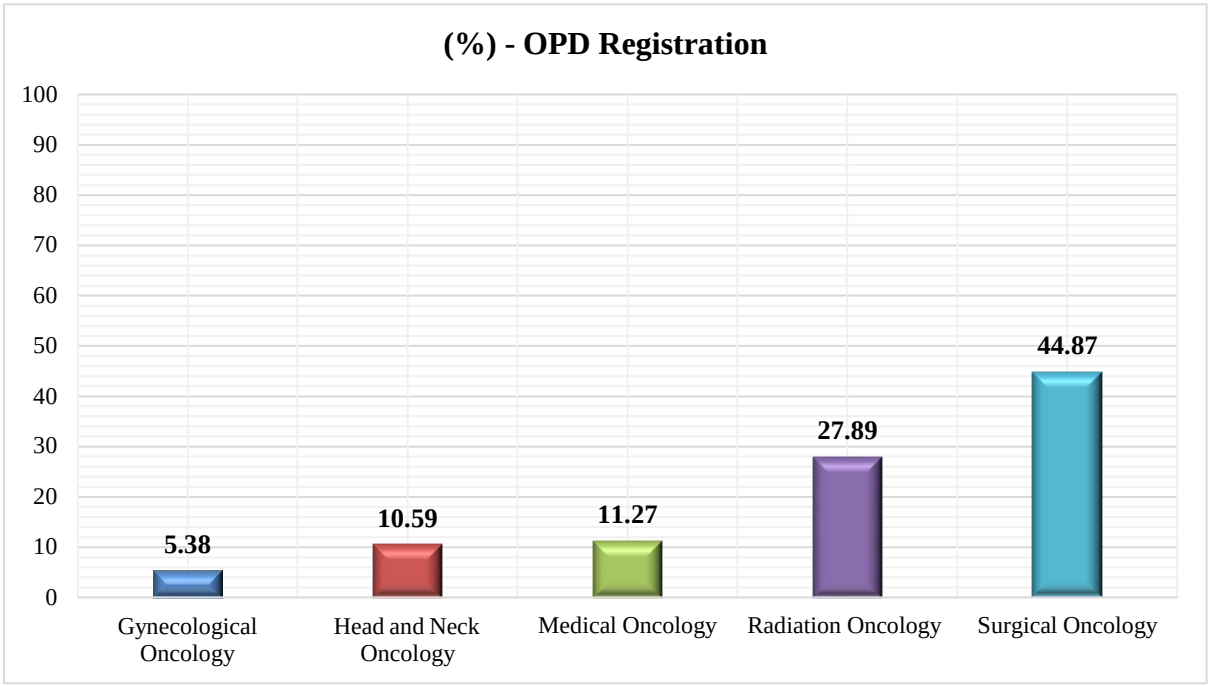
Hybrid records contain some electronically stored information, and some paper-based. Paper documents can be switched to electronic thus it is hybrid.
At this point, it's evident that there are various types of medical records in the Institute, so our Institute can manage multiple types of records while abiding by the regulations.

OPD Registration in Both Campus

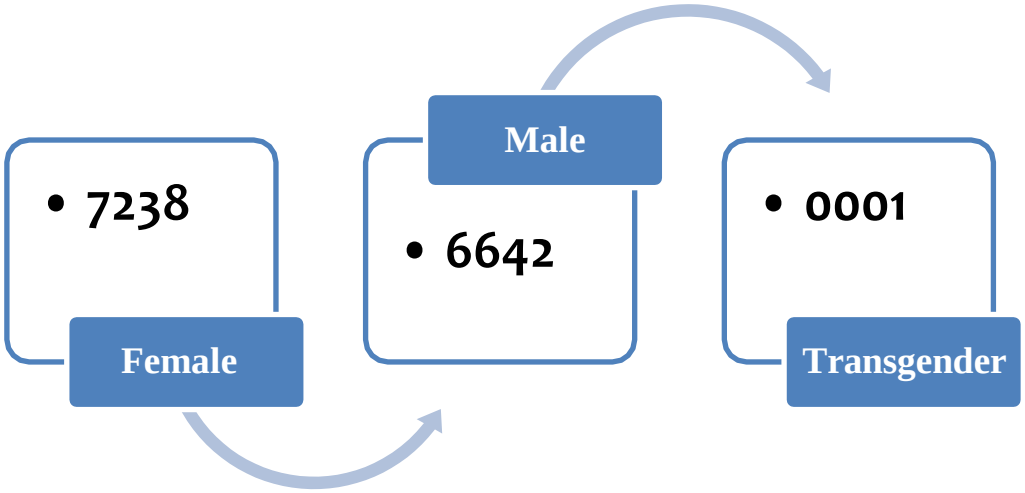
Total **13,881** nos. of new cancer patients registered and **94,371** nos. old patients Follow up for treatment during April 2022 to March 2023.

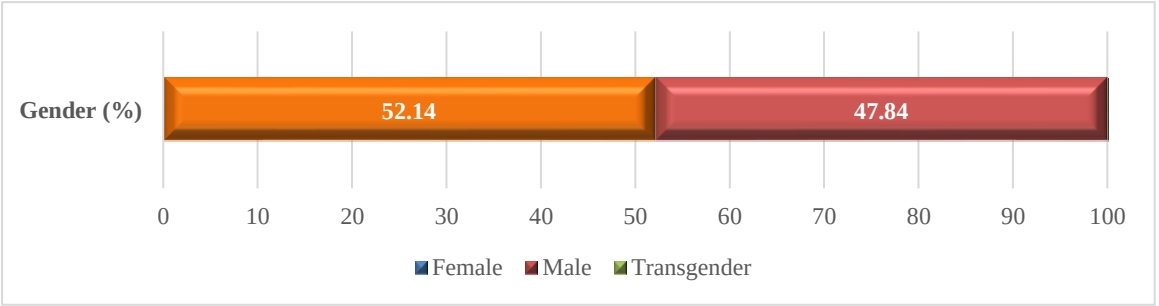
Department wise Precise of Cumulative OPD.

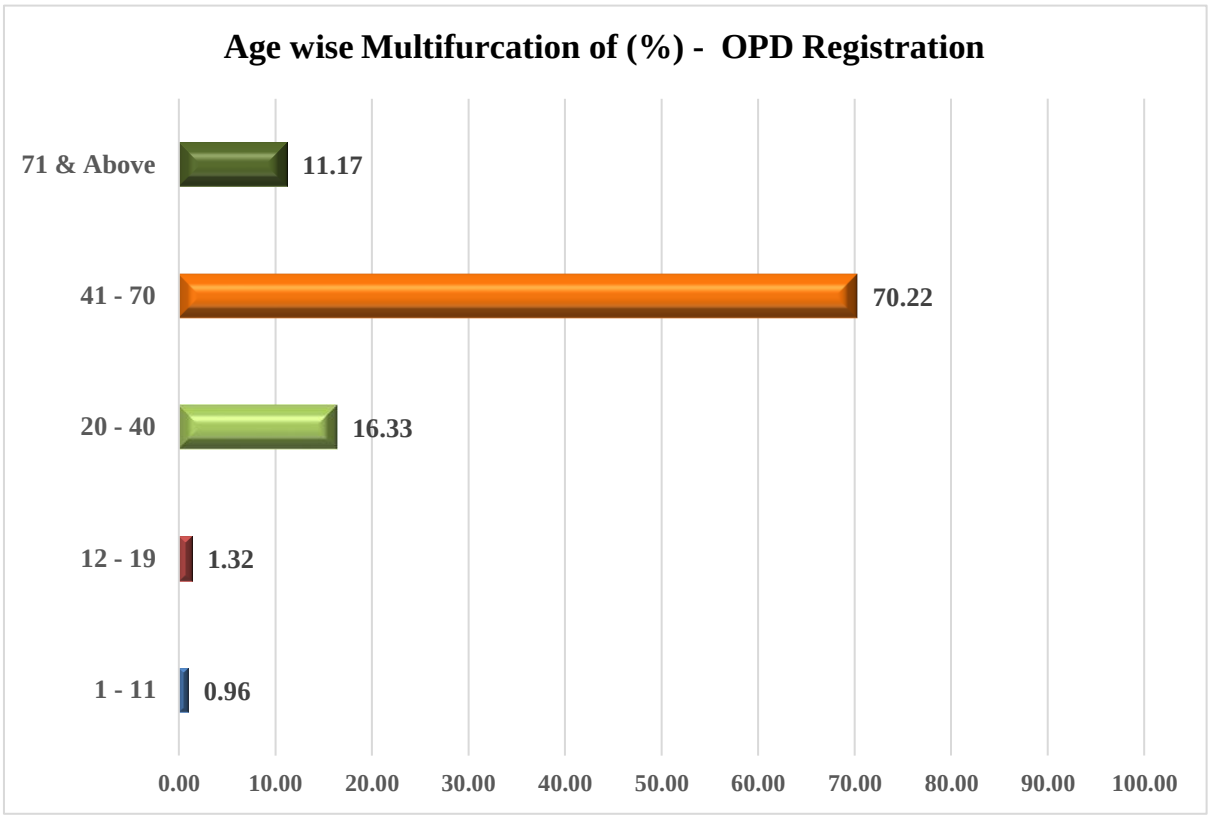


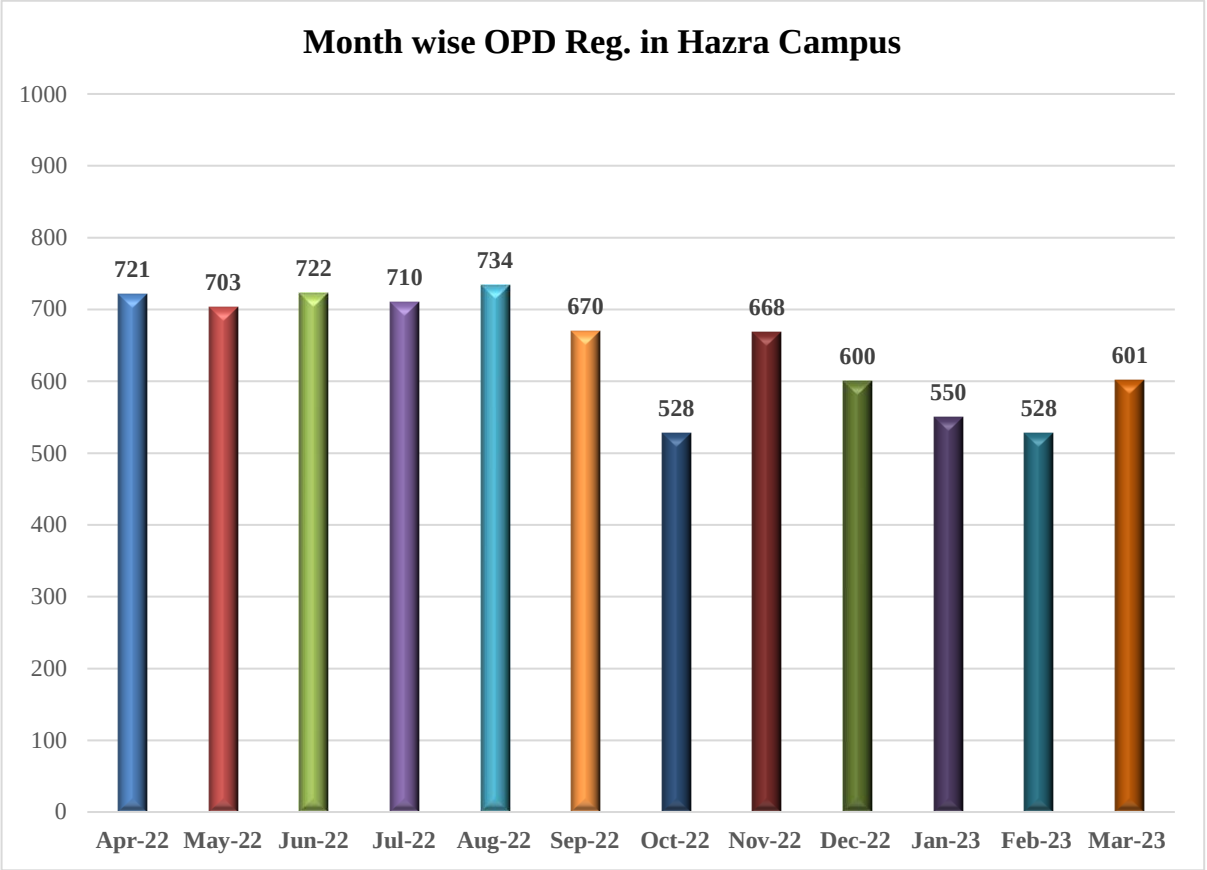


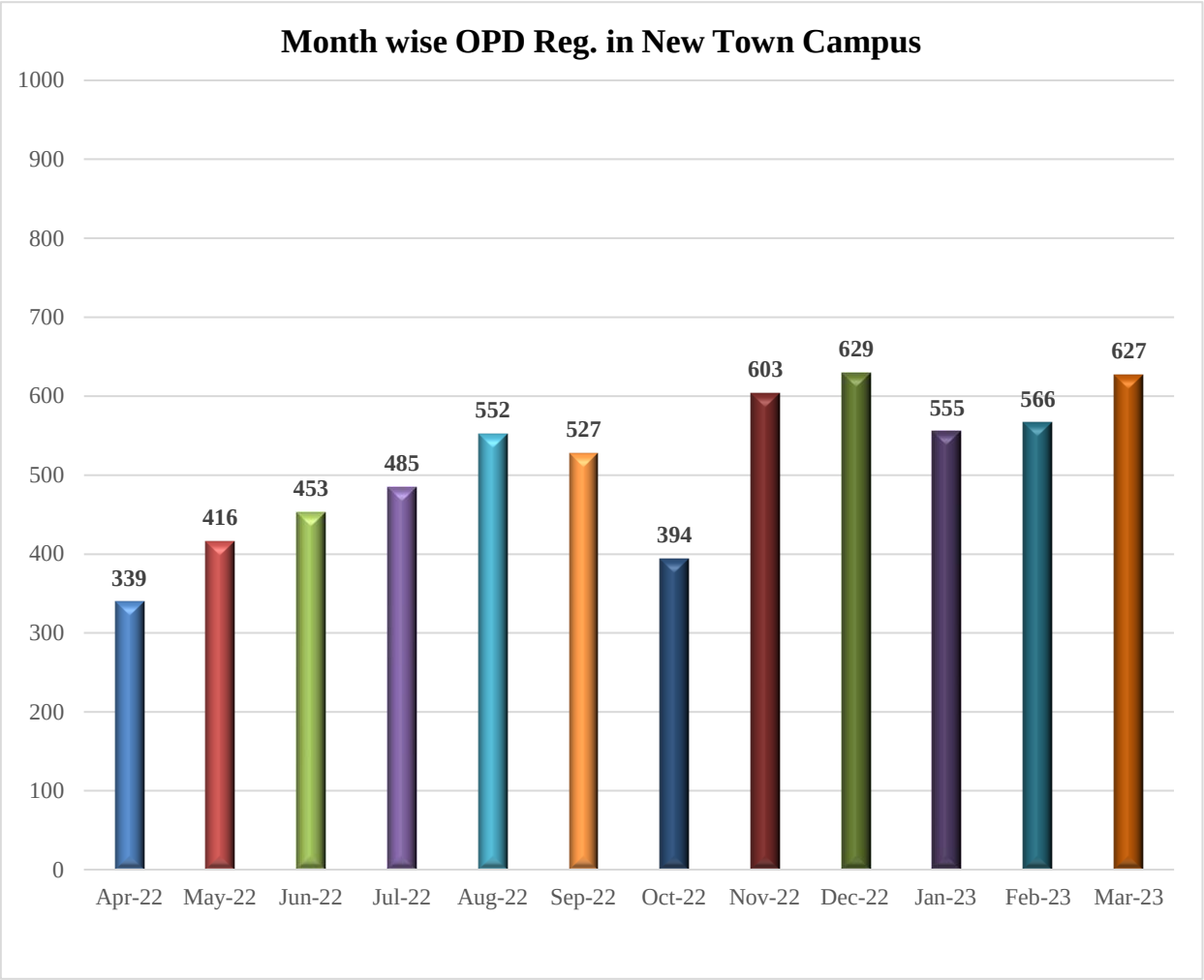
Gender Multifurcation with (%)





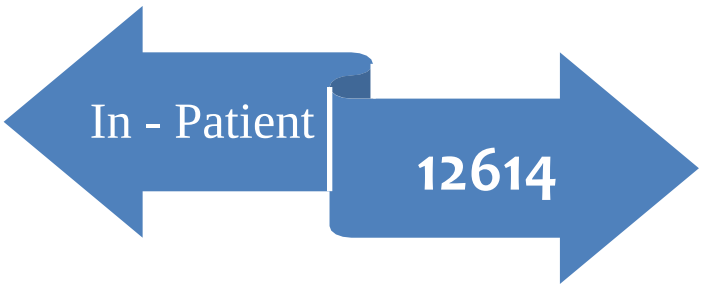

Age wise Multifurcation of (%) - OPD Registration
71 & Above
11.17
41 - 70
70.22
20 - 40
16.33
12 - 19
1.32
1 - 11
0.96
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
80.00
90.00
100.00


Month wise OPD Reg. in Hazra Campus
1000
900
800
700
600
500
400
300
200
100
0
721
703
722
710
734
670
528
668
600
550
528
601
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23

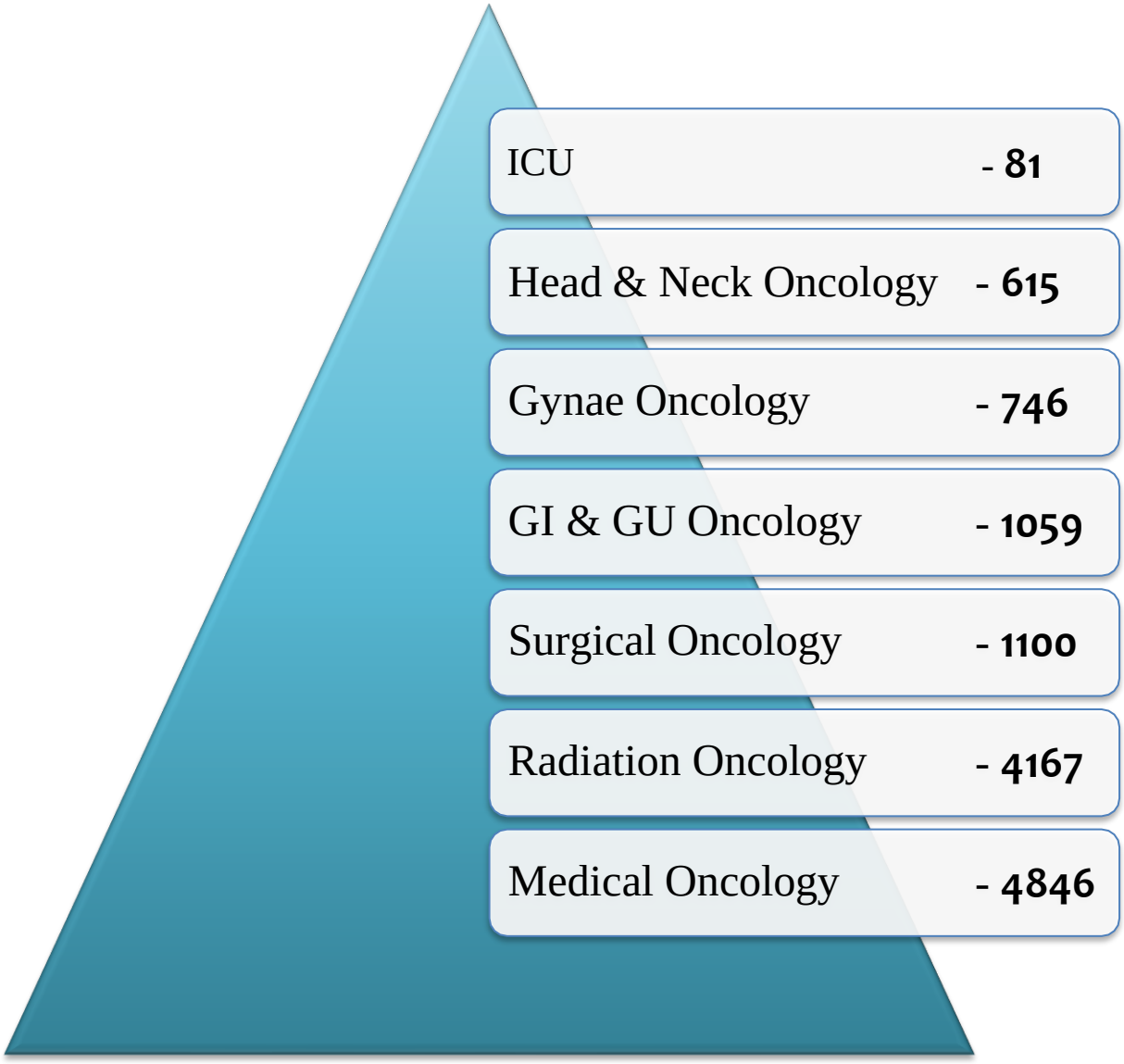


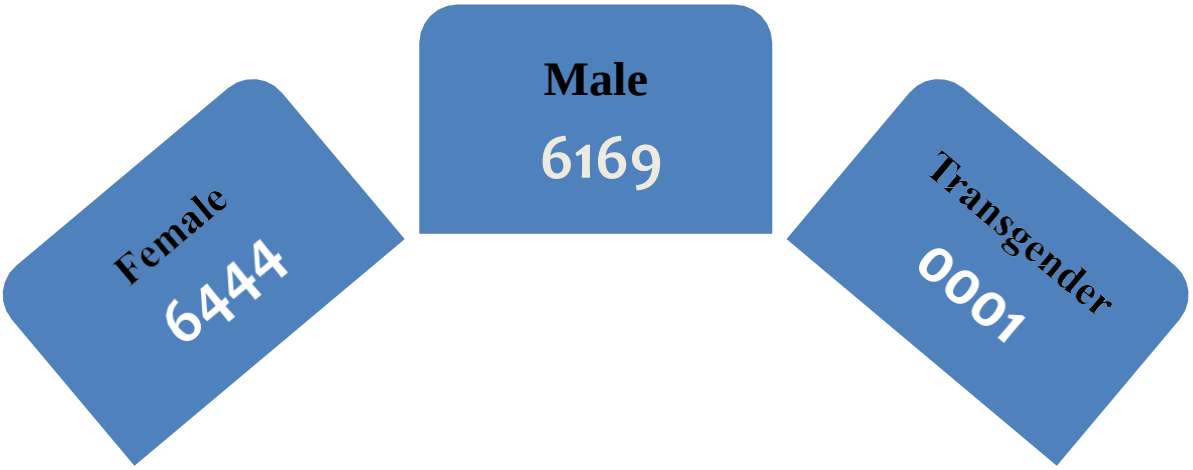
In – Patient Admission

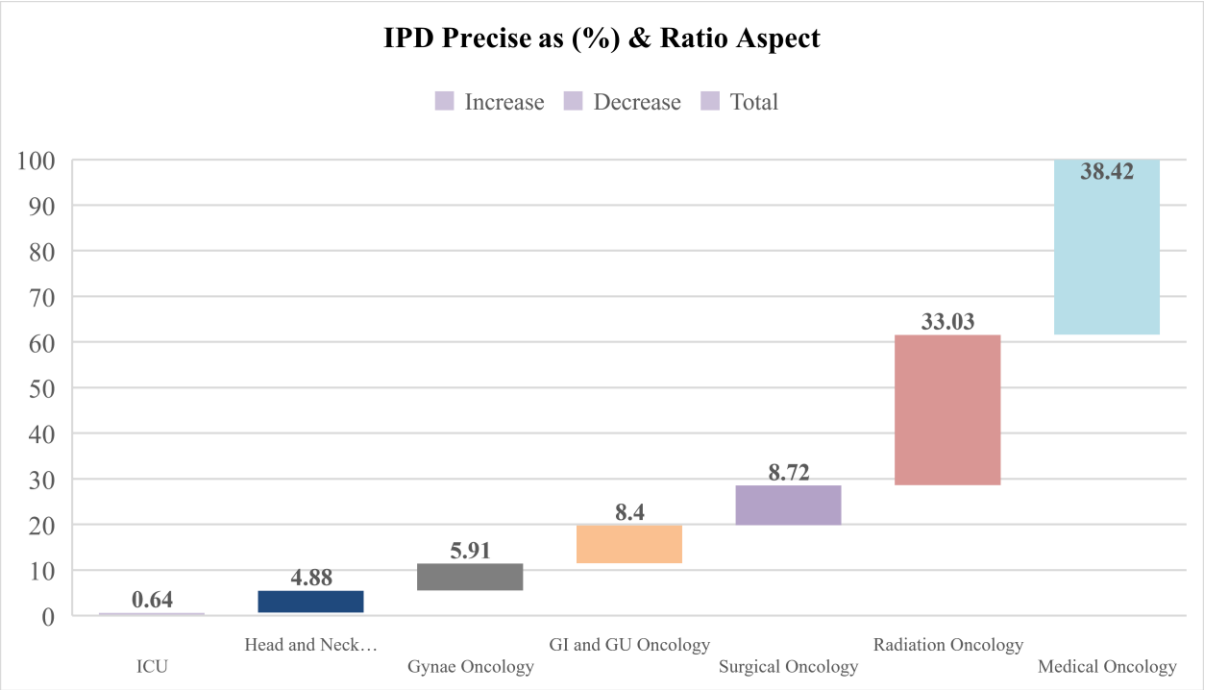
Digitization of in-patient medical records of hospital was started from 2012 for easy retrieval of records. Over one lakh of case records of patients has been scanned for future reference. Total **12614** number of cancer patients admitted for treatment in both campus during 2022-2023.



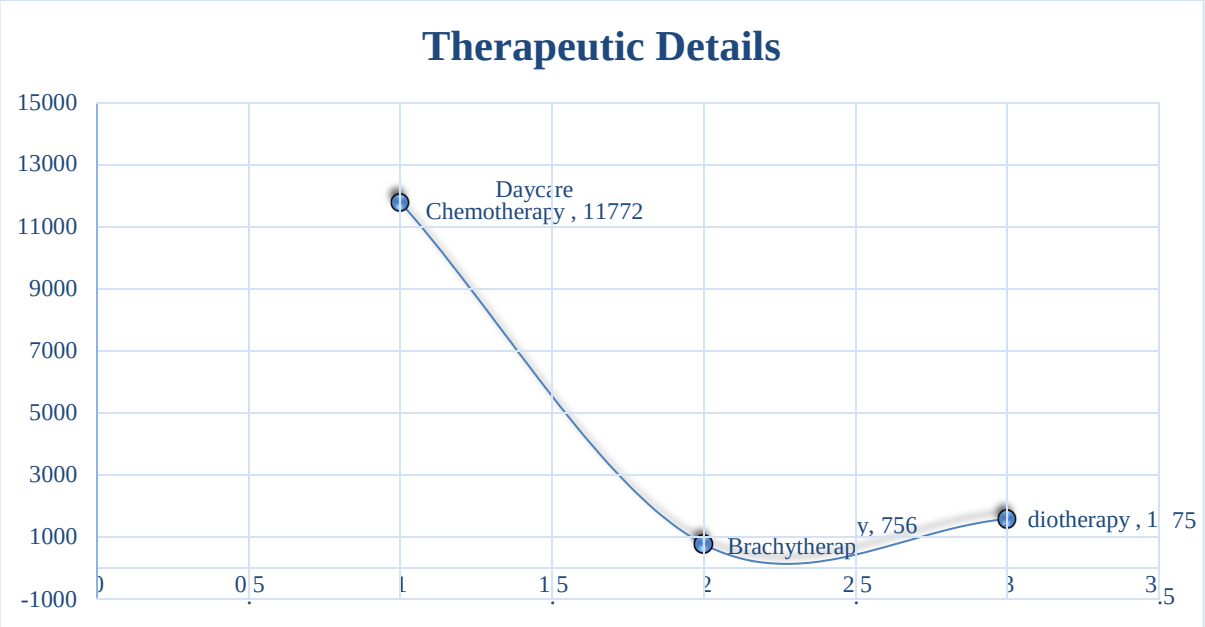
Department wise IPD Precise in a Graphical Aspect.

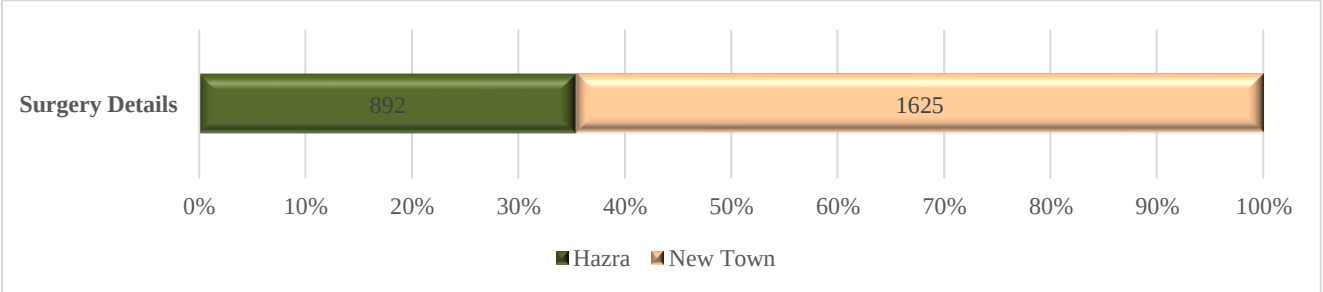


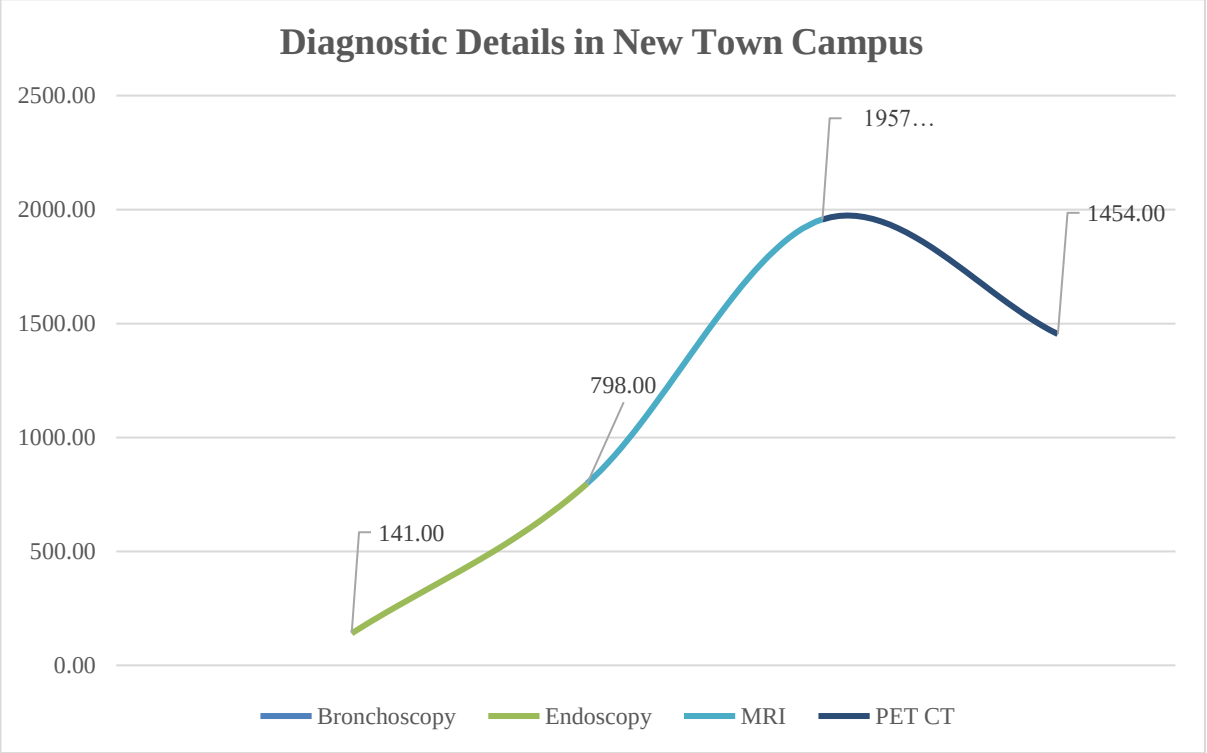




Therapy Summary

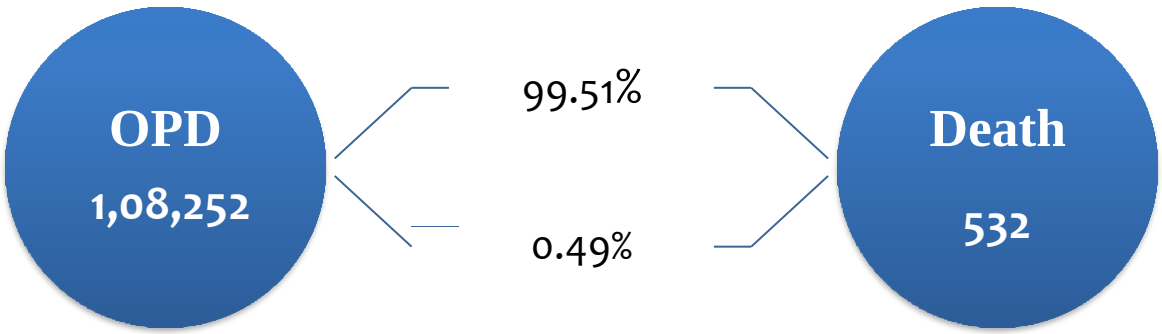






Death

Also, the data of OPD registration and consultancy against death numerical figure and percentage (%) are shown here:



Department of Nursing

Head of the Department - Smt. Mallika Mukherjee Barui B.sc (Hons) Nursing, Diploma in Oncology Nursing, Assistant Nursing Superintendent.

Members	**Designation**
Mrs. Rita Dutta	ANS (2nd Campus)
Mrs. Tanu Ghosh	ANS (2nd Campus)
Mrs. Kumkum Bhowmick	ICN
Mrs. Dalia Biswas	Nursing Sister
Mrs. Krishna Dey	Nursing Sister
Mrs. Bandana Chakroborty	Nursing Sister
Mrs. Rita Rana	Nursing Sister
Mrs. Japamala Maity	Nursing Sister
Mrs. Priya Bhattacharyya	Nursing Sister
Ms. Swati Ghosal	Nursing Sister
Mrs. Alpana Maisal	Nursing Sister
Ms. Tapati Barman	Nursing Sister
Mrs. Debjani Debangshi	Nursing Sister
Mrs. Soma Mukherjee	Nursing Sister
Mrs. Piyali Ghosh	Nursing Sister
Mrs. Kabita Maity	Nursing Sister
Mrs. Manjula Tudu	Nursing Sister
Mrs. Sandhya Das	Nursing Sister
Mrs. Kabita Bali	Nursing Sister
Mrs. Purnima Sarkar	Nursing Sister (2Nd Campus)
Mrs. Sujata Mazumder	Nursing Sister (2Nd Campus)
Mrs. Tapati Ghosh	Nursing Sister (2Nd Campus)

Staff Nurse

Number of Staff Nurse in 1st Campus	60
Number of Staff Nurse in 2nd Campus	75
Total Number of Staff Nurse	**110**

OBJECTIVES OF THE NURSING DEPARTMENT

Nursing service is an integral part of CNCI, which aims at high quality nursing care to the patients and community. The professional nurses work in an environment that encourages professionalism and expertise in providing comprehensive patient care with the members of allied disciplines in the hospital. To render high quality of nursing care in which the physical, psychological, spiritual and social needs of cancer patients are met. To carry out therapeutic measures ordered by the physician with intelligent application to the needs of the individual patient. The department of nursing provide quality nursing services to the cancer patients by preventing illness, promoting and restoring their health and in short, the role of an oncology nurse in cancer treatment is to advocate for the patient and their families and to treat the whole person, not just the cancer. Nursing department also ensures continuing nursing education to prepare quality oncology specialist nurses to improve standard and quality of nursing care for oncology patients.

The main objectives are-----

- Treating patient with honesty and respect.
- Developing good partnership between patient and the care givers.
- Alleviating pain and suffering.
- Providing clean and safe environment.
- Protecting comfort and wellbeing.
- Protecting the rights of patients as well as addressing the spiritual and cultural needs.
- Involving the staff in planning and decision making
- Efficient and effective team work
- Effective communication and understanding between the team

- Supporting staff to reach their full potential.
- Positive reinforcement and recognizing achievement at all levels in the organization.
- To Improve the Quality of Patient Care
- To Provide Palliative Care and Counselling to The Patients
- Proper Distribution of Staff by Making Duty Roster
- To Maintain Discipline and Punctuality
- To Improve Inter Departmental Coordination
- To Make Regular Round in Different Departments
- To Maintain Cleanliness of Different Departments
- To Improve the Quality of Relationship Among Workers
- To Ensure Proper Supply of Equipment's and Medicines
- Orientation And Class Arrangement for The New Nursing Staff
- To Ensure the Infection Control Icn Are Appointed.
- Arrangement Of Classes for Kayakalp Programme For Nursing Staff
- To Maintain Bmw Management Properly
- To Maintain The Records And Reports Properly
- To Arrange Meeting Among The Staff And Different Departments At Regular Interval
- Writing Of Diet Sheet, Supervision And Distribution Of Diets.
- To Arrange Classes For Post Basic Diploma In Oncology Nursing Course Students.
- To Arrange Regular In-Service Classes.

WORK DONE

- Nursing staff have worked in different departments named male word, female ward, ITU, paediatric ward, major OT, minor OT by shifting duty (morning, evening, night) and also in different OPDs such as SOPD, EOPD, GOPD, MOPD, ROPD, Brachytherapy, USG, Chemotherapy Day care and pain clinic and other departments.
- Nurses Carry out technical procedures, such as care of flaps, Naso-gastric intubation, Gastric Gavage and Lavage, care of mechanically ventilated patients, Oxygen Therapy, nebulization Dressing and Irrigation, Enema, Catheterization hot and cold applications, endotracheal and tracheostomy suction in ITU and in wards. PICC line dressing and its care are routinely done.

- Daily round by infection control nurse is taken to calculate daily occupancy of patient with different devices like urinary catheter, central line, mechanical ventilator. Regular visits to all wards and high-risk units to monitor infection control practices. Recording details of patients with healthcare associated infections. Collection of samples from different areas of the hospital for monitoring disinfection, sterilization and air quality and sending them to the lab. Compile ward wise, discipline wise and procedure wise statistics for HCAI. Monitoring and supervision of infection among hospital staff. Training of nursing aides and paramedical personnel on correct hygiene practices and techniques. **Hepatitis B** vaccination has been initiated for all nurses, doctors, paramedics, GDA and sweepers and other hospital employees.
- Post Basic Diploma in oncology nursing courses of one year duration with ten seats has been started in this institute. WBNC and INC inspection has been carried out for proper approval and sanction of the course (PBDON) and also for other VISITING INSTITUTE for sanction of their proposed courses.
- Supervision and management have been done for student nurses of various courses like G.N.M, B.sc nursing and M.sc nursing of different hospitals coming for their clinical experiences.
- Periodic and need based counselling has been done for nursing staffs, GDA, and Sweepers.
- Laundry services has been modified, laundry area renovation done, laundry committee has been formed and new format introduced for proper functioning of laundry department.
- Regular in-service classes have been arranged for nursing staffs and auxiliary staffs.
- Higher education (M.sc nursing) has been allowed for continuing education.
- Oncology nursing conference has been attended by the nursing staffs and three nursing staff has been awarded in the conference. Two of them awarded for their distinct research work carried out in December 2022 on cancer cervix screening practices among female doctors and nurses of CNCI.

RESEARCH WING

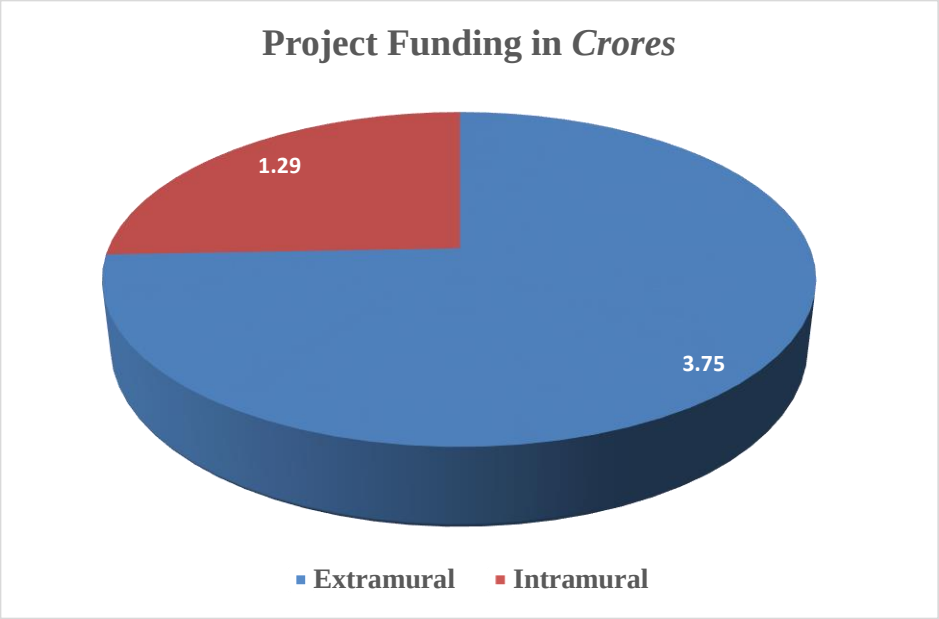
Annual Report for the year 2022-2023

RESEARCH AT A GLANCE

Scientific officers and Clinicians of this Institute are committed to numerous basic, applied, translational and clinical research projects that strive for a comprehensive understanding of cancer and attempt to achieve early diagnosis and improved survival of cancer patients. Most of these interdisciplinary projects involve collaborations both within the center and also with national international centers of academia and are supported by institutional intramural or extramural funding.

- During this year, **79 projects** were ongoing (more than five project/faculty) among those **54** projects received extramural financial support (Total ₹ **3.75** Crores) from Government agencies such as SERB, DBT, DST, ICMR, UGC etc. and **24 projects** are running by institutional intramural funds (Total ₹ **1.29** Crores). In addition, 1 project were funded by Pharmaceutical companies.

Financial Support	Project	Sponsored In Crores
Extramural	54	**3.75**
Intramural	(24+1) = 25	**1.25**



- In the year 2022, faculties of this institute were published **88 papers** in reputed international and national journals with total **~331.5** impact factor (average impactor factor ~5.7). Importance and the current relevance of CNCI research progresses was reflected and proven by extremely high number of citations (~**2040 citations for the year 2022**). Beside this research inventions also culminated into Indian patents from CNCI.
- During 2022, **Five** research fellows were awarded for PhD Degree and **24** Junior Research Fellows and **30** Senior Research Fellows in addition to **9** Post-Doctoral Fellows were doing full-time research in several departments. A large number of (**91**) Graduate and Post Graduate students from different University and Collage were trained in here in 2022 to build up future generation researchers.

Department of Anti-Cancer Drug Development & Chemotherapy

Faculty with educational qualification	
Name:	Designation:
Dr. Supratim Ghosh, Ph.D.	Senior Scientific Officer (Gr. II)
Scholars	
Ms. Oyendrila Ghosh	CSIR-Senior Research Fellow
Mr. Sougata Mondal	CSIR-Senior Research Fellow
Ms. Bidisha Maiti	UGC-Senior Research Fellow

Objectives of the department:

In continuation with our previous year's report, our current research is focused on the development of organo-metallic complexes/ compounds for advanced cancer treatment. Additionally, we are expanding our research towards the field of targeted cancer therapy and radiation therapy.

As mentioned in the previous report, we have synthesized a mercury based organo-metallic complex for the treatment of acute leukemia and a vanadium based complex for the treatment of epithelial malignancies. An Indian patent for the said mercury based complex is filed (**Application No. 201931006856; Feb, 2020**) and it is under examination. First round of examination has been done by the controller of the Indian patent office and response to their queries are submitted on March, 2023. In the year 2022-23, we tried to evaluate both the above mentioned complexes in combination with ionizing radiation for the treatment of solid tumors. Details are mentioned below.

Brief description of the work done during the year (from 1st April 2022 to 31st March 2023):

Since 2017, our primary research focus is to develop novel organo-metallic compound /complex based cytotoxic agents for advanced cancer therapy. Therapeutic potential of divalent metal ions, e.g. Hg^{2+} and Cu^{2+}, are evident from previous literatures. Utilizing those information, we have synthesized an organo-metallic complex by conjugating mercury with curcumin molecule for acute leukemia treatment. The molecular weight of the synthesized complex is ~568.565 Dalton, while the mercury content is ~34% (w/w). Therefore, mercury exposure should be within the range of WHO guideline (25.0 µg/Kg body weight per day), if the complex is applied, up-to 70.0 µg/kg body weight per day. Current therapeutics for acute leukemia are mostly cytotoxic analogues of nucleoside/s causing severe hepatocellular, cerebellar and haematopoietic toxicity in the long run. In contrast, controlled cytotoxic activity of our synthesized complex should reduce the immature blast count in the short term and induce bone marrow differentiation for the long run. On the other hand, we have also synthesized a vanadium containing organo-metallic complex for the treatment of epithelial malignancies. We are also investigating the efficacy of the above mentioned complexes in combination with ionizing radiation for localized tumor treatment.

In the previous year report, we have described synthesis and biophysical characterizations of mercury (Hg) and vanadium (V) based organo-metallic complexes. Further, the mercury-curcumin complex was characterized using HPLC, AAS, and FT-IR Spectroscopy. Cell viability assay demonstrated preferential cytotoxicity of the mercury complex against ALL cells (MOLT-4) as well as AML cells (HL-60),

comparing to healthy human peripheral blood mononuclear cells (PBMCs). The IC_{50} value of the complex on PBMCs is ~77 µM which is notably higher than IC_{50} values on MOLT-4 (~10 µM) and HL-60 (~12.5 µM); showing selective cytotoxicity against acute leukemia cells. Potential mechanism of action of our complex is investigated by cell cycle analysis; results suggested that the complex can arrest the cell cycle at the 'S' phase. Mitochondrial membrane potential assay by FACS suggested that apoptosis was induced by mitochondrial intrinsic pathway. Curcumin-mercury complex also increased intracellular reactive oxygen species (ROS) levels in HL-60 cells, as depicted in **Figure 1.vi).** Moreover, the complex also showed remarkable anti- proliferative activity on mammary adenocarcinoma cell line (MDA-MB-231) and squamous carcinoma cell line (FaDu). MTT assay demonstrated significant activity; the said complex can eradicate ~50% cells at concentration of ~1.2 µM for MDA-MB-231[**Figure 1.i)**] and ~12.5 µM for FaDu [**Figure 1.ii)**]. In case of both MDA-MB-231 [**Figure 1.iii)**] and FaDu [**Figure 1.iv)**] cells, clonogenic assay demonstrated significant inhibition of colony formation upon combined treatment of curcumin-mercury complex and ionizing radiation, comparing to the individual treatment with the complex and ionizing radiation.

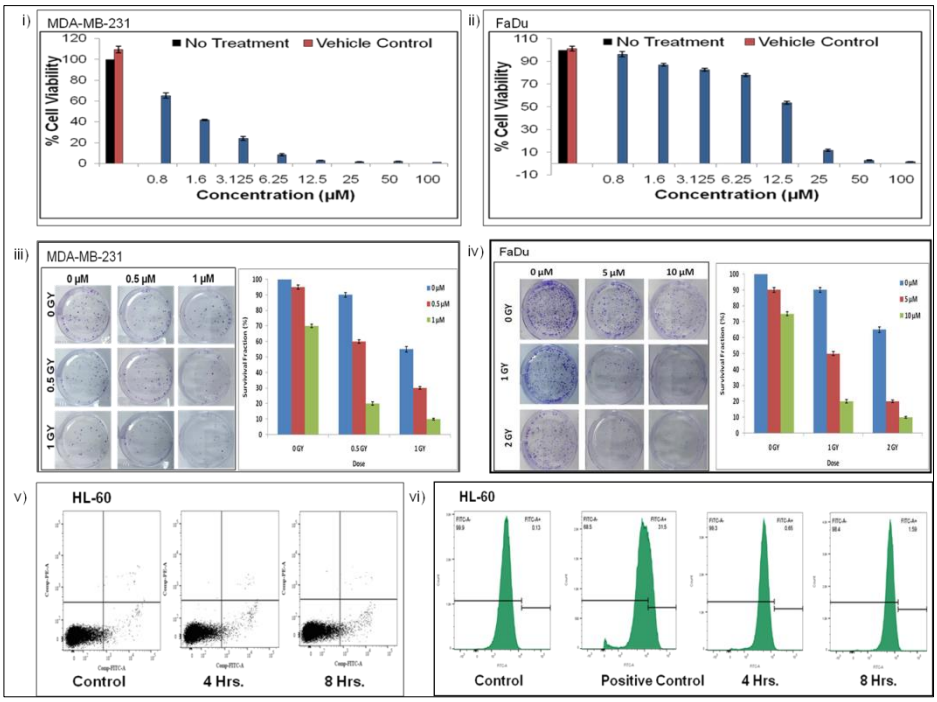


Figure 1: Cell viability assay of the synthesized mercury complex on **i)** MDA-MB-231 and **ii)** FaDu cells. Photographic and graphical representations of clonogenic assay on **iii)** MDA-MB-231 and **iv)** FaDu cells with the combined treatment of ionizing radiation and the complex. **v)** Induction of apoptosis with the treatment of the complex on HL- 60 cells. **vi)** The complex increase intracellular ROS levels in HL-60 cells.

In the other project, the synthesized vanadium complex was biophysically characterized using UV-Vis, FT-IR and HR-MS spectroscopy. UV-Vis spectroscopy [**Figure 2.i)**] showed that the characteristic peak of curcumin at 426 nm is shifted to 396 nm due to complex formation. FT-IR spectrum [**Figure 2.ii)**] of the complex showed that the intensity of the bands over the range of 1400 cm^{-1} to 600 cm^{-1} have decreased significantly most likely because of the change in stretching or bending vibrations of ν(C-C) or ν(C-H)

bonds, due to metal binding. The experimental mass of the complex showed distinct peak at ~433.32 Dalton, which is in agreement with the calculated mass of the synthesized complex, as depicted in **Figure 2.iii)**. In the previous year report, we demonstrated notable anti-proliferative activity of the complex on FaDu cells; calculated IC_{50} was ~12.5µM. Mode of cell death was analyzed using FACS, results suggested that the cell population started shifting towards early as well as late apoptosis. Effect of complex treatment on cell cycle progression by FACS analysis demonstrated that the complex could arrest the cell cycle at 'G2/M' phase. Induction of apoptosis was further investigated by analyzing mitochondrial membrane potential via flow cytometry with JC-1 staining. Result showed depolarization of mitochondrial membrane potential upon complex treatment [**Figure 2.iv)**]. Furthermore, clonogenic assay demonstrated a significant inhibition of colony formation upon combined treatment of curcumin-vanadium complex along with ionizing radiation, comparing to only complex and only radiation treatment [**Figure 2.v)**].

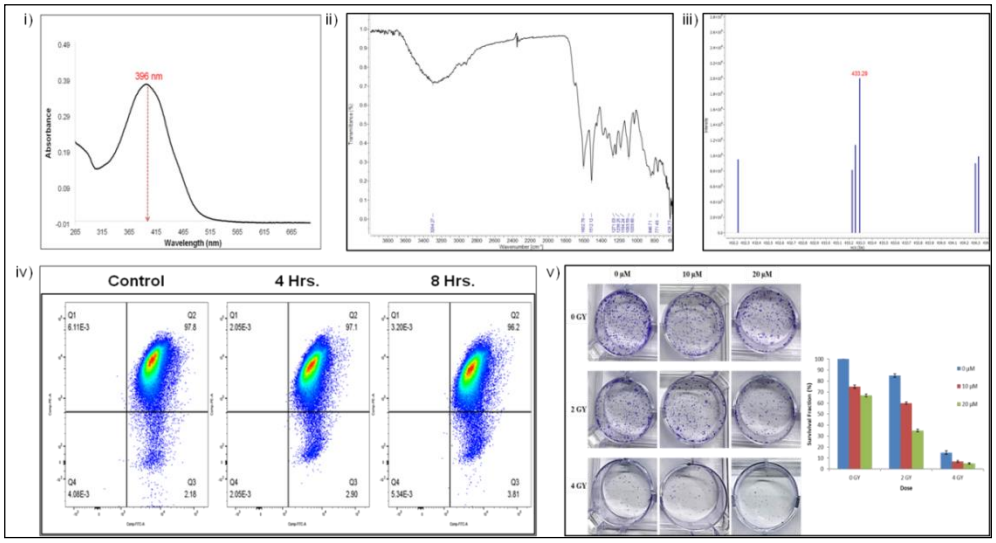


Figure 2: i) UV-Vis **ii)** FT-IR and **iii)** HR-MS spectrum of synthesized vanadium complex. **iv)** Effect of synthesized complex on mitochondrial membrane potential of FaDu cells. **v)** Photographic and graphical representation of clonogenic assay on FaDu cells with the combined treatment of ionizing radiation and curcumin-vanadium complex.

Utilizing our available resources we completed synthesis of the organometallic complexes. Structural characterizations are under progress. In future we are planning to complete the evaluation of their activity, *in vitro*, *in vivo* as well as *ex vivo*. In addition, we are also trying to synthesize novel organo-metallic complexes with different transition metals, having anti-proliferative as well as radiation sensitizing potential. We are expecting that the organic parts will provide anti-proliferative activity and sensitize the malignant cells to radiation, while metallic parts will enhance the ROS production significantly. Moreover, organic moieties should also elevate the immune system for long-term disease-free survival.

Projects running (Extramural)

P.I. : Dr. Supratim Ghosh

Title: “Development of a novel mercury based organo-metallic complex for acute leukemia treatment**”**
Funding Agency: Indian Council of Medical Research (Govt. of India)

Projects running (Internal)

P.I. : Dr. Supratim Ghosh

Title: "Development of a novel radiation sensitizer cum enhancer for localized cancer treatment"

C. No of Publications / Monographs / Patents etc. 01

D. PhD awarded:

Ms. Upasana Das was awarded Ph.D. (Science) degree in the year 2022 from the Department of Biochemistry, University of Calcutta; her thesis entitled "Development of an Advanced Class of Therapeutics for Progressive Cancer Treatment" under the supervision of Dr. Supratim Ghosh.

Department of Cancer Chemoprevention

Team

Head of the Department	**Designation**
Dr. Prosenjit Saha, M.Sc., Ph.D	Assistant Director (Grade)
Faculty	
Dr. Subhadip Hajra, M.Sc. Ph.D	Senior Scientific Officer Grade-II
Post-Doctoral Fellow	
Dr. Arijit Bhowmik	SERB- Project Associate
Research Scholars	
Mr. Souradeep Biswas	ICMR-SRF
Ms. Rituparna Ghosh	ICMR-SRF
Ms. Priya Samanta	CSIR-SRF
Ms. Rupali Sarkar	SERB-PA-I
Ms. Shampa Pakhira	CNCI-JRF
Ms. Mrinmoyee Mondal	CNCI-JRF

Who We Are

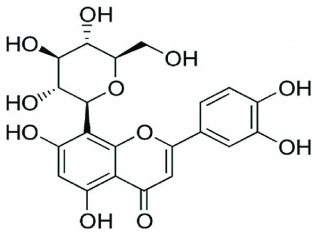
Department of Cancer Chemoprevention is focused to prevent cancer burden by using potential compound/s present in our foods/ beverage/ spices/medicinal plants which are antioxidative, anti-proliferative and can reduced the side effects of conventional therapy. These types of studies enable us to discover more effective strategies for cancer prevention as well as therapy to reduce drug resistance and recurrence as well as to improve survivability and quality of life. Our research team now focused on modulation of Cancer Stem cells by natural compound/s to restrict the recurrence of Breast, Colorectal and Penile cancer. Our Department also involved in public awareness program among poor village people to break the myth about CANCER and encourage them to visit hospital at early stage without fear.

Brief description of the work done during the year (2022-23)

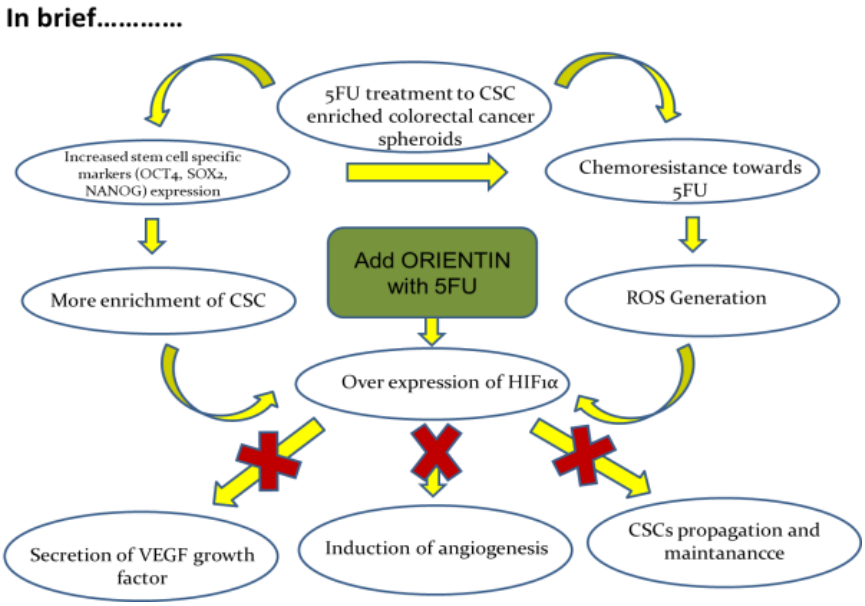
***Project 1: Use of Orientin in combination with 5-FU for targeting colorectal cancer stem cells* (Funded by ICMR & CNCI)**

Ocimum sanctum commonly known as Tulsi or Holi Basil has been used since ancient period in Indian traditional medicine. We found that hydro-alcoholic extract of Tulsi leaves has potent anti-cancer efficacy with IC50 value 124.93 µg/mL on HCT116 colon cancer cell line. AO/EtBr dual staining assay

also suggests that hydro-alcoholic extract of Tulsi leaves induces apoptosis into colon cancer cells. We identified orientin as the most active constituent of Tulsi leaves by liquid chromatography, mass spectroscopy from this leaf extract. In addition, Tulsi leaves extract significantly reduces growth and proliferation of Cancer stem cells. Besides, hydro-alcoholic extract of Tulsi leaves does not induce apoptosis on normal cell line HEK. In vivo analysis also suggests that tulsi leaf extract does not alter the ALT, AST, ALP and creatinine level in blood serum.



Tulsi Orientin



Project 2: *Exosome mediated co-delivery of orientin and 5-FU for targeting colorectal cancer stem cells involved in angiogenic progression* (Funded by SERB-CRG)

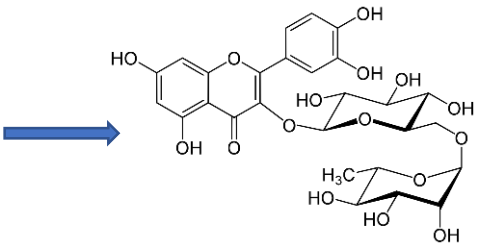
In case of spheroid culture, 5FU and orientin combinational treatment not only decreases the size compared to the control, only 5FU and only orientin treated group but also reduced the numbers. Reduced expression of cancer stem cell markers is observed in spheres which are treated with the combination of 5FU and orientin. *In silico* data is stating binding of orientin to angiogenic factor HIF1α which seems to be upregulated by 5FU treatment. However, due to *in vitro* combinatorial treatment HIF1 α expression is reduced. Along with that, downstream angiogenic regulator of HIF1α i.e.,

expression of VEGF is also reduced upon this combinatorial treatment. Combinatorial treatment of both 5FU and orientin efficiently can reduce colorectal CSC mediated angiogenic progression which is further proved by assays like HUVEC mediated angiogenic assay and CAM assay. Further, these compounds loaded in exosomes will be characterized and their anti-cancer and anti-angiogenic effects on colorectal cancer cells will be deciphered in the coming year.

Project 3: ***Evaluation of the therapeutic efficacy of Rutin in metastatic TNBC cells by targeting EMT and Anoikis-resistance cells*** **(Funded by ICMR & CNCI)**

We showed that concurrent administration of rutin and Paclitaxel (PTX) significantly (P< 0.05) improved therapeutic efficacy as evidenced by reduction of tumor size and enhancement of host survivability. On the other hand, results also showed that PTX promote metastasis by upregulating EMT- related molecules such as vimentin, twist and β-catenin in MDAMB-231 cells in vitro. However, administration of rutin significantly (P<0.05) decreased the EMT-related molecules such as vimentin, twist and β-catenin in MDAMB-231 cells. Additionally, co-delivery of Rutin and PTX significantly (P<0.05) increased anticancer activity as compared to monotherapy, as evidenced by cytochrome-c release assays, cell cycle analysis and flow cytometric analysis in vitro.

Olive

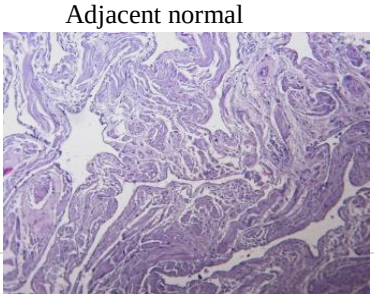


Rutin

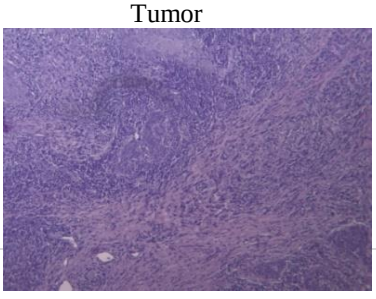
Project 4: ***Whole exome sequencing to uncover the mutations in genes associated with penile cancer*** **(Funded by CNCI)**

It is a rare cancer till now but it could be one of the major causes of cancer death among men, in near future if we neglect it now. India has the highest incidence of penile cancer since beginning. No treatment guideline is available, since genomics of this cancer not clear since No cell lines available in ATCC, related to penile cancer moreover not a single report is available based on Indian genome.

Adjacent normal



Tumor



Project 5: ***Evaluation of therapeutic and chemoprotective efficacy of indole based small molecule 3,3'-diindolylmethane (DIM) against triple negative breast cancer*** **(Funded by CNCI)**

Doxorubicin (DOX) is an anthracycline antibiotic widely used against solid tumors. However, its clinical use is limited due to dose-dependent cardiotoxicity, drug resistance and tumor recurrence after drug withdrawal. Therefore, the objective of the present study is to inhibit asymmetric division of triple negative breast cancer stem cells by co-delivery of DIM and DOX. (add some in vitro results). Further insight into the molecular pathway disclosed that the combination treatment caused down-regulation of ACD promoting proteins like NUMB. Additionally, co-administration of DIM and DOX significantly (P<0.05) decreased the tumor size and enhanced survivability of host against 4T1 cell line induced solid tumor in BALB/C mice. Furthermore, DIM significantly (P<0.05) attenuated DOX-induced hematopoietic, cardiac, genetic damages and provided additional host survival advantages.

Project 5: ***Regulation of crosstalk between EMT pathways and pathways maintaining anoikis resistant CSCs in triple negative breast cancer by exosome mediated co-delivery of 3,3'-diindolylmethane (DIM) and doxorubicin (DOX).*** **(Funded by SERB)**

Dual loaded E-MSNs were synthesized and characterized by SEM, FTIR. Release assay of this nanoparticle shows sustained release of the drugs even upto 10h. TNBC cell lines are treated with dual loaded E-MSNs and reductions of the expression of N-cad, slug and vimentin are observed. In case of CSC enriched spheres treated with dual loaded E-MSNs, reduction in the number and size of spheres are noticed. In the CSC population expression of EMT inducing factors like N-cad, slug and vimentin is also reduced upon dual loaded E-MSNs treatment which is proved by immune blotting. In case of *in vivo* analysis, it is observed that upon dual loaded E-MSNs treatment BRCA1 expression is reduced in the lung of tumor bearing mice compared to the tumor bearing control mice in both the group of mice injected with either 4T1 cells or CSCs.

Project 6: ***Regulation of oncogenic hallmarks of KRAS mutated colorectal cancer cells by co-treatment of 3, 3'-diindolylmethane and 5-fluorouracil***: **(Funded by CNCI)**

Results of the present study showed that, DIM in combination with 5FU significantly (P<0.05) reduces the growth and proliferation of colorectal cancer cell line HCT116 after 24 hours of treatment *in vitro*. In addition, flow cytometry analysis indicated that combinatorial treatment with DIM and 5-FU induced G0/G1 cell cycle arrest and apoptosis in HCT116 cell line. Additionally, mitochondrial depolarization significantly (P<0.05) increased in HCT116 cells after co-delivery of DIM and 5-FU. On the other hand, concurrent administration of DIM and 5-FU significantly (P<0.05) improved

therapeutic efficacy as evidenced by significantly ($P<0.05$) decreased tumor size and enhancement of host survivability against CT26 cell line induced solid tumor in BALB/c mice.

A. Extramural Projects:

- P.I.: Dr. Prosenjit Saha

Project Title: Exosome mediated co-delivery of natural flavonoid Orientin and 5-Fluorouracil for targeting colorectal cancer stem cells involved in angiogenic progression. Funding agency: SERB

- P.I.: Dr. Subhadip Hajra

Project Title: Regulation of crosstalk between EMT pathways and pathways maintaining anoikis resistant CSCs in triple negative breast cancer by exosome mediated co-delivery of 3,3'-diindolylmethane (DIM) and doxorubicin (DOX). Funding agency: SERB.

B. Extramural Fellowship:

1. Student Name: Mr. Souradeep Biswas

   Project title: *Evaluation of chemotherapeutic efficacy of rutin during metastasis by targeting EMT and Anoikis.* Funding agency: ICMR
2. Student Name: Ms. Priya Samanta

   Project title: *Evaluation of therapeutic and chemoprotective efficacy of indole based small molecule 3,3'-diindolylmethane (DIM) against triple negative breast cancer*. Funding agency: *CSIR*
3. Student Name: Ms. Rituparna Ghosh

   Project title: *Inhibition of 5-flurouracil induced cancer stem cells mediated angiogenesis by natural flavonoid orientin in colorectal carcinoma.* Funding agency: *ICMR*

B. No of Publication (Peer reviewed) : 04

D. Other Achievements:

- Department organize a one-day cancer awareness camp at Kashipur, Rangamati, Ranjandhi, Purulia funded by Science and Engineering Research Board (SERB).
- Dr. Prosenjit Saha acted as a reviewer of extramural projects submitted in SERB.
- Dr. Subhadip Hajra has reviewed several research papers for multiple international journals.

Department of Clinical and Translational Research

Team

Head of the department Dr. Kalyan Kusum Mukherjee, MBBS, MD, FCCM, ECMO	Specialist Grade I
Senior Scientific Officer Dr. Ugir Hossain Sk, PhD	Senior Scientific Officer
Other Team Members	
Students	
Debapriya Roy MahaPatra	ICMR-SRF
Rubi Roy	CSIR- JRF
Tasnim Ria	CNCI-JRF

Objectives of the department: Our objective is to develop highly interdisciplinary research focused on the pre-clinical development of novel organic molecules and therapeutic devices against different types of cancer. We are also focusing to developed a nano-size polymeric drug delivery system to enhance the therapeutic efficacy of the existing therapeutic drugs along with the repositioning of the clinically relevant nononcogenic drug in cancer. The nanodevices will be based on drug-polymer conjugation with the sustained drug release capacity. Our Objective is to create a pathway that bridges between scientists and clinicians to translate basic research outcomes to the clinic for the cancer patient health benefit by improving the prognosis rate. The mission of this department is to initiate clinical trials based on the finding of the basic research team. The work will be carried out with biologists and drug discovery scientists for the development of novel targeted cancer therapeutics. Our team is a highly interdisciplinary and efficient researcher consisting of organic chemistry and clinician from medical oncology experts.

Brief description of the work done during the year (from 1st April 2022 to 31st March 2023):

C. **Departmental Activities:** Design, synthesis, and development of clinically relevant drug remodelling and drug delivery System for anti-oncogenic response to target biomolecules.

D. Projects running –

1. PI – Dr Ugir Hossain Sk, Design and fabrication of novel drug delivery vehicle: using naturally occurring glycoside molecules for targeting delivery of anticancer drug, Funding agencies: **CSIR-EMR-II,** Project no. 80(0090)/20/EMR-II, Duration Jan. 2021-Dec. 2023.

2. PI – Dr Ugir Hossain Sk, Drug repurposing and remodeling: A study of the potential antitumorigenic activity of chemotherapeutic drugs against experimental murine lymphoma, awarded to Ms. Debapriya RoyMahaPatra, **ICMR-SRF**). F. No. 45/03/2022-DDI/BMS dated: 09/05/2022
3. PI – Dr Ugir Hossain Sk, Synthetic modification of anti-HCC drug sorafenib by selenoureaanalog and impact in hepatocellular carcinoma.**CNCI-intramural project.**
4. PI – Dr Ugir Hossain Sk, Development of dual targeting inhibitors in cancer therapeutics **,CSIR-JRF fellowship** project,File no. 09/0030(13107)/2021-EMR-I. (Present)
5. PI – Dr Ugir Hossain Sk ,Development of Mannose Mediated CD206 Targeted Drug Delivery System against Lymphoma, **CNCI-intramural project**
6. PI – Dr Ugir Hossain Sk, Development of elastin mimetic peptide conjugated PAMAM dendrimer- based selenium nanoparticles against experimental murine lymphoma. **DHR for "Women Scientist"**

E. Publications/Monographs/Patents etc. (*please mention international and national publications separately*)

Publications: 04

Patent: Filed for **Patent (Application no: 202231032973)** entitled "Synthetically developed DNA-targeting naphthalimide-artesunate derivatives and their tumoricidal effect".

- **Sk U H**, Editorial Board Member, 'Nature Scientific Reports' 2015-Present
- **Sk U H**, Editorial board of "Frontiers in Chemistry" as a review editor

Department of Environmental Carcinogenesis & Toxicology

Team

Head with Educational Qualifications	
Dr. Sutapa Mukherjee, PhD	Assistant Director Grade Scientist
Faculty with educational qualification	
Dr. Sutapa Mukherjee, PhD	Assistant Director Grade Scientist
Other Team Members	
Dr. Debomita Sengupta	CSIR- **Pool Scientist**
Students	
Ms Elizabeth Mahapatra	SRF (Institute)
Mr Archismaan Ghosh	SRF (Institute) till 15.10.22
Ms Salini Das	CSIR-SRF
Mr. Debanjan Thakur	JRF (Institute)

Objectives of the department:

- Elucidation of the role of black tea in prevention of arsenic induced skin cancer involving EMT
- Understanding the role of serine threonine kinases (PI3K/Akt, IAPs, and Aurora Kinases) in rendering therapy-resistance (chemo / radioresistance) in breast and cervical cancer scenarios.
- Identifying the potential of serine threonine kinases (PI3K/Akt, IAPs, and Aurora Kinases) as predictive biomarkers of chemo and radio resistance in aggressive stages of breast and cervical cancers.
- Comprehension of any presumptive role of stemness factors in inducing Aurora Kinase overexpression among aggressive stages of breast cancers.
- Determining whether Perioperative Cortisol acts through GR to induce AURKA mediated cellular proliferation and metastatic progression

Brief description of the work done during the year (from 1st April 2022 to 31st March 2023):

Departmental Activities: The team members of the department are sincerely engaged in the laboratory research mainly focusing to undermine the molecular mechanism underlying chemo/radioresistance in cancer, concerning Breast, Cervix and Ovary (recently initiated).

Projects Running :

- Dr. Madhumita Roy Black tea in prevention of skin cancer: A mechanistic study. (Intramural) Project has been completed on 15.10.2022
- Dr. Sutapa Mukherjee Phenethylisothiocyanate: Role in enhancing platinum accumulation in cervical cancer. (Intramural) Ongoing
- Dr. Sutapa Mukherjee Exploring The Regulatory Effect Of Cortisol /GR/AURKA Axis In Breast Cancer Progression: Possible Translational Implications (Intramural) Ongoing

Students' Projects running:

- Dr. Sutapa Mukherjee (Mentor), Dr. Debomita Sengupta (PI) - Role of Oct4 and Sox2 in p53 or Myc mediated transcriptional regulation of Aurora Kinase A and its implications on cell polarity during cell division with reference to cancer CSIR-SRA
- Dr. Sutapa Mukherjee Ms. Salini Das Molecular Targeting of GADD45a and AURKA: A Therapeutic approach to reverse radioresistance in cervical cancer CSIR-SRF

Project 1: Black Tea in Prevention of Skin Cancer: A Mechanistic Study:

Through elaborate studies in *in vitro* and *in vivo* models, Black Tea Extract (BTE) was identified to ameliorate Epithelial to Mesenchymal Transition (EMT) during arsenic induced skin carcinogenesis through down regulation of EMT markers and the associated signaling cascades in addition to quenching ROS.

Project 2: Phenethylisothiocyanate: Role in Enhancing Platinum Accumulation in Cervical Cancer.

Phenethylisothiocyanate (PEITC), a cruciferous vegetable derived phytochemical was found to potentiate platinum therapy in PI3K/Akt mediated cisplatin resistance within cervical cancer models (*in vitro*/ *in vivo*) by improving drug retention, free GSH levels reduction and by elevated ROS generation.

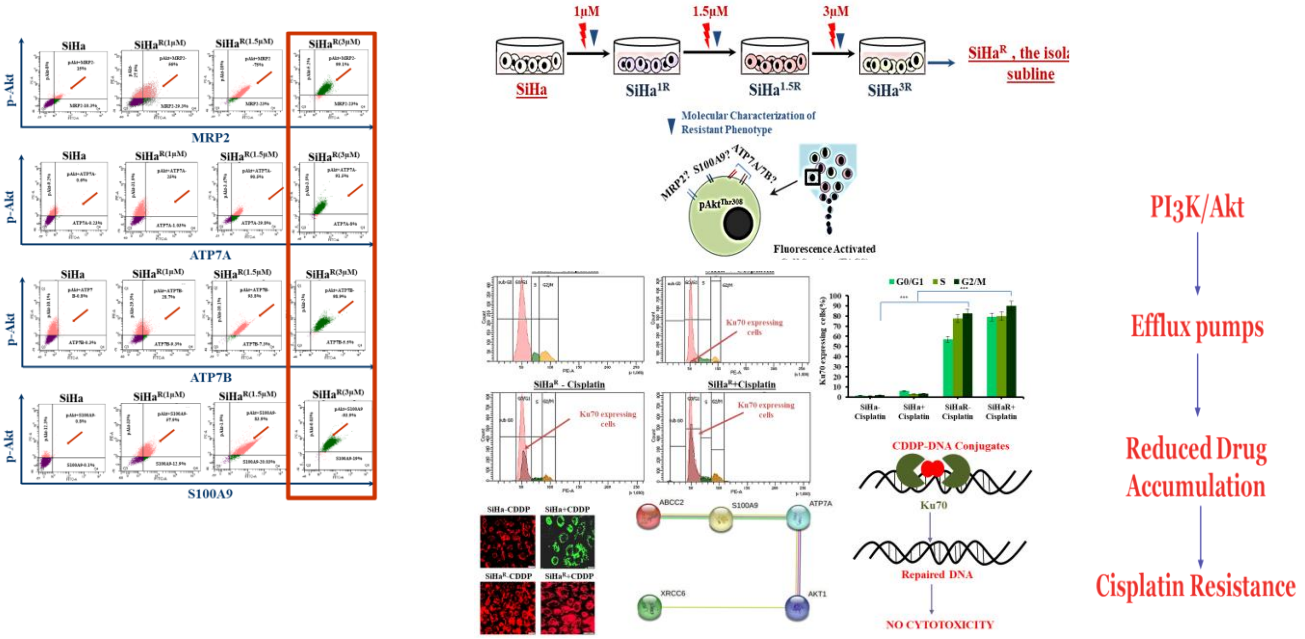
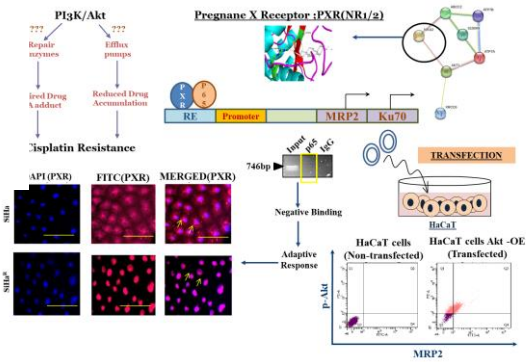


FIGURE1: Upregulation of PI3K/Akt pathway in imparting Cisplatin Resistance among cervical cancer cohorts.



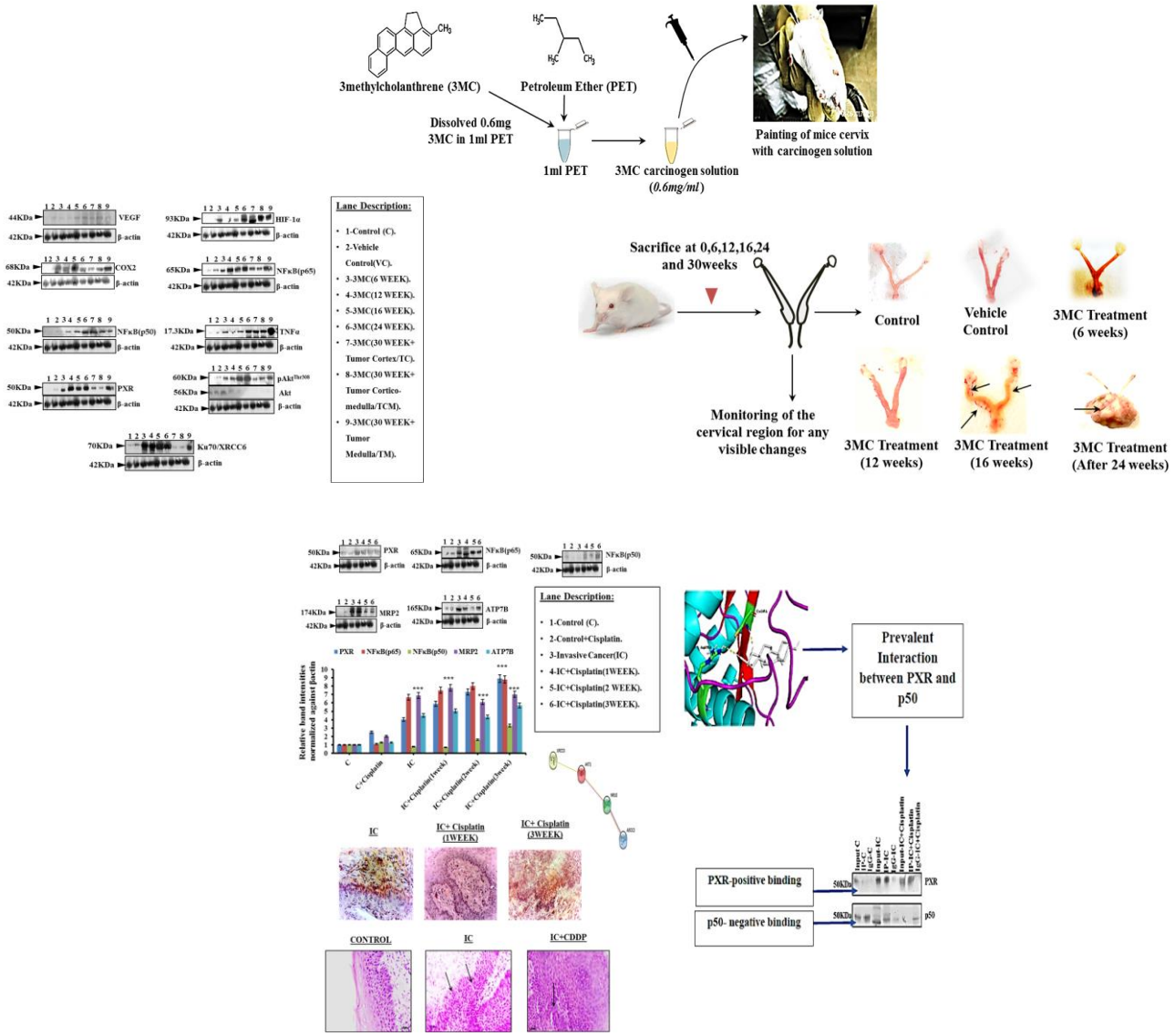
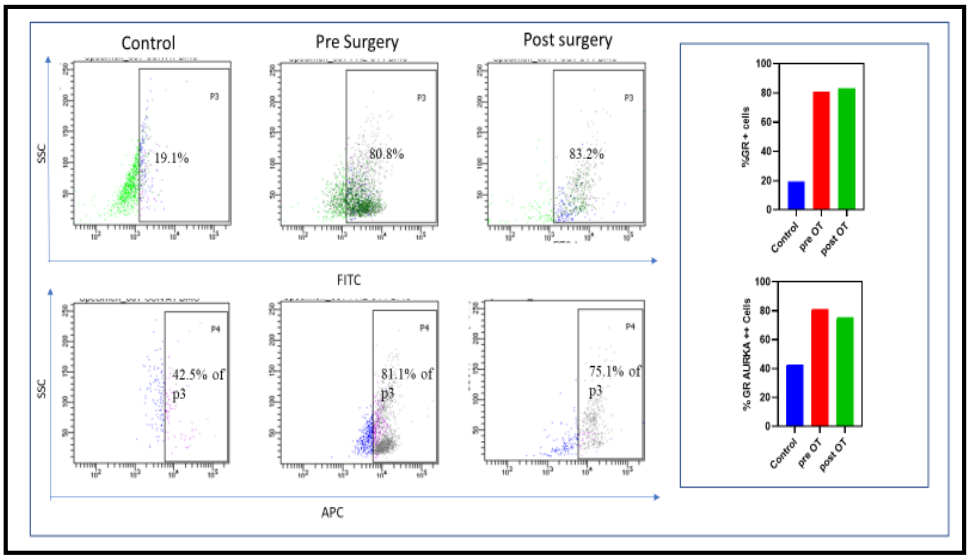
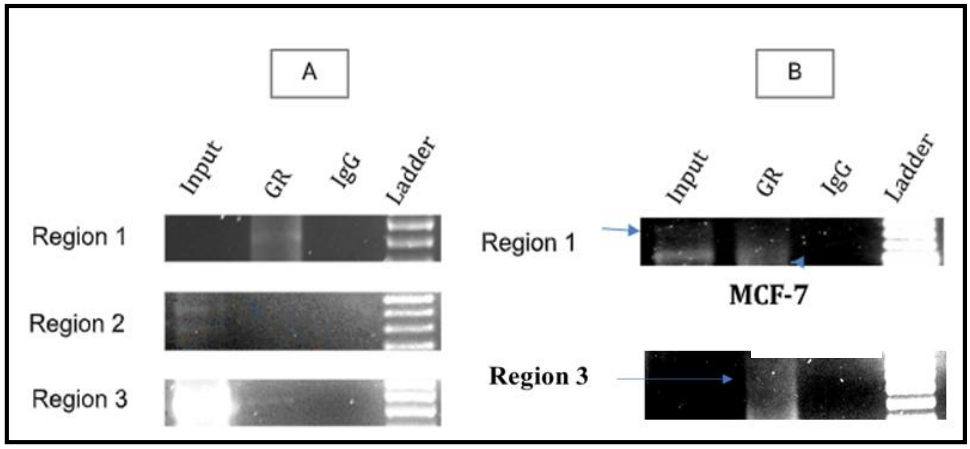


FIGURE 2: PI3K/Akt mediated Cisplatin Resistance in Cervical Cancer

Project 3: Exploring the Regulatory Effect Of Cortisol /GR/AURKA Axis In Breast Cancer Progression: Possible Translational Implications:

The present study was conducted to examine if Glucocorticoid Receptor (GR) could regulate AURKA in Breast Cancer scenario. The result showed that GR occupies binding sites upstream of AURKA TSS in breast cancer *in vitro*. ChIP assay definitively confirmed the binding of GR atleast in TNBC cell line MDAMB 231 at Region 1 and Region 3 but not at Region 2. However, GR binding was observed at Region 3 of MCF-7 but neither at Region 1 in case of MCF-7 nor at Region 2 and 3 in ER^- breast cancer tissue samples. AURKA was found to be co-expressed with GR in Breast cancer tissue samples as well with a higher percentage of co-expression in tumor samples compared to adjacent normal. GR and AURKA expression was also found to be elevated in both Pre Surgery and Post Surgery PBMC, indicating their possible significance in breast cancer progression.





MDA-MB-231 **MCF-7**

FIGURE 3: Representative agarose gel electrophoresis images demonstrating binding potential of GR upstream of AURKA TSS as observed in Chromatin immunoprecipitation assay

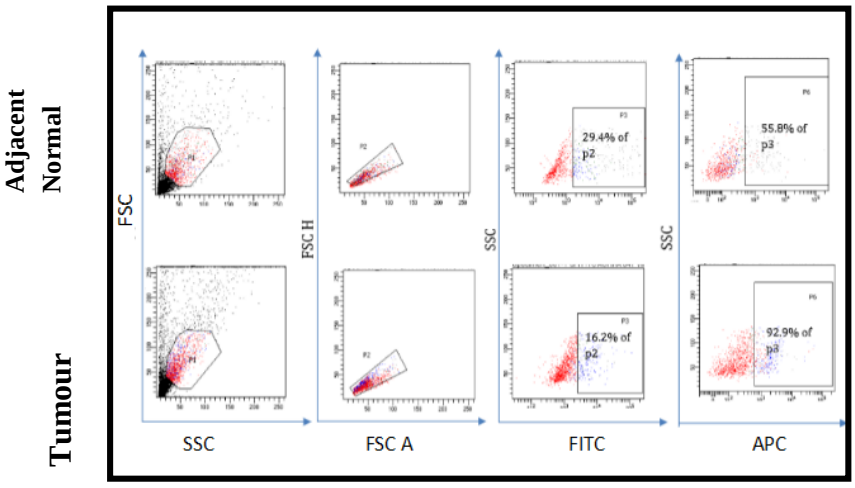


FIGURE 4: Flow cytometric analysis demonstrating expression patterns of GR and AURKA in GR expressing cells in breast cancer tumour samples relative to adjacent normal.

Project 4: Role of Oct4 and Sox2 in p53 or Myc mediated transcriptional regulation of Aurora Kinase A and its implications on cell polarity during cell division with reference to cancer:

In order to confirm the presence of AURKA in stem cell division, AURKA and phospho-NUMB localization was analyzed. With reference to the spindle axis, the asymmetric division is considered to refer to the dividing stem cells. Accordingly, co-localization of AURKA with phospho-NUMB **(Figure 5)** in both symmetrically and asymmetrically dividing cells, implicated Oct4/Sox2-driven AURKA upregulation. This was associated with decision of cell fate-symmetric division for non-stem cancer cell (NSCC) or BCSC proliferation; and asymmetric division for both self-renewal and generation of partially differentiated cells. In our study, both the stemness factors i.e., Oct4 and Sox2 appeared to be responsible for increasing the cells at G0/G1, which were affected by the silencing experiment (Figure 6). This result was an indirect confirmation, that targeting Oct4 or Sox2 may sensitize the earlier mentioned quiescent BCSCs, lacking AURKA expression towards the classical chemotherapeutic regimens through re-activation of the cell cycle.

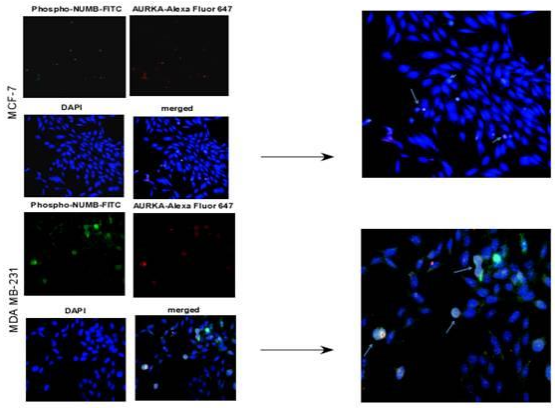


FIGURE 5: Indirect immunofluorescence assay demonstrating AURKA-phospho NUMB colocalization in dividing cells both in case of asymmetric and symmetric cell divisions

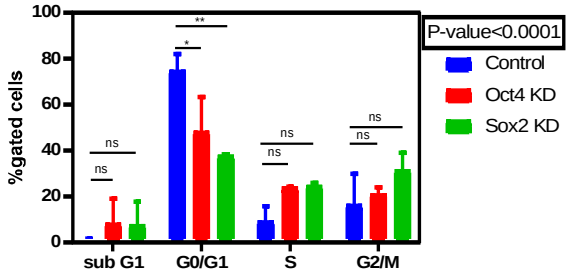


FIGURE 6: Bar diagram representing impact of Oct4/Sox2 knockdown on cell cycle phases.

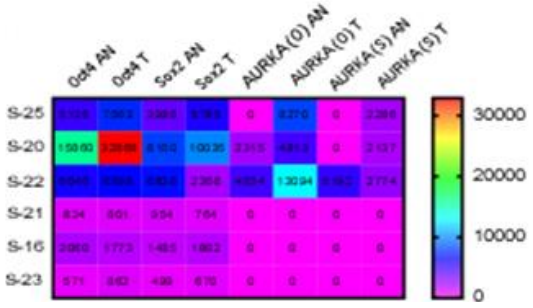


FIGURE 8: Hcl plot representing AURKA induction under high Oct4/Sox2 expressing tumour cells in patient tissues

Project 5: Molecular Targeting of GADD45a and AURKA: A Therapeutic approach to reverse radioresistance in cervical cancer

S-phase ROS which was identified as a potential activator of AURKA mediated signaling axis could be inhibited by Aspirin (ASA) in radio-resistant cases (*in vitro*/ *ex vivo*) of cervical cancer. ROS induced HIF1α overexpression advanced to transcriptional upregulation of AURKA upon binding at the novel region of AURKA promoter. S-phase ROS accompanied with AURKA detection can be used as a predictive biomarker for radiotherapeutic response among the cervical cancer patients.

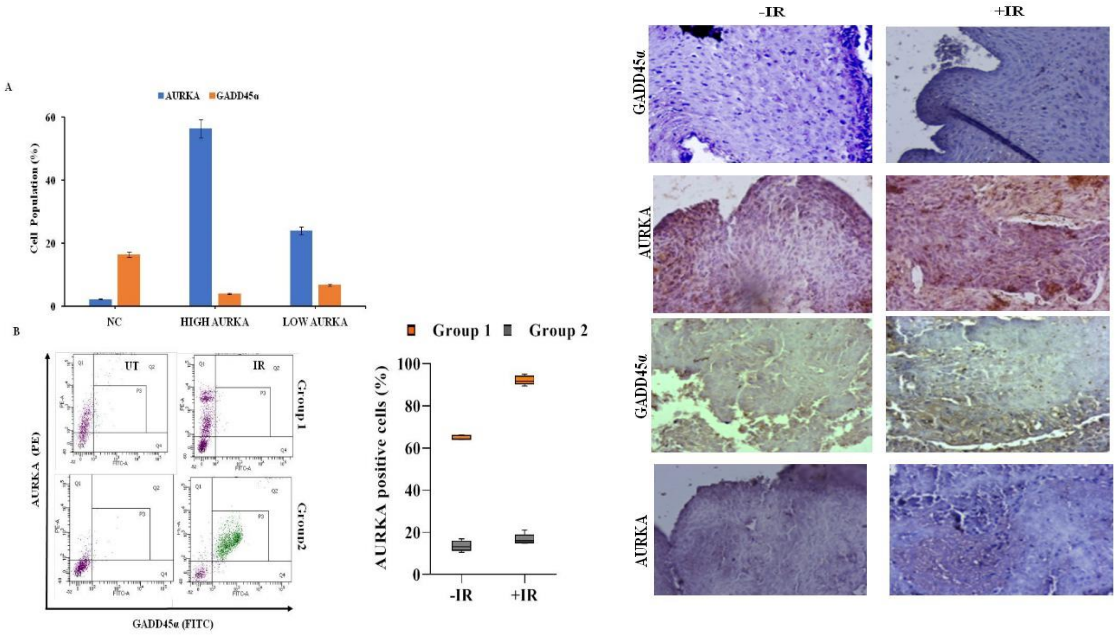


FIGURE 9. Left panel: Flow cytometric analysis of AURKA and GADD45α in two groups. Right Panel: IHC analysis of GADD45α and AURKA expression in High AURKA (Group 1) and Low AURKA (Group 2) patients.

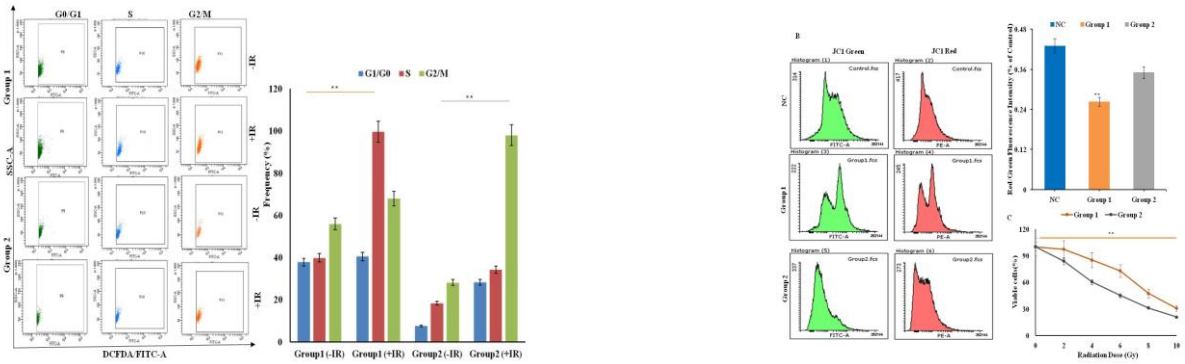


FIGURE 10. Cell cycle phase specific ROS accumulation in Group 1 and Group 2 Patients. Right Panel : Flow cyometric analysis image of JC-1 stained cells isolated from biopsy samples. MTT assay results showing radiation response pattern of primary tumor cells

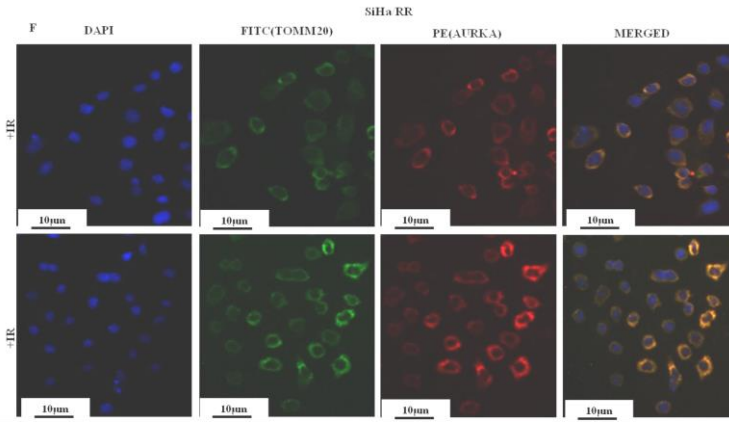


FIGURE 11: Immunofluorescence images of SiHa/RR showing mitochondrial localization of AURKA using TOMM20 as mitochondrial marker.

Publications: Research Paper: 09, Proceedings: 01
Students undergoing PhD: 05

Department of Epidemiology and Biostatistics

Head of the Department: Dr. Jayanta Chakrabarti, Director

Project staff

Population Based Cancer Registry and Population Based Cancer Survival, Kolkata

Name	Designation
Ms. Soumya Roy	Social Investigator
Mr. Biswajit Bhattacharya	Data Entry Operator cum Social Investigator
Ms. Indrani Nandi	Social Investigator
Ms. Pranati Sarker	Social Investigator
Mr. Biswanath Ghosh	Social Investigator
Ms. Soma Das	Social Investigator

Hospital Based Cancer Registries and Patterns of Care and Survival Studies on Cancer Breast, Cancer Cervix, Gall Bladder and Head and Neck Cancers

Name	Designation
Mrs. Julekha Mondal(Mallick)	Social worker
Mrs. Kaberi Biswas	Social Worker
Mrs. Sudeshna Ghosh	Social Worker
Ms. Rinkichitrakar	Social Worker
Mr. Dipanjan Mazumdar	Data Entry Operator
Ms. Priya Kumari Singh	Data Entry Operator
Ms. Sushmita Patra	Data Entry Operator

Objectives:

Reducing Cancer Burden through Research

Non-communicable diseases (NCDs) can manifest as a heightened local risk for a specific cancer type or a high incidence rate in a specific community. The department is devoted to exploring the underlying factors that may contribute to these health outcomes through scientific investigations. By conducting rigorous studies, the department seeks to shed light on the potential determinants of NCDs, including their causes and risk factors, and develop effective strategies for prevention and management.

In addition to investigating the causes of cancer, this department places a strong emphasis on cancer prevention. This is achieved through extensive research into the etiology of the disease and the assessment of screening techniques to identify at-risk individuals. The department's primary prevention investigations centre on exploring the genetic factors that may increase susceptibility to cancer, as well as the identification of modifiable lifestyle and environmental risk factors. By focusing on primary prevention, the department aims to reduce the overall incidence of cancer, ultimately.

The activity of the biostatistics has traditionally fallen into three broad categories long term collaborative projects, short term projects and research on new statistical methods.

The department has established several long-term collaborative projects in partnership with the Indian Council of Medical Research - National Centre for Disease Informatics and Research (ICMR-NCDIR). These projects include two Population-Based Cancer Registries (PBCRs) and a Population-Based Cancer Survival (PBCS) study. One of the PBCRs and PBCS are conducted in an urban setting, specifically PBCR & PBCS in Kolkata. Meanwhile, the other project is conducted in a rural setting, namely PBCR & PBCS in Daspur. Although PBCR & PBCS, Daspur is run by institutional resources, the department collaborates closely with ICMR-NCDIR to ensure that these projects are conducted with the highest scientific rigor and follow international standards. These collaborative initiatives aim to enhance our understanding of cancer epidemiology in India and inform the development of effective prevention and management strategies.

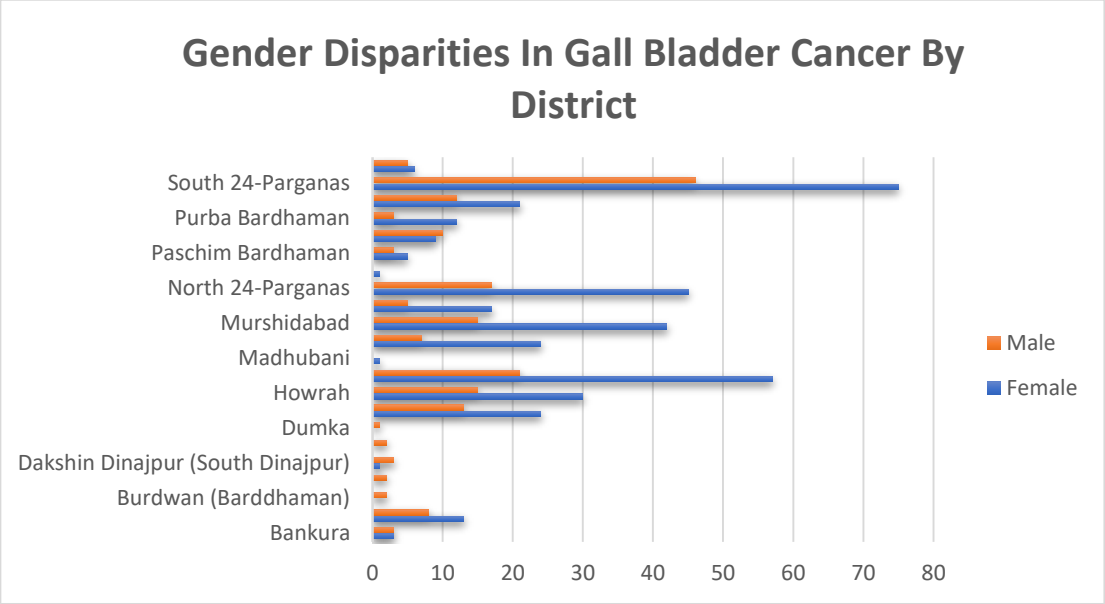
Short – term projects include, but are not limited to, protocol design, grant applications and statistical analysis.

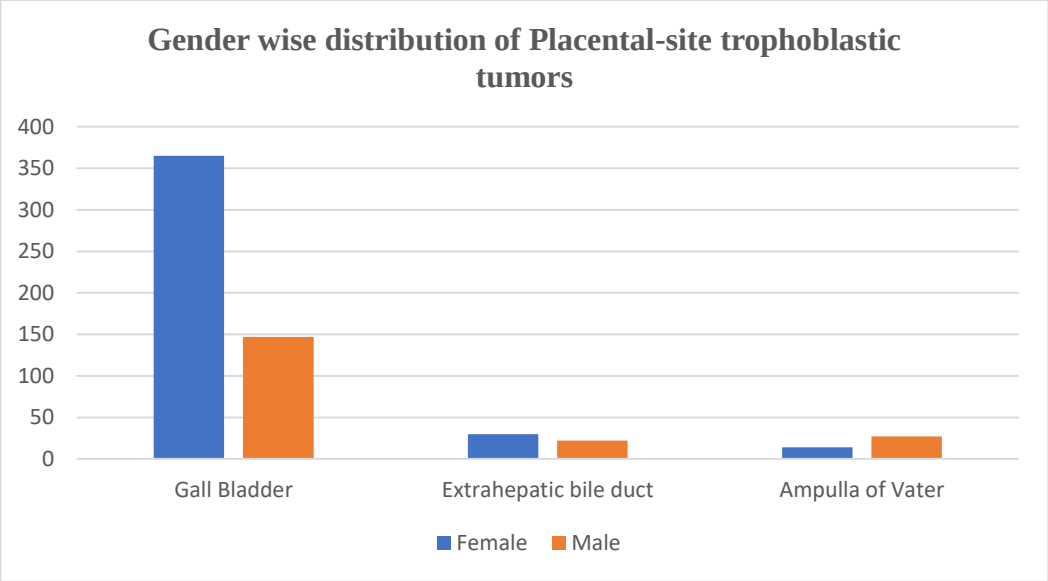
This department's research interests go beyond cancer epidemiology and prevention, extending to statistical methodology. These interests encompass clinical trials on cancer prevention, diagnosis, and treatment, specialized research on survival analysis, statistical genetics, and computer-intensive methods. Led by a Population Scientist, the department focuses on understanding the changing patterns of cancer in response to changing population demographics. By exploring statistical methodologies, the department aims to improve the precision and validity of research findings, develop evidence-based interventions, and reduce the burden of cancer on individuals and communities.

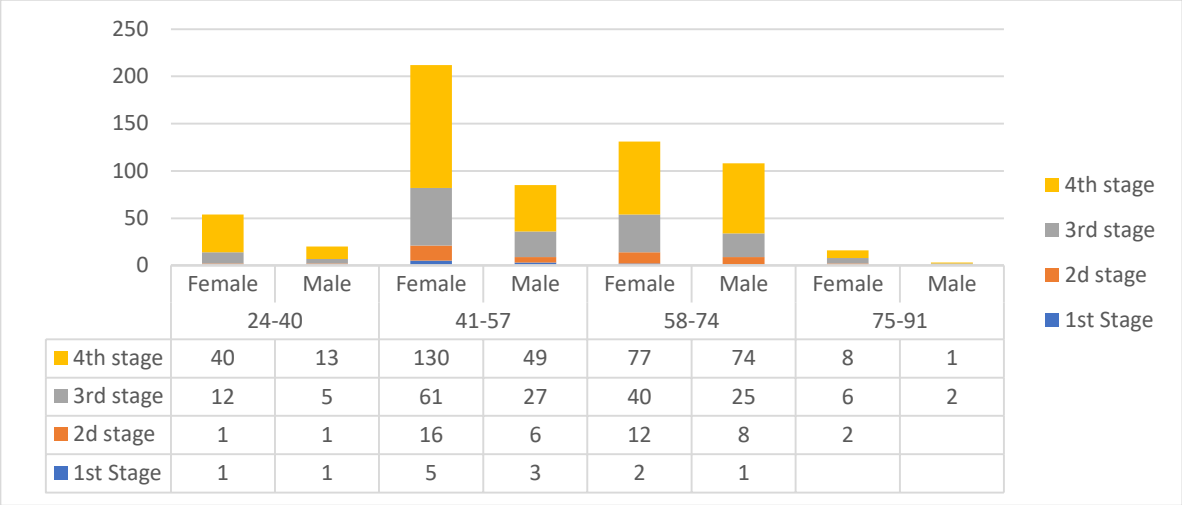
As the HOD is also Population Scientist researches are going on changing pattern of cancers with the changing patterns of populations.

In the Field of Epidemiology:

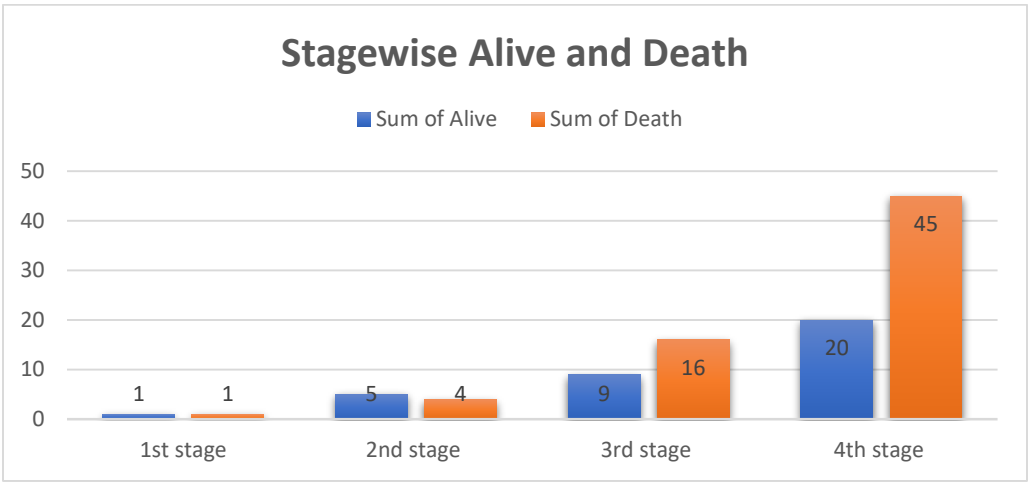
1) In order to comprehend the prevalence, risk factors, and potential therapies for gall bladder cancer in the Gangetic region, this research seeks to gather comprehensive patient data and conduct follow-up visits.


Gender Disparities In Gall Bladder Cancer By District
South 24-Parganas
Purba Bardhaman
Paschim Bardhaman
North 24-Parganas
Murshidabad
Madhubani
Howrah
Dumka
Dakshin Dinajpur (South Dinajpur)
Burdwan (Barddhaman)
Bankura
0
10
20
30
40
50
60
70
80
Male
Female


Gender wise distribution of Placental-site trophoblastic tumors
400
350
300
250
200
150
100
50
0
Gall Bladder
Extrahepatic bile duct
Ampulla of Vater
Female
Male

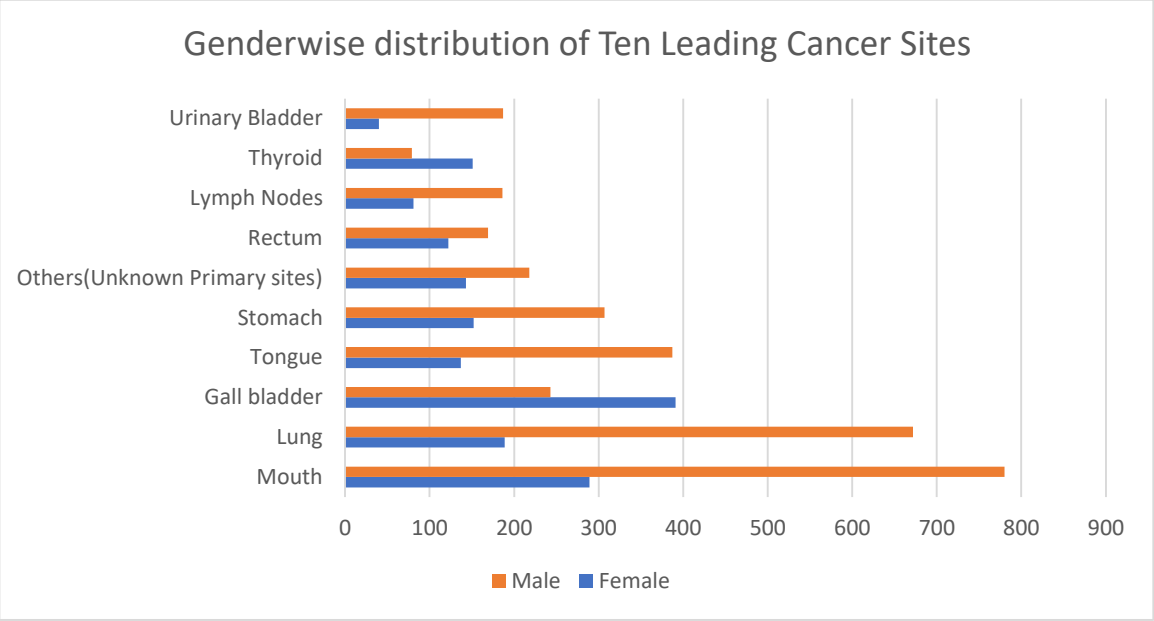


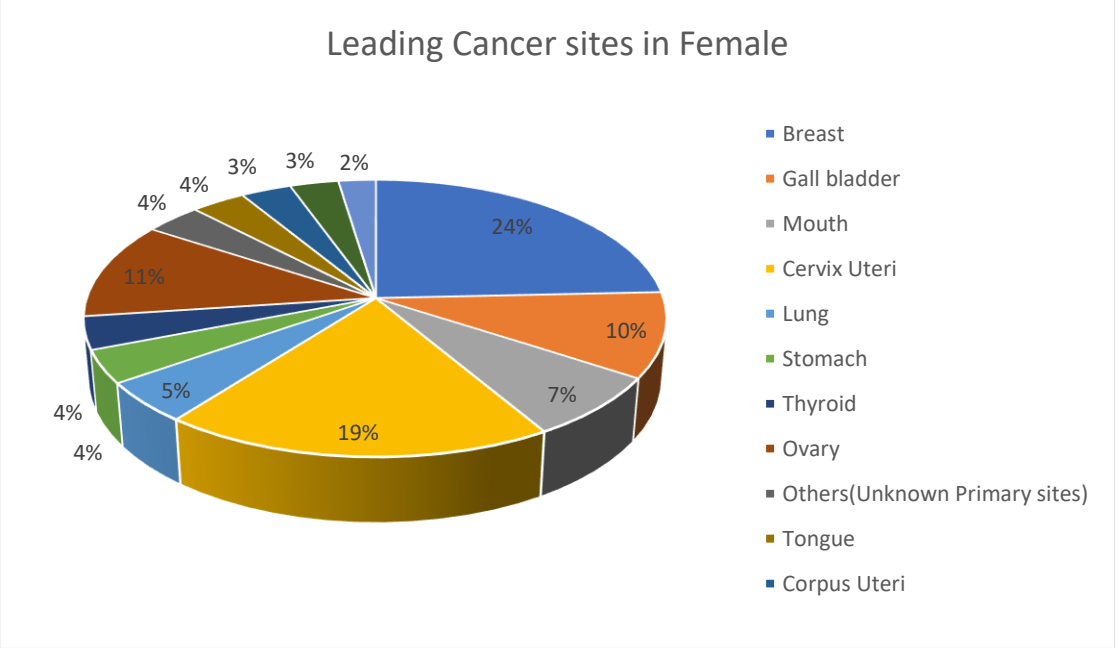
	Female	Male	Female	Male	Female	Male	Female	Male
	24-40		41-57		58-74		75-91	
4th stage	40	13	130	49	77	74	8	1
3rd stage	12	5	61	27	40	25	6	2
2d stage	1	1	16	6	12	8	2	
1st Stage	1	1	5	3	2	1		

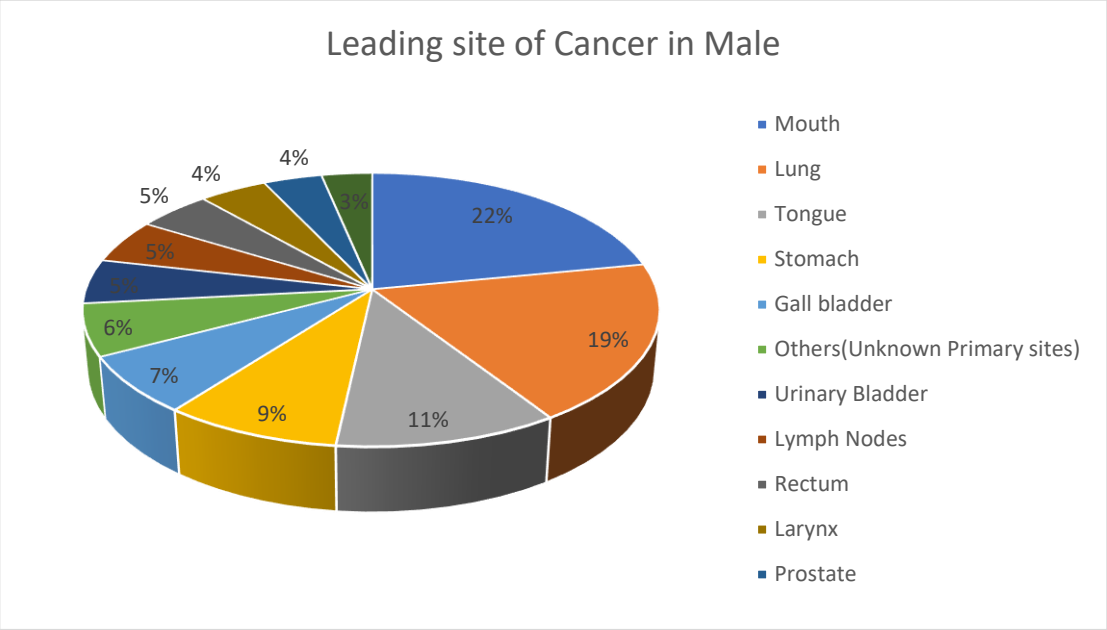


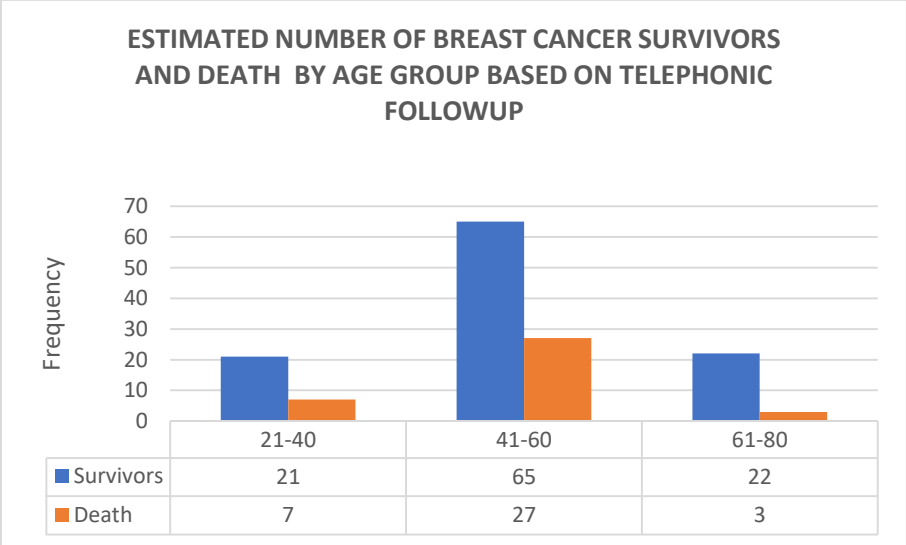
- There are 101 patients who responded our call. Out of 101 patients 35 patients have unfortunately passed away, while the remaining 66 patients are still alive.
- The Overall survival rate of gall bladder patient is 35.6% at 321 days i.e., 11 months(approx.).

2) The department is focused on studying cancer patients who have reported to the hospital of this institute through extramural projects. These projects include the Hospital-Based Cancer Registry (HBCR) and the Hospital-Based Pattern of Care and Survival Studies on various types of cancers, such as cervical, breast, head and neck, and gallbladder cancers. Through these initiatives, the department aims to improve cancer outcomes by enhancing our understanding of cancer patterns, improving cancer diagnosis and treatment, and ensuring accurate and comprehensive reporting of cancer deaths.


Genderwise distribution of Ten Leading Cancer Sites
Urinary Bladder
Thyroid
Lymph Nodes
Rectum
Others(Unknown Primary sites)
Stomach
Tongue
Gall bladder
Lung
Mouth
0
100
200
300
400
500
600
700
800
900
Male
Female


Leading Cancer sites in Female
24%
10%
7%
19%
5%
4%
4%
11%
4%
4%
3%
3%
2%
Breast
Gall bladder
Mouth
Cervix Uteri
Lung
Stomach
Thyroid
Ovary
Others(Unknown Primary sites)
Tongue
Corpus Uteri



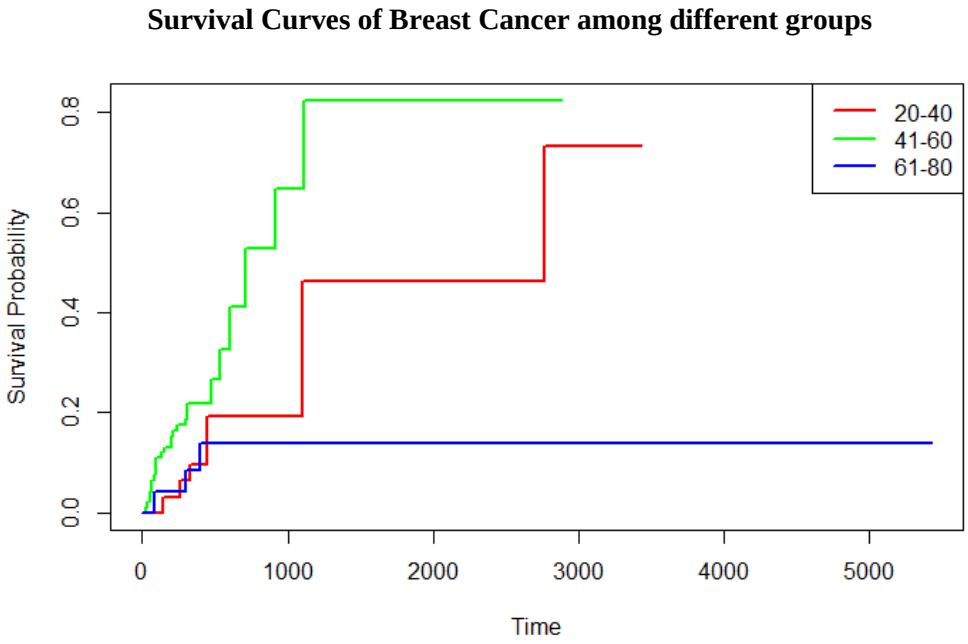


- One year Survival rate for all age group breast cancer patients is 82.8%.
- **<u>Relative Survival Rate by Age</u>**

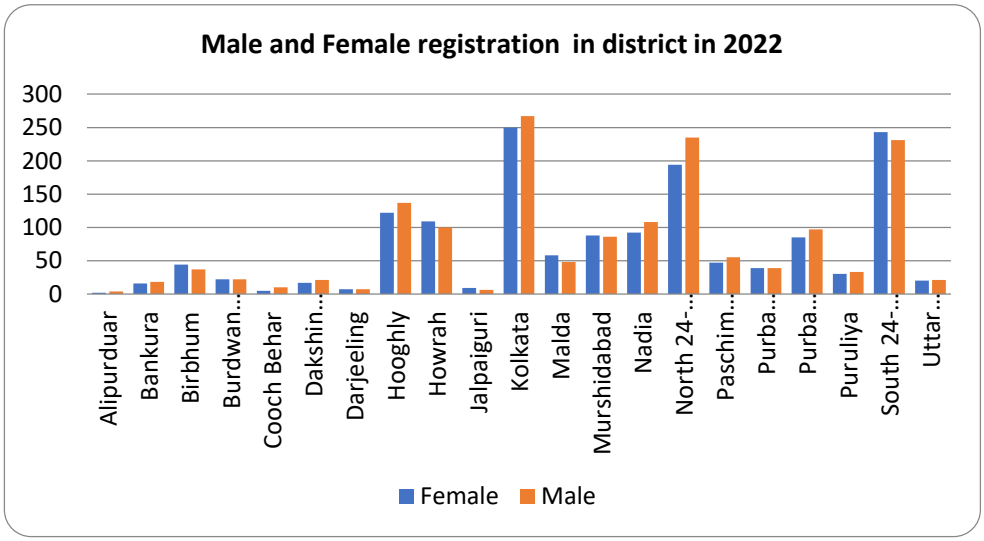
  One-year relative survival rates by age at the time of diagnosis are as follows:

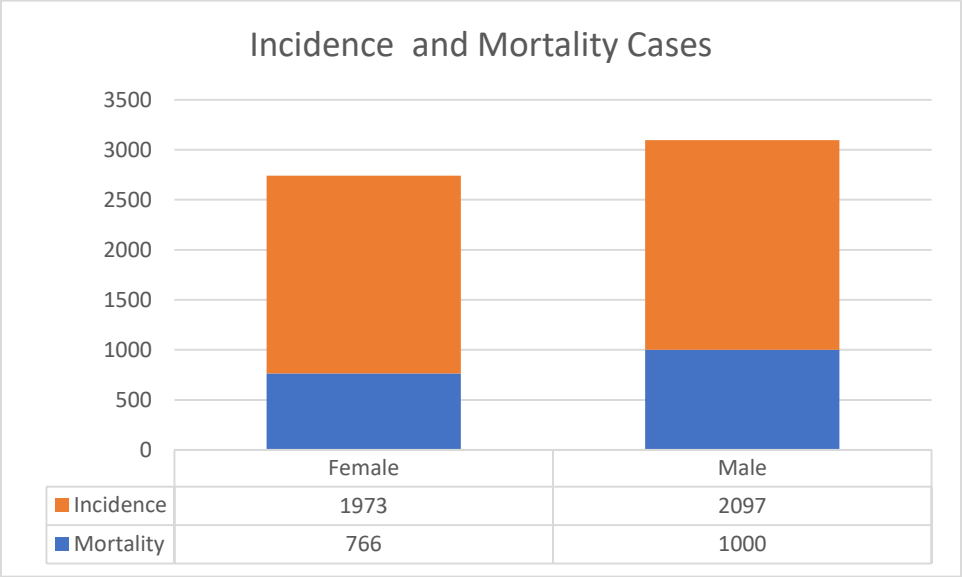
Age Group	Survival Rates
21-40	90.32%
41-60	78%

61-80	91.48%



3) This institute is working in the urban community to assess the cancer burden in Kolkata under Population Based Cancer Registry(PBCR), Kolkata and Pattern of Care and Population Based Survival Studies on Cancer Cervix, Head & Neck Cancers based on 4.5 million of 144 wards of Kolkata Municipal Corporation covering 206.08 Sqkm





In the field of Biostatistics

- The department conducts classes for DNB students, Research Scholars and students of Medical physics.
- The department has started outsourcing by conducing classes on resourcing by conducting classes on research methodology for the DNB of students of other institutions/ hospitals.
- The department is helping both clinical and basic researchers for their design and analysis of the data of research works.

Other academic activities

- A virtual training workshop, under the guidance of NCDIR-NCRP(ICMR) in Bangalore, was held to enhance the quality of data, case abstraction, and mortality for cancer patients in Punjab.

Special Achievements at a glance:

1.ICMR-NCDIR declared CNCI as a Centre of Cancer Registries.

2. On March 26th, 2022, a meeting was held at Rajarhat CNCI 2nd campus to discuss strengthening PBCR data collection with sources of registration.

3. The PBCR Kolkata celebrated its Silver Jubilee on December 17th, 2022, at Nalban Food Park.

Lists of Projects

Project Title	Principal Investigator	Co-Principal Investigator	Summary
1. Patterns of Care and Survival Studies on Cancer Gall Bladder.	Dr. Jayanta Chakrabarti		This project aims to collect detailed patient information and conduct follow-up visits to understand the prevalence, risk factors, and potential interventions for Gall bladder cancer in the Gangetic region.
2. Population Based Cancer Registry (PBCR), Chittaranjan National Cancer Institute, Kolkata	Dr. Jayanta Chakrabarti	Dr. Debasish Jatua	This project collects information on cancer patients from participating centers in and around Kolkata, providing incidence and prevalence rates of different cancers.
3. Population Based Cancer Survival on Cancers of Breast, Cervix and Head & Neck, Chittaranjan National Cancer Institute, Kolkata	Dr. Jayanta Chakrabarti	Dr. Debasish Jatua	This project collects information on the present health status of patients with Ca-Head & Neck, Ca-Breast, and Ca-Cervix from participating centers and house visits if required, aiming to provide population-based survival patterns for these cancer sites.
4. Hospital Based Cancer Regestries and Patterns of care and Survival Studies on Cancer Breast, Cancer Cervix and Head and Neck Cancers under Regional Cancer Centres	Dr. Jayanta Chakrabarti	Dr. Debasish Jatua	This project collects information on cancer patients from the medical records at CNCI Hospital, providing insights into the pattern of care provided to patients and their primary sites.

Department of Immunoregulation and Immunodiagnostics

Head: Jayanta Chakrabarti MS, DNB (Surgical Oncology)

In-Charge of the department: Dr. Saptak Banerjee, Ph.D, SSO-II

Faculty with educational qualification	
RathindranathBaral, Ph D.	Sr. Assistant Director Gr., HOD (till July, 22)
Anamika Bose, Ph D.	DST/WOS-A
Anirban Sarkar	Senior Research Fellow-ICMR
Mohona Chakraborty	Senior Research Fellow-UGC
SukanyaDhar	Senior Research Fellow-DST
Saurav Bera	Junior Research Fellow-ICMR
Jasmine Sultana	Senior Research Fellow-ICMR
Aishwarya Guha	Senior Research Fellow-CSIR
Pritha Roychoudhury	Senior Research Fellow-UGC

Objectives of the department:

- Studying the metabolic regulation of Breast Cancer Stem Cells (BCSCs) and its impact on immune landscape.
- To understand the molecular changes of immune cells within tumor micro environment and its modulation using natural immune-modulator (NLGP) and metabolic regulator (2-DG).
- Elucidating the role of tumor activated platelets in promoting EMT, metastasis and angiogenesis in breast cancer model: Modulation by 2DG/NLGP.
- To study the regulation of mesenchymal stem cells (MSC), cancer stem cells (CSC) in cancer progression.
- Understanding the influence of statin consumption on cancer progression from immune perspectives.

Brief description of the work done during the year (from 1st April 2022 to 31st March 2023):

- Role of NLGP in intervening the initiation-promotion protocol during 4-nitroquinoline-1-oxide mediated tongue carcinogenesis and epithelial mesenchymal transition are being assessed.
- The crosstalk between T cells and cancer stem cells under influence of the immunomodulator NLGP.
- Finding the underlining molecular mechanism of cancer progression in tumor hosts with type-

I/type-II diabetes with reference to the alteration in cancer immune-surveillance and its correction by NLGP are being investigated.

- Role of Monocytic MDSCs in generation of multi-drug resistance in non-Hodgkin lymphoma patients with standard care of treatment is investigated.
- Influence of cardiovascular disease-linked statin(S) treatment on cancer immunoediting process and its modulation by NLGP.
- Studies on experimental and human oral carcinogenesis on formation of cancer stem cell niche.
- Understanding the metabolic regulation of Breast Cancer Stem Cells (BCSCs) and its impact on immune landscape.
- Elucidation of the role of tumor activated platelets on metastasis, angiogenesis and EMT.

B. Projects running

Extramural projects:

1. Infiltration of tumor associated macrophages in the breast tumor microenvironment of different molecular sub-variants and their immunological impact on disease process

Principal Investigator: Dr. Saptak Banerjee

Sponsor: ICMR-Adhoc

2. Understanding the involvement of transcription factors within different molecular subtypes of breast cancer stem cells in remodeling of immune landscape of tumor: Therapeutic intervention of 2DG and NLGP – Jasmine Sultana

Principal Investigator: Dr. Saptak Banerjee

Sponsor: ICMR-SRF

3. Understanding the mechanism of cancer progression in tumor hosts with type I/type II diabetes with reference to alteration in cancer immune-surveillance: Correction by NLGP

– Anirban Sarkar

Principal Investigator: Dr. RathindranathBaral

Sponsor: ICMR

Projects for students

1. Elucidating the role of tumor educated platelets in promoting epithelial to mesenchymal transition and angiogenesis in breast cancer: Modulation by 2DG/NLGP- Aishwarya Guha

Funding agency – CSIR

2. Studies on the influence of prolonged statin(S) treatment on cancer immunoediting process: Modulatory role of neem leaf glycoprotein– Pritha Roy Choudhury

Funding agency – UGC

3. Studies on the experimental and human oral carcinogenesis on the formation of cancer stem cell niche: Modulation by NLGP– Saurav Bera

Funding agency – ICMR

4. Understanding the role of T cells in regulation of cancer stem cells: Influence of NLGP driven immunomodulation- Mohona Chakravarti

Funding agency – UGC

5. Study of the role of tumor residing Immunosupressor cells of the generation of multidrug resistance in murine lymphoma with the immunomodulation by Neem Leaf Glycoprotein– Sukanya Dhar

Funding agency - DST

Departmental Activities

Publications: 05

Reviewer of Journals

Dr. Saptak Banerjee acted as an honorary reviewer of several international Journals like, Frontiers in Immunology, Frontiers in Genetics, Frontiers in Oncology, Applied Biochemistry and Biotechnology, PLOS ONE.

Department of In Vitro Carcinogenesis and Cellular Chemotherapy

Team

Name	Designation
Faculty with educational qualification	
Dr. Arpita Chandra, Ph D	Senior Scientific Officer-II
Dr. Subhasis Barik, Ph D	Senior Scientific Officer-II
Ms. Kanisha Kar	Senior Research Fellow
Mr. Bikash Kabi	Senior Research Fellow
Mr. Soumyadeep Mukherjee	Senior Research Fellow
Ms. Paramita Paul	Junior Research Fellow
Mr. Subham Bhakat	Junior Research Fellow
Ms. Diya Ghosh	Junior Research Fellow
Ms. Tanima Das	Junior Research Fellow
Ms. Sunandita Bhar	Junior Research Fellow

Objectives of the department:

The department has multidisciplinary approaches to target cancer. The specific areas includes i) Identification of intra-thymic molecular mechanisms coupled with T-cell commitment from stem/progenitor - T cells to target their robust proliferation in T-cell leukemia/lymphoma, ii) Elucidation of the role heterotypic interactions of different immune suppressor cells in T cell tolerance in cancer condition. iii) Development of novel metal based complex or small organic molecule as chemotherapeutic agents. iv)Targeting cancer cells by application of different customized less toxic inorganic or organic molecules as chemotherapeutic agents v) Development of drug delivery system that will deliver the existing drug to the targeted location by exploiting hypoxia.

Brief description of the work done during the year **(from 1st April 2022 to 31st March 2023):**

F. Departmental Activities

1. T cell developmental defects in response to systemic Toll-like receptor (TLR) signaling was evaluated in murine model, with special emphasis on the role of reactive oxygen species and mitochondrial dynamics in the process. Primary focus of the studies was on the immediate alterations of thymic and pre-thymic T lymphopoiesis upon TLR agonist administration.

Long-term effects of such alterations on the effector functions of T cells in the periphery were also assessed in context of cancer immunity.

2. Since T cell developmental pace is significantly lost with aging, comparative bioinformatics-based analyses between prenatal and postnatal T cell progenitors were carried out. Briefly, key transcriptional regulators demarcating the developmental events in prenatal and postnatal thymopoiesis were identified based on a combinatorial transcriptome-interactome network-based computational algorithm. Using them, a boolean logic-driven three-layered Markovian mathematical model was constructed, whose predictions were validated on bench.
3. Expression of serum acute phase proteins were examined in different cancer cell lines (breast and ovarian carcinoma) and human breast tissues. Their expression was also studied in bone marrow derived classical, alternatively activated and tumor associated macrophages and impact on iron metabolism in these cells was studied. Expression level of serum acute phase proteins were studied in context of cancer biomarker identification and therapy designing in breast as well as ovarian carcinoma using public database.
4. Synthesis, characterization, isolation of different hydroxamic acid derivatives and exploring their efficacy in different breast cancer models (MCF-7, MDA-MB231etc.) was done. Their apoptosis inducing property and cell cycle arresting property was checked. Role of these hydroxamic acid derivatives in prompting cell death in breast cancer cell lines via histone deacetylases (HDAC) modulation was also investigated. Toxicity parameters of these derivatives was also checked in animal model.
5. The role of a cobalt Schiff base complex in inducing apoptosis via cell cycle arrest and inhibiting proliferation was investigated in triple negative breast cancer cell line MDA-MB 231. The wound healing property of the cells in presence of this novel complex was also checked. The efficacy of this novel complex was compared with the existing chemotherapeutic drug oxaliplatin. Toxicity parameters of this 1,2-diamino cyclohexane based cobalt Schiff base was also checked in animal model.
6. Different Schiff base complexes of cobalt, nickel, copper was synthesized by using various phenol based aromatic aldehydes. Compounds were checked for their solubility. UV-Visible spectra was done to check their oxidation state. Isolation of the compound was done. Few complexes are isolated as single crystals and sent for crystal structure analysis. Few of the cobalt Schiff base complexes were tested for their drug delivery potential in lung cancer cell lines under hypoxia.

G. Projects running – Name of the P.I. → Project Title → Funding agency

(A) ***Extramural:***

1. P.I.: Dr. Subhasis Barik ; Project Title: "Environmental regulation on T cell development and autoimmunity.", Funding agency: Department of Biotechnology (Ramalingaswami Fellowship).
2. P.I.: Dr. Subhasis Barik , Co-PI: Dr. Arpita Chandra and Dr. Soumitra Kumar Choudhuri. Project Title: "Targeting the role of serum acute phase proteins to induce peripheral T cell tolerance in breast, ovary and colon carcinoma." Funding agency: SERB-CRG (SCIENCE & ENGINEERING RESEARCH BOARD - CORE RESEARCH GRANT).
3. P.I.: Dr. Arpita Chandra, Name of the fellow: Ms. Diya Ghosh "Cobalt Schiff base complexes as redox activated effectors in targeting lung cancer", →Funding agency: DSTBT,WB.

(B) ***Intramural:***

1. P.I.: Dr. Subhasis Barik. Project Title: "Identification of intra-thymic mechanisms associated with T-cell commitment from T-stem/progenitor cells and robust T-cell proliferation in T-cell leukemia/lymphoma". Funding agency: CNCI intramural support
2. P.I.: Dr. Arpita Chandra. Project Title: "Targeting Breast Cancer Stem Cells through Chemotherapeutic Agents." Funding agency: CNCI intramural support

Students' Projects running – Name of the Student → Project Title → Funding agency

1. Name of the Fellow: Mr. Soumyadeep Mukherjee (CSIR-SRF) "Targeting multipotent nature of early T cell progenitors to inhibit their robust proliferation and lineage diversity: A Microenvironmental fine tuning over genetic mutations in Early Tcell precursor acute lymphoblastic leukemia (ETP-ALL)". PI: Dr. Subhasis Barik; Funding agency: CSIR.
2. Name of the Fellow: Mr. Subham Bhakat (UGC-JRF). "Unraveling the involvement of extracellular cytokine signaling in immune suppressive cells to govern their subset heterogeneity and peripheral T cell tolerance in cancer" PI: Dr. Subhasis Barik; Funding agency: UGC.

3. Name of the Fellow: Ms. Paramita Paul (CSIR-JRF). "Unraveling the involvement of molecular dictators in immune suppressive cells to control peripheral T cell tolerance in cancer" PI: Dr. Subhasis Barik; Funding agency: CSIR.
4. Name of the Fellow: Kanisha Kar (UGC-SRF). "Unraveling Chemotherapeutic efficacy of a Novel Cobalt Schiff Base Compound in both in vitro & in vivo." PI: Dr. Arpita Chandra; Funding agency: UGC.
5. Name of the Fellow: Bikash Kabi (UGC-SRF). "Repression of hypoxia induced angiogenesis by a hydroxamic acid derivative in Cancer" PI: Dr. Arpita Chandra; Funding agency: UGC.
6. Name of the Fellow: Tanima Das (UGC-SRF). "Repression of hypoxia induced angiogenesis by a hydroxamic acid derivative in Cancer" PI: Dr. Arpita Chandra; Funding agency: UGC

Publications: 05

1. Other academic activities

A. Short term projects:

- Dr. Subhasis Barik has conducted **six short-term** projects during this academic year.
- Dr. Arpita Chandra conducted **four short-term** projects during this academic year.

B. Reviewer of Journals:

- Dr. Subhasis Barik acted as an honorary reviewer of several international journals like, Plos One, Advances in Therapy and Frontiers in Oncology.
- Dr. Subhasis Barik acted as an academic editor of Plos One journal.
- Dr. Arpita Chandra acted as an honorary reviewer of Inorganic Chemistry.

Department of Neuroendocrinology & Experimental Hematology

Team

Name	Designation
Biswarup Basu, PhD	Senior Scientific Officer Grade-II
Mr. Sandip Ghosh (M.Sc)	UGC-SRF
Mr. Souvik Das (M.Sc)	UGC-SRF
Ms. Pratiti Bhattacharjee (M.Sc)	CSIR-JRF

Objectives of the department:

1. Neuroendocrine- immune-microbial axis and environmental impact in tumor progression
2. Multi- OMIC based biomarker identification for early detection, precision medicine & therapeutic drug designing in cancer
3. Development of affordable technologies to mitigate treatment adversities (lower bioavailability of oral drug, impaired healing in surgical/ radiation wound, chemotherapy resulted in neuropathy & bone degradation)
4. Theranostic drug targeting across blood brain barrier and immunoreactive cancers
5. Development of AI based tools for pathology and radiology guidance
7. Evaluation of therapeutic potential of different synthetic compounds and phytochemicals in preclinical models

Brief description of the work done during the year (from 1st April 2022 to 31st March 2023):

H. Departmental Activities:

- Students undergoing PhD= 3;
- Extramural Projects recommended in 2022-2023 =3

  a. ICMR as PI (49 lakhs): Development of Bio-mimicking Polymeric Scaffolds for Accelerated Healing and Sustained Drug Release: Preclinical studies in Radiation Impaired Surgical Wounds in Cancer

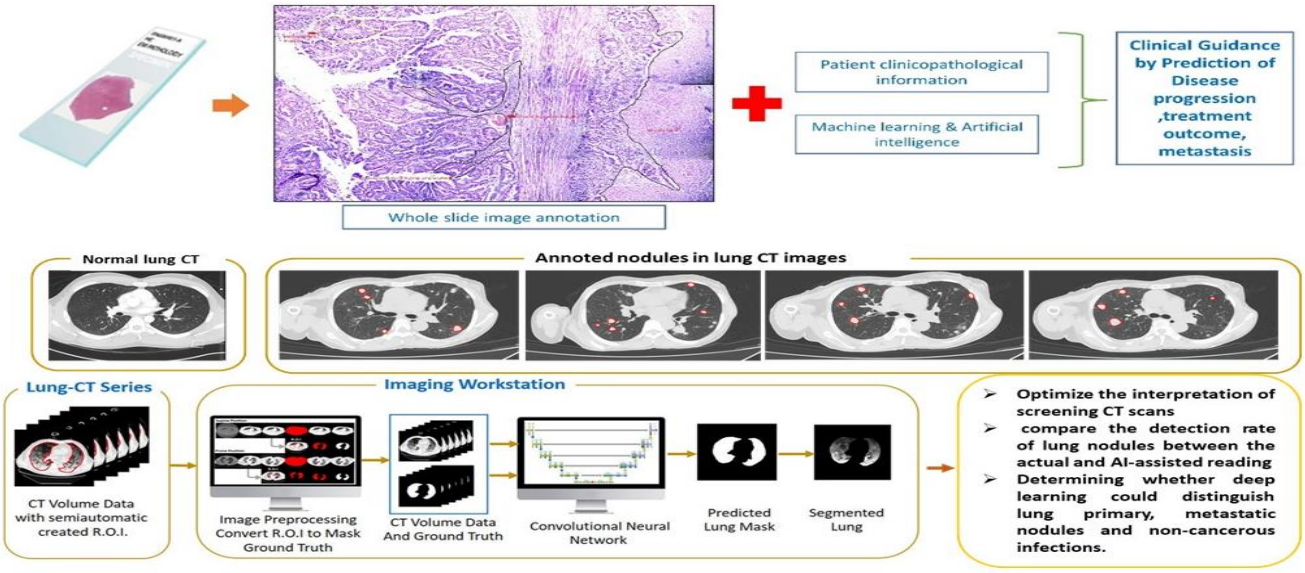
  b. DBT as PI (79 Lakhs): Study on Enriched Bacopa monnieri Active Component Delivery Targeting Glioblastoma and Associated Neurocognitive Dysfunction

  c. ICMR as Co-PI (49 Lakhs): Development and Preclinical Evaluation of Bio-synthetic, polysaccharide rich hydrogels as ECM bio-mimics to understand metastatic matrisome in tumor microenvironment and predict drug efficacy in 3D triple negative breast tumor model
- Work done in 2022-2023 are given in detail with results below-

1. **Development of Digital Pathology/ Radiology:**

Collaboration: Jadavpur University

Aim: Manual interpretation of histopathological images and CT scan images by radiologists/pathologist can be difficult, resulting in missed diagnoses. The objective of this



study is to introduce whole pathological slide imaging and annotated lung CT scan images to improve the detection accuracy of tumor histopathology and lung cancer by using artificial intelligence (AI). Work plan is given in Fig 1 below-

Fig 1: Whole slide image annotation and AI driven CT scan image analysis

Results: We showed that CNN outperformed other AI based lung cancer detection. Our proposed 3D-CNN had a classification accuracy of 97.17%, whereas the other previously present AlexNet 3D CNN had 92.9% in training and independent testing data sets, respectively. Furthermore, whole images of slides shown more enriched informations compared to averaging of multiple hpf views.

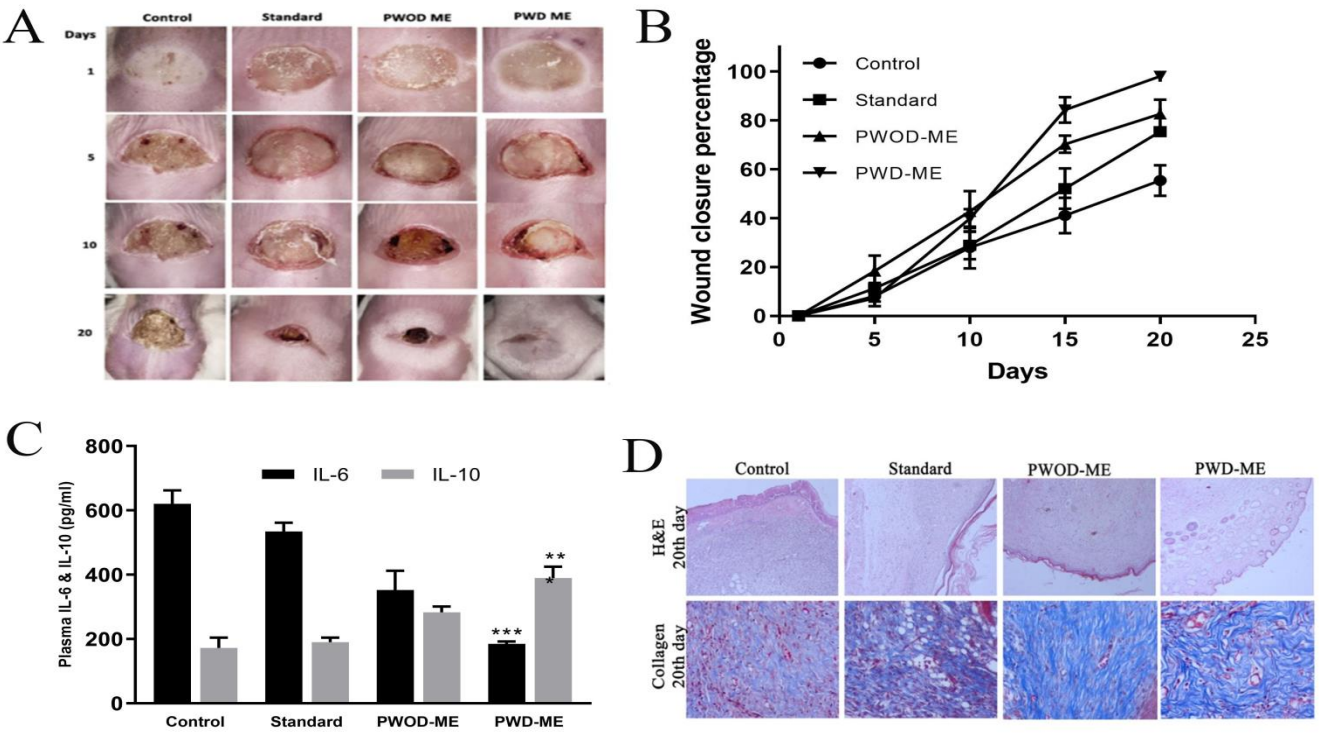
2. **Peppermint oil based Microemulsion of Cinnamic Acid for Burn Wound Management**

Collaboration: Amity University, Noida

Aim: Burn wounds mimic radiation impaired wounds , a characteristic adversity of radiotherapy in cancer patients. Development of microemulsion may incorporate wide range of drugs and

have the capability to improve their bioavailability in burn wound. We prepared peppermint oil and experimental drug (cinnamic acid) containing microemulsion (PWD-ME) and used topically in burn wounds

Results: At day 20, PWD-ME treated group experienced faster wound healing than control, standard (SilverX) and PWOD-ME (without drug) groups. PWD-ME treated group showed



thick outer epithelial layer with the greatest number of new hair follicles. PWD-ME treated group showed thick compact skin histology with most collagen fiber and fibroblast proliferation with very less inflammatory cells (Fig 2).

Fig2: Representative images of day wise burn wound closure images of control and all treated groups(A). Percentage of burn wound closure up to 20 days(B). Post burn injury plasma samples collected at day 10 to analyze the IL-6 and IL-10 levels(C). Hematoxylin and eosin-stained post burn day 20 and collagen-stained day 20 wound skin histology images(D). All images taken in 100X magnification Data represents as mean ± SEM (n=3); *p>0.05, **p>0.01, ***p>0.001; * represents significant difference from control group.

3. Effect of Changed Microbial Diversity in Dysbiosis and Occupational Health /Carcinogenesis

Collaboration: Vidyasagar College for Women, Calcutta University

Aim: Colonization of halophilic bacterial species because of high temperature and salinity in tropical climate fresh surface water sources became contaminated due to sea water intrusion, direct impact on human health. This study focused on the identification of enteropathogenic bacteria prevalence causing mass mortality in aquatic animals and transmitted to human by zoonosis and major reason for dysbiosis. PCR based detection methods were applied to check presence of halophilic bacterial species in collected surface water samples from Sunderban areas which are severely affected by cyclones.

Key Results: Growth of halophilic bacterial species observed in specific selective media. Samples were collected form cyclone affected areas of Sunderbans and high prevalence of Vibrio parahaemolyticus, Vibrio vulnificus, Vibrio mimicus, were found in the samples. Presence of toxic genes (such as tox-R, tdh, trh) were further reported in the Vibrio positive samples, which are known to cause severe gastrointestinal infection in humans. We further looked for bacteria related to carcinogenesis and that is presently ongoing.

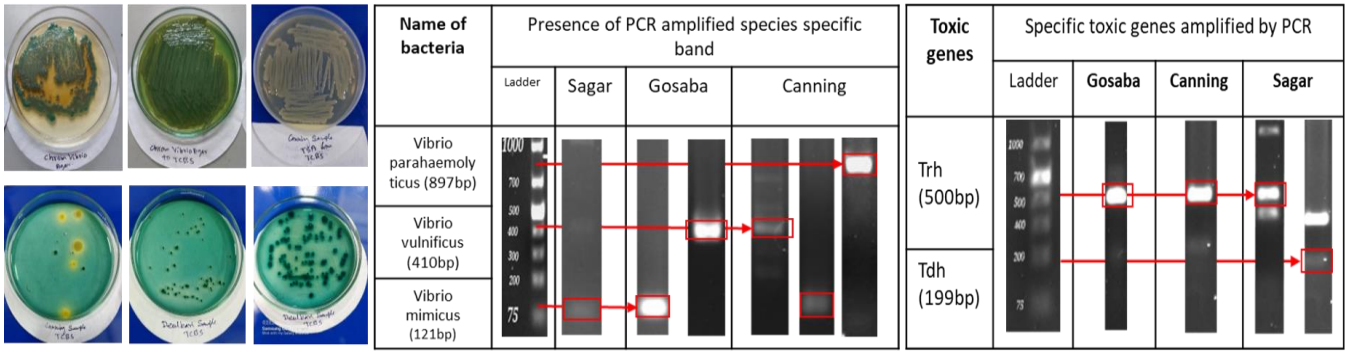


Fig 3: (left). Growth of halophilic bacterial species observed in specific selective media. (Middle panel) Species specific primers were used to amplify bacterial genomic DNA to check presence of enteropathogenic bacterial species. Vibrio parahemolyticus, V vulnificus, V mimicus are mainly found. (Right panel) Vibrio positive samples were also found to be positive for toxic genes causing gastrointestinal disease in human

I. **Projects running:** No.=1, Name of the P.I: Dr Biswarup Basu, Funding agency: WB-DSTB

Project Title → "Study on Role of Axon Guidance Molecules in Ovarian Tumor

Progression, Treatment Outcomes and Chemotherapy Induced Peripheral Neuropathy"

J. **Student's Projects running** – 3

- Name of the Student: Mr. Sandip Ghosh, Funding agency: UGC
  Project Title: "Study of autophagy signatures as prognostic biomarkers and therapeutic targets in Indian breast cancer patients"
- Name of the Student: Mr. Souvik Das, Funding agency: UGC
  Project Title: Study on molecular signatures and multiregional tumor heterogeneity in ovarian tumors in eastern India and therapeutic targeting
- Name of the Student: Ms. Pratiti Bhattacharyya, Funding agency: CSIR
  Project Title: Study on the role of neuronal regulators in ovarian cancer progression and chemotherapy induced peripheral neuropathy

D. **Publications: 03 Books Chapter :02**

E. **Other academic activities**:

- Dr Basu is approved as SAGE Publishing's Early Career Reviewer (ECR) on 15.08.2022
- Dr Basu acted as peer reviewer in journals (Frontiers, NPG, Elsevier) and SERB-CRG grants

DEPARTMENT OF ONCOGENE REGULATION

Head of the department: Dr. Jayanta Chakrabarti, MS; DNB; Director, CNCI

Team

Name	Designation
Faculty with educational qualification	Dr. Sankhadeep Dutta, Ph.D., Senior Scientific Officer, Grade-II
Other Team Members	Dr. Chinmay Kumar Panda, Ph.D., FNASc, FAScT NASI Senior Scientist Platinum Jubilee Fellow
	Prof. Bishnu Pada Chatterjee, Ph.D, FAScT, FNASc, FAMS Distinguished Honorary Scientist

Objectives of the department:

Our department aims to(a) understand the molecular pathogenesis of tumor development; (b) develop techniques for early detection of tumor; (c) develop precise therapeutic strategies of tumor. Aiming to the above points, we have studied the following objectives:

1) Molecular analysis of some epithelial malignancies to understand molecular pathogenesis of the disease;

2) Development of non-invasive biomarkers for early detection of carcinomas in Head and neck, cervix and liver.

Brief description of the work done during the year (from 1st April 2021 to 31st March 2022):

Projects running (Extramural)

1. **Name of the P.I.: Dr. Sankhadeep Dutta**
   Project Title: Identification of non-invasive microRNA and proteomic biomarkers in plasma for early detection of Head and Neck Squamous Cell Carcinoma in Indian patients
   Funding agency: Indian Council of Medical Research (ICMR)

2. **Name of the P.I.: Dr. Sankhadeep Dutta**
   Project Title: Evaluation of population prevalence and oncogenic potential of novel HPV type 217, 218, 223, and 225
   Funding agency: IARC, WHO

3. **Name of the P.I**.: **Dr. Chinmay Kumar Panda**
   Project Title: Analysis of molecular pathogenesis of uterine cervical carcinoma for the development of targeted therapy
   Funding agency: The National Academy of Sciences, India

4. **Name of the P.I.: Dr. Chinmay Kumar Panda**

Name of Co-PI: Prof. Bishnu Pada Chatterjee
Project Title: Use of phosphoprotein biomarkers to develop plasmonic ELISA for predicting chronic hepatitis, liver cirrhosis and hepatocellular carcinoma
Funding agency: Indian Council of Medical Research (ICMR)

Projects running (Internal)

1. **Name of the P.I.:** Dr. Sankhadeep Dutta
   Project Title: Analysis of non-coding RNA role in deregulation of key cellular pathways associated with HNSCC development: clinical implications
   Name of the Student: Md. Sadi Khan
   Funding: CNCI Junior Research Fellowship

Students' Projects running

1. **Name of the Student:** Ms. Debalina Mukhopadhyay
   Project Title: Analysis of stem cell renewal Notch1 pathway alterations during development of head and neck squamous cell carcinoma of Indian patients
   Funding agency: Woman Scientist (A), DST fellowship scheme

2. **Name of the Student:** Ms. Priyanka Dutta
   Project Title: Analysis of DNA modifying and DDR (DNA damage response) genes associated with the development of uterine cervical carcinoma (CACX)
   Funding agency: DST-INSPIRE fellowship scheme

3. **Name of the Student:** Ms. Farhin Sultana
   Project Title: Evaluation of LIMD1-VHL targeting miRNA(s) as biomarker in Uterine Cervical Carcinogenesis
   Funding agency: CSIR-NET fellowship scheme

4. **Name of the Student:** Mr. Subhadip Kundu
   Project Title: Analysis of the role of non-coding RNA in deregulation of cellular pathways associated with the development of bladder carcinoma: prognostic and therapeutic importance
   Funding agency: CSIR-NET fellowship scheme

Publications/Monographs/Patents etc. (*please mention international and national publications separately*) – for style and format, please see below

A. Publication in International Journals: 02
B. Publication in National Journals: 03

PhD awarded:
Mr. Balarko Chakraborty **was awarded Ph.D (Biotechnology) degree in the year 2022** from Calcutta University for his thesis entitled "Analysis of the alterations of Wnt and Hedgehog

pathways during the development of HNSCC ”under the supervision of Dr. Chinmay Kumar Panda.

Findings from objective 1: Molecular analysis of some epithelial malignancies to understand molecular pathogenesis of the disease:

- **Differential activation of NOTCH1 pathway in HNSCC of different anatomical sites.**

Head and neck squamous cell carcinoma (HNSCC) is the 6th most frequent cancer worldwide, and the role of NOTCH1 pathway during development of HNSCC is debatable. Here, we have made an attempt to evaluate the NOTCH1 pathway status in HNSCC cell lines from different anatomical sub-sites. At first, mRNA expression status of NOTCH1 pathway associated genes (NOTCH1/JAG1/JAG2/HES1/HEY1/CD44/FBXW7/HIF1α/VEGF) was analyzed in two HNSCC cell lines: FaDu (hypopharyngeal carcinoma) and SCC9 (tongue carcinoma) and was compared with publicly available database. Then, molecular profiling (RNA/protein) of the genes and cell cycle phase distribution analysis were done after DAPT (γ-secretase inhibitor) administration at different concentrations on the cell lines to see the differential effect, if any. High NOTCH1 pathway activation was noted in FaDu cell line than the SCC9. In cytotoxicity assay with DAPT, FaDu showed more sensitivity than SCC9. Therefore, gradual decline of the expression of NOTCH1 pathway associated genes was noted in FaDu with the increasing DAPT concentrations, leading to high S/G2-M arrest of the cell population. Contrastingly, SCC9 showed significant reduced expression of the genes at higher concentration of DAPT with comparatively low S/G2-M arrest of the cell population. The study demonstrates distinct NOTCH1 pathway signature in the HNSCC cell lines of specific sub-sites of head and neck.

- **Inverse molecular profile of epigenetic modifiers DNMT1 and TET1 in cervical carcinoma pathogenesis: clinical implications**

In this study, we aimed to understand the interplay of the epigenetic modifier genes DNMT1 and TET1 along with HPV infection in the cervical epithelium and how it changes during tumorigenesis. For this purpose, initially the bioinformatical analysis (methylation and expression profile) of DNMT1 and TET1 was analyzed in the TCGA dataset. Next genetic (deletion) and epigenetic profiling (promoter methylation) of DNMT1 and TET1 were done in our sample pool and also validated in CACX cell lines as well. The results were further correlated with different clinico-pathological parameters. Our data revealed that HPV infection in basal/parabasal layers of cervical epithelium actually disrupts the epigenetic homeostasis of DNMT1 and TET1 proteins which ultimately leads to the high expression of DNMT1 along with further reduction in TET1 protein during the development of carcinoma. Further, in-depth look into the results revealed that comparatively low methylation frequency of DNMT1 coupled with high promoter methylation and deletion frequency [22–46%] of TET1 were the plausible reasons of their antagonistic expression profile during the progression of the disease. Interestingly, the prevalence of promoter methylation in DNMT1 [9.1%] and TET1 [22.7%] found in both the plasma DNA of the respective CACX

patients implicated its diagnostic importance. Lastly, molecular alteration of TET1 alone or in combination with DNMT1 showed the worst overall survival among the patients. Hence, it may be concluded that an inverse molecular profile of DNMT1 and TET1 genes seen in the proliferative basal-parabasal layers of the cervical epithelium was aggravated during the development of CACX along with genetic and epigenetic changes due to HPV infection.

- **Findings from objective 2: Development of non-invasive biomarker for early detection of carcinomas in Head and neck, cervix and liver**

Identification of deregulated microRNA in plasma as non-invasive biomarkers for early detection of Head and Neck Squamous Cell Carcinoma (HNSCC) in Indian patients

Prognostic outcome of Head and Neck Cancer (HNSCC) patients in India is poor due to late diagnosis in advanced stages. Conventional invasive histopathological assessment of incisional biopsy is discouraging to the patients to undergo the entire diagnosis procedure. Hence, finding a non-invasive, molecular biomarker for early detection of the disease and therapeutic implication is of utmost importance. Hence, we aimed to identify the clinically relevant miRNA-panel and their downstream target genes/pathways showing significant expression-dysregulation in HNSCC patient samples for biomarker detection. We performed coding and non-coding RNA-sequencing in 5-paired HNSCC samples (5 primary-tumors and their adjacent-normal) to identify significantly altered mRNAs. Simultaneously, small-RNA library was prepared from the same 5-paired HNSCC samples and corresponding plasma. The identified, differentially expressed miRNAs and their downstream target genes' expression were validated in independent sample-set by qRT-PCR. MiRNA/mRNA dysregulation and associated pathway alterations were further identified by Pathway enrichment analysis. The transcriptome analysis revealed 704 statistically significant differently expressed genes (DEGs). Pathway enrichment analysis uncovered association with DNA damage response, protein ubiquitination, HPV infection etc. 127 conserved targeting miRNAs were predicted against the top 25 downregulated genes, among which 25 common miRNAs (≥2DEGs) were sorted. Parallelly, from the small RNA library 871 known miRNAs belonging to 461 miRbase families were identified. From these differentially expressed miRNAs, top 25 upregulated and downregulated miRNAs were sorted ($p \leq 0.05$). Finally, 5 miRNAs (i.e., hsa-miR-15b-5p, hsa-miR-424-5p, hsa-miR-30a-5p-Upregulated and hsa-miR-96-5p-downregulated) were identified, that are common in both our predicted and experimental miRNA list. Among these, hsa-miR-15b-5p and hsa-miR-424-5p are from the same seed family having common targeting genes. The pathway enrichment revealed involvement of 5 miRNAs in homologous recombination, cell cycle and different immunological pathways. We have also identified hsa-miR-135b-5p, which is upregulated in all patient samples either in tumor/plasma/both, and also in our predicted miRNA list. Expression of hsa-miR-135b-5p was further validated in independent, primary HNSCC samples (N=10) and their plasma by qRT-PCR. Thus, we identified a panel of 5 dysregulated miRNAs in HNSCC patients. A large-scale validation of this panel in patient plasma will further prove its potential as non-invasive biomarker for HNSCC.

- **Identification of novel/altered glycoproteins expressed in plasma of HNSCC patients in India**

Expression analysis of upregulated glycoprotein CD44 in blood plasma of HNSCC patients along with blood plasma of normal individual revealed that the protein expression of CD44 was significantly higher in HNSCC patients in comparison to normal subject. In western blot analysis we found multiple bands, which could be due to proteolytic cleavage of CD44. The mRNA expressional analysis, showed significantly higher CD44S in both primary tumor and patient plasma than their respective normal. The HNSCC primary tumor also showed significantly higher CD44v3 expression than their adjacent normal tissues. On further profiling of HA, the principal ligand of CD44, we found a differential HMW HA and LMW HA pattern among the patients and also between patients and normal individuals. It was found that the expression of pro-tumorigenic LMW HA level was higher in HNSCC patients than the normal subjects, on the other hand, the anti-tumorigenic HMW HA level was higher in the blood plasma of normal subjects. This higher LMW HA level in patient plasma is due to increased expression of HASs and HYAL1 and HYAL2, which are responsible for generation of small HAs from HMW HA by their hyaluronidase activity. These findings are indicative of the role of glycoprotein-CD44 and CD44-HA pathway in HNSCC development, however, needs validation in larger sample set and *in vitro*.

- **Evaluation of LIMD1-VHL targeting miRNA(s) as biomarker in Uterine Cervical Carcinogenesis**

High-risk human papilloma (HR-HPV) DNA testing and cervical cytology, the two most practiced methods for cervical cancer (CaCx) screening, are inadequate to determine high-grade cervical intraepithelial neoplasia (CIN) with optimum molecular alterations for transformation. Therefore, the identification of miRNA-based biomarkers as non-invasive molecular triage tool for early prediction of CaCx is a clinical demand of the time because of their high tissue specificity, sensitivity, and stability. Cellular stress response pathway activation is an early event in HR-HPV induced cervical carcinogenesis.HIF-1α, a key cellular stress response pathway gene, gets activated during this process which in turn is regulated by a number of genes, notably LIMD1. We previously reported downregulation of LIMD1 during cervical carcinogenesis; hence the identification of LIMD1 targeting miRNAs and their expression profile in cervical swabs of CIN/cancer patients is clinically pertinent. To this aim at first miR-135b-5p was identified in silico amongst the LIMD1 targeting miRNAs. LIMD1 and miR-135b-5p expression were then analyzed in CIN (N=12), CaCx (N=21) and unrelated normal (N=9) by qRT-PCR along with LIMD1 protein level expression by immunohistochemistry in cervical tissue samples [unrelated normal (N=9), CIN (N=12), and CACX (N=15)]. Independent validation of miR-135b-5p expression in non-invasive swab samples were performed by qRT-PCR in HPV-normal (N =21), HPV+asymptomatic (N =18), CIN (N =21), and CACX (N =22) followed by ROC analysis for its diagnostic value. Additionally, to check the effect of miR-135b-5p on SiHa cell line, in vitro functional assays were performed. We observed that during the progression of cervical cancer miR-135b-5p showed significant gradual upregulation from normal to CIN ($p=0.03$) to CaCx ($p=0.02$) with inverse correlation of LIMD1 mRNA/ protein expression. Upon validation of miR-135b-5p expression in non-invasive cervical swab samples, similar expression trend was observed i.e., the miRNA was significantly upregulated in CIN ($p=0.047$) and CaCx ($p=0.02$) compared to HPV- normal/ HPV+ asymptomatic. ROC analysis

determined higher sensitivity and specificity of miR-135b-5p in detection of CIN from cervical swab, hence proving its diagnostics value. Upon transient silencing of miR-135b-5p expression in SiHa cell line showed significantly reduced cell viability, migration, and invasion with cell cycle arrest at G0/G1 phase and significant induction of cellular apoptosis, suggesting oncogenic role of this miRNA in HPV-induced cervical carcinogenesis. Thus, our study postulates miR-135b-5p as a molecular triage biomarker that can be applied in cervical screening for non-invasive detection of clinically relevant CIN lesions.

- **Development of non-invasive biomarker for prediction of liver lesions at different clinical stages**

Phosphorylation is important post-translational modification of proteins because phosphoproteins play critical role in the regulation of a broad spectrum of biological processes and cellular functions including signal transduction, gene expression, cell proliferation and apoptosis. These phosphorylated proteins are secreted from cells into the circulatory system and present in serum. Previously, we discovered increased expression of phosphor-zinc finger protein in the serum of liver disease patients. In this study, we have developed a sensitive diagnostic ELISA test based on anti-phospho-zinc-finger protein antibodies to correctly detect liver disease from the serum samples. The diagnostic test detects liver cirrhosis with 100% sensitivity and 100% specificity. The diagnostic test is minimally invasive (using serum samples) and in-expensive and has a lot of potential for commercial development. However, more samples are being tested to confirm this test and to further develop its commercial application to the patients with liver disease.

Department of Pathology and Cancer Screening

Head / In-Charge of the department: Dr. Vilas D. Nasare, Senior Scientific Officer- I

Team

Students	
Dr Arpana Sharma Ph.D.	Research Associate
Sinjini Sarkar Ph.D.	DHR Young Scientist
Ranita Pal, M.Sc.	DST Woman Scientist-A
Tanuma Mistry M.Sc.	Senior Research Fellow
Sushmita Ghosh M.Sc.	Senior Research Fellow
Madhurima Ghosh M.Pharm	Senior Research Fellow
Trisha Choudhary M.Sc.	Junior Research Fellow

Objectives of the department:

The department of pathology and cancer screening has been catering to a comprehensive cancer screening and awareness programme for the last 40 years. The programme covers both rural and urban areas of West Bengal and adjoining states. In addition, this department has also been engaged in a basic cancer research programme for the last 28 years and has published many fundamental research papers in national and international journals. Presently, department is focusing to identify drug resistance or sensitive molecules to improve cancer treatment strategy by reducing the toxicological adversity and also trying to find alternative anticancer therapy.

Brief description of the work done during the year (from 1st April 2022 to 31st March 2023):

Departmental Activities

- **Student Undergoing PhD**: **4** students are undergoing, their PhD curriculum in the Department.
- **Students Undergoing DNB**: **3** students are undergoing, their DNB curriculum in the Department.
- **Students Training Completed**: **10**

Students' Projects running

1. **Sinjini Sarkar (Young Scientist)**
   Mentor: Dr Vilas D. Nasare; Completed 29th April 2022
   Study on MAD and BUB1 genes of Spindle Assembly Checkpoint with response to primary adjuvant chemotherapy in advanced ovarian cancer patients.
   Funding Agency: Department of Health Research

2. **Ranita Pal (DST Women Scientist A)**
   Mentor: Dr Vilas D. Nasare Completed 30th June 2022

MicroRNAs as prognostic biomarkers of chemoresistance and chemosensitivity in ovarian cancer patients undergoing combinational therapy
Funding Agency: Department of Science and Technology

3. **Tanuma Mistry (SRF)**
   Principal Investigator: Dr Vilas D. Nasare
   Study on CYP2D6 and ABCB polymorphisms with respect to tamoxifen adjuvant treatment in ER and PR receptor breast cancer patients
   Funding Agency: Council of Scientific and Industrial Research

4. **Sushmita Ghosh**
   Principal Investigator: Dr Vilas D. Nasare
   A study on sorcin mediated pathway of Multidrug resistance in Gastric Carcinoma
   Funding Agency: CNCI

5. **Trisha Choudhary**
   Principal Investigator: Dr Vilas D. Nasare
   Study the potential role of DEK as a therapeutic target in ovarian Carcinoma
   Funding Agency: Council of Scientific and Industrial Research

6. **Madhurima Ghosh**
   Principal Investigator: Dr Vilas D. Nasare
   A study on SMARCA-4, DICER-1, RAD51C/D mutations, their expression and associated miRNAs in ovarian cancer
   Funding Agency: Indian Council of Medical Research

7. **Dr. Arpana Sharma**
   Principal Investigator: Dr Vilas D. Nasare
   Investigating the role of PLK1 on glutamate receptor and cystine glutamate antiporter as regulator of proliferation and migration in ovarian cancer
   Funding Agency: Indian Council of Medical Research

- **Publications: 08**

Department of Receptor Biology & Tumor Metastasis

Head of the department: Dona Sinha, Ph.D. Senior Scientific Officer (Asst. Dir Grade)

Team

Faculty with educational qualification	
Nabanita Chatterjee, Ph.D.	Senior Scientific Officer-II
Suchisnigdha Datta, Ph.D.	ICMR-SRF
Sraddhya Roy	UGC-SRF
Ananya Das	CSIR-SRF
Priyanka Saha	CNCI-JRF
Sukanya Ghosh	WBPCB -JRF
Anurima Samanta	DSTBT, JRF
Aparajita Bairagi	CNCI-JRF
Rupa Chaudhuri	WBPCB - Project Assistant
Ganga Routh	Lab Attendant

Objectives of the department: In few words.

- ✓ Health impact of environmental pollution (especially particulate matter2.5 and groundwater arsenic) in an asymptomatic population of Kolkata and surrounding areas
- ✓ Redox regulation and drug resistance in lung adenocarcinoma
- ✓ EMT, cancer stemness, and therapy resistance in oral cancer
- ✓ Immuno-inflammatory response in cancer
- ✓ Metabolic and immunological changes of different biomolecules involved in cancer progression, metastasis, and drug resistance.
- ✓ Dysregulations in various metabolic pathways and identifying different biomolecules in order to target them as a mode of anti-cancer therapy.

Brief description of the work done during the year (from 1st April 2022 to 31st March 2023):

K. Departmental Activities

- **Oncoanesthesiology**: A prospective clinical study elicited that intravenous anesthetic, Propofol better regulated the frequency of T helper, cytotoxic T cells, B cells, and inflammatory cytokines than volatile anesthetic Isoflurane in perioperative breast cancer patients. Molecular docking and molecular dynamic simulations further confirmed that in comparison to Isoflurane, strong binding of Propofol with CD4 and CD8 altered their surface

chemistry and made their amino acids inaccessible to any interaction.

- **Air quality and human health**: A study across asymptomatic populations (without any chronic disease and/or addiction) exhibited that in comparison to a low particulate matter 2.5 (PM2.5) exposed rural area, Boria, South 24 Parganas, people residing in high PM2.5 exposed area, Jadavpur, Kolkata were associated with depletion of hemoglobin, decrement of lung function and deregulation of pro-oncogenic pathway EGFR/PI3K/AKT in pulmonary and systemic microenvironments.
- **Oral cancer**: Overexpression of a transcription factor ΔNp63 was found to influence epithelial-mesenchymal transition (E-cadherin, N-cadherin, TGF-β, MMP-9), cancer stemness (CD44, EpCAM, Oct-4), and therapy resistance (P-gp, MRP-1) signaling in advanced-stage oral squamous cell carcinoma patients.
- **Lung cancer**: Lung cancer is the leading cause of cancer-related deaths worldwide. Flow cytometry revealed a higher percentage of tumor-infiltrating lymphocytes, CD4+ and CD8+T cells in the peripheral blood of NSCLC post-treated patients and increased expression of PD-1 and PD-L1 proteins in immunohistochemistry analysis of pre-treated patients. Thus, targeting T cells can act as a novel therapeutic approach to advanced immune therapeutic regimens.

  An *in vitro* study demonstrated that treatment of resistant A549 lung adenocarcinoma cells with Nrf2-inhibitor + crizotinib (low-concentration) + pulsatile treatment of EGCG after drug holiday+ low concentration crizotinib elicited the best drug response in terms of spheroid shrinkage, drug kinetics, mitigation of MDR-like phenotype, and MRP1-downregulation.
- **Ovarian cancer:** A study based on the clinical samples for the estimation of different cytokine levels (IL-6, TNF-α, TGF-β1, IL-10), elucidated the influence of exosomes in the regulation tumor microenvironment (TME) and metastasis via VEGF, and ANGPT1 alteration. The aggressiveness of OvCa cells was observed to be correlated with the deregulated inflammatory tumor microenvironment under exogenous exosomes.
- **Ovarian cancer**: The estimation of different cytokine levels (IL-6, TNF-α, TGF-β1, IL-10) in OvCa patients have elucidated how the inflamed tumor microenvironment dictates the cancer cells acquire metastasizing potential by analyzing the metastatic markers like VEGF, and ANGPT1. Thus, we can draw a correlation between the aggressiveness of OvCa

cells deregulated the inflammatory tumor microenvironment of OvCa. We have further characterized the exosomes isolated from the advanced- stage patient Ovarian cancer: The estimation of different cytokine levels (IL-6, TNF-α, TGF-β1, IL-10) in OvCa patients have elucidated how the inflamed tumor microenvironment dictates the cancer cells acquire metastasizing potential by analyzing the metastatic markers like VEGF, and ANGPT1. Thus, we can draw a correlation between the aggressiveness of OvCa cells deregulated the inflammatory tumor microenvironment of OvCa. We have further characterized the exosomes isolated from the advanced- stage patient

- **Breast Cancer:** In the tumor microenvironment, the macrophages play a diverse role as antitumor and pro-tumor cues under the influence of cytokines via altering CD11b+CD206+PD-1+cells in peripheral blood and TME. Moreover, NACT significantly regulated the secretory cytokines (IL-1β, IL-12, TNF-α**,** TGF-β) to impose the antitumor potential.

➢ **Projects running –**

PI PI	**Project Title**	**Funding Agency**
Dr. Dona Sinha	Impact of air quality on human health: Exploration of probable PM2.5 triggered pathways associated with lung cancer in exposed population of Kolkata	West Bengal Pollution Control Board
Dr. Dona Sinha	Crosstalk of delta Np63 alpha with cancer stemness and epithelial mesenchymal transition: A study during two different neo adjuvant chemotherapeutic regimens in oral cancer	Dept. of Science and Technology and Biotechnology, Govt. of West Bengal
Dr. Dona Sinha	Identification and characterization of exosomal microRNAs with prognostic and therapeutic implications in non-small cell lung cancer: An approach towards molecular therapeutic developments for patients exposed to tobacco smoke and arsenic	Dept. of Health Research, Govt. of India

Students' Projects running –

PI	Student	Project Title	Funding Agency
Dr. Dona Sinha	Priyanka Saha	Effects of anesthetic agents on immune-inflammatory response of breast cancer (pilot project for 1yr)	CNCI, Ministry of health and Family Welfare, GOI
Dr. Dona Sinha	Suchisnigdha Datta	A study on the prognostic significance of Nrf2 mediated chemoresistance in lung adeno carcinoma	Indian Council of Medical Research-SRF
Dr. Nabanita Chatterjee	Sraddhya Roy	Exploring the roles of exosomes in the metabolic regulations of metastatic ovarian cancer	UGC, India
Dr. Nabanita Chatterjee	Ananya Das	Effect of Tumor Associated Macrophage Polarization on immune profile modulation in Tumor microenvironment of Breast Cancer subtypes	CSIR, India
Dr. Nabanita Chatterjee	Aparajita Bairagi	Study the immune metabolic regulation in lung cancer cells proliferation	CNCI, Ministry of health and Family Welfare, GOI

- **Total Publications: 05**

Ph.D. Award

- **Ms. Suchisnigdha Datta** was awarded Ph.D. (Sc.) degree in the year 2022 from the University of Calcutta for her thesis entitled " Exploration of the role of tea polyphenols in redox regulation of NRF2 in lung cancer " under the supervision of **Dr. Dona Sinha**.

Reviewer of peer-reviewed journals:

Sinha, D.

- Clinical and Translational Oncology; Springer, Current Medical Science; Springer, Ecotoxicology and Environmental Safety; Elsevier, Journal of Biochemical and Molecular Toxicology; Wiley, Proceedings of the Zoological Society; Springer, International Journal of Molecular Sciences; MDPI, Phytomedicine; Elsevier

Chatterjee, N.

- Cancers; MDPI, Cell and Developmental Biology; Frontiers, International Journal of Molecular Sciences; MDPI, SERB-CRG grant review, PlosOne; Plos group, Clinical and experimental Immunology; Oxford, Lipid Research; Elsevier, Lipid in health and disease; Springer, International Immunopharmacology; Elsevier

Department of Signal Transduction and Biogenic Amines

Head of the department: DR. NABENDU MURMU, Ph.D, SSO, Assistant Director Grade,

Team

Name & Designation	
	Dr. Avik Biswas, SSO Gr II Dr. Gaurav Das, DST- Inspire Faculty
Other Team Members	Samir Banerjee
	Prem Chand Das
Students	Debarpan Mitra, SRF, CNCI
	Depanwita Saha, SRF, ICMR Rimi Mukherjee. JRF,CNCI Debojit Talukdar, JRF, UGC Aritri Bhattacharjee, Project Research Assistant Subhabrata Guha, Project Assistant , DST-INSPIRE faculty project Arpita Kar, SRF,UGC Abhisekh Samanta, Fellow, CNCI

Objectives of the department:

1. To decipher the correlation between vasculogenic mimicry, angiogenesis and tumour invasiveness in the light of molecular signaling in different cancers.
2. To determine the molecular mechanism of cancer therapeutic and chemopreventive agents in signaling pathways, mRNA transcription and post transcription.
3. To examine the role of Ephrin pathway in vasculogenic mimicry in breast and oral cancer progression.
4. Isolation , extraction and purification of active components from the flowers of *Madhuca indica, Carica papaya, Justicia adhatoda* to check its cyto-toxic potential on breast cancer and oral cancer cells
5. Green synthesis of silver, zinc and gold nano-formulations with the extracts of the flowers of *Madhuca indica, Carica papaya, Justicia adhatoda* and study its efficacy on breast cancer and head and neck cancer cells.
6. Development of peptide based nano-delivery vehicles for targeting breast and oral cancer stem cells.
7. To investigate the complex role of protein-protein and protein-RNA interactions during viral as well as non-viral cancer development and progression.

Brief description of the work done during the year (from 1st April 2022 to 31st March 2023):

Projects running (Extramural) –

Name of P.I.	Project Title	Funding agency
Dr. Gaurav Das	To Develop Novel Peptide Based Nano-delivery system to deliver Potent Inhibitors into the Cancer Stem Cells	**DST-INSPIRE**
Dr. Avik Biswas	Identification and characterization of exosomal microRNAs with prognostic and therapeutic implications in non-small cell lung cancer: An approach towards molecular therapeutic developments for patients exposed to tobacco smoke and arsenic	**ICMR-GIA**

L. Students' Projects running –

Name of the Student	Project Title	Funding agency
Debarpan Mitra	The role of Ephrin and HGF/cMet pathway in regulating vasculogenic mimicry in Breast cancer and possible effects of phytochemicals.	**Institute funded, CNCI**
Depanwita Saha	Role of hypoxia mediated signalling mechanism in regulating vasculogenic mimicry and combating it with phytochemicals at transcription and post transcription level in oral squamous cell carcinoma.	**ICMR**
Rimi Mukherjee	Investigation on the anti-cancer potential of natural products and their subsequent nano-formulations on various cancer models	**Institute funded, CNCI**
Debojit Talukdar	Unravelling the Therapeutic potential of Natural products isolated from *JusticiaAdhatoda* leaves and its nano-formulations on various cancer models	**UGC**
Aritri Bhattacharjee	To standardize Glioblastoma Multiforme tumor model by intracranial implantation of Murine glioma cells via orthotopicsyngenic mouse in an invivo setting	**Canfinis Therapeutics Pvt Ltd**
Subhabrata Guha	To develop novel peptide based nano-delivery system to selectively deliver potent inhibitors into the cancer stem cells	**DST-INSPIRE Faculty project**
Guefack Fofack Michel Gael	In vitro and in vivo evaluation of anti cancer activities of some medicinal plant extracts of Cameroon	**DBT-TWAS**
Arpita Kar	Deciphering the mechanistic involvement of Hepatitis B virus (HBV) proteins in the progression and regulation of human hepatocellular carcinoma (HCC)	**UGC**
Abhisekh Samanta	Development of therapeutic peptides for blocking interactions between Hepatitis B and host cellular proteins related with regulatory signaling pathways in hepatocellular carcinoma: A proteomic approach deciphering host-pathogen protein interactive network	**CNCI Anupama Mallick Trust**

C. Collaborative Projects:

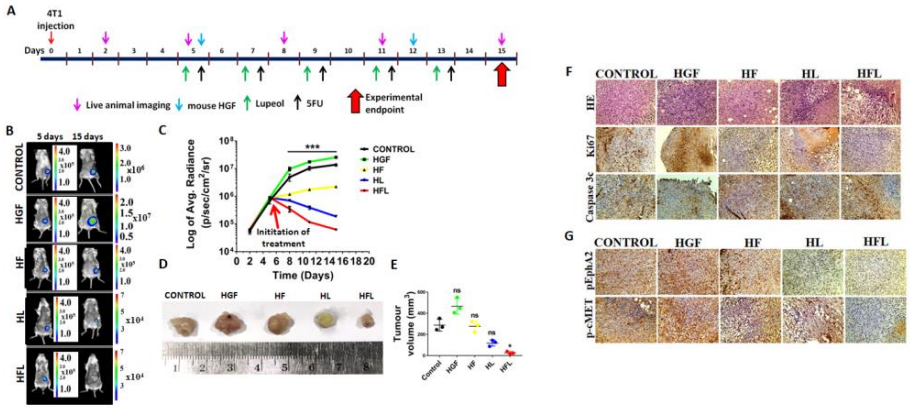
	Name of Scientist	Designation	Affiliation	Name of Project
1	**Dr. Prasanta Kumar Maiti**	Ex-HOD & Professor	IPGME&R/SSKM Hospital, Kolkata	Evaluation of antimicrobial and anticancer property of bio-compatible novel silver nanoparticles. (Student's Name: RehanaParveen; Funding Agency: DST)
2	**Dr. Pradip Majumder**	Co-founder and Advisor	CanFinis Therapeutics	Development of custom immunotherapies against cancer
3	**Dr. Tapan Kumar Mondal**	Associate Professor	Dept. of Chemistry, Jadavpur university, Kolkata	Application of novel palladium complex in biological field via live cell imaging.
4	**Dr. Umesh Chandra Naik.**	Assistant Professor	Rama Devi Womens' University, Odissa	Acalypha indica and Annona muricata promoteanticancer potential via Bax/Bcl2 mediated intrinsic apoptosis against non-small cell lung cancer: A comparative assessment.
5	**Dr. Chirantan Kar**	Assistant Professor	Amity University, Kolkata	Evaluation of anticancer property of bio-conjugated macromolecules and their nano-formulations
6	**Dr. Chittaranjan Sinha**	Professor	Dept. of Chemistry, Jadavpur university, Kolkata	Application of novel complex molecules in biological field via live cell imaging and anti-cancer effect
7	**Dr. Abhijit Saha**	Assistant Professor	Dept. of Chemistry, SRM Institute of Science and Technology, Chennai	Effect of liposomal nano-formulation of zinc conjugated molecules in breast cancer cell lines

D. Interesting Observations:

- **Project Name: Mechanistic elucidation of 5-Fluorouracil resistance in Triple Negative Breast Cancer: Synergistic combinatorial approach with Lupeol to combat this phenomenon.**

  Name of PI : Dr. Nabendu Murmu

  Name of student: Mr. Debarpan Mitra

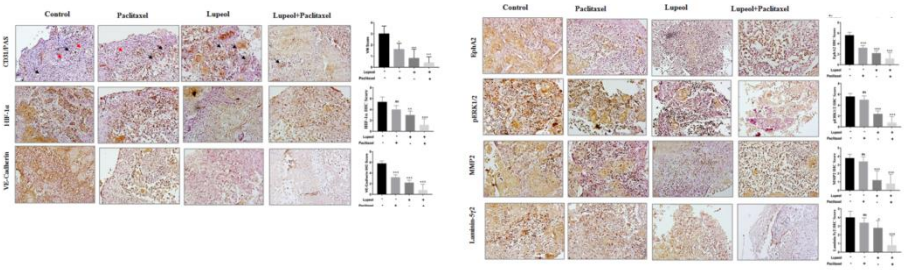


Important findings: 4T1 TNBC cells derived from BALB/c mice were used to induce syngeneic TNBC tumors in female BALB/c mice. After tumor induction (5days after the injection of 4T1 cells into abdominal mammary fat pads),when the tumor reached a dimension of 5 × 5 mm, the mice were treated with 5FU and/or Lupeol along with HGF (Fig. 1A). In this live animal model, tumor growth was monitored by in vivo animal imaging using IVIS, which detects bioluminescence as a measure of viable tumor cell density (Fig 1B). Prior to this in vivo dosing schedule, a separate group of non-tumor-bearing mice was administered the same treatment regimens to check for impending off-target toxicity. It was observed that there was a significant inhibition of tumor growth in the combination arm, even in the presence of HGF, compared to the other groups (Fig 1 C, D, and E). IHC staining of the harvested tumors revealed a marked reduction in the expression of Ki-67 and an increase in caspase 3c expression (Fig. 1F). Notably, the phosphorylation of EphA2, c-MET, and their downstream molecules was significantly reduced in the combination arm, thus confirming the efficacy of the combination regimen (Fig. 1G).

- **Synergistic effect of lupeol and paclitaxel in regulating hypoxia induced vasculogenic mimicry in patient derived ex-vivo culture**

  Name of PI: Dr. Nabendu Murmu

Name of student: Ms. Depanwita Saha

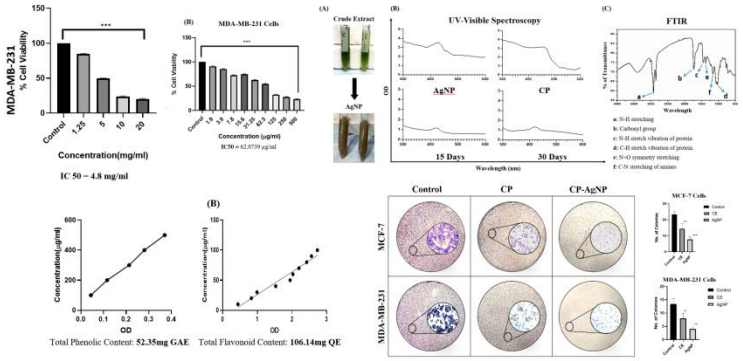


Important findings: In order to elucidate the efficacy of the combinatorial drug in ex-vivo system, the expressional alteration of VM associated regulators was assessed at 48 hours post treatment. Tissue architecture of untreated control exhibited compact tumor cells whereas the lupeol and paclitaxel co-treated group was found to have more disintegrated structures. CD31/PAS staining showed significantly decreased number of VM structures in lupeol and paclitaxel treated tumor fragments compared to the untreated control. Lupeol and paclitaxel treatment group displayed significant decrease in the expression of the VM associated HIF-1α and its downstream regulators VE-Cadherin, pEphA2 (S-897), pERK1/2, MMP2 and Laminin 5γ2 compared to the untreated control.

- **Investigation on the anti-cancer potential of *Carica papaya* leaf extract and its subsequent nano-formulation on breast cancer model**

  Name of PI: Dr. Nabendu Murmu

  Name of student: Ms. Rimi Mukherjee



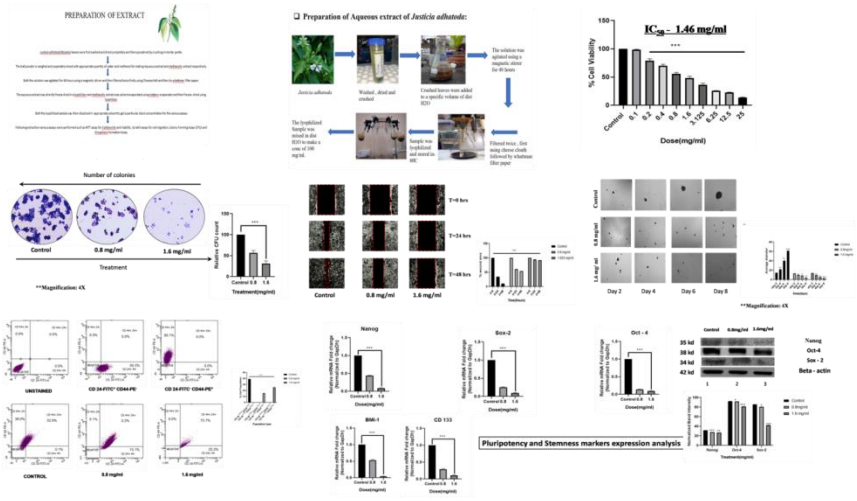
Important findings: We have prepared ethanolic extracts of *Carica papaya (*CP) by maceration process. Anticancer activity of the extracts were confirmed from MTT assay which showed a IC 50 value of around 4.8 mg/ml and 977 µg/ml in MDA-MB-231 and MCF-7 breast cancer cell lines respectively. We have extimated the total phenolic and flavonoid content of the CP extract which

came at around 52.35 mg GAE and 106.14 mg QE which is quite higher with respect to common medicinal plants of India. Thereafter, we have prepared a silver nano-formulation of the prepared CP extract by Green Synthesis. We have obtained the peak via UV-Vis Spectroscopy at round 410 nm indicating the formation of silver nanoparticle. We have further characterized the nano-formulation by FTIR which revealed the presence of phenolics and flavonoids in the extract. We performed MTT with the nano-formulation and the IC50 came at around 62.07µg/ml with MDA-MB-231 cells. Upon further in-vitro analysis, we have found that the crude extract and the silver nano-formulation have the potential to inhibit the colony size as well as numbers further proving their cytotoxicity.

- **Unraveling the therapeutic potential of natural products isolated from *Justicia adhatoda* leaves and their nano-formulations on Head and Neck Squamous cell Carcinoma (HNSCC) model**

  Name of PI : Dr. Nabendu Murmu

  Name of student: Mr. Debojit Talukdar

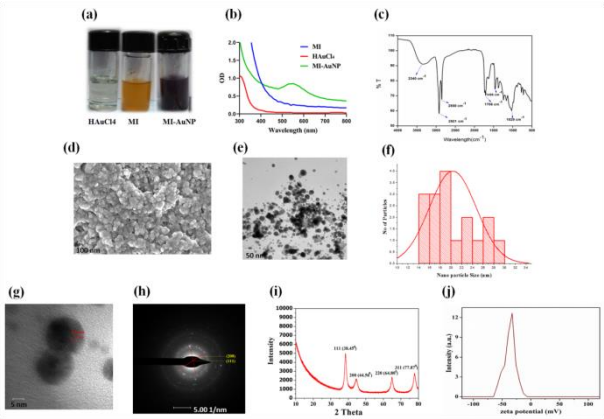


Important findings: The extract preparation of *Justicia adhatoda* leaves was done by maceration process followed by MTT assay on HNSCC cell line. Subsequently, colony formation assay and wound healing assay was performed. The effect on the cancer stemness and pluripotency was investigated through 3D spheroid model (orospheres), western blot and qRT-PCR.. The extract was found to have good cytotoxicity on HNSCC cell line and has the potential to inhibit cancer stem cell properties and with further modifications, a targeted delivery system may be designed that can open up a plethora of novel therapeutics with enhanced prognostic potential.

- **Green synthesis of gold nano-particles using *Madhuca indica* flower extract and its high-throughput characterization**

  Name of PI: Dr. NabenduMurmu

  Name of student: Ms. Depanwita Saha

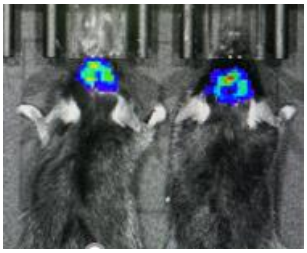


Important findings: The formation of Gold nanoparticles from ethanolic extract of*Madhuca indica* flower was evidenced by changing of color from yellowish brown to dark purple brown. The UV-visible spectroscopic analysis exhibited the spectrum of surface plasmon resonance at the range of 550 nm which indicates the formation of Gold nanoparticles in the reaction mixture. The functional groups in the samples were identified using FT-IR measurement. The surface morphology of nanoparticles was recognized by FE-SEM images indicating monodispersed distribution of spherical shaped nano particles. TEM micrographs further confirmed non-agglomerated spherical shapes of the nanoparticles with average size range of 20.34 ± 4.36 nm . The HR-TEM image of the gold nanoparticles revealed that the fringe spacing of nanoparticles was 0.23 nm which corresponded to the spacing between (111) plane of face centered cubic (fcc) gold . The crystalline structure of gold nanoparticles was evidenced by SAED pattern with circular rings which van be assigned to (200) and (111) Bragg's reflection planes. The crystalline nature of AuNP was also confirmed by powdered XRD analysis (Figure1i). Furthermore, the zeta potential value via DLS analysis was tend to be negative of nearly -50 mV reflecting the repulsion among synthesized nanoparticles and their colloidal stability as well .

- **To standardize Glioblastoma Multiforme model by intracranial implantation of Murine glioma cells via orthotopic syngenic mouse in an in vivo setting**

  Name of PI: Dr. Nabendu Murmu

  Name of student: Ms. Aritri Bhattacharjee

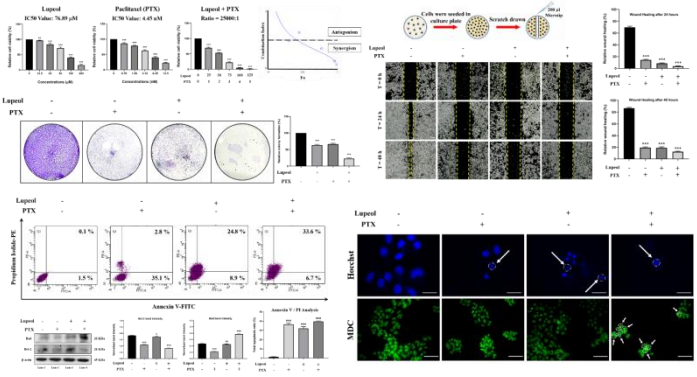


Important findings: Upon intracranial implantation of Murine glioma cells at various concentrations in C57BL6/J mice, we were able to generate intracranial tumors. Post-surgery the animals were monitored closely for behavioral changes. Approximately 2weeks post-surgery the tumor was visible under the IVIS. We have preliminarily standardized the model. In future, we plan on subjecting the animals to treatment with approved drugs, isolating the tumor and conducting biomarker and efficacy studies.

- **To develop novel peptide based nano-delivery system to selectively deliver potent inhibitors into the cancer stem cells**

Name of PI: Dr. Gaurav Das

Name of student: Mr. Subhabrata Guha



Important findings: For our preliminary study, we worked on phytochemical Lupeol combined with standard microtubule inhibitor, Paclitaxel (PTX) and delineate the potential underlying molecular mechanism on TNBC models. Chemically synthesized aptamer based nanoparticles can greatly aid in targeted drug delivery in cancer cells and cancer stem cells with lessor minimum side effects. The main aim of our study is to explore the cytotoxicity of phytochemicals, combinatorial effects with known anti-cancer drugs and prepare suitable nano-formulations of the photochemical and the combinatorial-nanoparticle treatment *in-vitro*, *in-vivo*, *ex-vivo*,and *ex-ovo* models which will eventually unravel novel therapeutic strategies.

- **Investigating the anti-cancer potential of *Hypericum roeperianum* bark extract on breast cancer model.**

  Name of PI :Dr. NabenduMurmu

  Name of student : Mr. Guefack Fofack Michel Gael

  Funding agncy: DBT TWAS Govt. of India

Important findings: Anticancer properties of the crude extract were confirmed from MTT assay which showed IC_{50} value of around 1.623 mg/ml in MDA-MB-231 and 0.897 mg/ml in MCF-7.After getting the cytotoxicity profile, the effect of the crude extract on cell proliferation and migration was examined by Colony Formation Assay(CFU) and Wound Healing Assay. We found after Colony Formation Assay, a reduction in the colony forming units with the increase in the dose of the treatment compared to the control. Furthermore, Wound Healing Assay revealed that the rate of cell migration as well as invasion has decreased with the administration of higher dose of the crude extract.

- **Identification and characterization of exosomal microRNAs with prognostic and therapeutic implications in non-small cell lung cancer: An approach towards molecular therapeutic developments for patients exposed to tobacco smoke and arsenic.**

- **Name of the Co PI: Dr. Avik Biswas**
- **Funding agency: ICMR-GIA; Govt of India.**

Important findings: This study would explore the role of exosomal microRNA population in the prognosis and therapeutics of non-small cell lung cancer (NSCLC) associated with tobacco smoking/arsenic.

- **Investigating the role of hetergeneous nuclear ribonucleoprotein (hnRNP) family members in Human Hepatocellular Carcinoma (HCC)**

  Name of the PI: Dr. Avik Biswas

Important findings: Liver cancer poses a global health burden, with an estimated incidence of more than 1 million cases by the year 2025. Hepatocellular carcinoma (HCC) is the most common form of liver cancer and accounts for about 90% of cases. Infection with hepatitis B virus and hepatitis C virus are the main causal factors for HCC development, although non-alcoholic steatohepatitis is becoming a more frequent risk factor. Altered RNA regulation during HCC development and progression is primarily governed by heterogeneous nuclear ribonucleoproteins (hnRNPs). The

hnRNPs are protein-RNA complexes and the recognition of the RNA targets are highly specific. The hnRNP family consists of about 20 major candidates, hnRNPs A1–U, which range in size from 34 to 120 kDa. HnRNPs bind to nascent transcripts to form functional hnRNP complexes, and have a wide range of roles in DNA repair, telomere biogenesis, cell signaling, and regulating the gene expression both at the level of transcription and translation which includes various oncogenes. This project aims to uncover the roles of specific hnRNPs in HCC through the regulation of different oncogenes.

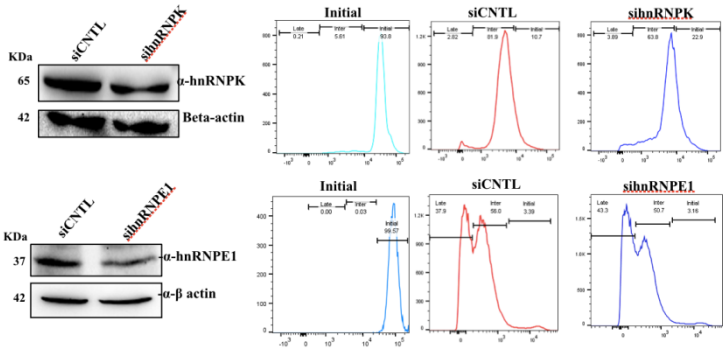
- **Deciphering the mechanistic involvement of Hepatitis B virus (HBV) proteins in the progression and regulation of human hepatocellular carcinoma (HCC)**

  Name of the PI: Dr. Avik Biswas
  Name of the Student: Ms. Arpita Kar

Important findings:: Hepatitis B virus (HBV) infection still continues to be a global health burden with significant morbidity and mortality. The information regarding the role of different HBV proteins during the development and progression of hepatocellular carcinoma is still incomplete. This study aims to decipher the modulatory effect of different HBV proteins (P, C, S etc. including X), and will provide information regarding HCC associated complex host cellular signaling networks. As part of the project, the interplay between HBc/HBx and different host cellular factors at the level of protein-protein interaction are under study.

- **Excavating the functional roles of different regulatory motifs / domains of heterogeneous nuclear ribonucleoprotein E1 (hnRNPE1) and heterogeneous nuclear ribonucleoprotein K (hnRNPK) in human cancers**

  Name of the PI: Dr. Avik Biswas
  Name of the Student: Mr. Abhisekh Samanta



Important findings: By using *in-vitro* experimental platform the role of hnRNPE1 and hnRNPK proteins is under study with special emphasis on different domains/motifs of the two proteins in the context of human cancers with genetics / reverse genetics experiments. Our initial hnRNPE1 and hnRNPK silencing based experiments clearly indicated their modulatory roles in cellular proliferation. While silencing of hnRNPK inhibit cell ear proliferation, on the other hand silencing of hnRNPE1 exhibit rapid cell growth, so hnRNPK might act as a cancerous protein and hnRNPE1 as an anti-cancerous factor. Both hnRNPE1 and hnRNPK contains different KH-domains and exact role of these domains in the context of human cancer is under study.

Total Publications: 10

Department of Animal Care and Maintenance

Head of the department: Dr. Abhijit Rakshit, M.V.Sc. Technical Officer - Animal House
Team (including permanent employees, other staff members and students)

Name	**Designation**
Faculty with educational qualification	
Dr. Abhijit Rakshit, M.V.Sc.	Technical Officer - Animal House
Shri Shibashis Das	Laboratory Helper
Shri Sambhu Halder	Laboratory Helper
Shri Jageswar Ram	Contingent Worker
Shri Kartick Biswas	Contingent Worker
Shri Panchanan Mondal	Contingent Worker
Shri Ramesh Mahato	Contingent Worker

Objectives of the department:

- To maintain laboratory animals in a clean and hygienic environment
- To produce good quality, healthy animals by adopting scientific breeding techniques
- To provide healthy, disease-free animals to various departments of this Institute for their research work
- To provide technical help in animal experiments
- To organize the Institutional Animal Ethics Committee (IAEC) meetings to scrutinize and guide the animal experimentation projects conducted by different research departments of this Institute
- To supervise ethical aspect of animal experimentation

Brief description of the work done during the year (from 1st April 2022 to 31st March 2023):

The Animal Care and Maintenance Department is the central animal facility of the Institute, where Swiss albino, Balb/c and C57BL/6J mice are maintained. Pedigreed animals were procured for breeding from the National Institute of Nutrition, Hyderabad. The Animal House is registered with the CCSEA (**C**ommittee for **C**ontrol and **S**upervision of **E**xperiments on **A**nimals), Department of Animal Husbandry and Dairying, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India, having its Registration No. 1774/GO/RBi/S/14/CPCSEA. Following CCSEA guidelines two IAEC meetings were held during the year 2022-23, on 23rd April 2022 and 15th October 2022. The Annual Inspection of Animal House was done by CCSEA Nominee on 25th March 2023.
Following is the chart of animals produced and supplied to various departments of the institute in the year 2022-23:

Production

Species	**Strain**	**Male**	**Female**	**Total**
Mouse	Swiss	586	566	1152
	C57BL/6J	151	135	286
	Balb/c	70	71	141

Supply

Species	**Strain**	**Male**	**Female**	**Total**
Mouse	Swiss	208	92	300
	C57BL/6J	105	35	140
	Balb/c	-	8	8

LIBRARY

(Research Library, Hospital Library and Rajarhat campus Library)

Team

Officer with educational qualification	Designation
Sanmoy Chakraborty, MLIS, M. PHIL.	Assistant Library & Information Officer
Gorai Ganesh, MCA, MLIS, M. PHIL.	Assistant Library & Information Officer
Other Team Member	
Kamalika Mandal, MLIS, M. PHIL	Assistant Librarian (Contractual)
Susmita Mandal, MLIS	Assistant Librarian (Contractual)
Amit Dhali, MLIS	Assistant Librarian (Contractual)

Objectives of the department:

The library service serves as the central hub for all academic and clinical endeavors within the Institute. On one hand, the Research section is dedicated to scientific investigations conducted by scientists and Ph.D. fellows. On the other hand, the hospital site hosts numerous academic courses and clinical research activities. In order to meet the requirements of these diverse areas, the library plays a crucial role. The readers and users from these sectors expect the library to be available on all working days.

1. Provide comprehensive information resources on cancer research, treatment, and related fields.
2. Support academic and clinical activities by offering access to up-to-date scientific literature and reference materials.
3. Facilitate research endeavors by assisting researchers and Ph.D. fellows with literature reviews and access to research tools.
4. Promote evidence-based practice in cancer care through the dissemination of reliable and current information.
5. Provide user assistance and promote information literacy among researchers, students, and healthcare professionals.
6. Foster collaborations and partnerships to enhance resource sharing and knowledge exchange.
7. Continuously develop and improve library resources, services, and infrastructure based on user needs and feedback.

Brief description of the work done during the year (from 1st April 2022 to 31st March 2023):

1. Library has procured Clinical Key Online database, UpToDate database for clinical decision-making online database and IThenticate, for checking plagiarism for clinical and research purpose.
2. Library automation software KOHA, and institutional repository software DSPACE are

running successfully.

3. Library is well equipped with sufficient number of computers with internet connectivity through LAN and wireless networking facility for laptop users.
4. Library is having access to plenty of electronic journals, e-books, archives at institutional level. Online journals are also accessible within the campus through campus LAN.
5. Classification, Cataloguing, Indexing and data entry of more than 260 new books, which were procure during this period, have been successfully completed through Library Management Software KOHA for creating online catalogues for users' access.
6. As a member of NCG library provides access to the Global Clinical Decision support tool of Elsevier.
7. The library provided the photocopying services to the users.
8. Library provides the newspaper clipping service on news related to cancer.
9. Library also provides e-mail service to the users.
10. The library shares its resources with all important academic/research institutions in India.
11. Like previous years, this year also focus was on the strengthening of collection and implementation of latest information and communication technologies in its services. 24/7 reading facility for online books, e-journals out of library hours through VPN service.

Library Resources					
	Total nos. of Books	**No. of Journals (Online & Print)**	**No. of Bound Journals**	**E-Books**	**Electronic Resources**
Research Library	3538	28	13824	54	212
Hospital Library	6551	16	2100	119	25
Rajarhat campus Library	206	6	-	130	-

List of Publications:

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Smt. Jyoti Singh, Hindi Officer	**Store and Purchase**
Shri Jayanta Sikder, Office Superintendent	Shri Subhasish Chakraborty, T.O.-(Store & Purchase)
Shri Sumit Kr. Majumdar, Office Superintendent	Shri Pankaj Srivastava T.O.-(Store & Purchase)
Smt. Moumita Chatterjee Social Welfare Officer	Shri Mukesh Krupanand Pandy, Store Supervisor
Shri Syed Imdad Hossain, Social Welfare Officer	Shri Debpratim Chakraborty, Pharmacist
Shri Ujjwal Kr. Barui, Head Clerk	Shri Somnath Nandi, Pharmacist
Shri Sanjay Kumar Shaw, Head Clerk	Shri Samson Soren, Store Supervisor
Smt. Pallabi Ghosh, Stenographer	Smt. Soma Das, Storekeeper
Shri Monojit Das, UDC	
Shri Koushik Dey, UDC	
Shri Malay Das, Daftari	
Shri Sailesh Kr. Singh, LDC (PwD)	
Smt. Arati Dey, GDA	

Staff Nurse		
1. Aripta Dey	39. Sita Ram	77. Munesh
2. Bijali Mistry (Mondal)	40. Sudeshna Bag	78. Naresh Kumar
3. Chaitali Guha	41. Suresh Kumar	79. Narpat Ram
4. Krishna Singha Saha	42. Ajantharani T	80. Neha
5. Banhisikha Das	43. Ajay Kumar Choudhary	81. Parakash Kumar
6. Barnali Patra (Sarkar)	44. Alka Kumari Singh	82. Prem Raj Meena
7. Chirosree Mukherjee	45. Ananya Biswas	83. Rajesh Kumar Yadav
8. Kakoli Bhattacharjee	46. Anil Kumar	84. Ram Chandra
9. Kum Kum Bhowmick	47. Anil Poonia	85. Ranjeet Singh Mavaliya
10. Moushumi Chowdhury (Charkraborty)	48. Ankush Choudhary	86. Rishikesh Meena
11. Pamela Choudhury	49. Archana Tudu	87. Roshni M Shaji
12. Ratna Roy (Karmakar)	50. Ashok Kumar	88. Rupa Dey Dutta
13. Rekha Das Sardar	51. Avdesh Jatav	89. Sahi Ram
14. Samita Dy	52. Dharamveer Singh	90. Sanchita Patra
15. Sarmila Das	53. Dharmendra choudhary	91. Sangita Dey
16. Sharmila Das	54. Dinesh Singh Gurjar	92. Santosh Kumar Meena
17. Sharmila Sarkar Kora	55. Gajraj Singh	93. Sapna Goutam
18. Rumi Sarkar	56. Girvar Singh	94. Satendra Singh
19. Sipra Pal	57. Hansraj Kodiya	95. Shiv Prasad Rav
20. Soma Das	58. Hitesh Khatri	96. Sita Ram
21. Aripta Mukherjee	59. Jagdish	97. Subhash Chand Yadav
22. Beauty Pradhan	60. Jitendra Kumar	98. Sugan Lal Prajapati
23. Kamal Singh Choudhary	61. Khem Raj Meena	99. Suman Satpathy
24. Kuldeep Meena	62. Krishan Kumar	100. Sunil Kumar Choudhary
25. Nipannita Ghosh	63. Kristamsetti Sreenivasa Rao	101. Surendra Kumar
26. Nitu Kumari	64. Lakkhi Ram Saini	102. Surendra Kumar Gurjar
27. Jayita Das	65. Lalit Kumar Mandrawal	103. Swagata Ghosh
28. Kuldeep	66. Lokesh Kumar Saini	104. Swatilekha Das
29. Nagamani Gudala	67. Madhurima Mondal	105. Trilok Chand Choudhary
30. Naveen Tailor	68. Mahaveer Prasad Godara	106. Umesh Yadav
31. Om Prakash	69. Mahendra Singh	107. Ved Prakash
32. Prem Kumar	70. Mamta Bhaskar	108. Versha
33. Rajpal Raigar	71. Manoj Kumar Sheshama	109. Vikram Singh Yadav
34. Sanjay Kumar	72. Monika Narwal	110. Yogesh Kumar Reshwal
35. Sebati Behera Nayak	73. Monu Kumar Darji	111. Gordhan Lal Hinoniya
36. Sonali Nath	74. Moumita Atha	112. Om Veer Singh
37. Suraj Mal	75. Moumita Dey	113. Pavan Kumar Sharma
38. Sikha jana	76. Mousumi Pramanick	114. Ramachandra Patroot

Ward Master's Section	Maintenance Department
Shri Purnendu Roy	Bappa Mondal, Maintenance Supervisor
Shri Tapan Saha	Sudipta Biswas, Maintenance Supervisor
Shri Sankar Naskar	Shri Swarup Ghosh, AC Attendant
Shri Karunakar Nayak	Shri Bidesh Roy, Electrician (PwD)
Smt Jhuma Lama	Shri Ranjit Singh, Telephone Operator
Smt Sumitra Routh	
Smt Rekha Guchait	
Shri Dipak Biswas	
Shri Rabin Pramanick	
Smt Sara Nayak	
Shri Sarju Das	
Shri Krishan Mallick	
Smt Ganga Routh	
Shri Ganesh Kundu	
Shri Dipak Malik	
Smt Arati Dey	
Smt Rina Bose	