INDIAN COUNCIL OF MEDICAL RESEARCH

NATIONAL INSTITUTE OF CANCER PREVENTION AND RESEARCH

ICMR-NICPR

ANNUAL REPORT 2022 - 2023

FROM THE DIRECTOR'S DESK

Dear All,

ICMR-National Institute of Cancer Prevention and Research – a permanent institute under the aegis of the Indian Council of Medical Research, Department of Health Research, is the country's premier institution for carrying out research in the field of cancer prevention. The institute has made significant strides in developing and validating innovative and improved strategies for cervical, oral, and breast cancer screening in the country. The Scientists are also working on other common cancers including gall bladder, head and neck, esophageal, and ovarian in collaboration. The institute regularly undertakes several programs for training the faculty, research scholars and students from across the length and breadth of the country, and in equipping them for carrying out screening of highly prevalent cancers, molecular research methods relevant to cancer biology, cancer epidemiology and tobacco control.

The Health Promotion Clinic spreads awareness regarding the risk factors of cancer and non-communicable diseases, provides services for early detection and screening both within our premises and in the Gautam Budh Nagar district. Tobacco cessation counselling is another important feature of our Health Promotion Clinic where behavioral and non-behavioral interventions are carried out to assist individuals to quit tobacco use. This report highlights the significant contributions made in research, and other institutional and non-institutional activities undertaken by the institute during this period.

Post the deadly COVID-19 pandemic, our institute is a part of the multi-centric study to characterize the humoral and cellular immune response in individuals receiving an additional third dose of Covishield/Covaxin vaccine. Besides, the institute is also participating in carrying out district level prevalence survey for Pulmonary Tuberculosis which shall contribute to the national data and providing innovative ideas to the health system functionaries for accelerating elimination of Tuberculosis in a district of Delhi with high case load.

The WHO FCTC Knowledge Hub on Smokeless Tobacco (WHO FCTC KH-SLT) has initiated an online lecture series "ToCoIndiaToCo" to showcase best practices in tobacco control for policy discourse. A report on the environmental waste generated from packaging of Smokeless Tobacco products was disseminated to the States for taking action. Results from Tobacco cessation studies amongst women including pregnant and lactating women have been encouraging and they shall be useful for inclusion in the National programmes.

The National Tobacco Testing Laboratory (NTTL) is the designated Apex Lab and is providing services to different States and is now a member of the World Health Organization's Tobacco Laboratory Network (TobLabNet).

The NICPR-ECHO training courses are continuing efficiently to train in-service healthcare providers in cancer screening. A training course for Pathologists in Cervical Cancer Screening through virtual platform and live microscopy is very popular and effective in capacity building of pathologists, especially in remote areas.

Molecular studies are also being undertaken to unravel the genetic and epigenetic signatures for different cancers including gastric and ovarian cancer. Results of a study carried out on screening for cervical and anal cancer through cytology and HPV testing undertaken in high -risk population (women living with HIV) has important policy implications.

The Model Rural Health Research Unit (MRHRU) at Panipat is working in collaboration with Kalpana Chawla Medical College, Karnal to understand Aspergillus infection among the local population. Another MRHRU is being established in Gautam Budh Nagar in collaboration with Government Institute Medical College, Greater Noida to solve local medical problems.

On the academic front, the scientists have published several high-quality research articles in peer reviewed high impact factor journals. Journal clubs, Colloquia, guest lectures and webinars are regularly held to keep abreast with the latest developments in the field of science.

Research infrastructure has been upgraded with the commissioning of a moderate throughput NGS facility and other high-end equipment including digital PCR, multimode reader, high precision Nanodrop, Hybrid Capture 2 (for cervical cancer DNA diagnostics) which have also been installed and operationalized. Several other instruments are being purchased to augment research output.

ICMR-NICPR's contributions in research and capacity building have been significant during this period. The constant guidance of the NCD division at ICMR Headquarters and the Department of Health Research for all our activities deserves a special mention. The harmony between the scientific, technical and administrative staff of the institute has made it possible to carry out diverse activities in the most efficient manner.

With best wishes,

Dr. Shalini Singh
Director

FACILITIES AT ICMR-NICPR

Health Promotion Clinic

WHO FCTC Knowledge Hub on Smokeless Tobacco

National Tobacco Testing Laboratory

Model Rural Health Research Unit, Khotpura, Panipat

Health Promotion Clinic

The Health Promotion Clinic is functional at NICPR since 2014. The attendees are screened for oral, breast and cervical cancer as per the Government of India Guidelines. They also undergo general physical examination, anthropometric measurements are recorded which include height, weight and abdominal girth, Blood pressure measurement and blood sugar estimation. The attendees and the accompanying persons are made aware of the cancer screening opportunities and counselled for various risk factors and provided management and referral as per need.

Oral Examination Clinic

Counselling for Cancer screening and NCDs

Patient Waiting area

Various activities carried out at Health Promotion Clinic (May 2022 - May 2023):

1.	Total population screened in Health Promotion Clinic	Female-1865 Male-136	Screen positive
2.	PAP smears	1592	3.3%
3.	VIA	1363	4.9%
4.	HPV DNA tests	1336	6.7%
5.	COLPOSCOPY	175	Low grade CIN – 3.4% High grade CIN– 1.7% Invasive cancer – 2.9%
6.	Endo-cervical curettage	12	
7.	Cervical Biopsy	45	
8.	Breast Examination	1612	
9.	Oral Examination	1302	Oral potentially malignant disorders/OPMDs, oral malignancy and other tobacco-related lesions- 138 (10.6%)

Community outreach activities by Division of Clinical Oncology

Community outreach programs for awareness on Oral, breast and cervical cancer were conducted in nearby health centers, schools, and colleges

Cervical, breast and oral cancer screening camp at PHC Mohna Faridabad on 17.6.2022

Health talk and cancer screening on cervical and breast cancer at Dasna jail on 14.09.2022

Cytopathology

The Division of Cytopathology provides various diagnostic services to the patients referred from nearly hospitals such as the District Hospital Gautam Budh Nagar, ESI Hospital NOIDA, PGICH, Sai Sansthan and Tuberculosis centres across Noida and nearby PHCs etc.

Investigation/ Procedure	**No. conducted from May 2022 – May 2023**
Pap smears	1770
Fine needle aspiration cytology (FNAC)	2923
Histopathology (biopsy examination)	143

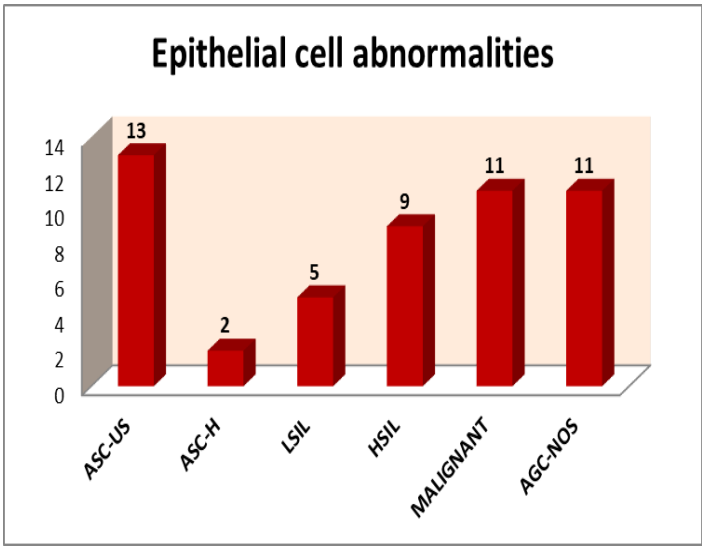
A. Audit of cervical smear reporting (May 2022 – May 2023)

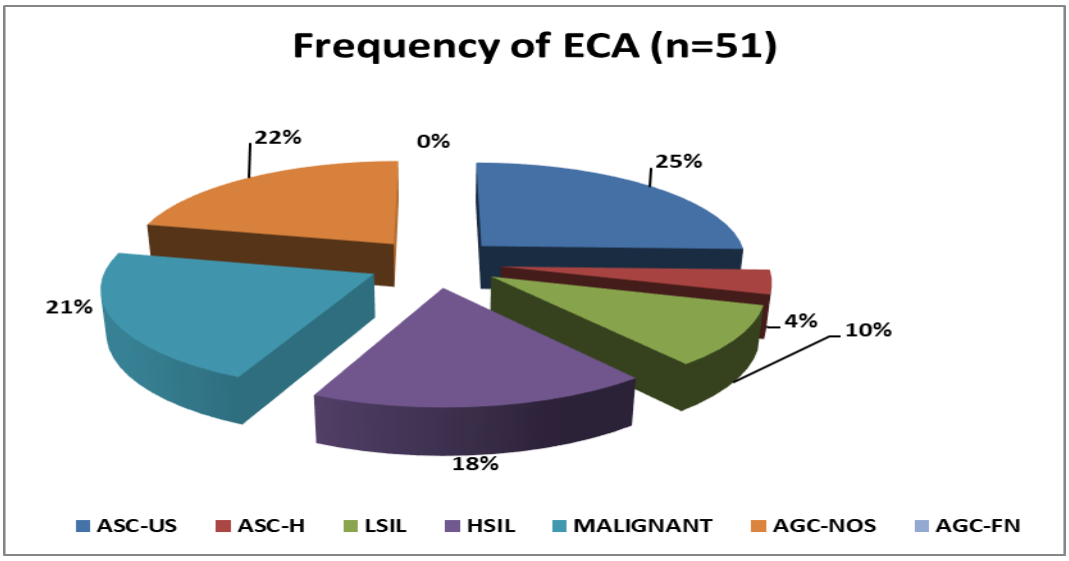
Total no. of cervical smears: 1770

Unsatisfactory rate: 23 (1.2%)

Epithelial cell abnormalities (ECA): 51 (2.9%)

Epithelial cell abnormality	Number of cases	Percentage (N=1747)
ASC-US	13	0.74
ASC-H	2	0.11
LSIL	5	0.28
HSIL	9	0.51
MALIGNANT	11	0.63
AGC-NOS	11	0.63
Total	49	2.9



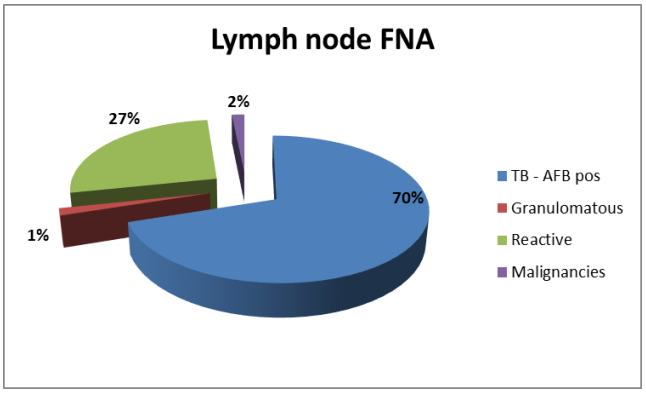


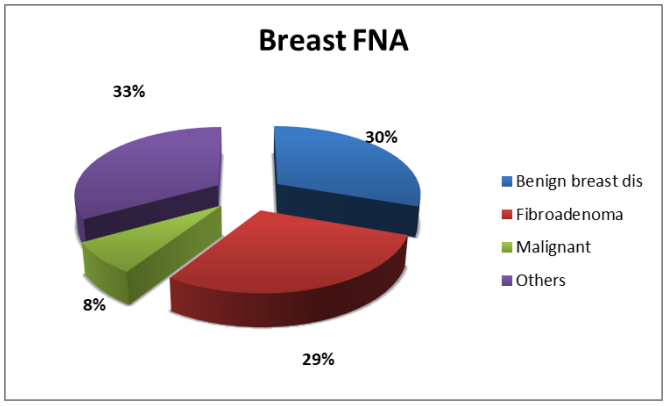
Cyto-histo correlation of cervical abnormalities *(as per American Society of Cytopathology guidelines 2017)*:

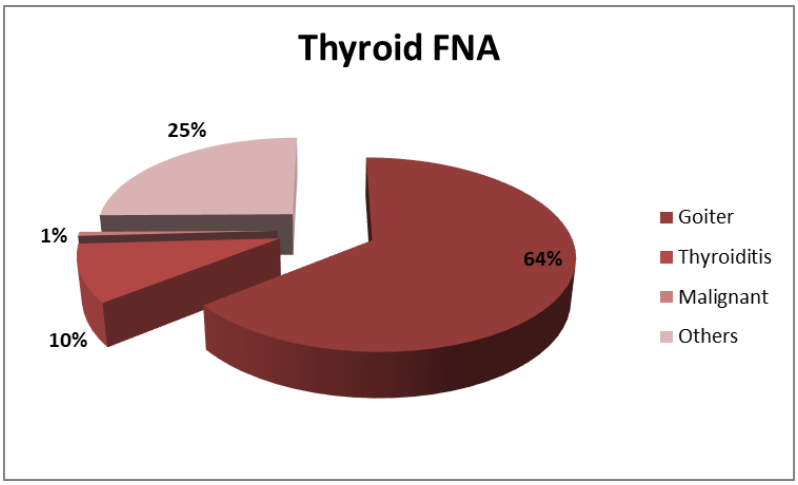
- **Cervical biopsies:** **76**
    - **Inadequate biopsies:** **7**
    - **Adequate biopsies:** **69**
- **Cyto-histo concordance:** **78.3% (54 of 69)**
- **Discordance:**
    - **Interpretative error on Pap:** **15 (8 minor undercall, 6 minor overcall, 1 major undercall)**

Fine needle aspiration cytology:

- **FNACs:** **2923**
  - Lymph nodes: 1288
  - Breast: 511
  - Thyroid: 143
  - Other sites: 981







National Tobacco Testing Laboratory

Director NTTL NOIDA: Dr Shalini Singh, Director; NICPR
Officer In-charge: Dr. Mausumi Bharadwaj
Nodal Officer: Dr. Anuj Kumar

The National Tobacco Testing Laboratory (NTTL) funded by the Ministry of Health & Family Welfare (MoHFW), Govt. of India under Non-Communicable Diseases (National Tobacco Control Program) provides necessary scientific inputs for implementation of directives of WHO Framework Convention on Tobacco Control (FCTC) specifically Articles 9 and 10 and provide analytical facilities for tobacco and tobacco products analysis, technology validation, development of SOPs etc. The NTTL at NICPR is the Apex Lab established in 2017 and the other two being at CTDL Mumbai and RDTL Guwahati. The Standard Operating Procedures (SOPs) received from WHO TobLabNet are used for analysis of tobacco and tobacco products.

Activities during the reporting period:

- The Scientific Advisory Committee (SAC) of ICMR-NICPR approved 3 research projects of NTTL as given below:

  (i) Testing of Tobacco and Tobacco Products for Profiling of Chemical Constituents in SLT and Bidi samples marketed in North India.

  (ii) Comparative Studies and Method Development for Smokeless Tobacco Products Analysis.

  (iii) Estimation of Flavouring Agents in Smokeless Tobacco Products.

- Participated in evaluation of technical documents received from ISO, BIS etc.
- Participated in WHO TobLabNet Method Validation: Nicotine, Moisture and pH analysis. The SOPs have been published by WHO TobLabNet as SOP 12, 13 and 14 respectively.
- Testing of tobacco and tobacco products received from various government enforcers is ongoing.
- NTTL is also working on optimization, validation and method development for tobacco testing protocols.

- Staff attended a webinar titled 'The important Variable: Lab water & it's impact on your Research' by Milli-Q on 3rd June, 2022.
- Smt. V. Hekali Zhimomi, Addl. Secretary, MoHFW visited the NTTL on 28th October, 2022.
- Participated in the WHO Tobacco Laboratory Network (TobLabNet) Training and 7th Plenary meeting of the WHO TobLabNet, 5th to 9th December, 2022, Singapore.
- LC-MS/MS customized training as Shimadzu MS Community Meet at Shimadzu Delhi on 6th & 7th December, 2022.
- National Level Meeting for the State Programme Managers under NTCP, 20th-21st Dec 2022, Hotel Lalit, New Delhi.
- Visit of Global Tobacco Regulators Forum (GTRF) organized by MoHFW on 27th April, 2023.
- Participated International Quality and Accreditation Services, Organized by Asia Pacific Accreditation Co-operation (APAC), India, 28th January, 2023.
- Webinar training-cum-awareness of ERMED resources for access on 23rd March, 2023 organized by Wolters Kluwer.
- Analytical method validation and its regulatory perspectives (ICH/USFDA/ANVISA), 16th Apr, 2023.
- Webinar on Ion Chromatography for Pharmaceutical Applications, April 18, 2023, by Metrohm.

RESEARCH PROJECTS

Cervical Cancer

AI-assisted classification of conventional cervical smears using Google's TensorFlow artificial neural network

Principal Investigator: Dr Ruchika Gupta, Scientist E, ICMR-NICPR, Noida

Co-Investigators:

Dr Sanjay Gupta, Scientist- G, ICMR-NICPR, Noida

Dr Shalini Singh, Scientist- G & Director, ICMR-NICPR, Noida

Dr Sompal Singh (Hindu Rao Hospital, Delhi)

Type of study: Intramural

Category of Research: Development

Project Duration: 15.01.2023 - 14.01.2024

Funding Agency & budget: NIL

Brief background & rationale: Cervical cancer is the second most common malignancy among women in India with high mortality due to late presentation in majority of the cases. Despite the availability of cervical cancer screening methods, the incidence of cervical cancer has not declined in developing countries as compared to the developed nations where cytology-based cervical cancer screening has had a huge success story. One of the reasons for this disparity is the shortage of cytoscreeners as well as cytopathologists to screen the cervical smears to detect the abnormal cells. Technical difficulties like skills, time and effort required to detect the few abnormal cells in a smear containing tens of thousands of cells, pose additional challenges in cytology-based cervical cancer screening.

The emergence of artificial intelligence (AI) in diagnostic medicine has increased manifold in the last few years. Attempts at AI-assisted cervical cancer screening date back to 1950s when the Cytoanalyzer project developed an automated microscope that could differentiate cancer and normal cells based on the size and optical density of the nucleus. PAPNET system used neural network classifiers for the identification of abnormal cells and flagging the smears for cytopathologists' review. Though there are USFDA-approved commercial products for AI-assistive cervical cancer screening, majority of these systems are cost-intensive and utilize liquid-based cytology preparations for this purpose which again pose additional financial burden. Also, none of these systems precisely classify the cervical smears in accordance with The Bethesda System of classification of cervicovaginal smears. Google's TensorFlow is an actively maintained open-source project in machine learning and neural network that can model the neural networks in a natural way and can run in a variety of environments such as CPUs, GPUs and distributed clusters. Using Keras application programming interface (API), TensorFlow can be utilized for building and training models easily. The TensorFlow Object Identification API is a framework that is easy to construct, train and deploy for automated object identification by examination of raw pixels of the images and identifying the combination of features that best describe the phenotypic appearance of cells in the examples provided to the algorithm. Hence, image segmentation which is a tedious process is not required to be done by the researcher. In medicine, TensorFlow has been applied to

a variety of scenarios such as prediction of hospital readmissions, colorectal polyp pathology, and colposcopy images among others.

Objectives:

- To design an algorithm based on TensorFlow-based convoluted neural network for detection of normal cervical epithelial cells and various grades of intraepithelial lesions in cervical smear images.

- To validate the algorithm on a different set of cervical smear images.

Brief Methodology:

- ***Training of neural network***: The study shall include images of cervical smears (normal as well as various intraepithelial lesions reported in our Division as per TBS 2014) such that at least 1000-1500 individual cells of each phenotype is provided to the algorithm (training set). All the images shall be captured at the same magnification to ensure appropriate training of the neural network. The cells shall be identified by trained cytopathologists and marked using squares on the images (annotation). Using the open-source software, Python and Google's TensorFlow, the marked images shall be analyzed using the Object Detection API to train the neural network for phenotypic appearance of various types of cells. The training steps and iterations for the neural network shall be increased, as per the requirement.

- Following the training of the neural network, a separate set of cervical smear images (unmarked test set) shall be provided to the trained network for classification of cells. The test set shall include images of normal cervical smear as well as the various intraepithelial lesions at the same magnification which has been used in the training set. The trained neural network shall identify the cells and mark them individually as normal or cells representing cervical intraepithelial lesions. The accuracy of the algorithm in identification of the cells shall be assessed.

- ***Validation of trained neural network***: A third set of cervical smear images shall be used in a similar way to validate the test characteristics of the neural network trained in this study.

Main Findings: The pilot training and testing of the algorithm with 100 cervical cells of each grade (normal, ASC-US, LSIL, HSIL) had yielded an accuracy of 70% in categorization of cells as per the Bethesda system. Further training of the algorithm has been conducted using 500 cells of each grade. The testing and retraining of the algorithm is underway.

Translational Potential: This study shall provide us the initial trained neural network based on Google's TensorFlow for cervical smears. Subsequently, the neural network can be modified to provide the initial screening results and future automation of the process. This is likely to pave way for augmentation of cervical cancer screening in low-resource settings that have a paucity of trained cytotechnologists and cytopathologists.

Scaling up of implementation of primary HPV screening by self-sampling

Principal Investigator: Dr. Kavitha Dhanasekaran, Scientist-E, ICMR-NICPR, Noida

Co-Investigators: Dr. Sangeetha Pradhan, Director, Health and Family Welfare, Sikkim

Type of study: Extramural, Ad-hoc

Project Duration: November 2020 – November 2023

Funding Agency & budget: ICRC-ICMR, Rs. 1,47,92,600/-

Brief background & rationale:

India is working towards achieving the target set by the World Health Organization (WHO) for cervical cancer elimination by 2035.Cervical Cancer is the second common cancer among females in India. Globocan 2018 estimates the incidence of cervical cancer in India as 96,922 and mortality as 60,078. Sikkim state is the first state in our country which has successfully included HPV vaccination in their immunization program for girls between 9-14 years of age and completed 2 doses of vaccination (first dose in August 2018 and second dose in April 2019).

HPV testing is considered the most effective screening approach for cervical cancer. Our implementation research study focuses on feasibility of introducing primary HPV DNA testing on self-collected samples in the state of Sikkim.

Objectives:

- To evaluate the acceptance of home-based self-collection by the women, compliance of the women to further assessment
- To evaluate the acceptance of the home-based screening by the ASHA workers, the facilitators and barriers faced by them to motivate women
- To assess the feasibility of setting up a centralized HPV test facility in a district hospital with appropriate training of the laboratory technician
- To assess the feasibility and effectiveness of a referral mechanism, through which the screen positive women will be managed at the district hospital

Brief Methodology:

- Women aged 30-65 years, residing in East district of Sikkim will be offered HPV test on the self-collected samples. ASHAs will collect the self-collected HPV samples from women and transport it to district hospital where the HPV testing facility will be placed.
- **Sample size**: For this pilot study we have selected one rural and one urban PHC in this district and the eligible women will be approximately 6000.

Main Findings:

- A total of 3966 samples collected and tested for HPV. We have observed 10% positivity. All screen test positive women underwent VIA and precancerous lesions were treated as per the guidelines.

Capacity building: The healthcare providers involved in the study are trained (refresher) periodically

Translational Potential:

- The results of this implementation study can be used to replicate in other states who are ready for primary HPV screening and the various challenges faced in the implementation will become clearer and help GOI and the states to make necessary changes during implementation of the population cancer screen.

Identification of rare variants in Pattern recognition receptors (PRRs) and their crosstalk with Interleukins and NF-kB to understand the functional Implications in Reproductive Tract Infections (RTIs)

Principal Investigator: Dr. Mausumi Bharadwaj, Scientist-G, ICMR-NICPR, Noida

Co-Investigators:

Dr. Shalini Singh, Scientist-G & Director, ICMR-NICPR, Noida
Dr. Sanjay Gupta, Scientist-G, ICMR-NICPR, Noida
Dr. Ruchika Gupta, Scientist-E, ICMR-NICPR, Noida
Dr. Kavitha Dhanasekaran, Scientist-E, ICMR-NICPR, Noida

Type of study: Ad-hoc

Project Duration: 01/12/2021 – 30/11/2024

Funding Agency & budget: ICMR, Rs. 50 Lakhs

Brief background & rationale: According to the World Health Organization (WHO), each year around 499 million cases of curable RTIs occur throughout the world in the age group of 15-49 years, of which 80% cases occur in developing countries and about 79 million cases occur in India annually. Even though India contributes a significant percentage of global burden of disease, there are no large-scale screening programs in the country or public health policies aiming at effective integration of awareness and screening in any region of India. Improved awareness, infrastructure, and efficient health services, for early detection and treatment of RTIs is fundamental for women health control.

Objectives

- To detect the major reproductive tract infections (RTIs) from cervical scrape samples of symptomatic and asymptomatic women.
- To identify rare variants in Membrane-bound PRRs, Cytoplasmic PRRs and cytokines/interleukins/interleukin receptors by using targeted Next Generation Sequencing Platform with special reference to RTIs.
- To, analyse the functional implications of identified variants and their interaction with NF-kB/AP1.
- To correlate the above findings in the progression of RTIs.

Brief Methodology: In the present study we will recruit a total of 2000 married women who will visit the OPD of NICPR. All the women will be interviewed based on questionnaire. Cervical scrapes of all recruited women (symptomatic and asymptomatic) will be collected using cytobrush. All collected samples will be screened for RTIs through cytology & PCR. Women who will be found to be positive for any reproductive tract infection will be subjected to molecular analysis by using Next generation Sequencing platform.

Main Findings: The study revealed a high prevalence of Human papillomavirus (33.33%) and a low prevalence in *Chlamydia trachomatis* (3.12%) in symptomatic individuals. Further,

Trichomonas vaginalis infection was found to be positive in 6.6% of symptomatic individuals. Similarly, in the case of asymptomatic women Human papillomavirus infection was higher (56%) and *Chlamydia trachomatis* infection was lower (1.04%). The 10% of asymptomatic women showed presence of *Trichomonas vaginalis* infection. Additionally, we had calculated TNF-α level in RTI samples (n = 20) and controls samples (n = 20) and observed a statistically significant ($p = 0.0184$) increase in TNF-α level in RTI samples compared to the control individuals. Next, 20 samples were sequenced and aligned against the reference genome and the variants were identified through variant calling approach by comparing against the reference sequence. The known single nucleotide polymorphism was observed in the genes of pathogen recognition receptors.

Translational Potential: This comprehensive study would be beneficial for women who are not aware of the risk and risk factors of RTIs, there were so many studies that only showed the prevalence of infections but in our study, we will see the effect of different Interleukins and TLRs in the aspect of different RTIs which may prove to be one of the beneficial studies for the public health especially women those were living in the rural area because of lack of facilities. This will show the association of these different cytokines with RTIs and their correlation with social and behavioral factors in the Indian population. Hence, the outcome of the proposed project will help in better management of RTIs by contributing to the designing of molecular targeted therapies, especially in the Indian scenario.

Molecular Evaluation of Anticancer and Antiviral Properties of Thuja Occidentalis

Principal Investigator: Dr. R. Suresh Kumar, Scientist-F, ICMR-NICPR, Noida

Co-Investigators: Dr. Rana Pratap Singh (JNU), Dr. Arya (CCRH-Noida), Dr. Binit Dwivedi (CCRH-NOIDA)

Type of study: Ad-hoc

Project Duration: 2017– 2024

Funding Agency & budget: Ministry of Ayush, Govt of India, Rs.45,92,670/-

Brief background & rationale:

Cancer is disease of uncontrolled cell division, caused by genomic instability that resulted in altered gene expression patterns. Cervical cancer is one of the major health burden of women in the developing world. Cervical cancers are associated with Human papilloma virus infection, and those who are persistently infected with the virus will develop cancer. The present study planned to evaluate the cytotoxic and antiviral property of Homepathy drug Thuja Occidentalis. Thuja has been used for treatment of various illness including warts which was caused by low-risk HPV viruses. We planned to examine the antiviral property in high-risk HPV infected cancer cells and its role in transcriptional regulation of HPV.

Objectives

- To examine the effect of active component/mother tincture of Thuja Occidentalis plant extract and study its efficacy
- To study the anti-tumorigenic potential of *T.Occidentalis* in mouse models.

Brief Methodology:

HeLa cell lines were procured from NCCS Pune**.** Cells were cultured in DMEM with 10% FBS Cells were maintained in 95% humidified condition, 5% CO_2 atmosphere at 37^0C temperature in CO_2 incubator.

For *Invitro* studies, MTT assay was performed to observe the effect of LD50 values in mother tincture and 30 C of Homeopathy drug. For *invivo* The Swiss albino mice were taken for toxicity studies, each group 6 animals were taken and 10ul and 20ul doses of different potencies were checked Positive control we used cisplatin. Mice were treated for one month and various parameters were recorded.

Main Findings:

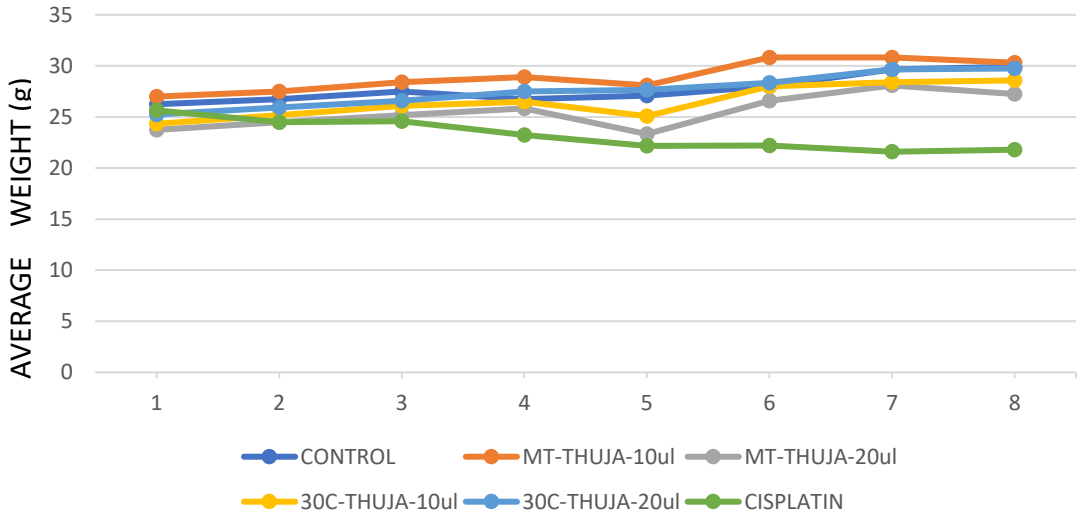
Hela cells were treated with Thuja with various potencies from Mother tincture, 6C, 30 C, 200C for various time points. i.e 24 hrs, 48hrs, 72hrs. The mother tincture dose has shown efficient LD 50 effect at particular dose. The better effects were observed when cells were maintained for 72 hours.

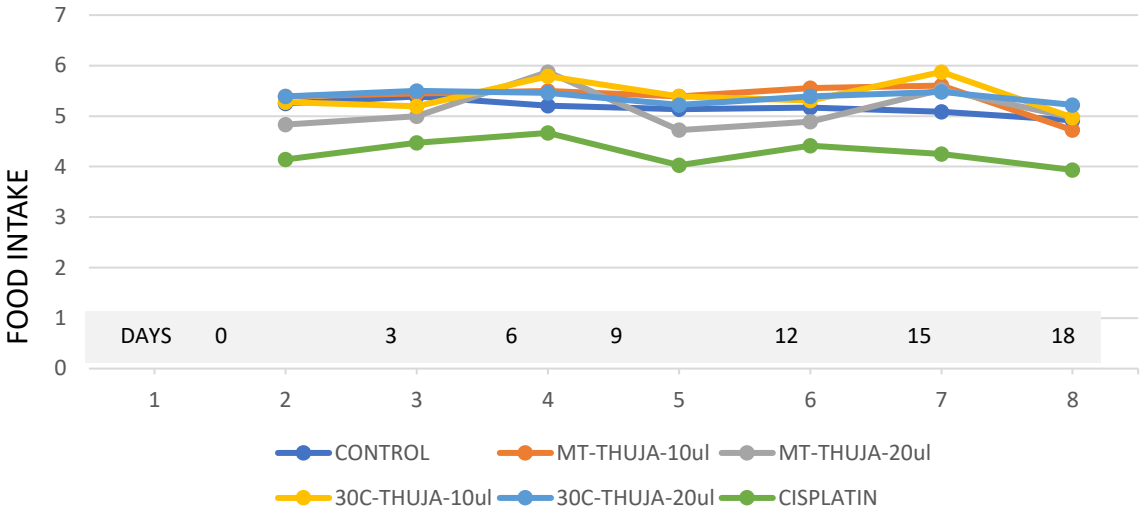
However, the effects were observed in 48 hrs too. The 30 C doses also gave effect but the effects were not consistent. So we have taken mother tincture for *invivo* studies.

Six mice per treatment groups were taken for toxicity studies, low dose and high dose of homeopathy drugs were taken in all i.e mother tincture, 30C and as a negative control 88% alcohol and as positive control Cisplatin were taken. All homeopathy drugs were given daily orally and cisplatin injection given intra-peritoneal once in 3 days The mice were observed with defined food , water supply and body weight were measured. We found mother tincture and 30 C treated mice shown maximum water intake and food intake and increased body weight when compared to negative control and positive control cisplatin treated mice shown less body weight, less water intake and less food intake.

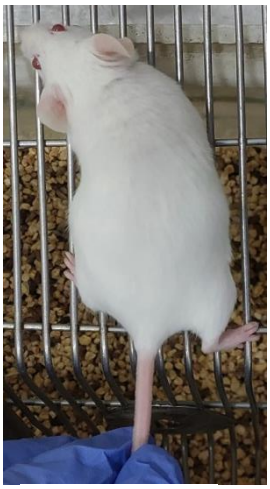
The Mother tincture treated mice shown toxicity like hair loss, and abstain from cleaning behaviour, whereas the control and 30 C mice shown nil or les toxicity respectively. The mice will be sacrificed for biochemical and histological changes associated with homeopathy drug.

Translational Potential: This work will lead to understanding the molecular mechanism by which Thuja elicit its medicinal effects and its associated possible organo-toxicity upon administration in real human trials.





Organo toxicity In Animal Models



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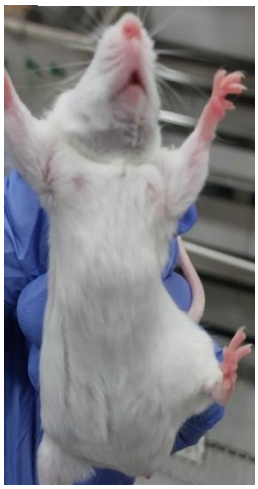

30C
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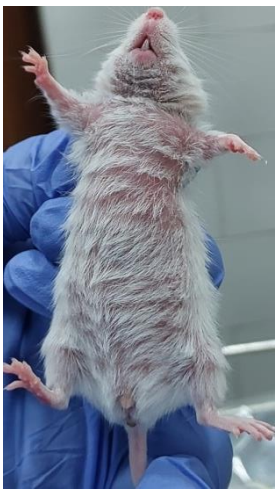


Thuja Mot Tincture low

Thuja Mot Tincture High

Prioritization and Meta-analysis of coding SNPs in cervical cancer to identify high risk genetic variants

Principal Investigator: Dr Subhash M Agarwal, Scientist F

Brief background & rationale: Cervical cancer is a leading women's cancer globally with respect to both incidence and mortality. Its increased risk has been linked with HPV infection and genetic variations like single nucleotide polymorphisms (SNPs). Although, studies have been published which evaluates the effect of SNPs in a few candidate genes, however the role of coding regions of the genome in high risk SNPs have not been evaluated comprehensively.

Objective:

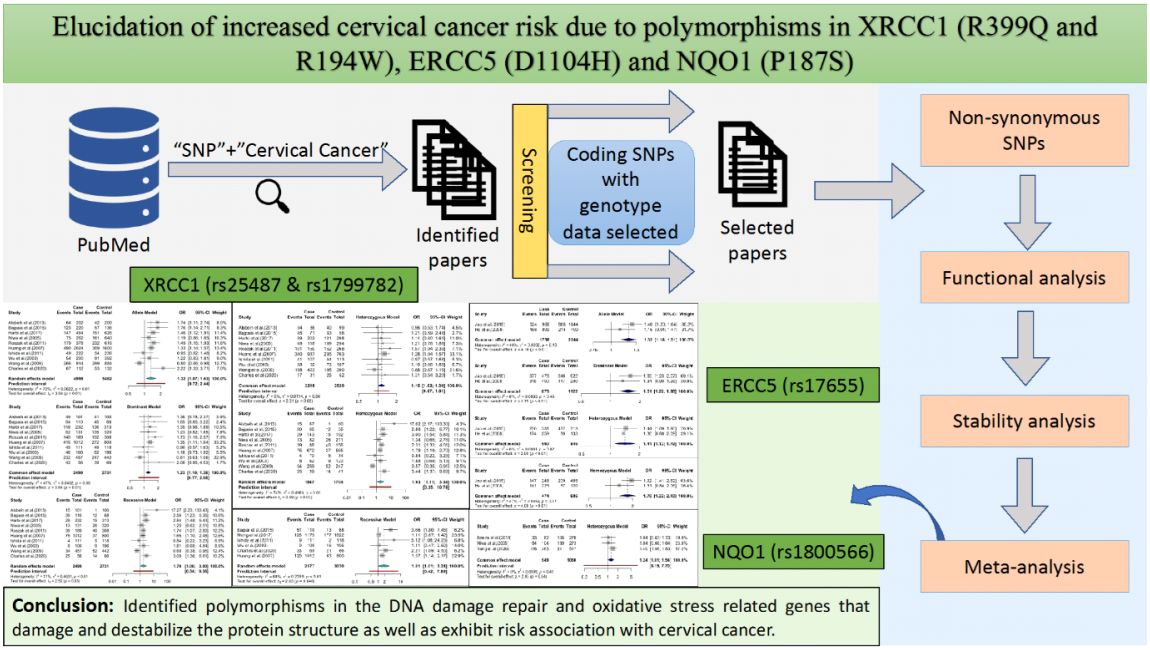
To prioritize and shortlist non-synonymous SNPs from the coding regions of the genome and elucidate their role in increasing cervical cancer risk

Brief Methodology:

The bibliographic database PubMed was searched using keywords like “coding SNPs, non-synonymous SNPs, nsSNPs, single nucleotide polymorphism, cervical cancer”. Literature mining identified 179 papers with 114 non-synonymous SNPs (nsSNPs) with population-based evidence in cervical cancer. Subsequently, the functional assessment was performed using sequence-dependent tools and thereafter, protein stability was analyzed using sequence and structural data. nsSNPs found to be damaging and destabilizing to the protein structure and function were thereafter analyzed to check their risk association at the population level using meta-analysis. The meta-analysis was performed using five genetic models and two statistical models.

Main Findings:

- Functional analysis of nsSNPs performed via PolyPhen2, PROVEAN, SIFT, Mutation assesor, and SNAP2 identified 25 nsSNPs as damaging or deleterious.
- Stability analysis performed using sequence and structure based tools like iMutant, MUPro, iStable, CUPSAT and mCSM identified twenty-three SNPs as structurally destabilizing.
- Results of the meta-analysis indicated four nsSNPs in DNA damage repair genes XRCC1 (rs25487 and rs1799782), ERCC5 (rs17655), and oxidative stress-related gene NQO1 (rs1800566) as significantly associated with increased cervical cancer risk.



Translational Potential: The study has highlighted a few polymorphism targeting genes related to DNA damage repair and oxidative stress management that are significantly associated with higher risk of cervical cancer. Study of these polymorphisms in Indian population will allow to determine their risk and has the potential for development as a predictive risk factor.

Publication(s):

- Das AP, Saini S, Tyagi S, Chaudhary N, **Agarwal SM***. Elucidation of Increased Cervical Cancer Risk Due to Polymorphisms in XRCC1 (R399Q and R194W), ERCC5 (D1104H), and NQO1 (P187S). Reprod Sci. 2023 Apr;30(4):1118-1132. doi: 10.1007/s43032-022-01096-6.

Breast Cancer

To decipher and target the metabolic signatures associated with Epirubicin-resistant triple negative breast cancer

Principal Investigator: Dr. Suresh Hedau, Scientist-E, ICMR-NICPR, Noida

Co-Investigators: Dr. Mausumi Bharadwaj, Scientist-G, ICMR-NICPR, Noida

Type of study: ICMR Ad-hoc Project

Project Duration: 15.11.2021 – 14.11.2024

Funding Agency NICPR budget: ICMR, Rs. 35.42 Lakhs

Brief background & rationale:

Triple negative breast cancer is more aggressive subtype and account for 20% among the breast cancer worldwide. Lack of receptors in TNBCs patients, endocrine therapy and the HER-2 receptor targeted therapies are not applicable. Epirubicin (Epi) is a chemotherapeutic drug is being used as first line of treatment. It is a semi-synthetic doxorubicin derivative intercalates into DNA and inhibits Topoisomerase-II enzymes results in inhibition of DNA and RNA synthesis and cell death. The aim of this study is to understand the molecular mechanisms associated with metabolic changes behind Epi-resistance in TNBCs and further identify drug candidates for the treatment of disease.

Objectives:

- To develop an Epirubicin-resistant in triple negative breast cancer cell models.
- To access the transcriptome profile for Epi-sensitive and Epi-resistance cells.
- To identify mi-RNA and proteome profiles, and their comparative study of Epi- resistance TNBC cells with sensitive cells.
- To validate transcriptome and proteome profiles at mRNA as well as protein level.

Brief Methodology:

- **Maintenance of cell lines**- Cell lines were maintained in DMEM with supplement 10% FBS, 1% Pen/Strep at 37^0C with 5% CO2 in CO2 incubator.
- **Protocol Standardization -** Protocols related to cell culture and drug treatment to fulfill the first and second objectives were standardized.
- **Cell viability assay –** MTT cell viability assay was performed to check efficacy of Epirubicin drugs on MDA-MB-231 cell line.
- **Developing resistant cell models**- MDA-MB-231 cell lines were treated with 250 nM concentration of Epirubicin.
- Colonogenic Assay used to check migration and proliferation behaviours of resistant cells
- PI-staining and ROS generation and microscopy used to observe whether ROS generation is the cause of initiation of apoptosis or not and if yes than observed behaviour of drug resistant cells.
- Wound healing assay used to determine cell migration tendency in the resistant cells
- **Flow-cytometry assay-** Cell cycle and apoptosis were done by flow cytometry using PI staining for cell cycle analysis and Annexin V+ PI staining for apoptosis analysis.

Main Findings:

Here we developed a resistant cell model (Epi-R-MDA-MB-231) and validated by cell viability assay that showed 4-fold increased drug tolerance capacity. Further resistance cells showed increased colony formation and migration tendency by conducting colonogenic assay and wound healing assay respectively. Resistant cells further analysed by flow cytometry for their apoptosis and cell cycle behaviours where we found Epi- resistant cells showed minimal apoptotic effect and there is no cell cycle restriction were observed. These observations conclude that our Epi-resistance MDA-MB-231 cells are developed. In another cell line, drug resistance development process is under process.

Translational Potential: The present study will understand the molecular mechanism of epi-resistance in TNBC as well as discover the new potential prognostic marker, using the information from epi-resistant TNBC cells.

Identification of prognostic marker for mTOR kinase inhibitor and their mechanisms of therapeutic resistance in breast cancer

Principal Investigator: Dr. Suresh Hedau, Scientist-E, ICMR-NICPR, Noida

Co-Investigators: Dr. Shalini Singh, Scientist-G & Director, ICMR-NICPR, Noida, Dr. Ruchika Gupta, Scientist – E

Type of study: DHR, Grant-in-Aid (GIA) Project

Project Duration: 14.12.2021 – 13.12.2024

Funding Agency & budget: DHR, Rs. 46.62 Lakhs

Brief background & rationale: Everolimus is a synthetic small molecule mTOR kinase inhibitor arresting cell cycle in G1-phase being used for advanced stage breast cancer treatment. Although efficacy of everolimus is highly variable in breast cancer subtype. Lack of bio-marker in breast cancer's tumor subtype and poor understanding of molecular mechanisms of acquired resistance in breast cancer are limiting factors in the successful therapy. Here, we are addressing these limiting factors in the following objectives.

Objectives:

- Efficacy of everolimus will be evaluated in BC cell lines originate from breast cancer subtype tumor cells.
- Everolimus resistance cell models will be developed and evaluate the regulatory mechanisms at transcription and translation levels.
- Further validation study will be done in breast cancer clinical samples.

Brief Methodology:

- **Maintenance of Resistant Cell lines**- Everolimus and rapamycin resistant cell lines of MDA-MB-231 and MCF-7 were maintained.
- **Protocol Standardization**- Protocols needed to fulfil the first and second objective for MDA-MB-231 and MCF-7 were standardized.
- **Cell viability assay**-The cell viability assay for Everolimus and Rapamycin drugs on their corresponding everolimus and rapamycin resistant MDA-MB-231 and MCF-7 cell lines were performed via MTT assay.
- **Cellular Assays**- The resistance mechanism developed in everolimus and rapamycin drug resistant MDA-MB-231 and MCF-7 cells lines were further validated using wound healing assay and clonogenic assay.
- **Flow Cytometry Assay**-Cell cycle and apoptosis were done by flow cytometry using PI staining for cell cycle analysis and Annexin V+ PI staining for apoptosis analysis.

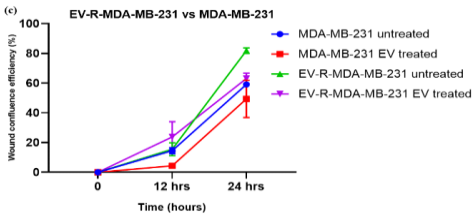
- **Clinical Sample Collection-** 60 fresh breast cancer samples (FNAC) were collected from cancer clinic of NICPR, Noida.

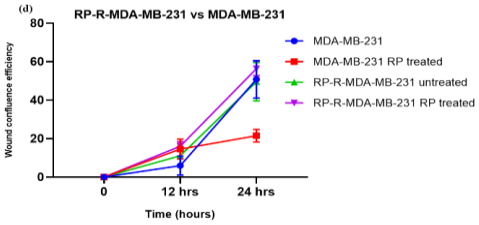
Main findings:

The everolimus and rapamycin drug resistant model in MDA-MB-231 and MCF-7 cells line have developed. There was ~3 fold higher drug tolerance showed by resistant model based on IC50 value obtained in the resistant model as compared to the sensitive cells for everolimus and rapamycin drugs as shown in table 1 below. The increased cell proliferation and migration tendency have been also observed in the resistant cells as shown in Fig.1.Enhanced colony formation tendency has also been observed in the resistant cells. Increased G2 population in cell cycle analysis indicate increased cell cycle proliferation in resistant cells after drug treatment. Further, resistant cells have shown lesser apoptotic effect of everolimus and rapamycin drug on their corresponding resistant MDA-MB-231 cell lines. Based on above outcomes of different level of experiments, Everolimus and Rapamycin drug resistant models have been validated.

Drug	Cell line	Fold change		
		24 Hours	48 Hours	72 Hours
Everolimus (EV)	MDA-MB-231	1.28	3.03	3.72
	EV-R-MDA-MB-231			
	MCF-7	1.62	2.51	2.49
	EV-R-MCF-7			
Rapamycin (RP)	MDA-MB-231	1.31	1.69	3.72
	RP-R-MDA-MB-231			

Table 1: The comparative fold change increase in IC50 value of everolimus and rapamycin drug in control and resistant MDA-MB-231 and MCF-7 cells.





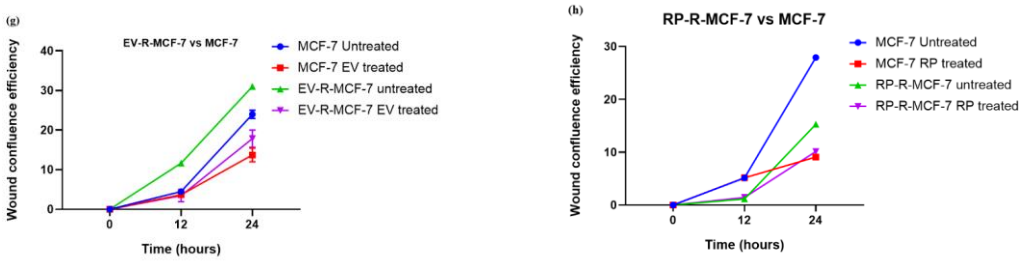


Fig. 1: Graphs depicting the increased migration tendency of resistant MDA-MB-231 and MCF-7 cell lines as compared to control cells.

Translational Potential: This study may help to find out the potential biomarker and an efficient co-drug to re-sensitize the breast cancer cells against everolimus drug which will enhance the effect of chemotherapy of HR+, HER+ and TNBC breast cancer patients.

Role of SOX2, OCT4, KLF4 and NANOG genes in therapy resistance against multi-kinase inhibitors and their post-transcriptional regulation in breast cancer

Principal Investigator: Dr. Binayak Kumar, DHR-Young Scientist

Mentor: Dr. Suresh Hedau, Scientist-E, ICMR-NICPR, Noida

Type of study: DHR, YSS Project

Project Duration: 3 years (13.08.2020 – 12.08.2023)

Funding Agency & budget: DHR, Rs. 29.10 Lakhs

Brief background & rationale:

Breast cancer is one of the most common cancers worldwide. Emergence of drug resistance is the major obstacle in the management of breast cancer. Accumulating evidence suggest that most of the anti-cancer drug kills the bulk population of tumor cells but fails to target cancer stem cells (CSCs). CSCs have self-renewal capacity and ability to differentiate into diverse progenies. SOX2, OCT4, KLF4 and NANOG genes are considered as stem cell transcription factors (STFs). The role of SOX2, OCT4, KLF4 and NAOG genes in cancer therapy resistance and targeting these factors by miRNA is still needs to be studied.

Objectives:

- To study the expression of SOX2, OCT4, KLF4 and NANOG genes in enriched cancer stem cells population.
- To study the expression of SOX2, OCT4, KLF4 and NANOG genes in abemaciclib and palbociclib drug resistance cell models.
- miRNA identification and their functional analysis towards SOX2, OCT4, KLF4 and NANOG genes in enriched cancer stem cells and abemaciclib and palbociclib drug resistant cell models.
- Validation of outcomes of the 1st and 2nd adjectives in the breast cancer clinical samples.

Brief Methodology:

Resistance model development by continuous drug treatment to MDA-MB-231 and MCF-7 Cell lines. Cell viability evaluated by MTT-assay to calculate IC50 values in drug sensitive and resistant cells. Colony formation and wound healing assay done to evaluate proliferation and migration tendency of the resistant cell models. Functional evaluation of the above mentioned STFs done by gene knock down assay using siRNA. Differentiation of apoptosis and necrosis due to drug effect on the resistant cell evaluated by using Annexin-V and PI Staining and run the cell on flow-cytometry. Analyses of cell cycle, apoptosis, proliferation, cell survival were also evaluated by studying genes responsible for the same by real-time qPCR. miRNAs profile and whole proteome profile were evaluated by using NGS and LC-MS-Ms.

Main findings:

We have successfully developed drug-resistant model Ab/Pb-R-MDA-MB-231 and Ab/Pb-R-MCF-7 cells models and validated them by above mentioned methods. Cell viability assay showed > 5 fold higher IC50 value. Wound healing assay and colonogenic assays showed enhanced cell migration and proliferative nature respectively of drug resistant cells. Elevated expression of Stem cell markers and STFs indicated that increased stmeness characteristics of the drug-resistant cell models. A panel of proteins (NUDT5, PEPD, ABAT, ATP1B1, GGCT, and SELENBP1 proteins were down-regulated and the SBSN, HSD17B10, CD9, PDIA3, PSMB4, SLC2A1, and VTN proteins are up-regulated in Ab-resistant cells. Similarly, NUDT5, PEPD, and GGCT proteins were down-regulated, while CD47, HIST1H2BN, LMNA, VTN, PSMB5, HBB, PSMA7, FLNB, PRDX4, VDAC1, GOT2, HSPA5, SERPINH1, EIF4A2, FTH, and VIM proteins were up-regulated in Pb-resistant cells) and miRNAs (miR-429, miR-107, miR-300 and miR-200 etc) were identified that might be have great potential to resolve the therapy resistance challenges for Ab and Pb drugs.

Translational Potential:

These panels of proteins and miRNAs might have prognostic value for personalized therapy for Ab/Pb drugs in breast cancer. These markers also might be helpful to manage the therapy resistance of targeted therapy in breast cancer patients.

No. of Publications: 1

Other Cancers

Identification of Polymorphisms associated with Increased Endometrial Cancer Risk

Name & Designation of PI: Dr Subhash M Agarwal, Scientist E

Brief background & rationale:

Endometrial cancer (EC) is among the most common gynecological disorders globally. As single nucleotide polymorphisms (SNPs) play an important role in the causation of EC, therefore, a comprehensive meta-analysis of 49 SNPs covering 25,446 cases and 41,106 controls was performed to identify SNPs significantly associated with increased EC risk.

Objective:

To identify SNPs significantly associated with increased EC risk

Brief Methodology:

The PubMed database was searched to identify case control studies of SNPs in endometrial cancer. Meta-analysis was performed to compute the pooled odds ratio (OR) at 95% confidence interval (CI). Cochran's Q-test and I^2 were used to study heterogeneity, based on which either a random or a fixed effect model was implemented. 5 different statistical models were employed for identifying high risk alleles and genotypes.

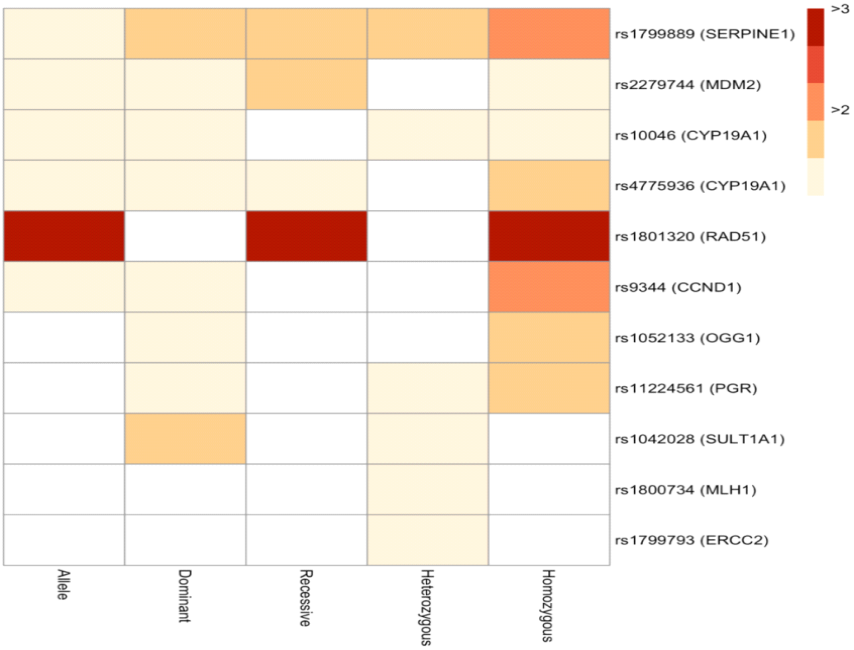


Fig 1: Heatmap of pooled odds ratio of the 11 SNPs that show statistically significant association with increased endometrial cancer risk

Main Findings:

- The meta-analysis indicates that polymorphisms present in various hormone related genes-SULT1A1 (rs1042028), PGR (rs11224561), and CYP19A1 (rs10046 and rs4775936); DNA repair genes-ERCC2 (rs1799793), OGG1 (rs1052133), MLH1 (rs1800734), and RAD51 (rs1801320) as well as genes like MDM2 (rs2279744), CCND1 (rs9344), and SERPINE1 (rs1799889), are significantly associated with increased EC risk (**Fig 1**).
- Seven SNPs were significant in at least three of the five genetic models
- Three of the polymorphisms (rs1801320, rs11224561, and rs2279744) corresponding to RAD51, PGR, and MDM2 genes, contained more than 1000 EC cases each and exhibited increased risk.

Translational Potential:

The current meta-analysis has identified a few polymorphism that are significantly associated with higher risk of Endometrial cancer, which need to be studied by experimentalist in Indian population to ascertain their risk.

Publication:

Das AP, Chaudhary N, Tyagi S, **Agarwal SM***. Meta-Analysis of 49 SNPs Covering 25,446 Cases and 41,106 Controls Identifies Polymorphisms in Hormone Regulation and DNA Repair Genes Associated with Increased Endometrial Cancer Risk. Genes (Basel). 2023 Mar 17;14(3):741. doi: 10.3390/genes14030741.

LSD1 ablation regulates dsRNA and IFN responses, targeting LSD1 in combination with anti-PD-(L) 1 immunotherapy in gastric cancer cell lines & B16 cells

Principal Investigator: Dr. Soni Kumari, DHR-Young Scientist

Mentor: Dr. Suresh Hedau, Scientist-E, ICMR-NICPR, Noida

Type of study: DHR, YSS Project

Project Duration: 3 years (03.08.2020 – 02.08.2023)

Funding Agency & budget: DHR, Rs. 29.10 Lakhs

Brief background & rationale:

The roles of chromatin regulators in cancer have been investigated both at the levels of cancer cell proliferation and impact on human immune system. However, the relative effects of chromatin regulation on cancer cell- intrinsic functions versus T cell functions, as well as on the overall responses to tumor to immune system, are unexplored. In the current study we target the histone H3K4 demethylase LSD1 (KDM1A) which play a critical role in suppressing endogenous double stranded RNA (dsRNA) levels and IFN responses in tumor cells. dsRNA stress resulted from LSD1 inhibition leads to potent anti-tumor T cell immunity. Targeting LSD1 in combination with anti-PD-(L)1 may prove to be a broadly applicable new strategy in cancer immunotherapy.

Objectives:

- To investigate the role of TLR3, MDA5, RIG 1, AGO2, DICER, TRBP2, IFN, IL-28, ISG115, OASL and endogenous retroviruses in sh-control and sh-LSD1 gastric cancer cell line.
- To confirm the methylation status and stability of AGO2 in cell treated with cychlohexamide (CHX) in the presence or absence of GSK-LSD1(LSD1 inhibitor) in gastric cancer cell line.
- To investigate the Anti-tumor T cell immunity and survival rate in scramble, LSD1 KO, TCRalpha KO, IFN-beta KO and LSD1/ TCR-alpha DKO, LSD1/MDA5 DKO, and LSD1/ IFN-beta in B16 cells.

Brief Methodology:

Cell line maintenance: AGS cells were cultured in Ham'sF'12 media supplemented with 10% FBS and 1% Peniciline and Streptomycine antibiotics. Cell culture maintained in the 5% CO2, 95% humidified air and at 37° C temperature in CO2 incubator.

siRNA Transfection:AGS Cells was plated in six well plated in antibiotic free high glucose medium. 70–80% confluent cells were subjected to transfection using Opti-MEM medium and LipofectamineTM 3000 regent (Invitrogen, CA, USA) followed by standard protocol.

LSD1 inhibitor and Cyclohexamide treatment:70–80% confluent AGS cells were subjected to treatment of cyclohexamide and LSD1 inhibitor. The concentration of LSD1 inhibitor was 2µM, and Cyclohexamide was 50µg/mL.

RNA Isolation, cDNA Preparation and qRT-PCR: Total RNA was isolated from the samples by Trizol method. The first strand cDNA synthesis was performed using high-capacity cDNA reverse transcription kit (ABI, USA) according to the manufacturer's protocol.

Protein extraction and Immunoblotting: Total protein was isolated from AGS cell line using cell lysis buffer and protein quantity was determined via Bradford reagent. Equal amounts of protein (50μg) were separated using 10% SDS-PAGE and transferred to PVDF membrane. Membrane was blocked with 5% skimmed milk in TBST buffer for two-hour at room temperature and probed with primary antibody in 5% skimmed milk in TBST for overnight at 4ºC. After washing with TBST, the membrane was incubated with secondary antibody in 5% skimmed milk in TBST at room temp for 2 hours. After washing thrice with TBST, Signal was detected using chemi-luminiscence.

Main findings:

Differential expression of LSD1, AGO2, DICER, HERV1, IFNB, HML2, TLR3, RIG1, MAD5, OASL, TRBP2, and ISG15 after siLSD1, SiTLR3, siDDX58 (RIG1), siIFIH1, siLSD1+ SiTLR3, siLSD1+ siDDX58 (RIG1), siLSD1+ siIFIH1, SiTLR3+ siDDX58 (RIG1), SiTLR3+ siIFIH1, and siDDX58 (RIG1) +siIFIH1 treatment in AGS cell line compared to scramble control which could be a critical role in T-cell immunity. AGO2 was up-regulated in case of cyclohexamide treatment but in combination with cyclohexamide and LSD1 inhibitor it was down-regulated at mRNA level that data suggest LSD1 play an important role in methylation. Current study suggests that after inhibition of histone H3K4 demethylase LSD1 (KDM1A) activate expression of HERV1. Activated HERV1 enhance the expression of IFNB1, TLR3, OASL, and IL-28. Activated immune cells play a critical role in T cell immunity that leads to tumor interferon pathway activation and increase response to cancer immunotherapy. Further study will suggest how those genes involve in cancer immunotherapy.

Translational Potential:

Current study suggests that after inhibition of histone H3K4 demethylase LSD1 (KDM1A) activate expression of HERV1. Activated HERV1 enhance the expression of IFNB1, TLR3, OASL, and IL-28. Activated immune cells play a critical role in T cell immunity that leads to tumor interferon pathway activation and increase response to cancer immunotherapy. Inhibition of DNA methylation alone, or together with HDAC inhibitor, leads to tumor interferon pathway activation and increase response to cancer immunotherapy. Further study will suggest how those genes involve in cancer immunotherapy.

Brain derived neurotrophic factor (BDNF) and its receptor, TrkB in gall bladder carcinoma: potential biomarkers and prognostic markers

Principal Investigator: Dr Ruchika Gupta, Scientist D, ICMR-NICPR, Noida

Co-Investigators: Dr Sanjay Gupta, Scientist- G, ICMR-NICPR, Noida, Dr Suresh T Hedau, Scientist- E, ICMR-NICPR, Noida, Prof Puja Sakhuja, Govind Ballabh Pant Institute of Postgraduate Medical Education and Research, University of Delhi (GBPIMER), Prof Anil Agarwal (GBPIMER), Dr Ratna Chopra (Hindu Rao Hospital)

Type of study: Ad-hoc

Category of Research: Discovery

Project Duration: 30.03.2021 - 29.03.2024

Funding Agency & budget: ICMR, Rs 30,08,631/-

Brief background & rationale: Gall bladder cancer (GBC) is the most common biliary tract malignancy and fifth commonest cancer of the digestive tract with a high morbidity and mortality. Serum tumor markers like CA19-9 and CEA are commonly utilized to support a clinical diagnosis of GBC. However, these markers are usually elevated only in advanced stages and their specificity in early stages of the cancer is very low. Brain derived neurotropic factor (BDNF), a member of neurotrophin growth factor family, has been demonstrated to be overexpressed in tissues of GBC. Benign lesions such as adenomas and polyps exhibiting BDNF positivity have demonstrated moderate to severe dysplasia of the epithelium, suggesting that BDNF might play a role in the early phases of gall bladder tumorigenesis.

Objectives:

- To evaluate the tissue expression of BDNF, TrkB, PI3K, Akt and EGFR in chronic cholecystitis, gall bladder showing epithelial dysplasia and GBC.
- To quantitate the pre-operative serum levels of BDNF and TrkB in these three study groups.
- To correlate the tissue expression and serum levels with diagnostic markers (CEA, CA19-9) and prognostic factors (tumor grade, stage, hepatic invasion, lymph node metastasis) and patient survival.

Brief Methodology: A total of 150 cases comprising of 60 cases of gall bladder carcinoma, 60 tissues from chronic cholecystitis samples and 30 from cases with epithelial dysplasia of gall bladder shall be included in this study. Written informed consent shall be taken from all participants.

- Detailed clinical history, including demographic data and presenting complaints shall be noted. Investigations, including serum tumor markers (CEA, CA 19-9) and radiological evaluation (ultrasound/ CT scan/ MRI) shall be recorded.
- Pre-operative blood sample of patients undergoing choelcystectomy shall be collected, serum separated and appropriately stored.

- The surgical procedure with significant intra-operative finding shall be noted from the case records. The final histopathological diagnosis shall be noted for categorization of the participant into one of the three groups: chronic cholecystitis, epithelial dysplasia or GBC.
- H&E-stained sections of cases diagnosed as GBC shall be reviewed for tumor grade, extent of invasion into the gall bladder wall, local infiltration into liver parenchyma (if included) and lymph node metastasis.
- Immunohistochemistry on paraffin-embedded sections for BDNF, TrkB, PI3K, Akt and EGFR shall be performed as per the protocol. The immunostained sections shall be evaluated for cytoplasmic (PI3K, Akt, TrkB), cytoplasmic and/or membranous (BDNF) and membranous (EGFR) positivity. For PI3K and Akt, cases with ≥50% cells staining for the antibody shall be considered as positive while at least 25% positive staining will be taken for BDNF and TrkB. And 10% for EGFR.
- Serum BDNF and TrkB shall be estimated using the sandwich ELISA technique following the kit protocol.
- Follow-up data: Further clinical work-up of the cases diagnosed as epithelial dysplasia or adenocarcinoma shall again be recorded along with the status at the last available follow-up or completion of the study, whichever is earlier.

Main Findings: Till date, 110 cases have been recruited in the study. Formalin-fixed paraffin-embedded tissues have been collected for all these cases. The age of the patients ranged between 18-70 years with male: female ratio of 1:5. Histopathologically, 78 cases showed features of chronic cholecystitis with or without cholesterolosis while 32 cases were diagnosed as gall bladder carcinoma. We considered chronic cholecystitis as a reference control and 18S gene was used as an internal control. Of the cases of gall bladder carcinoma, 26 cases showed a 15-19-fold amplification for BDNF gene. Amplification of Akt and PI3K genes was also noted in gall bladder carcinoma. Immunohistochemistry was performed in 30 cases. Tissues of gall bladder carcinoma showed positive staining for BDNF, TrkB, Akt, and PI3K in the tumor cells while the intensity and extent of staining in chronic cholecystitis was significantly lower.

Translational Potential: The role of BDNF-TrkB pathway in the pathogenesis of GBC and in the dysplasia-carcinoma sequence shall be established. One or more of these markers may be found to have potential utility as prognostic markers or early biomarkers in diagnosis of epithelial dysplasia of gall bladder or GBC.

Establishment and Transcriptomic Profiling of Multidrug-Resistant Ovarian Cancer Cells

Principal Investigator: Dr. Dinesh Kumar, Scientist- C, ICMR-NICPR, Noida

Co-Investigators: Dr Mausami Bharadwaj, Scientist- G, ICMR-NICPR, Noida

Type of study: Intramural

Project Duration: 01.01.2022 – 30.06.2023 (1.5 years)

Funding Agency & budget: ICMR-NICPR, 5 lakhs

Brief background & rationale: Ovarian cancer is seventh most common cancer globally. It contributes to 2.5 percent of all female cancers but cause more than 5 percent of deaths due to cancers which highlight the lethality of disease. India stands on 3rd place after China and USA in ovarian cancer number. More than 90% of cases of ovarian cancer incidence have been seen after postmenopausal age which suggests the increased risk with longevity. Most of the ovarian cancers are epithelial tumor. The high-grade serous carcinoma shows high genetic instability in TP53, BRCA1 and BRCA2. It has been observed that more than 20 % of ovarian cancers are due to inherited genetic mutations. Metastasis and recurrence have been associated with the deaths due to cancer. The drug resistance has been counted as escalating factor for deaths due to cancers. The Fluorouracil, Cisplatin and Docetaxel have been used widely to treat cancers. The cancer cells may develop resistance due constant exposure of the lifesaving drugs. The several studies have reported the effect of the lifesaving drugs on cancer cell lines. Understanding the combined impact of the Fluorouracil, Cisplatin and Docetaxel on ovarian cancer cells would be very useful.

Objectives:

- Optimization of ovarian cancer cell culture
- Induction of drug tolerance and resistance against Fluorouracil, Cisplatin and Docetaxel
- Transcription profiling of multi drug resistant ovarian cancer cells by RNAseq
- Screening of drug resistance related genes in ovarian cancer cells and drug resistant cells at different time points and drug concentrations.

Brief Methodology:

Ovarian cancer cell line will be procured and culture conditions will be optimized for proper growth of ovarian cancer lines. These cells will be characterized for the sphere forming cancer properties. Cancer stem cell markers will be observed by RT-PCR

The minimum inhibitory concentration for cell proliferation will be determined by treating cells with different concentration of drugs. The sphere forming OCCs will be cultured for 6 month under gradual increase in concentration of Fluorouracil, Cisplatin and Docetaxel. The RNA of cells will be extracted at d0, day1, day3, day7,

The day0 OCCs and day180 for samples of multidrug resistant-OCCs will be used for RNAseq. The RNAseq data will be analyzed to find out the differentially expressed genes.

The genes related to the drug tolerance will be screened using molecular techniques.

Main Findings:

The multi-drug resistant cell may be used to screen the other drugs which may be used for resistance reversal

Transcription profiling may highlight the mechanism of drug resistance in ovarian cancer and may provide target to reduce the drug resistance.

Translational Potential:

MDR cell may be used for research and commercial purpose.

Helicobacter pylori and Epstein-Barr virus co-infection in patients of Gastric Carcinoma

Principal Investigator: Dr Nazneen Arif, Scientist-D, ICMR-NICPR, Noida

Co-Investigators: Dr Sandeep Sharma, Scientist-B

Type of study: Intramural

Project Duration: Three years (March 2023–Feb 2026)

Funding Agency & budget: 5.8 lakhs

Brief background & rationale:

Gastric cancer (GC) is one of the leading causes of morbidity and mortality worldwide. Infection of the gastric epithelium remains the major challenge against disease prevention. Our understanding of co-infection of the gastric epithelium by *Helicobacter pylori* (*H. pylori*), or by Epstein-Barr virus (EBV) is currently very limited in terms of demographic factors. Both agents can establish a lifelong persistent infection in the host, leading to chronic inflammation, which also contributes to cancer development. These infections are acquired early in life, with a seroprevalence of around 50% and 90 % for *H. pylori* and EBV respectively.

An increased number of reports suggest that some sort of cooperation exists between EBV and H. pylori, where the presence of one promotes the growth of the other and also plays a potential role and in virulence and disease pathogenesis. Although the mechanisms controlling this synergistic interaction are not entirely known, several lines of evidence suggest that during the course of co-infection with H. pylori and EBV, immune cell recruitment to the site of infection is considerably increased, which potentiates gastric inflammation and tissue damage.

Objectives

- To determine the prevalence of co-infection of H. pylori and EBV in Gastric Carcinoma
- To identify variations in histopathology in these Gastric Carcinomas based on etiological infectious agent identified.
- To identify demographic factors related to the infectious agents, if any.

Brief Methodology:

Endoscopically extracted Gastric Carcinoma biopsies (n = 100) and willbe collected in 1% PBS from All India Institute Of Medical Sciences (AIIMS), New Delhi, India. All tissues will be stored at -80ºC until further processing. DNA extraction will be performed using the QIAamp DNA Mini Kit (Qiagen,Germany) as per instructions of the manufacturer. DNA will be quantitated using the Qubit Fluorometer(Thermo Fisher Scientific, USA). PCR reactions targeting the genome of H.pylori and EBV genome will be performed. The prevalence of individual infections and co-infections will be calculated as percentage. The presence of any infectious etiology will be subjected to association analysis with clinicopathological characteristics as well as demographic factors like age, sex,

development status, tumor type, histologic type, anatomic location, depth of invasion, tumor stage and lymph node invasion in gastric carcinoma patients.

Translational Potential:

The results of the present study will direct future experimental studies toward elucidating the role of co- infections in the carcinogenesis process, and will inform clinicians and policy-makers to improve preventive intervention and control.

This study will help to unravel the profile of infectious etiology in Gastric Carcinoma patients, which in future might be useful to understand the disease pathogenesis process. Future prospects involve identification of upregulated genes through transcriptome analysis, which could further be used clinically in Gastric Carcinoma detection and early diagnosis.

Decoding the long non-coding RNA landscape in Polycystic Ovary Syndrome (PCOS) and PCOS-linked gynecologic oncogenesis for potential clinical biomarkers

Principal Investigator: Dr. Sandeep Kumar, Scientist-B, ICMR-NICPR, Noida

Co-Investigators: Dr. Showket Hussain, Scientist-D, ICMR-NICPR

Prof. (Dr.) Bindiya Gupta, MD, UCMS & GTB Hospital

Type of study: Intramural

Project Duration: Two years (November 2022 – November 2024)

Funding Agency NICPR budget: 10 lakhs

Brief background & rationale: PCOS is a major public health concern affecting women of reproductive age in India and across the world. This complex condition is characterized by a triad of ovulatory dysfunction, cardiometabolic disturbances, and hyperandrogenism, and incurs substantial healthcare costs. Besides, confounding factors including epigenetic aberrations have been observed to seed oncogenesis, especially endometrial cancer. Epidemiological findings have also accentuated the fact that women with PCOS are at higher risk of developing endometrial cancer. However, the molecular mechanisms that relate to PCOS and its link with gynecologic oncogenesis are poorly understood.

Objectives:

- To identify and characterize the differential lncRNA landscape in PCOS and PCOS-linked gynecologic oncogenesis - Discovery phase.
- To characterize candidate lncRNAs identified from Obj. 1, their molecular targets, and associated pathways using various bioinformatics tools.

Brief Methodology: Peripheral blood samples of the study participants will be collected in EDTA tubes, and plasma will be separated. The collected plasma will be immediately processed for total RNA isolation followed by deep next-generation sequencing (whole circulatory transcriptome). Data will be analysed and translated into a functional interactome using an integrated bioinformatics approach. A panel of identified candidate targets will be prepared which will be validated functionally and tested further for their potential to be developed as biomarkers (not part of this study).

Translational Potential: The study will generate information on significant RNA molecules that might be potential clinical biomarkers for PCOS and gynecological oncogenesis.

Genomic sequencing of HCV associated with Hepatocellular Carcinoma to identify conserved regions for vaccine candidates

Principal Investigator: Dr Pramod Kumar, Scientist-C, ICMR-NICPR, Noida

Co-Investigators: Dr Dinesh Kumar, Scientist-C, ICMR-NICPR, Noida, Dr Anuj Kumar, Scientist-C, ICMR-NICPR, Noida, Dr Sandhya Kabra, Additional Director, NCDC, Delhi, Dr Partha Rakshit, Joint Director, NCDC, Delhi

Type of study: Task Force

Project Duration: Two years (March 2022 – Feb 2024)

Funding Agency & budget: 1.8 lakhs

Brief background & rationale

In India, chronic viral hepatitis or HCV infection is the most important risk factor in HCC development. Viral mutations contribute in viral pathogenesis, immune escape and resistance to antivirals which leads to liver damage or development of HCC. No effective vaccine is available for HCV. Genome sequencing of HCV and identification of conserved immunogenic regions would help in designing vaccine candidate.

Objectives

- Genome sequencing of HCV to determine their association to HCC
- Identification of conserved immunogenic regions

Brief Methodology

- Extraction of viral RNA, library preparation, NGS & data analyses
- Epitope mapping (B cell epitopes, T cell epitopes (HTL & CTL) and identification of potential conservational immunogenic regions in HCV

Main Findings: Optimization of Nested PCR for amplification of 5'-UTR and NGS based genome sequencing

Translational Potential: nested/RT-qPCR can be used for diagnosis

Evaluating the efficacy of interferon-mediators in combination with α-fetoprotein and Des-γ -carboxy-prothrombin in diagnosing hepatocellular carcinoma

Name & Designation of PI: Dr Anuj Kumar, Scientist-C, ICMR-NICPR, Noida

Co-investigators: Dr Pramod Kumar, Scientist-C, ICMR-NICPR, Noida, Dr Ekta Gupta, Scientist-E, ICMR-NICPR, Noida, Dr Mausumi Bharadwaj, Scientist-G & Head, Molecular Biology, ICMR-NICPR, Noida, Dr Shalini Singh, Scientist-G & Director, ICMR-NICPR, Noida

Type of study proposed - Intramural

Background & Rationale:

Hepatocellular carcinoma (HCC) accounts for nine lakhs cases and eight lakh deaths in the year 2020 worldwide. The tests used to diagnose HCC include radiologic studies and pathologic diagnosis with a biopsy. In addition, serum α-fetoprotein (AFP) is a referred non-invasive marker of diagnosis as per the American Association for the Study of Liver Diseases (AASLD) and the European Association for the Study of the Liver (EASL). The level of AFP is also critical in determining the prognosis and treatment. AFP level above 400ng/dL is the cutoff value for HCC. However, unlike biopsy, which has sensitivity and specificity of 89% and 100%, respectively, the sensitivity and specificity of AFP are inferior at 64% and 62%, respectively.

Interferons (IFN) are used in HBV therapy in clinics, and IFN-induced pathways are involved in chronic HBV infection, where their role is found in the stimulation of the JAK pathway and regulation of STAT transcription. Viral clearance of HCV is associated with IFNL4. The genetic polymorphism of IFNL4, MxA and MxB influence infection.

Thus in the present proposal, we aim to study and develop interferon mediators as a complementary marker for HCC diagnosis, along with two biomarkers AFP and DCP. For the same, we propose to develop a multiplex assay of AFP and DCP plus interferon-mediators and determine the diagnostic efficacy by analyzing the levels of markers in the serum of HCC patients

Objectives

- Study the IIAE levels in chronic hepatitis and HCC patients against control population
- To evaluate the diagnostic efficacy of a panel of markers containing AFP, DCP and IIAE
- Study polymorphism in IIAE in chronic hepatitis and HCC patients

Methodology/ study design

The project will start after obtaining approval from the institution's ethics committee. Subjects will be recruited based on inclusion and exclusion criteria. Sample collection will be performed from both hospitalized and outpatients from selected hospitals and dispensaries. Approximately 2-3 ml blood sample will be collected, from which serum will be separated for the determination of AFP level. Where ever possible, an in-house test will be developed to determine the level of AFP, DCP and other markers in serum. Samples with AFP and DCP levels will be tested for interferon mediators. The buffy coat of the blood sample will be stored for the extraction of DNA. The samples in which interferon mediators' level is above the threshold level will be checked for polymorphism in interferon mediators.

Expected outcome(s):

The levels of interferons and immune markers in at risk and HCC patients will be determined. Knowledge will be gained on efficacy of panel of markers. The level and type SNPs acquired by IIAE in at risk and HCC patients will be studied

Funding Agency & Budget: Intramural

Epidemiology

Setting up of "Population Based Cancer Registry at ICMR-National Institute of Cancer Prevention & Research covering Gautam Budh Nagar

Principal Investigator: Dr Smita Asthana, Scientist E, ICMR-NICPR, Noida

Co-Investigators: Dr Shalini Singh, Director of ICMR-NICPR, Noida

Type of study: Task Force

Project Duration: 7 Years (Extendable on yearly basis)

(08.03.2017– 31.03.2024)

Funding Agency & budget: NICPR, Rs 34.79 lakh yearly budget

Brief Background & Rationale:

This Cancer registry is a part of national cancer registry which provides population based data of cancer in the local population by site, age, sex, geographical location and other demographic parameters.

Objective:

- To collect cancer demographic data for Population-Based Cancer Registry covering the rural and urban population of Gautam Budh Nagar (G.B. Nagar) district of Uttar Pradesh.

Brief Methodology:

Cancer cases information from various sources where they report are collected which included Government hospital, community health centre, private hospitals and private laboratories from the selected district. Details such as name, age, sex, permanent address, duration of stay in the area, exact site of cancer, diagnostic modality, histological type of cancer, date of report, cancer stage and treatment done are being recorded. Data arranged in alphabetical order and thoroughly checked for duplicates. Data is submitted online to ICMR-NCDIR on regular basis for further quality checks and generation of reports.

Main Finding: (During May, 2022 – May, 2023)

Number of new cancer cases registered from different hospitals in Population Based Cancer Registry, G.B. Nagar during reporting period (May, 2022– May, 2023) till date is 2081 for the year 2020 and 2021. For the year 2021, data collection and data entry is ongoing.

Incidence Data Collected from Various Hospitals

Sr No.	Hospital Name	Incidence (%)
1.	All India Institute of Medical Sciences, Ansari Nagar, New Delhi	299 (14.37)
2.	Apollo Hospital, Noida	30 (1.44)
3.	BLK Super Speciality Hospital, Karol Bagh	28 (1.34)
4.	Delhi State Cancer Institute, Delhi	95 (4.56)
5.	Dharmshila Cancer Hospital & Research Center	306 (14.70)
6.	Fortis Hospital, Noida	250 (12.01)
7.	Indraprastha Apollo Hospital, New Delhi	70 (3.36)
8.	Jaypee Hospital, Noida	218 (10.47)
9.	Kailash Hospital, Noida	96 (4.61)
10.	Metro Heart Institute and Metro Multi Speciality Hospital	4 (0.19)
11.	Neo Hospital, Noida	33 (1.58)
12.	NICPR, Noida	23 (1.10)
13.	Rajiv Gandhi Cancer Hospital, New Delhi	242 (11.63)
14.	Safdarjung Hospital and Medical College, New Delhi	64 (3.08)
15.	Shanti Mukund Hospital, Delhi	83 (3.99)
16.	Sharda Hospital, Greater Noida	66 (3.17)
17.	Shri Jagannath Charitable Cancer Institute & Research Centre	31 (1.49)
18.	Sir Ganga Ram Hospital	16 (0.77)
19.	Sumitra Hospital, Noida	9 (0.43)
20.	Yatharth Hospital, Noida	44 (2.11)
21.	Others	74 (3.56)
	Total	**2081**

Total cancer mortality cases registered during reporting period (May, 2022 – May, 2023): **154**

Distribution of cancer data for major cancer sites collected under the reporting period:

Family of Cancer	ICD10	Incidence cases entered in data base
Breast	C50.9	326 (15.66%)
Lip, Oral Cavity and Pharynx	C0-C14	276 (13.26%)
Lung	C34.9	140 (6.73%)
Gallbladder	C23	99 (4.76%)
Prostate	C61	93 (4.47%)

Translational Potential:

Publication: Data will be published by ICMR-NCDIR as registry report.

A Demonstration Project for Reduction of Tuberculosis in India- a Multi-centric Study

Principal Investigator: Dr Smita Asthana, Scientist-E, ICMR-NICPR, Noida

Co-Investigators: Dr Shalini Singh, Scientist G, Director of ICMR-NICPR, Noida

Type of study: Ad-Hoc

Project Duration: 2 Years

Funding Agency NICPR budget: ICMR, Rs. 27,49,000/-

Brief Background & Rationale:

India has the highest number of TB cases in the world inspite of a very robust NTEP. The CTD, MOHFW have set the guidelines for TB and MDR-TB, however, there are implementation challenges, which hamper the achievement of the goals. Moreover, logistic issues are adding to the delayed diagnosis, compliance to treatment and specially implementation of the preventive therapy. Therefore, it is planned to develop a cost effective, scalable strategic model consultation with STOs, DTOs and officials from CTD, MOHFW (DDG, TB).

Primary Objective:

- To improve awareness on TB and NTEP services through community-based activities and implement cost effective innovative strategies to strengthen access to existing NTEP services (policies) at district level.
- To support NTEP in accelerating TB elimination at district level by promoting early case detection, treatment adherence, contact tracing and preventive therapy through innovative approaches.

Secondary Objective:

- To assess the institutional and convergence mechanisms and devise implementation strategies for strengthening uptake of NTEP services at community level at district level.
- To identify the state specific challenges and barriers in implementing the NTEP services (policies) in selected districts

Brief Methodology:

The Project will be carried out in as an Implementation Research approach wherein the intervention outcomes will be evaluated as per defined protocol through rigorous novel research methods thereby providing evidence to National TB Elimination Programme (NTEP) for decision on further policy designing.

ICMR-NICPR will work in close collaboration with State Tuberculosis Officer (STO) and District Tuberculosis Officer (DTO) of Karawal Nagar district. The STO and DTO of Karawal Nagar will be equal partners in the project and will also be responsible for the smooth execution

of the project. They will be actively involved from the planning stage itself and during the whole execution of the project. Currently the project is under some major revision.

Main Findings:

Situational analysis for the TB patients in the Karawal Nagar area of the North East Delhi has been done. We conduct two focus group discussions (FGD) of TB patients. In each FGD group we included 8 patients. We also conducted 11 in depth interview with Medical Officers, Health Care workers, ASHAs, ANM, TB Patients and relatives. TB patients' data of this area from Nikshay Portal for last six months has also been collected.

Total 6 Filed visit has been done on 10/11/22, 18/11/22, 22/03/23, 25/03/23, 27/03/23 and 28/03/23 for repo building and situational analysis.

Translational Potential:

The global public health and TB community is shifting its focus from control of the TB epidemic towards its elimination. It is India's success that will determine the global progress towards ending TB and subsequently elimination. India has committed to END TB and is at a critical stage with the national momentum expected to accelerate after the increased political commitment and heightened community awareness about tuberculosis. This project, aims to develop cost effective innovative strategies and interventions comprising of structured community engagement, involvement of traditional healers, local pharmacies, private practitioners, DTOs and setting up diagnostic camps and promoting TB screening services in an effort to improve access to TB care services and improve the health seeking behavior of the affected population.

Challenges associated with community cancer screening (cervical, Breast and oral) among older Adults: A community-based study in low- and middle-income setting

Principal Investigator: Chandresh Pragya Verma, T.O "B" (MSW)

Co-Investigators: Dr. Prashant Kumar Singh, Scientist-E, Dr. Shalini Singh, Director, ICMR-NICPR, Noida

Type of study: Intramural

Project Duration: February 2022 – February 2023

Brief background & rationale: Cancer alone accounts for 7% of all deaths in India. The three most common cancers in India are breast, oral and uterine cancers, which account for 34% of all cancers in India. The morbidity and mortality due to breast, oral and uterine cancer has increased significantly in India. The Government of India has recently issued guidelines for common cancer screening and prevention. Screening is an important measure of cancer control. Even though screening is a major component of the national program, it is not effectively implemented in most parts of the country. The age group prescribed for screening is 30 to 65 years, but screening of people of 50-65 years is associated with problem related to personal, family support, financial, lack of information, or lack of awareness. Our main objective in this study is to find out the challenges due to which the eligible population is not able to benefit from the cancer screening program.

Objectives:

- To understand the level of awareness regarding cancer among older adults aged 50-65 years.
- To explore the challenges regarding cancer screening in the study population.
- To understand the potential solutions to curb low cancer screening in India.

Brief Methodology: This preliminary community based qualitative study was conducted at the Health promotion clinic of NICPR, Primary Health centres & the District hospital of Gautam Buddha Nagar, Uttar Pradesh. The participants comprised of individuals who came for treatment of other health ailments or basic screening. In this study, we conducted in-depth interviews of 30 males and 30 females of 50-65 age group who never undergone for cancer screening in their life-time and willingly provided their consent for the study. All eligible participants were informed about the purpose of the study and their participation in detail. Questions related to socio-demographic profile, health behaviour, knowledge, attitude and awareness of cancer were included.

Main Findings: To mobilize healthy Male and female to undergo cancer screening is a major constraint in cancer screening program because their perception towards screening is that when we don't have any problem why should we get screened. i.e., They need recommendation from doctor for cancer screening. Secondly public education about the need and benefits of cancer screening is lacking, most of the people are not aware about the common cancer screening program, their risk factors, symptoms and where to go for screening. Though people feel fear about the disease and have cancer in family and relatives even they do not go for screening. It is found in the study that

there is lack of accessible health facilities for screening, people who wants to go for screening, they didn't know where to screened. Most participants were aware about the oral cancer due to more publicity in T.V, newspaper, cinemas and other social media platforms but there is lack of access to cancer information like symptoms and risk factor of cervical and breast cancer.

Translational Potential:

- Increased awareness about the common cancer screening program
- Aware about the risk factors and symptoms of common cancers.
- Increased health seeking behaviours and participants motivate for cancer screening after interview.
- Understand the challenges regarding cancer screening in the study population.
- Understand the potential solutions to curb low cancer screening in India.

ICMR Task Force Study on Understanding availability of Essential Diagnostics in health care systems: identifying barriers and facilitators

Name & Designation of PI: Dr. Prashant Kumar Singh, Scientist-D, ICMR-NICPR, Noida

Co-investigators: Dr Shalini Singh, Scientist-G and Director, ICMR-NICPR, Noida

Type of study proposed – Task Force

Background & Rationale:

Access to essential diagnostics is the first key step in improving quality of care. It is also central to universal health coverage (UHC) as poor quality, independent of access, can be a barrier to UHC. In 2019, National Essential Diagnostic List (NEDL), a breakthrough step to make availability of quality diagnostics an essential component of the health care system that is aspiring to provide universal access to affordable, accessible and good quality health services. This list has been adopted by the Free Diagnostic Initiative (FDI) which is coordinated by NHSRC that is providing all possible help to States to roll out FDI. Despite the support by NHSRC and States' commitment towards this initiative, significant gap exist in terms of implementation of FDI. Here, we propose to perform a comprehensive survey using a simple random sampling approach to assess the availability of essential diagnostics in Sub centre (SC) and Primary health care (PHC)/Health and wellness centres (HWCs) in selected states of India in accordance with NEDL. This study shall be able to elucidate the status of health care levels in Indian States and shed light on the drawbacks, necessary measures, evidence of effective approaches, pathways and build a strong case for more focus and investment on diagnostics. Through this study we hope to provide feedback to uptake of NEDL/FDI and identify barriers and facilitators to improve diagnostic availability and uptake in the country.

Objectives:

- To assess the availability of essential diagnostics tests in health care system of India
- To evaluate the facilities available in health care levels.
- To identify a mechanism being used to deliver diagnostic services in States.
- To identify barriers and facilitators to tests availability and uptake

Methodology/ study design:

A cross-sectional survey of SC and PHC healthcare level will be conducted in phases. In the first phase, two states will be selected and an initial pilot study will be carried out to validate the questionnaire to assess knowledge and performance gaps in each facility.

Expected outcome(s):

This project would identify the availability of essential diagnostics at PHCs and SCs in the study area within the framework of universal health coverage, which is the first key step in improving quality of care; and diagnostics availability in the country. The responses form a survey sheet that includes in-depth questionnaires including challenges faced by the facility in delivering diagnostic services, basic details about utilization of hub and spoke facilities and other details prepared for observations will be utilized for comparisons between actual care delivery and guidelines availability = that may illuminate gaps between them and exposes the barriers that allow these gaps to persist. To ensure effective implementation of the services, feedback that will be received on components such as necessary infrastructure, storage conditions, procurement, supply chain, trained health workers and delivering of diagnostic services in States or any variation between urban v/z rural areas or communicable vs non communicable diseases will be beneficial to policy makers .In order to improve diagnostic availability and uptake in the country, the barriers and facilitators on the basis of responses will be identified. We hope to provide feedback and evidence to policymakers on the need for investment in diagnostic infrastructure, human resources and service as part of knowledge dissemination and translation activities.

Proposed Funding Agency & Budget: ICMR

Capacity Building Projects

Basic Molecular Biology Techniques Relevant to Cancer Research – Hands on Training- Tissue Culture related Techniques

Principal Investigator: Dr. Mausumi Bharadwaj, Scientist-G, ICMR-NICPR, Noida

Co-Investigators: Dr. R Suresh Kumar, Scientist-F, ICMR-NICPR, Noida, Dr. Suresh Hedau, Scientist-E, ICMR-NICPR, Noida

Type of study: DHR-HRD

Project Duration: 5 years **(**07/11/2019 – 06/11/2024**)**

Funding Agency & budget: DHR, Rs. 80 Lakhs

Brief background & rationale: Cancer being a major public health issue in the developing world. The emerging technologies are providing newer initiatives to tackle the intricacies associated with the cancer. Therefore, it is necessary to trained the young investigators to these molecular techniques related to cancer research. This will help them to learn the basic to advanced molecular techniques and try to apply them to execute their scientific ideas and give a boost to the cancer research.

Objectives

- Module A: Hand on training in Molecular Biology Techniques (General) (4 to 12 weeks)
- Module B: Long time training: Advance application topics (6-10 months)
- Module C: Workshop in Research Methodologies (4 days)

Brief Methodology: The trainees and participants were included in different modules of the program. In module A, 1 participant was enrolled for short time training. In module B, 6 participants were enrolled for long time training. In module C, two workshops (4 days each) of research methodologies were conducted. To assess the effectiveness (improvement in knowledge) of the workshop, a multiple-choice question (MCQ)-based practice was carried out. A total of 20 MCQ questions were designed related to basic knowledge of cancer and the basic molecular techniques, which was taught during the workshop.

Main Findings: During workshop, the participants were exposed to several molecular biology techniques like western blot, immunohistochemistry, methylation specific-PCR, qPCR, cell culture methods, Hybrid-Capture assay, and learned several molecular biology applications such as *in-silico* methods (molecular modelling and structural analysis), and NGS data handling. A significant improvement in the knowledge of participants was observed in the question related to techniques learned during the workshop.

Translational Potential: This basic molecular biology technique learning opportunity will bridge the gap between clinical practice and laboratory expertise. Participants will be benefitted significantly from attending the training and workshop, because they will communicate more effectively with their basic science colleagues and apply advances of molecular biology to the problems of clinical oncology based on the knowledge they gain during training and workshop.

Capacity building of healthcare providers in screening & early detection of common cancers using a hybrid model as a part of the population-based cancer screening program in India

Principal Investigator: Dr. Kavitha Dhanasekaran, Scientist-D, ICMR-NICPR, Noida

Co-Investigators: Dr. Shalini Singh, Scientist-G & Director, ICMR-NICPR, Noida, Dr.Roopa Hariprasad, Scientist-E

Project Duration: Three years (August-2019– August 2024)

Funding Agency & budget: ECHO India, Rs. 28,00,000/-

Brief background & rationale: Cancer Screening was introduced to the Indian Public Health services in August 2016. Since then, NICPR has been training interested individuals in cancer screening online through the NICPR-ECHO Program. Curricula have been designed for medical officers, gynaecologists and dentists. In May 2019 this program was approved by the MoHFW for training MOs in the public sector. All those who successfully complete the online program are eligible for our hands-on workshop at NICPR, Noida campus

Objectives:

- To evaluate the knowledge, skills and practice of the trainees by pre and post training knowledge, attitude and practice (KAP) before and after the course.
- Skills evaluation during workshops on the cancer screening procedure
- To evaluate the implementation of cancer screening services in primary care settings among Medical Officers receiving ECHO training**.**

Methodology:

- **Study Design**: Prospective interventional single arm study
- Population and Setting:
    - **Target**: All health care providers (Medical Officers, Gynecologists, Dentists, Nurses) nominated by the State Nodal officers or self-registered through the online registration link in the course advertisements on the NICPR and ICMR webistes of the NICPR-ECHO's cancer screening training program (online and hands-on training).
    - **Inclusion criteria**: Medical Officers, Gynecologists, Dentists and Nurses enrolled in the NICPR ECHO courses and willing to take part in the study
    - **Exclusion criteria**: Trainees not willing to participate in the study**.**

- **Expected Outcomes:**

    - HCPs working at PHCs/CHCs/DH will be equipped with knowledge and skills to implement comprehensive cancer screening services at their respective health facilities.
    - Gynecologists and dentists will be trained to manage the screen positives at DH/CHC.
    - This will ultimately assist in implementing population-based cancer screening program as per the guideline, which is released by the Indian Government in 2016.

Translational Potential:

This model may be used for capacity building of healthcare providers in cancer screening in all states.

Establishing Model Rural Health Research Unit (MRHRU) at CHC Khotpura, Panipat, Haryana

Nodal Officer: Dr Sanjay Gupta, Scientist G, ICMR-NICPR, Noida

Co-Investigators: Dr Shalini Singh, Scientist- G & Director, ICMR-NICPR, Noida, Dr Ruchika Gupta (Coordinating Officer) and Scientist- E, ICMR-NICPR, Noida

Type of study: DHR Scheme

Category of Research: Delivery

Project Duration: 01.11.2019 (ongoing)

Funding Agency & budget: Rs 2.42 Cr

Brief background & rationale: MRHRU Scheme was approved by the Govt of India in 2013 as an initiative to develop/strengthen the health research infrastructure in the country and make the relevant health research facilities available across the country. ICMR-NICPR is mentoring the MRHRU at CHC Khotpura, Panipat, Haryana.

Objectives:

- Create infrastructure at the periphery for transfer of technology to the rural level for improving the quality of health services to rural population.
- To ensure an interface between the new technology developers (Researchers in the Medical Institutions; State or Centre), health systems operators (Centre or state health services) and the beneficiaries (communities in rural areas)
- Ensure the much-needed geographical spread of health research infrastructure in the Country.

Work Done:

- Lease deed for the land allocated in Khotpura for the establishment of MRHRU was signed on 11th May 2023 by the Director, ICMR-NICPR and Sarpanch, Khotpura village.
- Two research projects are currently being undertaken at the Kalpana Chawla Govt Medical College, Karnal under the aegis of MRHRU:
    - ***Antimicrobial resistance surveillance in view of one health concept (PI – Dr Prerna Aggarwal, Prof & Head, Dept of Microbiology, KCGMC, Karnal)***

  In this project, stool samples from 84 healthy individuals were collected along with samples of tap water, drainage outlet, cowdung, and environmental samples from dairy, meat shop, and village sewage outlet. Of the 267 samples collected, 19 showed multidrug resistant (MDR) *E.coli* and 35 showed MDR *Klebsiella pneumonia*. Identification of genes for extended spectrum beta-lactamases (ESBL) has been completed. Genetic analysis for fluoroquinolone resistance is being done.

- ***Sero-prevalence of Aspergillus in patients with Chronic Obstructive Pulmonary Disease and their clinical co-relation (PI – Dr Prerna Aggarwal, Prof & Head, Dept of Microbiology, KCGMC, Karnal)***

  In this project, 81 patients with COPD with an age range of 45-82 years have been enrolled. Of these patients, 52 had raised serum total IgE while 25 had aspergillus specific IgE. Both raised total IgE and aspergillus specific IgE were found in 18 patients. Follow-up samples of these patients are being collected for a repeat analysis.

Translational Potential: The MRHRU scheme expects to build health research capacity in the linked medical college and the CHC catering to the local health priorities in the village community.

Tobacco Related Research

ICMR Task Force Study on Smokeless Tobacco and reproductive & Maternal Health (ICMR SLT-RMH Study)

Principal Investigator: Dr. Prashant Kumar Singh, Scientist 'E', NICPR, Noida

Co-Investigators: Dr. Shalini Singh, Director, NICPR, Dr. Sanghamitra Pati, Director, ICMR-RMRC, Bhubaneswar, Dr. Anna S Kerketta, Scientist-F (Clinical), ICMR-RMRC, Bhubaneswar

Type of study: Task Force

Funding Agency & budget (Rs. in lakhs): ICMR, Rs 1 Crore 39 Lakhs

Project Duration: July 2019- March, 2023

Brief background & rationale: Smokeless Tobacco (SLT) and areca nut use remains to be neglected among females, especially pregnant women, despite causing much preventable morbidity in mothers and the neonates. Hence, this study aims to understand SLT use among women of reproductive age as a means to develop training and behaviour change intervention models for cessation.

Objectives:

- To examine the socioeconomic factors associated with SLT and areca nut use among women of reproductive age and adverse pregnancy outcomes using Demographic and Health Surveys in selected south Asian countries.
- To understand the socioeconomic and cultural norms along with inter-generational linkages of SLT and areca nut use among women of reproductive age group in two study sites (Noida, Uttar Pradesh and Bhubaneswar, Odisha).
- To develop Behavioural Change Intervention (BCI) strategies for SLT and areca nut cessation among women belonging to reproductive age group.

Brief Methodology:

- For the first objective, latest rounds of Demographic and Health Surveys (DHS) on the consumption of SLT among the women from the reproductive age group (15 - 49 years) from Afghanistan, Bangladesh, India, Nepal and Pakistan will be conducted.
- For the second objective, an attempt to understand the socio-cultural context and determinants of SLT and areca nut use among target population will be undertaken. It will examine the role of social network, family history, occupation on current use along with knowledge and awareness regarding its adverse effects and quitting intentions.

- For the third objective, utilising the insights obtained from the above two studies, SLT cessation behavioural change intervention (BCI) tool will be developed using Information, Education and Communication (IEC) strategy which will be tested for cultural acceptability at a local cessation centre.

Main Findings:

- **Secondary data analysis**

Smokeless Tobacco Use among Pregnant Women in India: The Tale of Two Nationally Representative Surveys

- SLT use among pregnant women is markedly high, and is considered to be a global concern. Consequently, the associated health effects of SLT consumption on pregnant women and the foetus cause long-term adverse effects. The aim of this article was to understand the extent of deviation in SLT use estimates among Indian pregnant women based on two nationally representative surveys, namely GATS (2016-17) and the DHS-NFHS (2015-16).

- Both the surveys utilise multi-stage sampling techniques and have collected self-reported information related to SLT use among pregnant women aged 15-49 years. The findings from this article showcased quiet evident differences in SLT use patterns among pregnant women between these two large-scale nationally representative surveys. Overall, the prevalence of SLT use among pregnant women was reported to be higher in GATS than NFHS and this pattern remains similar between age groups of 15 to 34.

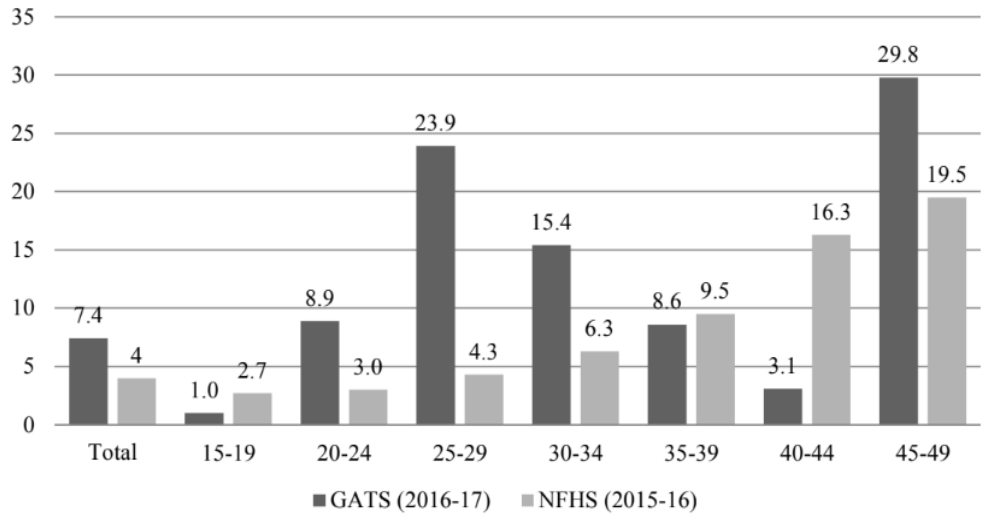


Figure 1: Percentage of pregnant women reported any form of smokeless tobacco use, India

- This study suggests that there is need for more reliable estimates of SLT usage among the pregnant and lactating population. Subsequently, the reported difference could have

significant implications for both reproductive, maternal and child health policies and tobacco control efforts in India and other Southeast Asian countries with high prevalence of SLT use. Hence, this issue needs to be acknowledged and addressed in a targeted manner. One paper was published as below:

- **Findings from Primary Data Collection**

Factors influencing initiation, continuation and cessation of Smokeless tobacco among pregnant and lactating women: A qualitative study in urban slums of India

- Women bear double burden of smokeless tobacco consumption. With increased risk of cardiovascular diseases, cancer, oral health issues, it can also have negative reproductive health effects on women and long-term adverse effects on foetus. This study tries to understand the factors associated with initiation, continuation as well as cessation of Smokeless Tobacco among women of reproductive age group (18-49 years) so as to include prevention and cessation interventions from its inception.

- The study was conducted in urban slums of Noida. Using snowball and purposive sampling techniques, in depth interviews were conducted with 22 lactating and 20 pregnant women who currently use smokeless tobacco. Data was analysed using thematic analyses with the help of QSR NVivo software.

- People influencing usage, change with different life stages; friends and relatives have major influence during premarital stage, while in-laws, especially elderly female relatives along with women in the community have more influence in post marriage period. Perceived health benefits, urge to consume mud during pregnancy, social influences turned out to be the major factors of initiation. Women were found more aware of its harmful effects during pregnancy in comparison to lactation. The findings of the study elucidate upon the need to develop Behavioural Change Intervention tools which are culturally and locally appropriate and follow gender sensitive approach. Different socio-cultural factors which are found to be associated with initiation at different life stages should also be catered while developing these tools.

Table: Factors associated with Initiation and Cessation of SLT based on I change model by Hein d Vries et al., 1988; 1998)

Themes	Initiation	Cessation
Predisposing Factors		
Psychological and Behavioural	Curiosity, craving for mud/chalks	Self-motivation, awareness/knowledge of harm to the child
Biological	Pregnancy, remedy for oral health issues, fragrance	Complications in delivery, face aesthetics, oral health consequences

Social and cultural	Social acceptance, rituals and ceremonies, usage by elderly	Gender based differential treatment for usage, social stigma
Awareness Factors		
Knowledge	Perceived benefits of using SLT products	Aware about adverse health consequences (via advertisement, health workers, community members)
Cues to action	Peers offering the product for use or using it	Counselling during ANC visits/ health check-ups, advice from community members/ family members
Risk perception	In recessive phase, risk perceptions ignored despite awareness of harmful effects, remote possibility of harm (low risk perception to self)	Harmful for the child
Motivational Factors		
Attitude	Positive due to normalised SLT usage	Negative towards SLT usage
Social influences	Usage by family/friends/community members	Family unacceptance of SLT usage
Economic influences	Affordability	Financial crisis especially during COVID-19 lockdown
Ability Factors		
Implementation plans	Easily accessible, variety of products available thus preferences based on prices	Lack of awareness of cessation programs
Barriers	Lack of cessation centres and extrinsic motivational factors to quit	Rationalizing behaviour of usage, defence and coping mechanism

- **Translational Potential:**

  The study will provide scientific understanding about the usage of smokeless tobacco among the reproductive age women including its associated cultural and socio-economic determinants. Moreover, study also explores the extent of smokeless tobacco use, its determinants among the pregnant and lactating women.

Development of a Mobile App & Web based System for Screening, Risk Assessment, Management and follow-up of Tobacco Cessation: a demonstration study at NICPR, Noida

Principal Investigator: Dr. Manjeet Singh Chalga, Scientist-D

Co-Investigator: Dr. Prashant Kumar Singh, Scientist-D, ICMR-NICPR, Noida

Type of study: Ad-hoc

Funding Agency & budget (Rs. in lakhs): ICMR, Rs 1 Crore 39 Lakhs

Project Duration: July 2019- March, 2023

Brief background & rationale: Non communicable diseases (NCD) are on the rise in India. Cancer is one of the NCDs which is showing a steady rise in incidence as well as the deaths caused due to it. The incidence of cancer has risen from 1 million in 2012 to 1.15 million in 2018. The number of deaths caused due to cancer has also risen from 6,80,000 in 2012 to 7,84,821 in 2018. (1,2). The common cancers are preventable and can be detected early by screening and managed at an early stage and thus increasing the survival rate. To bring down the deaths due to cancer, Government of India (GOI) has planned a national program for population based cancer screening. (3)

There is a need to develop a Mobile Application and Web based System for Screening, Risk Assessment, Management of Tobacco users. To find the high risk population and follow-up of Tobacco Cessation. All the activities are need to be recorded on an information system. Thereafter study of various research issues, counselling of Patients, their family members, treatment adherence, feasibility and compliance of the developed system.

Hence, development of an comprehensive information system is the need of hour to understand the intension to quit Tobacco and Tobacco quit rate and facilitate affected individuals reach the management centers at earnest therefore contributing to the national interest of combating Cancer.

Objectives:

- To develop a Mobile App & Web based application for tobacco cessation in Hindi and English language.
- To assess the feasibility and compliance of the developed system.
- To examine the intension to quit tobacco among users registered with the system.
- To assess the feasibility and compliance of mobile app and web based tobacco cessation programme among tobacco users.
- To examine the tobacco quit rate among the mobile app and web based tobacco users.

Brief Methodology:

A web-based system will be developed at NICPR and privilege to assess it will be provided to all the clinicians of NICPR OPD. Formats will be developed for registration of subjects, there diagnosis details and to records each activity thereafter. The system will be developed so that the data can be shared among subjects through mobile application. The subjects will be reminded through mobile based alarm system to take their medications timely and to visit NICPR back on the scheduled date of re-visit. A self-observation format will be developed in the mobile application for the subjects for recording their routine activities. The system will be developed for synchronization of data between mobile application and project website.

Feasibility of integrating tobacco use screening and tobacco cessation services with routine antenatal care services: a pilot study in district hospital of Gautam Buddh Nagar

Name & Designation of PI: Dr. Shalini Singh, Scientist G & Director, NICPR Noida

Co-investigators: Dr Ekta Gupta, Scientist-E, NICPR**,** Dr Prashant Kumar Singh Scientist-E, NICPR

Type of study: Ad-hoc

Project Duration: 1.03.2021 - 29.02.2024

Funding Agency & budget (Rs. in lakhs): 40,51,320

Brief background & rationale (100 words)-

It is a well-established fact that tobacco use is contra-indicated in pregnant women. The health hazards of using tobacco during pregnancy range from intrauterine growth restriction to perinatal mortality. In India, as per the latest Global Adult Tobacco Survey (GATS) 2016-17, the prevalence of tobacco use among pregnant women was as high as 7.5%. It has also been documented that advice by a healthcare professional is a potent motivation for quitting tobacco use. Pregnant women meet healthcare providers several times during their pregnancy (antenatal visits). These visits could be utilized for providing tobacco cessation services through behavior change intervention strategies. Hence the present study is designed to understand how antenatal services can be utilized to provide tobacco cessation counseling and help in providing tobacco cessation services in pregnant women through antenatal services **Novelty:** It is the first cohort study that looks at the integration of ANC services with tobacco cessation services. It also aims to measure the quit rate among pregnant women along with the pattern of tobacco use (smoking and smokeless form both).

Objectives:

Primary Objective:

- To assess the feasibility of integrating tobacco cessation services with antenatal care services.

Secondary Objective:

- To measure the prevalence of tobacco use (smoking and smokeless form) among pregnant women
- To study the pattern of use of tobacco products during pregnancy and lactation
- To develop a comprehensive behavioral intervention module for tobacco cessation in women
- To assess the tobacco quit rate during pregnancy using behavioral intervention
- To study adverse pregnancy outcomes among tobacco users (including in mothers and new-borns)

Brief Methodology:

- It's a mixed methods study wherein the qualitative tools included Focus Group Discussions (FGDs) conducted among ASHA workers and In-depth interviews (IDIs) conducted with doctors to understand the health system factors in identifying tobacco users. Insights received

from FGDs and IDIs were used for designing behavioral intervention guide, especially for antenatal mothers to support tobacco cessation among them.

- The quantitative part of the study is a prospective cohort study. Women registered in the antenatal clinic are being screened for tobacco use and their anthropometric and biochemical parameters, and are being followed up till delivery for pregnancy outcomes. The tobacco users are administered a tobacco cessation intervention to support quitting tobacco use and followed up for self-reported quit rate and biochemical documentation using urine cotinine levels.

- A Total of 315 ANC women will be enrolled in the study. Users and non-users would be enrolled in a ratio of 1:2 i.e., out of 315 samples, 105 would be registered in the exposed arm (users) while the remaining 210 would be registered in the non-exposed arm (non-users).

Main Findings:

Qualitative study findings [Focus Group Discussions with twenty-two Community Health Workers (ASHA) and In-depth Interviews with seven gynaecologists]:

- Most of the ASHAs had some knowledge regarding tobacco products and their harmful effects on women (common types of cancers, poor oral hygiene, infertility) and on pregnant women (miscarriages, developmental abnormalities in foetus and low birth weight).
- They routinely did not screen pregnant women for tobacco use and also had limited knowledge regarding how to manage a tobacco user and where to refer them for cessation counseling.
- Majority of the gynecologists reported not asking about the tobacco use status of the pregnant women due to time constraints and enquired only when someone developed complications during pregnancy or delivery. They had knowledge regarding the adverse effects of tobacco on babies' and mothers' health but they did not apply that knowledge in routine antenatal care.
- Most of the gynecologists opined that health workers can play a big role in assessing and reporting tobacco use amongst pregnant women and motivating them to quit.

Barriers and challenges faced by Community Health Workers in counselling tobacco users:

- No formal training was provided for counseling women regarding the harmful effects of tobacco especially during pregnancy and childbirth and lack of specific training material and IEC material.
- Poor knowledge about referral mechanism- once they identified a tobacco user, or were asked for help, they did not know where to refer or accompany these users for guided counselling and help
- Social acceptability of tobacco use among women leading to reluctance in quitting tobacco
- Resistance from family members faced by health workers when they provided brief cessation advice to pregnant users

Quantitative study findings:
Prevalence of tobacco use amongst early trimester pregnant women: 2.76% with smoking prevalence of 0.03% and smokeless tobacco use is 2.73%

Table 1. Adverse Pregnancy outcomes reported amongst study population		
Complications developed during pregnancy	**Pregnant tobacco users (n = 117)**	**Pregnant non-users (n = 167)**
Anaemia at enrolment	78 (66%)	74 (44%)
Intrauterine Growth Restriction	2 (1.7%)	0
Abruptio placenta/ placenta previa/ antepartum hemorrhage	9 (7.6%)	0
Oligohydramnios	1 (0.8%)	0
Miscarriage	5 (4.2%)	0
Gestational hypertension	1 (0.8%)	0
Diminished vision	4 (3.4%)	0
Complications developed at birth	**Tobacco users who delivered (n = 63)**	**Tobacco non-users who delivered (n = 12)**
Stillbirth	2 (3.1%)	0
Pre-term birth	6 (9.5%)	0
Congenital heart disease: needed NICU admission	1 (1.5%)	0
Difficulty in breathing: Required resuscitation and NICU admission	6 (9.5%)	1 (8.3%)
Congenital malformations	3 (4.7%)	0
Low birth weight	25 (39.68%)	5 (41%)

- **Translational Potential**: The study outcomes will provide insights for incorporating tobacco cessation services in antenatal clinics in public healthcare settings and this model can be replicated in other hospitals and in the national program. The behavioural intervention developed during the study can be translated into other Indian languages for use in the Indian context

- **Publications**:

  - Chaudhary J, Gupta E, Singh PK, Singh S. Tobacco exposure among antenatal women in India: Challenges in tobacco screening & cessation counselling. Indian J Med Res. 2023 Nov 1;158(5&6):477-482. doi: 10.4103/ijmr.ijmr_188_23. Epub 2024 Jan 24. PMID: 38088423; PMCID: PMC10878484.

  - Tobacco use during pregnancy: A threat to motherhood. Down to Earth. Published 31st may 2022. https://www.downtoearth.org.in/blog/health/tobacco-use-during-pregnancy-a-threat-to-motherhood-83097

WHO FCTC Knowledge Hub on Smokeless Tobacco

Principal Investigator: Dr. Shalini Singh, Scientist 'G' & Director; NICPR, Noida

Co-Investigator: Dr. Prashant Kumar Singh, Scientist-D, ICMR-NICPR, Noida

Type of study: Intramural

Funding Agency & budget (Rs. in lakhs): ICMR, Rs 3,33,73,600/-

Project Duration: January 01, 2022 & on-going

Brief background & rationale: At sixth session of the Conference of the Parties (COP) of WHO Framework Convention on Tobacco Control (WHO FCTC) treaty in Moscow 2014, smokeless tobacco use was recognized as a global health problem. Parties felt the need to establish a global knowledge hub to identify and support the work of controlling smokeless tobacco use, with its center based at India. The Government of India along with WHO FCTC Secretariat designated the ICMR- National Institute of Cancer Prevention & Research, Noida to serve as the 'WHO-FCTC Global Knowledge Hub (KH-SLT) on Smokeless Tobacco' with a formal launch of the hub on 6 April 2016. The KH-SLT envisions generating awareness around the world about the harms caused by smokeless tobacco use and supports global smokeless tobacco control efforts through scientific evidence and technical research inputs in coordination with all relevant disciplines and stakeholders globally, especially among Parties with high smokeless tobacco burden. For the last five years, it is serving as the focal point to collect, generate and disseminate the correct scientific knowledge and information on smokeless tobacco.

Objectives:

- To generate and share expertise, information, knowledge and provide training, regionally and globally on SLT.
- To promote and facilitate communication among the Parties to the Convention and other stakeholders on SLT.
- To support the Convention Secretariat in hosting meetings, prepare technical materials and participate in technical and subsidiary body meetings on SLT.

Work Done:

- **2nd National Consultation on Smokeless Tobacco Control in India, February 21-22, 2023, New Delhi**

The "2nd National Consultation on Smokeless Tobacco Control in India" witnessed great deliberations with academicians, experts, researchers, civil society members and officials working in tobacco control in the country. The deliberations ranged from very specific health and nutrition burden due to SLT use which highlighted the cardiovascular effects as the major cause of premature mortality apart from cancer. Effect of tobacco use on the reproductive health of men and women and especially pregnant and breastfeeding women were identified as the low hanging fruits for tobacco cessation intervention with joint efforts of the Maternal and Child Health programme,

RBSK and others. Various aspects of SLT policy and its effective regulation was also discussed and it was unanimously recommended that there is a need for an exclusive policy framework to resolve inconsistencies within different laws and regulations to strengthen SLT control efforts and initiatives in the country. The need for cessation strategies specific for smokeless tobacco was highlighted. Nicotine as the underlying constituent responsible for cardiovascular events was discussed and non-nicotine options for de-addiction need to be promoted. Consultation also highlighted the large burden of tobacco product based litter and waste and recommended for levying and charging the tobacco product manufacturers for the related cost of cleaning, treatment, disposal and management of such waste. Delegates from the high SLT burden states also suggested for increased testing of all kinds of SLT products through the National Tobacco Testing Laboratories to enable the law enforcers take action against violations of specific laws. The need for intensive research on SLT disease burden especially in high burden geographies was suggested to be taken up by ICMR to present clinching evidences to support policy changes needed for advancing SLT control in the country. Inclusion of tobacco harms in school curricula and clear public messaging like campaigns etc. was emphasized.

- **Release of Report – The Environmental Burden of Tobacco Product Wastes in India, a joint study by ICMR-NICPR and AIIMS Jodhpur**

The direct morbidity and mortality caused by tobacco is well documented but it is equally important to quantify the environmental hazards due to tobacco waste in low- income and middle-income countries (LMICs). This study estimates the annual waste generated due to consumption of smoked and smokeless tobacco products in India and states. A cross-sectional survey was conducted to collect samples of smoked and smokeless tobacco products from 33 districts of 17 states/union territories across all geographic regions of India. Segregated weighing of plastic, paper, foil and filter components of the packaging along with gross empty weights was tabulated. Total 222 brands of tobacco products (70 cigarette, 94 bidi and 58 smokeless tobacco brands) were included in the final analysis. A total waste of 1,70,331 (± 29,332) tonnes was estimated to be generated annually, out of which 43.2% was plastic, 3.6% was foil and 0.8% was filter. Two-third of overall waste was contributed by smokeless products alone. Maximum waste was generated in Uttar Pradesh (20.9%; 35,723.7 ± 6,151.6 tonnes), Maharashtra (8.9%; 15,116.84 ± 2,603.12 tonnes) and West Bengal (8.6%; 14,636.32 ± 2,520.37 tonnes). This study provided first of its kind national-level evidences of on various the types (plastic, paper, foil and filter) and quantity of waste generated by use of tobacco products in India. The evidence thus generated may serve to reinforce and amend the existing policies on regulation of tobacco product packaging through Plastic Waste Management Rules (2016) and the provisions of environmental compensation under the Extended Producer Responsibility. Further, this study may provide framework to aid evidence generation from other countries/regions and expose the holistic threat posed by the tobacco products to the environment. The full report can be accessed here: http://nicpr.org/wp-content/uploads/2023/02/tobacco_waste_report.pdf

Release of report by Secretary, MoHFW, GoI and other dignitaries during "2nd National Consultation on Smokeless Tobacco Control in India", at India International Centre, February 21-22, 2023

- Development of new website of WHO FCTC KH-SLT (link: https://extranet.who.int/fctcapps/fctcapps/fctc/kh/slt)

- Co-organized the '3rd National Consultation on Tobacco Control in India' during February 22-23, 2023 at India International Centre (IIC), New Delhi in collaboration with The Union South-East Asia Regional Office, New Delhi and SEEDS, New Delhi.

- Organized Oral Screening Camp on the occasion of 'World No Tobacco Day' May 31st 2022 at the local Bus depot, Noida (Uttar Pradesh) for the bus drivers, conductors and other staff members. Total 100 participants attended the screening camp and received the counseling. Tobacco cessation experts shared the information about the adverse effects of tobacco consumption and delivered tobacco cessation advice along with the oral screening.

- The hub team participated in '11th General Assembly of the Asia Pacific Organisation for Cancer Prevention and the APOCP 11 Conference on Cancer Prevention', held in Kolkata during December 8-20, 2023. Total nine papers were presented at the conference.

- Evidences generated on 'Smokeless Tobacco and Public Health Nutrition' at KH-SLT hub was shared at '2nd National Conclave On "Public Health Nutrition: Measuring Progress Towards Achieving Sustainable Development Goals', organized by Center of Excellence-Public Health Nutrition, Department of Humanities and Social Sciences, National Institute of Technology (NIT), Rourkela during December 16-17, 2022.

- Evidences generated at KH-SLT hub was shared at 'National Workshop on Emerging Challenges and Opportunities for Implementation of Illicit Tobacco Protocol, Standardized Packaging of Tobacco Products and Prompting Research in Tobacco Control in India', organized by The Union South-East Asia Region Office in Indore during September 27-30, 2022.

Knowledge, Attitude & Practices related to Tobacco / Areca Nut use and Oral Cancer among College Students: A cross-sectional quantitative pilot study from Govt. Degree College Noida

Principal Investigator: Dr. Sudhir Tanwar, Scientist B

Co-Investigators: Dr. Prashant Kumar Singh, Scientist-D, ICMR-NICPR, Noida, Dr. Ruchika Gupta, Scientist-D, ICMR-NICPR, Noida

Type of study: Intramural

Funding Agency & budget (Rs. in lakhs): ICMR-NICPR, Rs 50,000/-

Project Duration: March, 2023- March, 2024

Brief background & rationale: In India tobacco use is estimated to cause 800,000 deaths annually. The World Health Organization predicts that tobacco deaths in India may exceed 1.5 million annually by 2020. Review of literature suggests that the age of initiation of tobacco use is pre-adolescent period. It is crucial to screen and capture those cases as early as possible so that the cessation intervention can be offered at early stage. Considering the youth as an asset, the current proposal is aimed to target college students of non-medical background. The targeted population will be assessed for their knowledge, attitude and practices regarding the use tobacco / areca nut, awareness regarding oral cancer and oral potential malignant disorders. The current study will also offer a free of cost oral cancer screening and cessation services for all the participation (upon their consent and willingness). The participants will be educated / aware regarding the adverse health effects of different kind of tobacco/ areca nut use and the change in knowledge, before and after the awareness intervention will also be assessed. Findings of the proposed study may help to design and plan intervention according to the current level awareness of participants. Additionally this will help in reaching towards the ultimate goal of prevention of oral cancer and other related lesions.

Objectives:

- To understand the knowledge, attitude and practice of students with respect to tobacco / areca nut use.
- To understand the knowledge, attitude and practice of students with respect to oral cancer and oral potential malignant disorders
- To provide an awareness intervention with respect to tobacco use and oral cancer.
- To promote the oral cancer screening and tobacco cessation services among youth.

Brief Methodology:

It will be a cross-sectional qualitative study utilizing primary data. Eligible students will be enrolled as participants of the study after a written informed consent. All the participants after enrolment will be provided the 'participant information sheet' and asked to provide basic demographic details, to be filled in by the research team on site. There after participants will be assessed, using a pre structured questionnaire on aspect of their knowledge, attitude and practice related to tobacco / areca nut use and oral cancer / OPMDs. A separate set of questionnaire will be used to assess KAP for Tobacco use and oral cancer. Participants in two groups of 25 each will be provided an awareness intervention by means of a didactic interactive session (offline) @ NICPR on two different days. Experts identified at NICPR, working in relevant domain will give conduct the session. A pre and post intervention assessment of KAP will be done. To promote oral cancer screening and tobacco cessation services, we will encourage the participants to get their oral screening done. Researcher will also motivate them to enrol themselves in tobacco cessation services where their anonymity will be maintained and they can get professional assistance in quitting their use of tobacco / areca nut.

Study settings: Govt. Degree College, sector 39, and National Institute of Cancer Prevention (NICPR) sec 39, Noida, Gautam Buddh Nagar, UP.

Sampling: N= 50, Participants will be recruited by convenience sampling method based on pre-defined inclusion criteria.

Inclusion criteria: Either gender, above the age of 18 years enrolled in any stream/ course at Govt. Degree College, Sec. 39 Noida who currently consuming tobacco / areca nut in any form.

Tools / instruments used:

- Customised socio-demographic sheet with all variables of concern
- KAP- Questionnaire for tobacco use
- KAP- Questionnaire for oral cancer / OPMDs
- IEC including PowerPoint presentation: will be used to disseminate awareness through an interactive session.

Main Findings: This ongoing study will help in understanding the current knowledge, attitude and practices related to tobacco use and oral cancer among the participants.

Translational Potential: Findings of the study may be useful in improving the existing tobacco cessation services and designing new intervention for the specific study group

Strengthening Bio-chemicals research policy capacity building and cessation support to advance smokeless tobacco control in India

Principal Investigator: Dr. Mausumi Bharadwaj, Scientist-G, ICMR-NICPR, Noida

Co-Investigators: Dr. Roopa Hariprasad, Scientist-E, ICMR-NICPR, Noida, Dr. Prashant Singh, Scientist-E, Dr. Anuj Kumar, Scientist-C

Type of study: Task Force

Project Duration: 3.6 years **(**20/05/2019 – 19/11/2022**)**

Funding Agency & budget: NICPR, Rs.4.3 Cr.

Brief background & rationale: Smokeless tobacco products (STPs) harbour a large number of microorganisms and these microbes can enter directly into the oral cavity and can cause infection. In addition, the gene pool present in the microbes can alter the level of molecular constituents of STPs during storage including the level of carcinogens like TSNAs. Thus, the characterization of the microbiome present in SLT is essential to understanding the biological hazards and maintaining the quality of the STPs. Further, STPs consumption significantly alter the microbial diversity of the healthy oral cavity and account for the prevalence of several pathogenic bacteria in the oral cavity.

Objectives

- Characterization of common microbiome in processed smokeless tobacco products and oral cavity of smokeless tobacco users
- To evaluate the impact of major constituents of smokeless tobacco products on cell viability and apoptotic pathways (intrinsic and extrinsic): in vitro and in vivo
- Identification of nicotine metabolism genes/proteins in the processed smokeless tobacco products
- Resistome in microorganism present on smokeless tobacco products

Brief Methodology: In this study, we have applied next generation sequencing to identify microbial population resides in various STPs popularly consume in India and also determined the oral microbiome status of the SLT users. The gDNA was isolated using PowerSoil DNA isolation kit. For bacteria identification, 16S V_3-V_4 region, and for fungi, the ITS1 region of gDNA was selected for library preparation. QIIME2 workflow was performed using UNITE and SILVA database to identify at the bacteria and fungus at genus level. All the statistical analysis was performed using MicrobiomeAnalyst tool. Further, using similar approach, oral microbiota of smokeless tobacco users was also determined.

Main Findings: The predominant bacterial genera in smokeless tobacco were *Acinetobacter*, *Bacteroides*, *Bacillus*, *Prevotella*, *Faecalibacterium*, and *Pseudomonas*. STP-associated bacteriome is predicted to carry genes of nitrogen metabolism, antibiotic resistance genes, proinflammatory and toxins genes. *Moist-snuff*, *Qiwam*, *Gul* and loose STPs like *Mainpuri Kapoori* contain a high abundance of these genes. The prevalent fungal genera in STPs were *Pichia*,

Sterigmatomyces and *Mortierella*. Saprotrophic fungi were high in number in STPs that can ferment the constituents of STPs and convert them into carcinogens like TSNAs.

Further, overrepresented genera were *Prevotella*, *Fusobacterium*, *Veillonella*, *Haemophilus*, *Capnocytophaga*, and *Leptotrichia* were observed in SLT users having oral premalignant lesions. The fungi belonging to *Pichia* genus were in higher relative abundance in the oral swab of the SLT users having oral premalignant lesions than that of the non-users. SLT users having oral premalignant lesions had high bacterial and low fungal α-diversity along with distinct β-diversity compared to non-users. Aqueous extract of STPs like *Mainpuri Kapoori* and *Ghudakhu* caused serious damage to the cell lines via the production of ROS, inducing cell death pathways, and stimulating the migratory potential of cells.

Translational Potential: Identification of the carcinogenic potential of the microbial population and their products will provide a detailed insight into oral cancer induction in SLT users and provide a basis to regulate the use of STPs. Hence, policymakers can emphasize on sterilization of STPs by the manufacturers. Further, awareness among STP users regarding the carcinogenic/toxic effects of STP-associated microbes will help them to quit these products. Such grass root approaches can help in the cessation of STPs.

No. of Publications: 03

Phytocompound Research

Predicting the anti-cancer potential of phytomolecules against different cancers using knowledge of natural products

Name & Designation of PI: Dr Subhash M Agarwal, Scientist E, ICMR-NICPR, Noida

Type of Study: Indian Council of Medical Research (ICMR) funded

Date of Start: 07-01-2020

Date of Completion: 06-01-2023

Total Duration of project: 3 Years (2020-2023)

NICPR Budget: 50 Lakhs

Brief background & rationale:
Researchers and pharmaceutical companies worldwide are actively striving to uncover anti-cancer therapeutic agents derived from phytomolecules. As phytomolecules are a highly valuable source of novel scaffolds, it makes them excellent candidates for initiating rational drug design projects. Consequently, there is a necessity to develop computational resources that facilitate the identification of potential leads from phytomolecules.

Objective:
To develop machine learning prediction models and employ them to identify enriched scaffolds against lung cancer.

Brief Methodology:
Molecules having anticancer efficacy against lung cancer were first identified from literature and classified into actives and inactives. These actives and inactives were then transformed into the training and test sets to construct the ML models and test their performance. Virtual screening was thereafter performed on ADMET (absorption, distribution, metabolism, excretion, and toxicity) screened 1.8 lakh molecules. The molecules with binding affinity better than the co-crystal ligand were further screened for their inhibitory potential using the lung cancer ML model developed in this project. The stability of the top three compounds with the highest binding affinities were thereafter checked through molecular dynamics simulations.

Main Findings:

In case of Lung cancer, the model developed with MACCS fingerprint and Random forest classifier showed best performance. The model on the training set showed 75.0% sensitivity, 77% specificity, and 76.5% balanced accuracy with 0.53 MCC. On the test set the models shows 71.2% sensitivity, 75% specificity and 73.1 % balanced accuracy with 0.46 MCC.

- Natural compounds containing indolocarbazole moiety have been identified through virtual screening, machine learning and molecular dynamics as stable EGFR targeting anti-lung cancer agents.
- As the indolocarbazoles identified in the current study have shown inhibition of the EGFR mutant kinases, they are potential candidates for EGFR targeted cancer therapies.

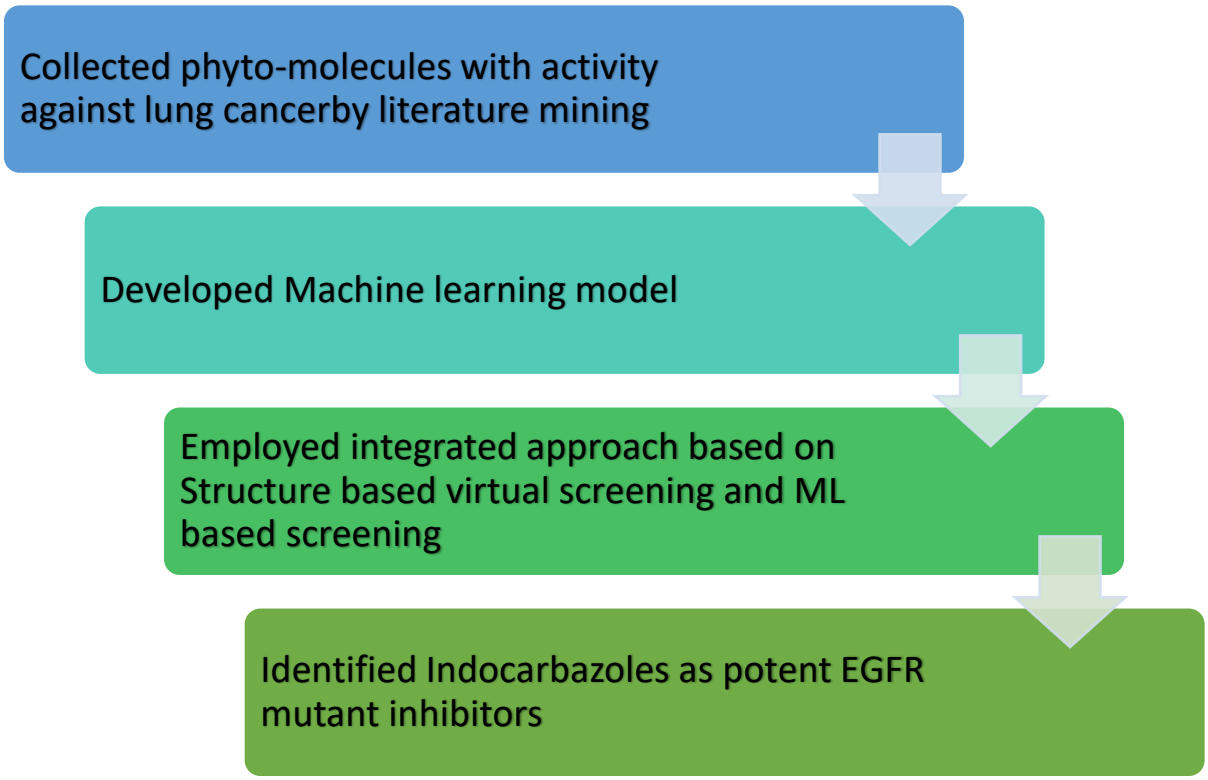


Fig 1. Overview of computational pipeline implemented

Translational Potential: A number of naturally occurring plant based molecules with anticancer activity were collected and utilized to derive structure-activity relationship for Lung cancer inhibiting molecules. Further an integrated approach employing structure based drug discovery and machine learning is implemented which enabled identification of indolocarbazoles as potential candidates for targeting EGFR mutated Lung cancer. Therefore, it is expected that the developed machine learning models will allow screening large library of phyto-molecules derived from traditional source in a cost effective manner so as to identify a few potential leads against lung cancer for experimental testing.

Publication: Das AP, **Agarwal SM***. Recent advances in the area of plant-based anti-cancer drug discovery using computational approaches. Mol Divers. 2023 Jan 21:1–25. doi: 10.1007/s11030-022-10590-7.

Identifying anti-cancerous phytomolecule combinations against cancers for leveraging traditional drug discovery

Name & Designation of PI: Dr Subhash M Agarwal, Scientist E, ICMR-NICPR, Noida

Type of Study: Indian Council of Medical Research (ICMR)

Date of Start: 11-10-2021

Date of Completion: 10-10-2023

Total Duration of project: 2 Years (2021-2023)

NICPR Budget: 10 Lakhs

Brief background & rationale:
While cancer treatment using chemotherapeutic agents has progressed significantly in recent decades but drug resistance remains one of the key problems. This has necessitated the development of combination therapy. In this regard the use of natural products in combination therapy is an interesting avenue of research that has its roots in the traditional medicinal system. Therefore, knowledge of plant based natural product combinations having anti-cancer effect may provide opportunity for alternate therapeutics.

Objective:
To identify and collate anticancer phytomolecule combinations along with their bioactivity and structural information.

Brief Methodology:
To achieve the objective of identifying papers that contain information on phytomolecule combinations, the bibliographic database PubMed, was extensively searched using the R programming language. A python program was developed to check the presence of phytomolecule combinations in the abstracts of the papers. After successful identification of papers, collection of in-vitro, in-vivo bioactivity data, synergistic potential of the phytomolecule combinations and development of web resource is currently underway (Fig 1).

Main Findings:

- Data for 350 anti-cancer phytomolecule combinations in 23 cancers and 283 different cell lines have been collected. These combinations were found to regulate almost 230 different genes and proteins.
- The largest number of combinations have been tested against Breast cancer followed by Leukemia and Colorectal cancer.
- The highest number of combinations have been reported with the phytomolecule curcumin.
- The phytomolecule combination of Curcumin and Resveratrol was found to target the most number of cancers.

Translational Potential: A unique resource is being developed by integrating experimental data encompassing chemical, biological, and combinatorial space connected with the phyto-molecules and traditionally used medicinal plant information so as to address the issues of drug toxicity and chemo-resistance, two of the main drivers behind the development of combination therapy. It is expected that availability of this resource will allow exploring combinatorial therapies with phyto-compounds.

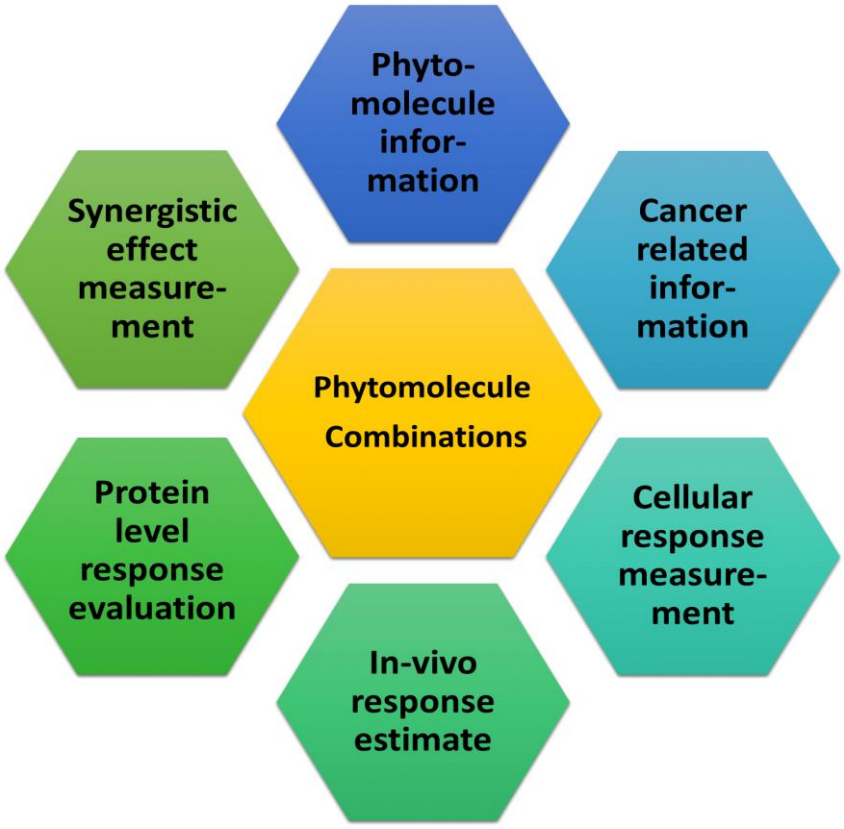


Figure 1. Different levels of biological data being collected for the phytomolecule combinations

COVID-19 Related Research

Immune response to precautionary third dose of COVISHIELD/COVAXIN among healthy adult population: an ICMR Cohort study, India

Principal Investigator: Site-PI: Dr Pramod Kumar, Scientist-C, ICMR-NICPR, Noida

Co-Investigators: Dr Shalini Singh, Director, ICMR-NICPR, Noida, Dr Anuj Kumar, Scientist-C, ICMR-NICPR, Noida

Type of study: Task Force

Project Duration: Two years (March 2022 – Feb 2024)

Funding Agency & budget: 1.8 lakhs

Brief background & rationale

The present study is designed to understand immune response of additional third dose of COVISHIELD/COVAXIN vaccine using homologous regimen. In this context, it is proposed by ICMR to establish a cohort in ICMR institutes receiving additional third dose to characterise the humoral and cellular immune response. As participating institute, ICMR-NICPR will be conducing this study in NICPR, Noida, while other ICMR centers has been assigned to conduct the study in their respective institutes. The study follows similar methodology and tools across all the participating institutes.

Objectives:

Primary objective: Characterise SARS-CoV-2 specific humoral and cellular immune response after homologous precautionary third dose of COVISHIELD/COVAXIN vaccine at different time points

Secondary objective: Estimate the incidence of SARS -CoV-2 symptomatic infection post third dose of COVID-19 vaccine

Brief Methodology: Collection of 5 ml blood followed by separation of serum from all the participants at the baseline (Pre-vaccination), 4 weeks, three months, six months and 9-12 months after the third dose. Estimation of antibodies quantity against the vaccine.

Main Findings: It was found that the antibody titre gets decreasing with time.

ACADEMIC ACTIVITIES

Journal Club presentation

MSc. Dissertation trainee

JOURNAL CLUB PRESENTATIONS

Date	Presenter	Mentor	Title of paper presented
19.07.2022	Dr. Sandeep Kumar, Scientist B	-	The metastatic spread of breast cancer accelerates during sleep
19.07.2022	Dr. Mohammad Sajid, RA	Dr. Mausumi Bharadwaj	Altered vaginal microbiota composition correlates with HPV and Mucosal Immune Responses in women with symptomatic cervical ectopy.
02.08.2022	Dr. Sudhir Tanwar, Scientist B	-	Night-shift work duration and breast cancer risk: an updated systematic review and meta-analysis
02.08.2022	Dr. Binayak Kumar, DHR Young Scientist	Dr. Suresh Hedau	FGFR1 Overexpression Induces Cancer Cell Stemness and Enhanced Akt/Erk-ER Signaling to Promote Palbociclib Resistance in Luminal A Breast Cancer Cells
16.8.2022	Dr. Rakesh Meena, Scientist B	-	Evaluation of Malnutrition and Quality of Life in Patients Treated for Oral and Oropharyngeal Cancer
16.8.2022	Dr. Anita, PDF	Dr. R. Suresh Kumar	Bacterial profile and antimicrobial susceptibility patterns in cancer patients
30.8.2022	Dr. Shamsuz Zaman, Scientist D	-	The global burden of cancer attributable to risk factors, 2010–19: a systematic analysis for the Global Burden of Disease Study 2019
20.09.2022	Dr. Nazneen Arif, Scientist D		Microbiota and HPV: The role of viral infection on vaginal microbiota
20.09.2022	Dr. Rishita	Dr. Prashant	Cross-sectional analysis of oral

	Chandra	K. Singh	healthcare vs general healthcare utilization in five low and middle-income countries.
27.09.2022	Dr. Pragya Sharma, Senior Technical Officer	-	Impact of Pulmonary Tuberculosis on the EGFR Mutational Status and Clinical outcome in patients with Lung Adenocarcinoma
27.09.2022	Dr. Sristy Shikha	Dr. Pramod Kumar	Synergistic Effect Induced by Gold Nanoparticles with Polyphenols Shell during Thermal Therapy: Macrophage Inflammatory Response and Cancer Cell Death Assessment
11.10.2022	Dr. Anuj Kumar, Scientist C	-	Cooking methods are associated with inflammatory factors, renal function, and other hormones and nutritional biomarkers in older adults
11.10.2022	Dr. Ved Vrat Verma	Dr. Mausumi Bharadwaj	Computationally designed peptide macrocycle inhibitors of New Delhi metallo-β-lactamase 1
01.11.2022	Dr. Dinesh Kumar, Scientist C	-	A phase II study of talazoparib monotherapy in patients with wild-type BRCA1 and BRCA2 with a mutation in other homologous recombination genes.
01.11.2022	Dr. Varsha Pandey, Project Scientist B	Dr. Prashant Kumar Singh	Child marriage and risky health behaviors: an analysis of tobacco use among early adult and early middle-aged women in India
29.11.2022	Dr. Ekta Gupta, Scientist E	-	Metabolic Syndrome and Breast Cancer: Prevalence, Treatment Response and Prognosis
29.11.2022	Dr. Sonam	Dr. Showket	Exercise-induced engagement

	Tulsyan, ICMR-RA II	Hussain	of the IL-15/IL-15Ra axis promotes anti-tumor immunity in pancreatic cancer
10.01.2023	Dr. Pramod Kumar, Scientist C	-	Antigenic alterations in SARS-Cov Omicron spike
10.01.2023	Dr. Mayank Maheswari, PDF	Dr. R. Suresh Kumar	High expression of p21 a a potential therapeutic agent in ovarian clear-cell carcinoma

PhD/ MD/ MS Thesis Enrolled/ Completed

S. No	Name of student	Mentor	Title of Thesis	Program (University enrolled)	Duration
Division of Cytopathology					
1	Ms. Shivani Bansal	Dr. Ruchika Gupta, Sci. D, Cytopathology	Prognostic potential of neurotrophin(s) in gall bladder cancer	Ph.D (Amity University)	June 2022 - ongoing
Division of Clinical Oncology					
2	Dr. Harsh Rajvanshi	Dr. Ekta Gupta	Assessment of community-based strategies under Malaria elimination demonstration project (medp) for reduction of malaria cases in a tribal district of madhya pradesh, india.	Ph.D (Jamia Hamdard University)	2019-2023
3	Jyoti Sharma	Dr. Kavitha Dhanasekaran	Cervical Cancer Control in India: Enquiries into Health System Challenges	CSIR-NIScPR	2020-2026
Division of Molecular Biology					
4	Mohd. Abu Taleb	Dr. Mausumi Bharadwaj	Study on Single Nucleotide polymorphism in microRNAs and their correlation with susceptibility to Colorectal Cancer in Indian Population	Jamia Millia Islamia	2017- 2022 (Awarded)
5	Heena Gautam	Dr. Mausumi Bharadwaj	Comparative study on endometrial and cervical cancer: with special reference to HPV-16	Jamia Millia Islamia	2018 –2023
6	Ram Krishna Sahu	Dr. Suresh T. Hedau, Scientist - E	Role of CpG binding proteins in the regulation of BRCA1 and BRCA2 genes expression in breast cancer cell	Amity University, Noida	2016 - 2023
7	Ms. Sanchita Roy Pradhan	Dr R. Suresh Kumar	Identification and evaluation of lead compounds for Endometrial Carcinoma through targeting	Ph.D (Amity University)	2021-24

			Enhancer of Zeste Homolog 2 (EZH2).		
8	Mukesh K Jogi	Dr Pramod Kumar	Synthesis of chitosan-folic acid conjugated nanoparticles loaded with nimbolide and its efffact on Pancreatic Cancer cell lines	Amity University, Noida	July 2022-onwards
Division of Preventive Oncology					
9	Mr. Badshah Sarkar	Dr. Prashant Kumar Singh	Migration in the Drought-affected Rural Areas in India: An Exploratory Study	TERI University, New Delhi	2018-2023
Division of Bioinformatics					
10	Mr Agneesh Pratim Das	Dr Subhash Agarwal	Identification of Inhibitors Targeting Epidermal Growth Factor Receptor (EGFR) Mutants: A Therapeutically important Target in Cancer	Amity University, Noida	2020 - 2024
Division of Epidemiology and Biostatistics					
11	Pawan Kumar	Dr Smita Asthana	Effect of Ambient air Pollution on lung function among population of Delhi/NCR	Santosh University	2019 – July, 2022
12	Dr Swati Sharma	Dr Smita Asthana	Risk factor analysis of potentially malignant oral lesions among adults & assessing their oral health related quality of life : A mixed method Study	School of Medical Sciences & Research, Sharda University	2022-2025

Post-doctoral fellows/ Research Associates

S. No	Name of the Scholar	Mentor	Fellowship/ Award	Title of the project	Duration
Division of Cytopathology					
1	Dr Shuchita Sharma	Dr. Ruchika Gupta, Sci. D, Cytopathology	IAC Fellowship	-	1 month
Division of Molecular Biology					
2	Dr. Sristy Shikha	Dr. Pramod Kumar	ICMR-PDF	Preparation, encapsulation of recombinant	2 years

				multiepitope protein/peptides of SARS-CoV-2 in nanoparticles and their immunogenic studies	
3	Dr. Ved Vrat Verma	Dr. Mausumi Bharadwaj	ICMR-Research Associate	Identification of molecular landscape in Familial/Sporadic Breast Cancer	3 Years (15 Jan 2021-14 Jan 2024)
4	Dr. Upma Sharma	Dr. Mausumi Bharadwaj	ICMR-Research Associate	Evaluation of Functional role of Identified Novel SNPs of IL-10 gene and their interaction with miRNAs (miR-27a/mir-98) in Oral Carcinoma.	3 Years (12 May 2021 – 11 May 2024)
5	Dr.Anita Kumari	Dr R. Suresh Kumar	ICMR-PDF	Develioment andetectiond Evaluation of CRISPr-CAs13 based..detection	2021-23
6	Dr. Mayank Maheshwari	Dr R. Suresh Kumar	ICMR-PDF	Investigating potential modulation of ..endoplasmic stress	2021-23
7	Dr. Nivedita Mishra	Dr R. Suresh Kumar	DHR-WOS	Studies o impact of microbial treatment.tobacco products"	2019-23
8	Dr. Shruti Mishra	Dr R. Suresh Kumar	ICMR-PDF	Evaluating role of Novel phytochemicals in colorectal tumorigenesis	2022-2024

Dissertations/ Trainees

S. No	Name of the trainee	Mentor	Degree Pursuing	University enrolled	Study title	Duration
Division of Clinical Oncology						
1	Amisha Rastogi	Dr. Ekta Gupta	M.Sc, Microbiology	GLA University, Mathura	High-risk HPV detection using Hybrid Capture 2 technique	6 months
2	Shivangi Agarwal	Dr. Ekta Gupta	Master's in Public Health	Manipal Academy of Higher Education	Prevalence of OPMDs in patients attending health promotion clinic	2 months
Division of Preventive Oncology						
3	Md. Shameem	Dr. Prashant Kumar Singh	Master's in Public Health	Amity University, Noida	Surrogate advertisements of smokeless tobacco products	Dissertation
4	Himanshu Roshan Lal	Dr. Prashant	Master in Public Policy	Tata Institute of Social Sciences	Tobacco use among adolescents	Summer internship

		Kumar Singh	and Governance	(TISS), Hyderabad		
5	Manish Chaube	Dr. Prashant Kumar Singh	Master in Public Policy and Governance	Tata Institute of Social Sciences (TISS), Hyderabad	Tobacco use among adolescents	Summer internship
6	Ramraja Patel	Dr. Prashant Kumar Singh	Master in Public Policy and Governance,	Tata Institute of Social Sciences (TISS), Hyderabad	Tobacco use among adolescents	Summer internship
7	Alisha	Dr. Prashant Kumar Singh	Master in Biostatistics and Demography	International Institute for Population Sciences (IIPS), Mumbai	Alcohol ban in Bihar	Summer internship
8	Nasir Mamoon	Dr. Prashant Kumar Singh	Master in Biostatistics and Demography	International Institute for Population Sciences (IIPS), Mumbai	Alcohol ban in Bihar	Summer internship
Division of Molecular Biology						
9	Priyanshi Bhardwaj	Dr. Mausumi Bharadwaj	M.Sc. (Toxicology)	Chaudhary Charan Singh University, Meerut	Effect of smokeless tobacco extract on oral cancer cell line	6 months
10	Subhasree S	Dr. Mausumi Bharadwaj	M.Tech. Biotechnology	Bharathidasan University, Tiruchirappalli	Reproductive tract infection in asymptomatic and symptomatic women: A correlation of clinical parameters and RTIs	6 months
11	Abhishek Singh	Dr. Mausumi Bharadwaj	M.Tech Biotechnology	Delhi Technological University	-	2 months
12	Yashita Devidi	Dr. Mausumi Bharadwaj			-	2 months
13	Jyotsna Jain	Dr. Mausumi Bharadwaj	M.Tech Biotechnology	Delhi Technological University	-	2 months
14	Sneha Singhal	Dr. Mausumi Bharadwaj	M.Sc. Biotechnology	Jaypee University	-	2 months

15	Birundha	Dr. Mausumi Bharadwaj	M.Sc. Biotechnology	Jaypee University	-	2 months
16	Vrinda Maheswari	Dr. Mausumi Bharadwaj	B.Tech Biotechnology	Jaypee University	-	2 months
17	Jyoti Sharma	Dr. Mausumi Bharadwaj	B.Tech Biotechnology	Jaypee University	-	2 months
18	Vanshika Kesarwani	Dr. Mausumi Bharadwaj	M.Sc Bioscience	Jamia Millia Islamia	-	2 months
19	Keshav Tiwari	Dr. Mausumi Bharadwaj	M.Sc Biotechnology	Amity University	-	2 months
20	Swekcha	Dr. Mausumi Bharadwaj	M.Sc Microbiology	Amity University	-	2 months
21	Ayushi Verma	Dr. Mausumi Bharadwaj	M.Sc Immunology	Amity University	-	2 months
22	Tanisha Aggarwal	Dr. Mausumi Bharadwaj	M.Sc Biochemistry	Jamia Hamdard University	-	2 months
23	Ajija Akram	Dr. Mausumi Bharadwaj	B.Tech Biotechnology	Amity University	-	2 months
24	Shashank Suraj	Dr. Mausumi Bharadwaj	B.Tech Biotechnology	IILM College of Engineering & Technology	-	2 months
25	Yashaswani Shukla	Dr. Mausumi Bharadwaj	B.Tech Biotechnology	IILM College of Engineering & Technology	-	2 months
26	Shrey Jain (INSA Fellow)	Dr. Mausumi Bharadwaj	B.Tech Biotechnology	Thapar institute of Engineering and Technology, Patiala	Oral microbiome 16S sequencing data analysis using Mothur pipeline and MicrobiomeAnalyst tool	2 months
27	Ms. Soumya	Dr. Suresh T. Hedau	M.Sc	Amity Institute of Microbial Technology, Noida	Development of Drug Resistant Model in Breast Cancer Cell	5 months
28	Ms. Himani Rathore	Dr. Suresh T. Hedau	M.Sc.	Banasthali Vidyapith, Rajasthan	Development of Epi-resistance Model in Triple	5 months

					Negative Breast Cancer Cells	
29	Ms. Riya Rathore	Dr. Suresh T. Hedau	M.Sc.	Banasthali Vidyapith, Rajasthan	Expression study of TLR3, TLR4 and NF-kB in Gastric Carcinoma	5 months
30	Mr. Hudhaifa	Dr. Showket Hussain	M.Sc.	Alagappa University - Karaikudi, Tamil Nadu.	Molecular based Human Papillomavirus (HPV) DNA diagnostics and subtyping in cervical cancer patients	6 months
31	Mr. Yashraj Singh	Dr. Showket Hussain	M.Sc.	Amity Universi Noida, UP	To check the effect of natural compounds on HPV mediated Cervical Cancer	6 months
32	Ms. Suryanshi	Dr. Showket Hussain	M.Sc.	Jamia Milia Islamia, Delhi, New Delhi	The impact of 6,6 dihydroxythiobinu-Pharidine in breast cancer cell lines	6 months
33	Swati Nisha Raj	Dr. Showket Hussain	M.Sc.	Vinoba Bhave University, Hazaribag, Jharkhand	Molecular Based Detection of HPV DNA in Cervical Cancer	6 months
34	Ayushi	Dr. Showket Hussain	M.Sc.	Maharshi Dayanand University	Basic molecular biology training relevant to cancer research	2 months
35	Tanya Gupta	Dr. Nazneen Arif	M Sc	Banasthali Vidyapith	To identify methods of cost-effective TB diagnostics and their role in TB elimination	6 months
36	Madhukarnika Mahata	Dr. Nazneen Arif	M Sc	Chandigarh University	PCR based HPV detection in oral carcinoma samples	6 months
37	Nainika Parihar	Dr. Nazneen Arif	M Sc	Kumaun University, Nainital.	Effect of storage temperature on diagnosis of SARS-CoV-2 by RTPCR testing	6 months
38	Pushpendra Singh	Dr. Pramod Kumar	M.Sc. Biotech	Central University of Haryana	Immunogenic alterations in SARS-Cov 2	6 months
39	Ritu Sagar	Dr. Pramod Kumar	M.Sc. Biotech	Central University of Haryana	Molecular diagnosis and whole genome sequencing of	6 months

					Hepatitis C virus (HCV) associated with hepatocellular carcinoma	
40	Tathagat Sah	Dr. Pramod Kumar	BTech. Biotechnology	Punjab Technical University	Role of Oral microbiome in cancer	6 months
41	Rana Amit Singh	Dr. Pramod Kumar	M.Sc. Biotechnology	Department of Biotech, A.N. College, Patna, Bihar	RT-qPCR based diagnosis and genome sequencing of SARS-Cov-2	6 months
42	Ruchika Jha	Dr. Pramod Kumar	M.Sc. Biotechnology	Vinoba Bhave University Hazaribagh,	Identification of MHC displayed tumor peptides related to oral cancer.	6 months
43	Anuradha Sharma	Dr. Anuj Kumar	M.Sc	Amity University, NOIDA	Identification of genetic factors associated with nicotine addiction and cancer	6 months
44	Sonam Mallik	Dr. Anuj Kumar	M.Pharma	Delhi Pharmaceutical Sciences And Research University, Delhi	Network analysis of human proteins associated with cancer – a bioinformatics approach	6 months
45	O S K Paavana	Dr. Anuj Kumar	M.Sc	Amity University, NOIDA	Structural insight and functions of histone chaperone and histone	6 months
46	Rasanpreet Kaur	Dr. Anuj Kumar	M.Sc	GLA University, Mathura	Insights on the Nuclear Shuttling of H2A-H2B histone chaperones	2 months
47	Rahul Yadav	Dr. Dinesh Kumar	M.Sc	Amity University, Noida	Generation of fusion gene signature in oral cancer using whole exome and RNAseq data	6 months
48	Hafsa Khan	Dr. Dinesh Kumar	M.Sc	HIMT College, CCS	In-silico analysis of fusion transcript detection from RNA sequence data of Hepatic Cancer in Indian Population	5 months
49	Ragtmika Rai	Dr. Dinesh Kumar	M.Sc	Amity University, Noida	In silico Analysis of RNA seq data for the detection of Fusion Genes	6 months

50	Sandini Garg	Dr. Dinesh Kumar	M.Sc	JPIIT, NOIDA	Basic Cell culture and RNA seq data analysis	2 months
51	Khushi Garg	Dr. Dinesh Kumar	B.Tech	Amity, Gurugram	Basic Cell culture and RNA seq data analysis	2 months
Division of Bioinformatics						
52	Geetika Rawat	Dr. Subhash M Agarwal	MSc	Amity University, Noida	Computational identification of inhibitors against mutated G719S EGFR targeting lung cancer	Jan-May, 2023
53	Shivangi Sahu	Dr. Subhash M Agarwal	MSc	Sharda University, Greater Noida	Molecular docking study for identifying fibroblast growth factor receptor dual inhibitors	Jan-May, 2023
54	Dhairya Gupta	Dr. Subhash M Agarwal	MSc	Jaipur National University, Jaipur	Identification of dual ALK and EGFR inhibitors using in-silico approach	Jan-Jun, 2023
55	Sweta Chaudhary	Dr. Subhash M Agarwal	MSc	CCS University, Meerut	Molecular docking-based approach for identifying inhibitors against L858R mutant EGFR	Jan-Jun, 2023
56	Rahul Gupta	Dr. Subhash M Agarwal	MSc	Thapar Institute of Engineering & Technology, Patiala	Dual inhibitor identification for EGFR and SRC protein kinases	Jan-Jun, 2023
57	Nancy Dhyani	Dr. Subhash M Agarwal	MSc	Pondicherry University	Bioinformatics training	July-Aug 2022
58	Sakshi Chaudhary	Dr. Subhash M Agarwal	MSc	Chandigarh University	Bioinformatics training	July-Aug 2022
59	Maithilee Chaudhary	Dr. Subhash M Agarwal	MSc	Chandigarh University	Bioinformatics training	July-Aug 2022
60	Manshi Pandey	Dr. Subhash M Agarwal	MSc	Jaypee University of Information Technology Solan	Bioinformatics training	July-Aug 2022

61	Sumit Saxena	Dr. Subhash M Agarwal	MSc	Jaypee University of Information Technology Solan	Bioinformatics training	July-Aug 2022
Division of Epidemiology and Biostatistics						
62	Dr Debjani Roy	Dr. Smita Asthana	MPH	IIPH, Delhi	Two Months hands-on training in Research Methodology	2 months

PUBLICATIONS

1. Adsul P, de Cortina SH, Pramathesh R, Jayakrishna P, Srinivas V, Nethan ST, **Dhanasekaran K**, Hariprasad R, Madhivanan P. Asking physicians how best to implement cervical cancer prevention services in India: A qualitative study from Mysore. PLOS Global Public Health. 2022 Jun 2;2(6): e0000570. **Impact Factor (IF): NA**
2. **Agarwal SM**, Nandekar P, Saini R. Computational identification of natural product inhibitors against EGFR double mutant (T790M/L858R) by integrating ADMET, machine

learning, molecular docking and a dynamics approach. RSC advances. 2022; 12(26):16779-89. **IF: 4.036**

3. Balhara YP, Sarkar S, **Singh PK**, Chattopadhyay A, Singh S. Impact of three years of prohibition on extent and pattern of alcohol use in Bihar: Observations and insights from the National Family Health Survey. Asian Journal of Psychiatry. 2023 Apr 1; 82:103479. **IF: 13.9**
4. Balhara YP, **Singh PK**, Sarkar S, Chattopadhyay A, Singh S. How and What are Indians Drinking? Findings from the National Family Health Survey. Alcohol and alcoholism. 2022 Nov; 57(6):674-7. **IF:3.91**
5. Chadha S, Gandhi G, Hedau ST, **Gupta R**. Comparison of HPV 16/18 Genotyping and p16/Ki67 Dual Staining for Detection of High-Grade Cervical Lesion in Patients with Low-Grade Cervical Smears. The Journal of Obstetrics and Gynecology of India. 2023 Jun; 73(3):248-53. **IF:0.552**
6. Das AP, Chopra M, **Agarwal SM**. Prioritization and Meta-analysis of regulatory SNPs identified IL6, TGFB1, TLR9 and MMP7 as significantly associated with cervical cancer. Cytokine. 2022 Sep 1;157:155954. **IF:3.926**
7. Das AP, **Agarwal SM**. Recent advances in the area of plant-based anti-cancer drug discovery using computational approaches. Molecular Diversity. 2023 Jan 21:1-25. **IF:3.364**
8. Das AP, Chaudhary N, Tyagi S, **Agarwal SM**. Meta-Analysis of 49 SNPs Covering 25,446 Cases and 41,106 Controls Identifies Polymorphisms in Hormone Regulation and DNA Repair Genes Associated with Increased Endometrial Cancer Risk. Genes. 2023 Mar 17;14(3):741. **IF:4.141**
9. Das AP, Saini S, Tyagi S, Chaudhary N, **Agarwal SM**. Elucidation of Increased Cervical Cancer Risk Due to Polymorphisms in XRCC1 (R399Q and R194W), ERCC5 (D1104H), and NQO1 (P187S). Reproductive Sciences. 2023 Apr;30(4):1118-32. **IF: 2.924**
10. **Dhanasekaran K**, Hariprasad R, Singh M, Jain S, Nethan ST, Singh S. Impact of the COVID-19 pandemic on an online cancer screening training programme for healthcare providers in the public sector in India: learnings from a hub and spoke model perspective. ecancermedicalscience. 2023;17. **IF:0.665**
11. **Dhanasekaran K**, Verma C, Sriram L, Kumar V, Hariprasad R. Educational intervention on cervical and breast cancer screening: Impact on nursing students involved in primary care. Journal of Family Medicine and Primary Care. 2022 Jun; 11(6):2846. **IF:NA**
12. Dhingra A, Sharma D, Kumar A, Singh S, **Kumar P**. Microbiome and Development of Ovarian Cancer. Endocrine, Metabolic & Immune Disorders-Drug Targets (Formerly Current Drug Targets-Immune, Endocrine & Metabolic Disorders). 2022 Sep 1;22(11):1073-90. **IF:2.387**
13. Gaonkar VB, Mathur S, **Hussain S**, Priyadarshini A, Sharma CK, Mehrotra R, Kataria K, Ranjan P, Dhar A, Seenu V, Hari S. Estrogen and Progesterone Receptors in Fibroadenoma in Response to Centchroman—a Selective Oestrogen Receptor Modulator (SERM). Indian Journal of Surgery. 2022 Jul 16:1-9. **IF:0.609**

14. Gautam H, Verma VV, Husain SA, **Bharadwaj M**. Forecasting most deleterious nsSNPs in human TLR9 gene and their cumulative impact on biophysical features of the protein using in silico approaches. Systems Biology in Reproductive Medicine. 2023 Mar 4;69(2):112-28. **IF:3.061**

15. Gill J, **Kumar A**, Sharma A. Structural comparisons reveal diverse binding modes between nucleosome assembly proteins and histones. Epigenetics & Chromatin. 2022 Dec;15(1):1-9. **IF: 4.5**

16. Gupta R, Hussain S, Hariprasad R, Dhanasekaran K, Verma S, Agarwal V, Das PK, Singh S, **Gupta S**. Concurrent Cervical and Anal High-Risk Human Papillomavirus Infection in Women Living With HIV: An Observational Case–Control Study. JAIDS Journal of Acquired Immune Deficiency Syndromes. 2022 Nov 1;91(3):319-24.**IF: 3.731**

17. Group RQ, Indrayan A, Vishwakarma G, Malhotra RK, Gupta P, Sachdev HP, Karande S, **Asthana S**, Labani S. The development of QERM scoring system for comprehensive assessment of the Quality of Empirical Research in Medicine-Part 1. Journal of Postgraduate Medicine. 2022 Oct;68(4):221. **IF: 1.566**

18. **Gupta R**, Hussain S, Hariprasad R, Dhanasekaran K, Verma S, Agarwal V, Sandeep S, Parveen S, Kaur A, Verma CP, Amita A. High prevalence of cervical high-grade lesions and high-risk human papillomavirus infections in women living with hiv: a case for prioritizing cervical screening in this vulnerable group. Acta Cytologica. 2022 Nov 3;66(6):496-506. **IF:2.75**

19. **Hussain S**, Rani J, Tulsyan S, Sisodiya S, Chikara A, Nazir SU, Srivastava A, Khan A, Dash NR, Saraya A, Das BC. Influence of HPV infection in esophageal cancer: A systematic review and meta-analysis. Gene Reports. 2022 Jul 11:101640. **IF:NA**

20. **Hussain S**, Tulsyan S, Dar SA, Sisodiya S, Abiha U, Kumar R, Mishra BN, Haque S. Role of epigenetics in carcinogenesis: recent advancements in anticancer therapy. InSeminars in cancer biology 2022 Aug 1 (Vol. 83, pp. 441-451). Academic Press. **IF:17.012**

21. Islam F, Alvi Y, Ahmad M, Ahmed F, Rahman A, Singh FH, Das AK, Dudeja M, **Gupta E**, Agarwalla R, Alam I. Household transmission dynamics of COVID-19 among residents of Delhi, India: a prospective case-ascertained study. IJID regions. 2023 Jun 1; 7:22-30. **IF: 12.7**

22. Jadaun P, Seniya C, Pal SK, Kumar S, **Kumar P**, Nema V, Kulkarni SS, Mukherjee A. Elucidation of Antiviral and antioxidant potential of C-Phycocyanin against HIV-1 Infection through In Silico and In Vitro approaches. Antioxidants. 2022 Sep 28;11(10):1942. **IF:7.765**

23. Jain CK, Srivastava P, Pandey AK, Singh N, **Kumar RS**. miRNA therapeutics in precision oncology: a natural premium to nurture. Exploration of Targeted Anti-tumor Therapy. 2022;3(4):511. **IF:2.4**

24. Kumar B, Prasad P, Singh R, Sahu RK, Singh A, Magani SJ, **Hedau S**. Role of identified proteins in the proteome profiles of CDK4/6 inhibitor-resistant breast cancer cell lines. Molecular Omics. 2023;19(5):404-17. **IF:4.212**

25. Kumari S, Singh M, Goswami S, **Gupta E**, Sharma P, Gupta V, Chaudhuri S, Kishore J. Have the relaxations in legislation related to termination of pregnancy made abortions safe in India? A meta-analysis on the prevalence of unsafe abortions among 15–49-year-old

females in India. CHRISMED Journal of Health and Research. 2022 Jul 1;9(3):164-71. **IF: NA**

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Book Chapter:

1. **Hussain S**, Sisodiya S, Kasherwal V, Tulsyan S, Khan A. Use of Immunotherapy in Gynaecological and Breast Cancer. InLatest Advances in Diagnosis and Treatment of Women-Associated Cancers 2022 Jul 12 (pp. 37-50). CRC Press.
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4. **Singh PK**. Release of Report & Factsheet – The Environmental Burden of Tobacco Product Wastes in India, a joint study by ICMR-NICPR and AIIMS Jodhpur. http://nicpr.org/wp-content/uploads/2023/02/tobacco_waste_report.pdf

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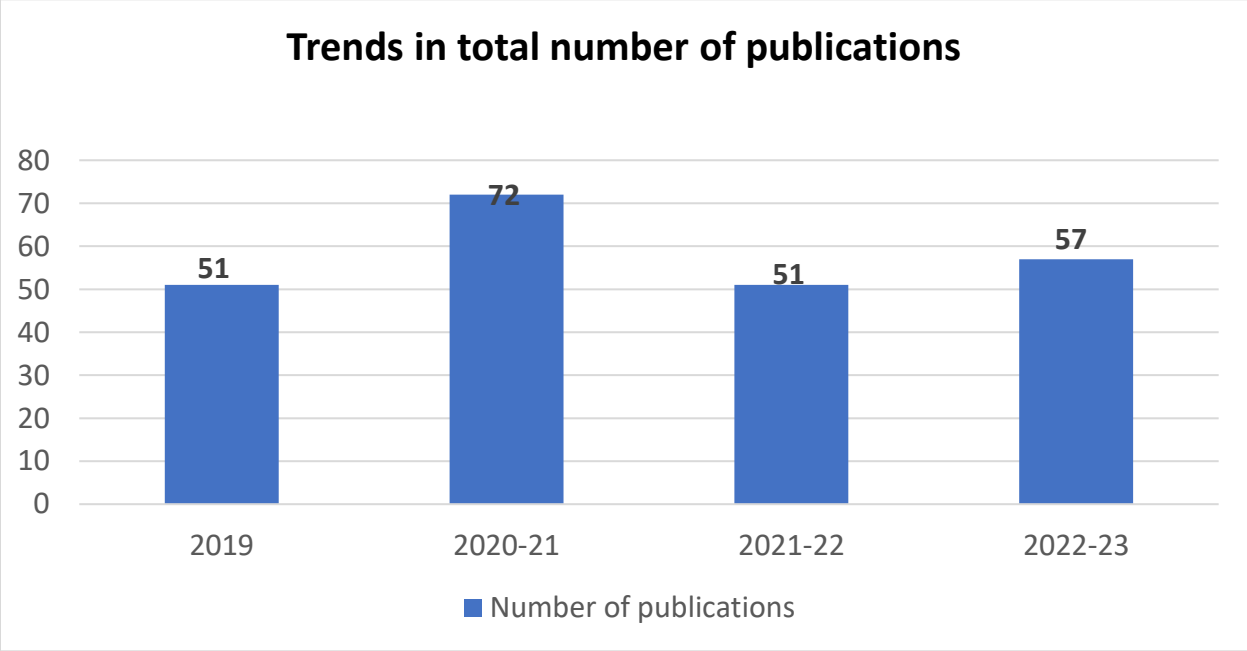
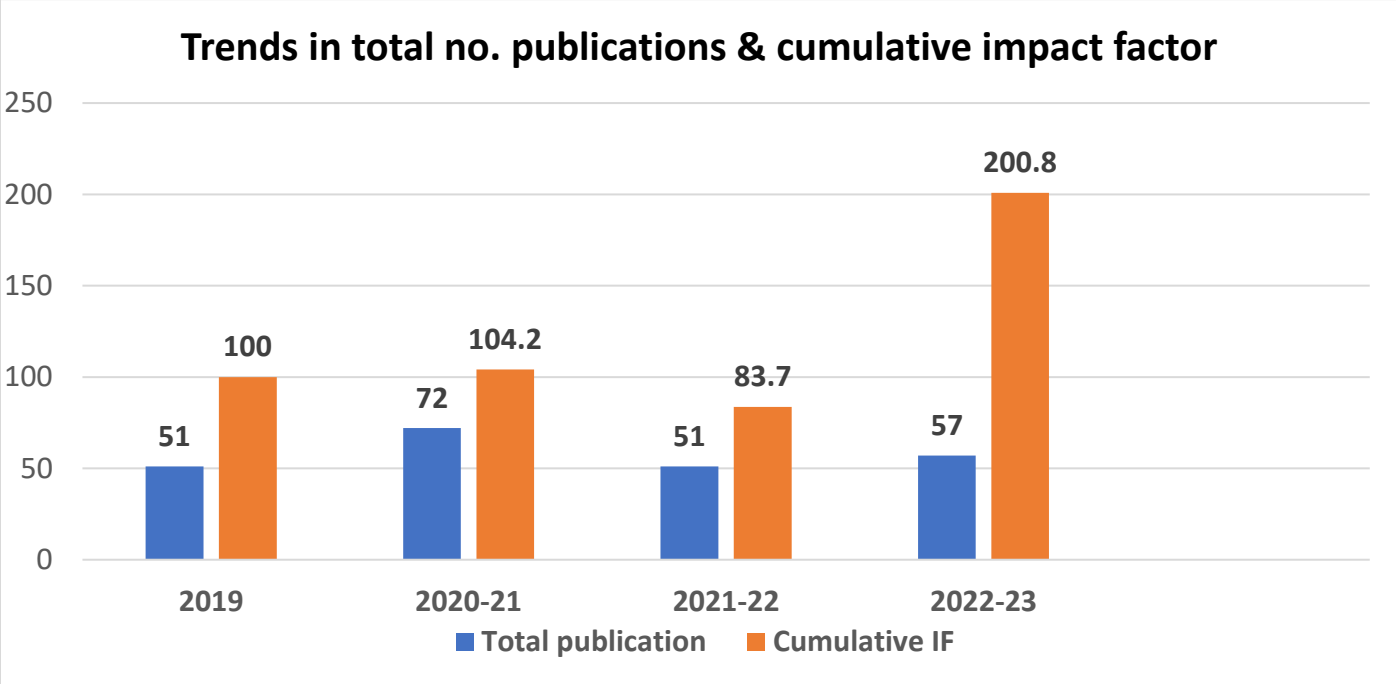
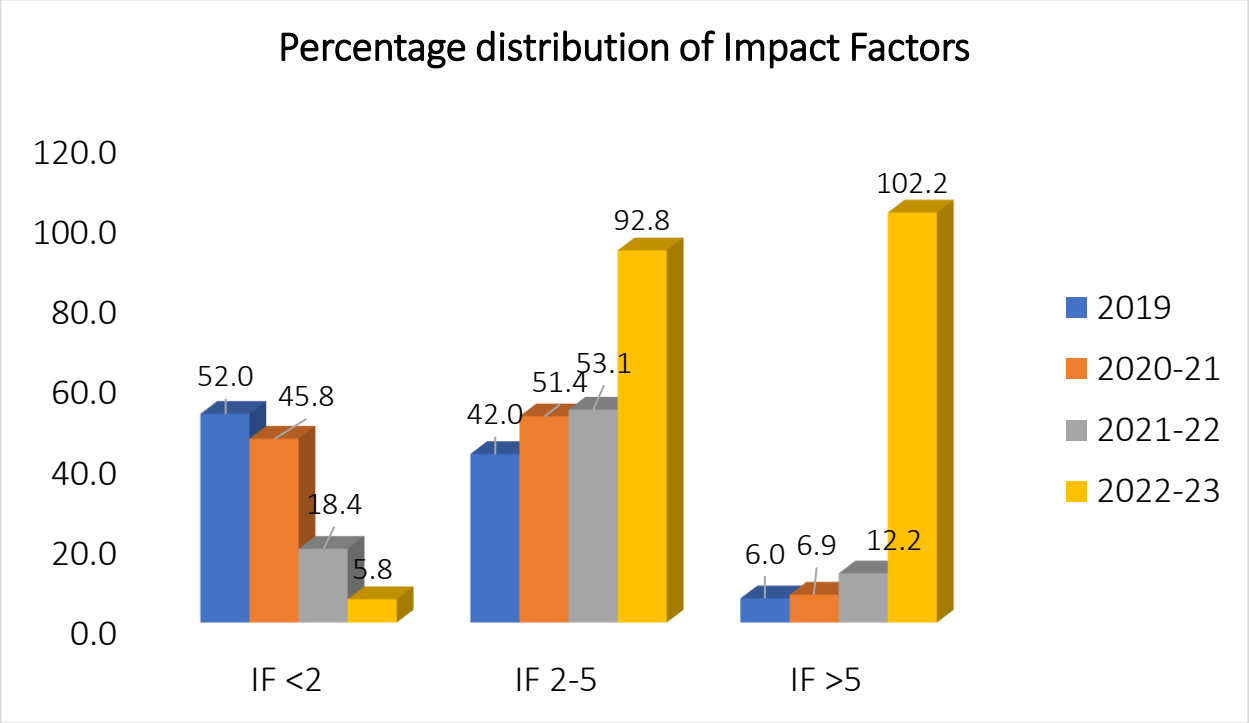
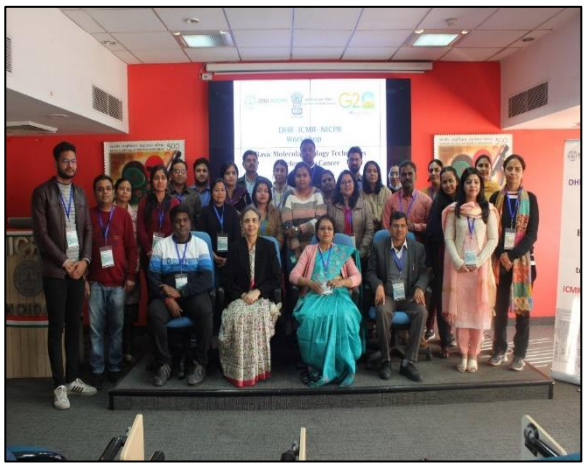






Percentage distribution of Institute's Publication Impact Factors over given periods

WORKSHOPS ORGANIZED



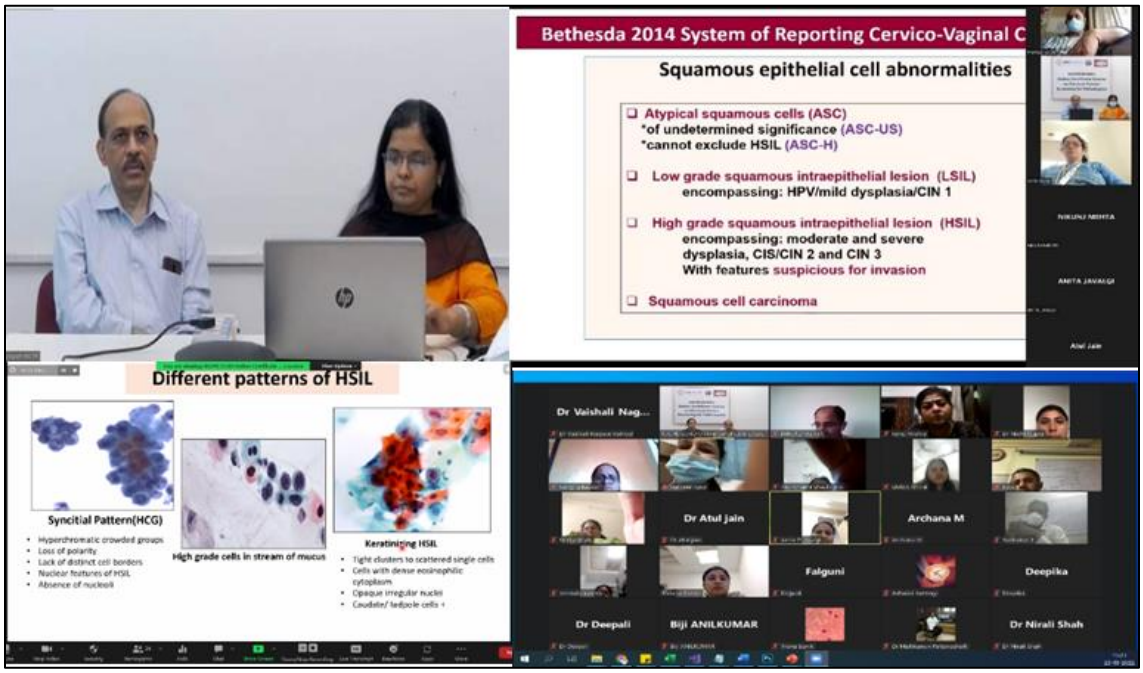
S.no.	Title of the Workshop	Division	Date	Numbers trained
1.	Hands-on workshop for screening of breast, oral and cervical cancer for nursing officers at All India Institute of Medical Sciences, Guwahati	Clinical Oncology	27.04.23 – 29.04.23	40
2.	An Update on Research Ethics and Good Clinical Practice and NDCT Rules	Clinical Oncology	21.07.2022	59
3.	Hands-on training on cervical cancer screening for CHOs/Nurses organized by NCD cell, Chhattisgarh state Government in association with ICMR-NICPR	Clinical Oncology	25.07.2022 - 27.07.2022. 30.11.2022 - 02.12.2022 12.12.2022 - 12.14.2022	65 61 54
4.	Hands-on training on cervical cancer screening for medical officers organized by NCD cell, Chhattisgarh state Government in association with ICMR-NICPR	Clinical Oncology	16.08.2022 - 18.08.22 15.12.2022- 15.12.2022.	53 69
5.	Pre-conference workshop during 3rd IAPSM Young Leaders' National Conclave-2022 at AIIMS, Bhubaneswar, India.	Clinical Oncology	10.11.2022- 12.11.2022	40
6.	Hands-on Workshop on “Molecular Docking, Pharmacaphore modeling and Machine Learning”	Bioinformatics	15.03.2023- 16.03.2023	83

7.	Basic Molecular Biology Techniques Relevant to Cancer Research – Hands-on Training.	Molecular Biology	31.01.2023 - 03.02. 2023: 28.02.2023-03.03.2023	20 24
8.	ICMR funded hands-on workshop on "NGS based whole genome sequencing (WGS) of epidemic RNA viruses	Molecular Biology	22.05.2023 - 27.05.2023	20
9.	Application training on SARS CoV2 next generation sequencing using Ion S5 Technology	Molecular Biology	23.08.2022 -26 .08.2022.	08
10.	Training for Flow Cytometer	Molecular biology	13.02. 2023	25
11.	2nd National Consultation on Smokeless Tobacco Control in India	Preventive Oncology	21.02.2023-22.02.2023	130
12.	3rd National Consultation on Emerging Challenges and Opportunities in Tobacco Control	Preventive Oncology	22.02.2023-23.02.2023	70
13.	TOCOIndiaटोको – An online lecture series on tobacco COntrol in India	Preventive Oncology	9.02.2023	125
14.	National NICPR-ECHO Online Certificate Course on Cervical Cancer Screening for Pathologists	Cytopathology	3.08.22 – 7.10.22 8.2.23 – 31.3.23	50 54

Hands-on Workshop “Molecular Docking, Pharmacaphore modeling and Machine Learning”

Pre-conference workshop during 3rd IAPSM Young Leaders' National Conclave-2022

ICMR funded hands-on workshop on "NGS based whole genome sequencing (WGS) of epidemic RNA viruses



National NICPR-ECHO Online Certificate Course on Cervical Cancer Screening for Pathologists

- **2nd National Consultation on Smokeless Tobacco Control in India from February 21-22, 2023, New Delhi. Number of participants/ trainees: 130**

- **Hands-on workshop for screening of breast, oral and cervical cancer for nursing officers at All India Institute of Medical Sciences, Guwahati from 27th – 29th April, 2023.**

AWARDS, FELLOWSHIPS & RECOGNITIONS

icmr | NICPR

आई. सी. एम. आर.
राष्ट्रीय कैंसर रोकथाम एवं अनुसंधान संस्थान

VIGILANCE AWARENESS WEEK

31ST October to 6TH November, 2022

CERTIFICATE OF PARTICIPATION

This is to certify that

Dr./Mr./Mrs. Dr. Subhash Agarwal

has participated in Slogan/Poster making competition during the Vigilance Awareness Week

and is awarded 1st / 2nd / 3rd Prize.

Dr. Sanjay Gupta
Scientist-G & Vigilance Officer

Dr. Shalini Singh
Director

Indian Institute of Public Administration
New Delhi

This is to certify that

Chandresh Pragya Verma

received the First Prize in Group Presentation
Topic : Role of Science & Technology in addressing
Challenges Faced by Himalayan States

16th Capacity Building Programme for
Technical Personnel of Science & Technology Departments,
Government of India, (February 07-18, 2022)

Conducted by
Indian Institute of Public Administration

Sponsored by
Department of Science and Technology, Government of India

Prof. Vinod K. Sharma
Programme Coordinator

Dr. Shyamli Singh
Programme Coordinator

New Delhi
February 18, 2022

Dr. Sanjay Gupta

- Certificate of Appreciation for Highest Number of Publications in recognition of Academic excellence during the year 2022
- Certificate of Appreciation for High Impact Factor in recognition of Academic excellence during the year 2022
- Certificate of Appreciation for High Cumulative Impact Factor in recognition of Academic excellence during the year 2022
- Certificate of Appreciation for Leadership Role and contribution to the Institute during 2022

Dr. Subhash M Agarwal

- Awarded 3rd Prize in Poster making competition held during Vigilance Awareness Week between 31st Oct to 6th Nov, 2022 at NICPR.

Dr. Ekta Gupta

- Completed 6-month Executive Programme in Public Health Policy, Leadership and Management' conducted by School of Public Health, AIIMS Jodhpur (July – December 2022)

Dr. Prashant Kumar Singh

- Certificate of Appreciation for Highest Number of Publications in recognition of Academic excellence during the year 2022
- Certificate of Appreciation for High Impact Factor in recognition of Academic excellence during the year 2022
- Certificate of Appreciation for High Cumulative Impact Factor in recognition of Academic excellence during the year 2022

Dr. Showket Hussain

- Selected for International young biomedical scientist fellowship award by DHR-ICMR to work in NCI-designated Stephenson Cancer Centre, University of Oklahoma, USA, 2022-23.
- Certificate of Appreciation for High Impact Factor in recognition of Academic excellence during the year 2022
- Certificate of Appreciation for High Cumulative Impact Factor in recognition of Academic excellence during the year 2022

Dr. Ruchika Gupta

- Certificate of Appreciation for Highest Number of Publications in recognition of Academic excellence during the year 2022
- Certificate of Appreciation for High Impact Factor in recognition of Academic excellence during the year 2022
- Certificate of Appreciation for High Cumulative Impact Factor in recognition of Academic excellence during the year 2022
- हिंदी पखवाडा 01-15 सितम्बर 2022 में हिंदी टंकण प्रतियोगिता में प्रथम पुरस्कार
- हिंदी पखवाडा 01-15 सितम्बर 2022 में हिंदी श्रुतलेख प्रतियोगिता में द्वितीय पुरस्कार
- हिंदी पखवाडा 01-15 सितम्बर 2022 में हिंदी निबंध प्रतियोगिता में द्वितीय पुरस्कार
- हिंदी पखवाडा 01-15 सितम्बर 2022 में हिंदी प्रश्नोतरी प्रतियोगिता में चतुर्थ पुरस्कार
- 2nd Prize in Online Quiz Competition held on the occasion of World No Tobacco Day, 31st May 2023

Dr. Sandeep Kumar

- हिंदी पखवाडा 01-15 सितम्बर 2022 में हिंदी प्रश्नोतरी प्रतियोगिता में प्रथम पुरस्कार
- हिंदी पखवाडा 01-15 सितम्बर 2022 में हिंदी टंकण प्रतियोगिता में तृतीय पुरस्कार
- 1st Prize in Online Quiz Competition held on the occasion of World No Tobacco Day, 31st May 2023.

Mrs Chandresh Pragya Verma

- Received First prize in Group presentation in “16 capacity building program for technical personnel of sciences & technology Department
- Certificate of Appreciation for taking additional responsibility in the Administration
- 2nd prize in poster competition on the occasion of vigilance awareness week

EVENTS ORGANIZED

World No Tobacco Day, 31st May 2023

World Hypertension Day, 17th May 2023

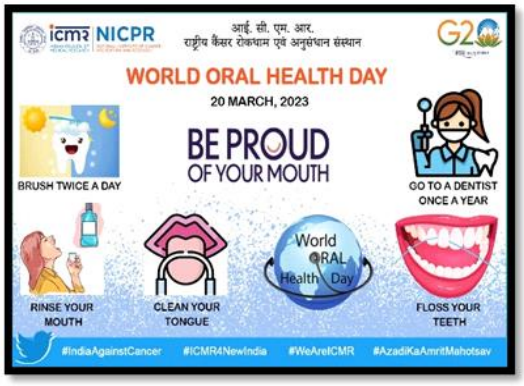
Hindi Training program, 28th April 2023

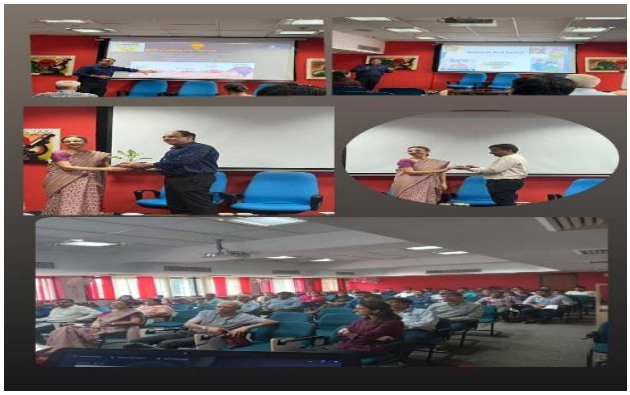
Visit by Delegates of the Global Tobacco Regulators Forum (GTRF), 27th April 2023

"Cancer Prevention Campaign" at Shivaji College, University of Delhi, 29th March 2023

Tuberculosis Day, 24th March 2023

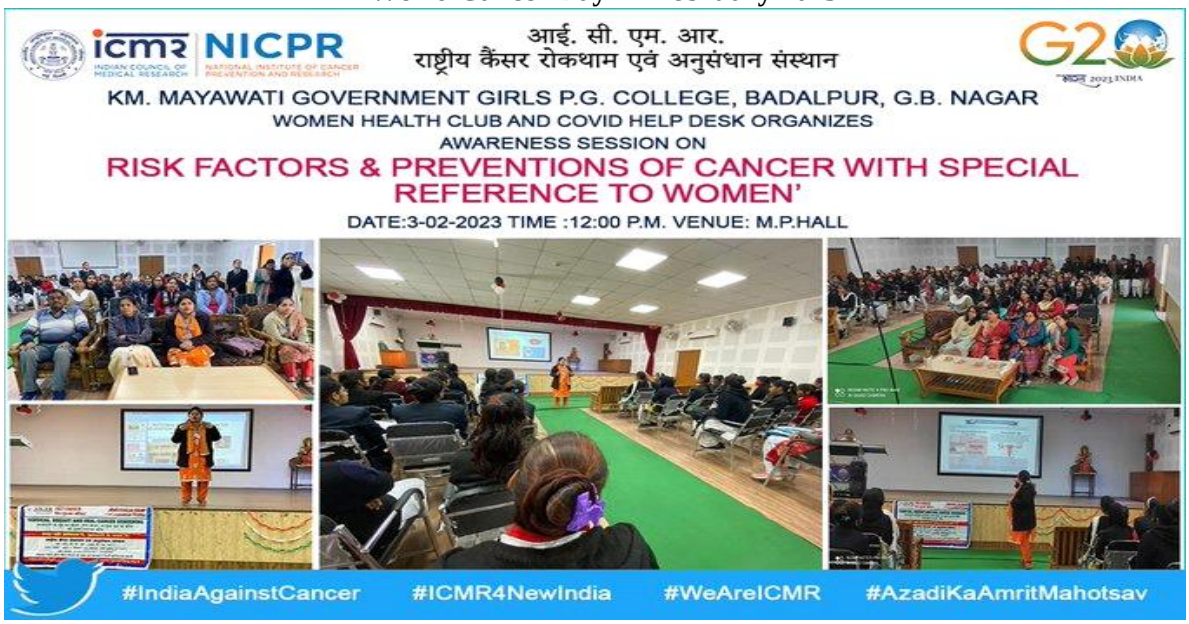
WORLD ORAL HEALTH DAY 20th March 2023





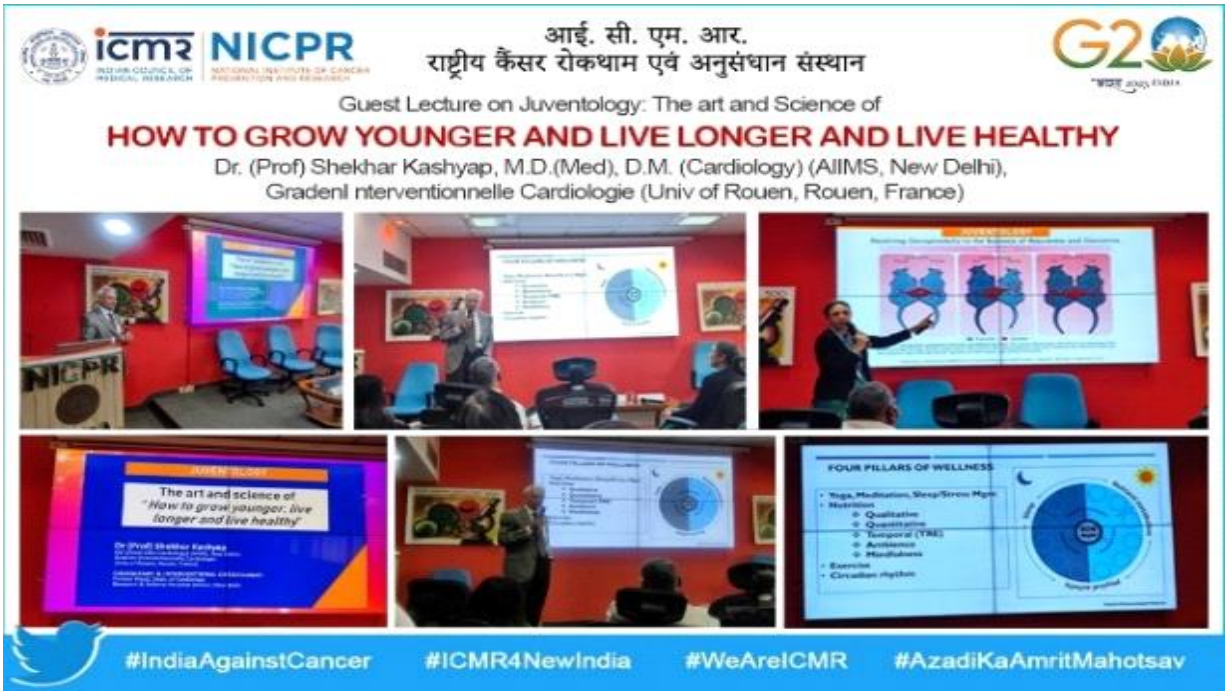
International Women's Day, 8th March 2023

World Cancer Day 4th February 2023



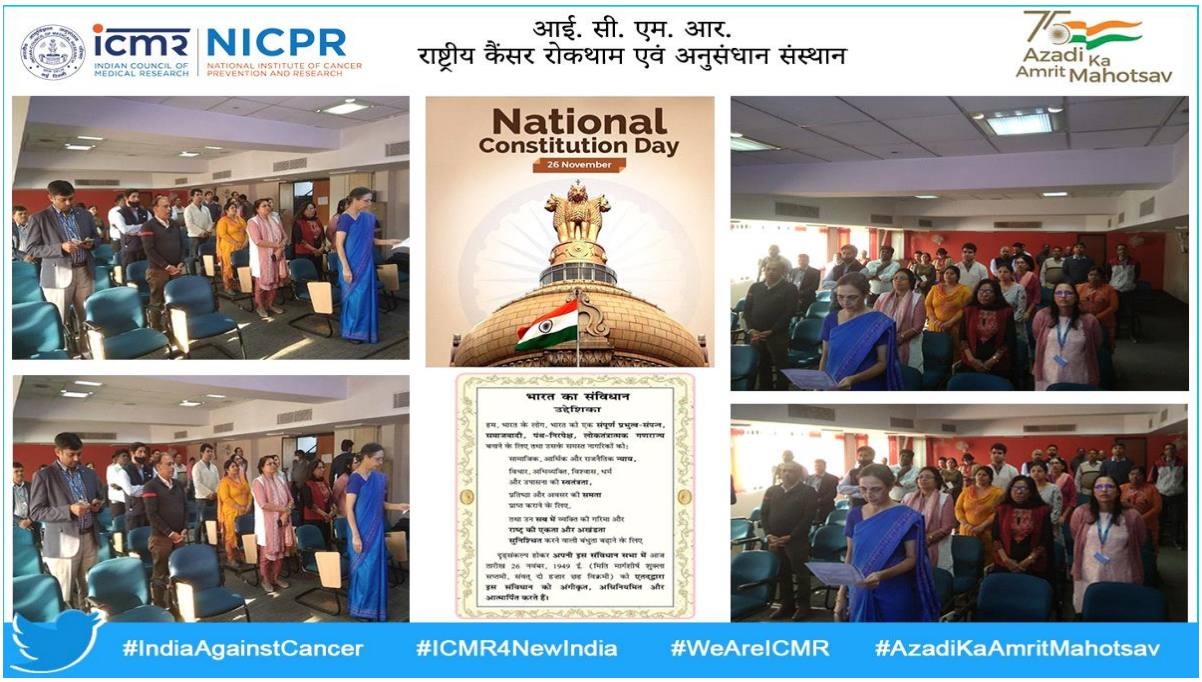
REPUBLIC DAY 26TH JANUARY 2023

44th Foundation Day of ICMR- NICPR - 14th Jan 2023



5th December, 2022: Lecture on Women Safety, security and Empowerment

27th November, 2022: National Constitution Day



Vigilance Awareness Week (31st October – 6th November 2022)

FIT INDIA RUN 3.0: 31st October, 2022

हिंदी पखवाडा (1-15 सितंबर, 2022)

आई. सी. एम. आर.
राष्ट्रीय कैंसर रोकथाम एवं अनुसंधान संस्थान

हिंदी पखवाड़ा समापन एवं पुरस्कार वितरण समारोह

Independence Day, 15th August 2022

5th August: World Breastfeeding Week celebration 2022

World Population Day, 11th July 2022

National Statistics Day (29th June 2022)

आई. सी. एम. आर.
राष्ट्रीय कैंसर रोकथाम एवं अनुसंधान संस्थान

राष्ट्रीय सांख्यिकी दिवस
दिनांक: 29-06-2022

International Yoga Day, 21st June 2022

आई.सी.एम.आर - राष्ट्रीय कैंसर रोकथाम
एवं अनुसंधान संस्थान

10th June 2022: World Environment Day 2022

Theme for World Environment Day, 2022

ONLY ONE EARTH

Time	Session	Speaker
10:00 AM	Welcome Address	Dr. Anuj Kumar, Scientist C, NICPR
10:10 – 10:20 AM	Address by the Director	Dr. Shalini Singh, Director ICMR-NICPR
10:20 - 10:40 AM	SAVVY BIOTECHNOL NOIDA: An introduction	Mr Sharad Srivastava, SAVVY BIOTECHNOL Noida
10:40– 11:00 AM	Lecture on "Organic waste management solutions"	Mr Ankit Tandon, TANCO Pvt. Ltd. New Delhi
11:00 – 11:20 AM	Lecture on "Solar energy technologies for sustainable development"	Mr Abhay Verma, Mr Paravind Upadhaya, AN ELECTROMECH Faridabad
11:20 AM	Vote of Thanks	Dr. Sandeep Kumar, Scientist B, NICPR

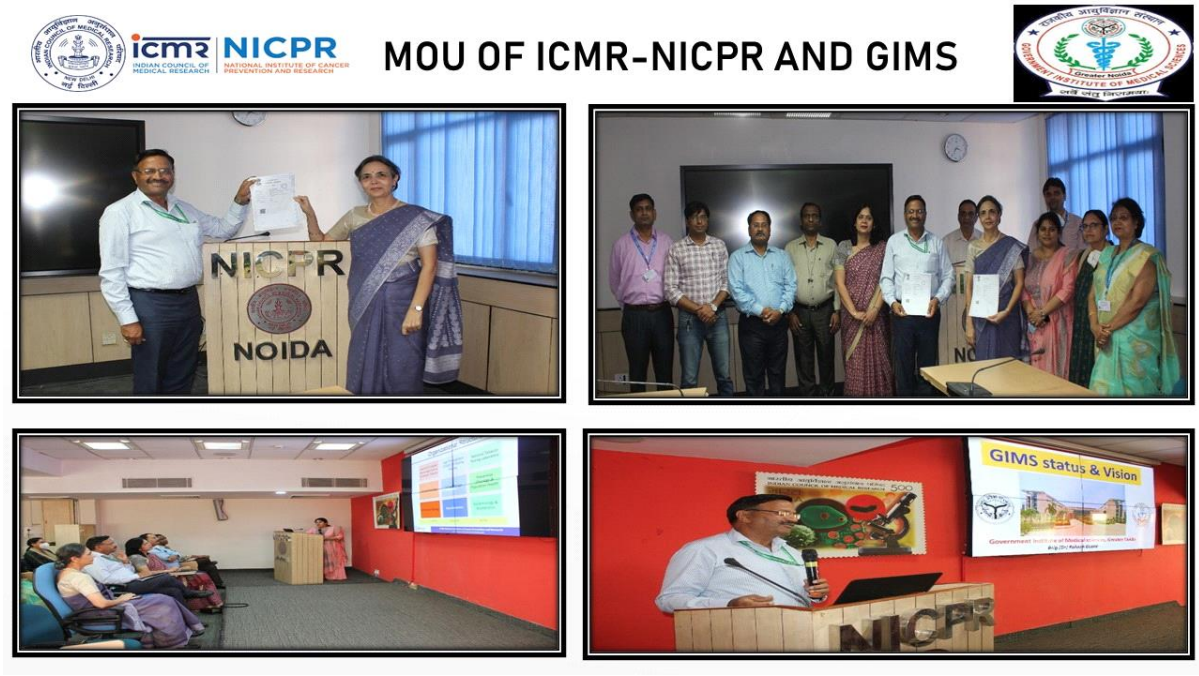
Venue - Conference Hall, ICMR-NICPR, Noida, 10th June, 2022.

Zoom link - https://us02web.zoom.us/j/89850790688?pwd=ekhVdjFrbVpPajYvVWRSUFJuWXE3Zz09

Meeting ID: 898 5079 0688, **Passcode:** 396162

8th June 2022: एक दिवसीय हिंदी प्रशिक्षण कार्यक्रम

03.6.22: Signing of MoU between ICMR-NICPR and Government Institute of Medical Sciences (GIMS), Greater Noida



31st May: World No Tobacco Day 2022

SCIENTISTS' PROFILE

Name: Dr. Sanjay Gupta

Designation: Scientist-G

Division: Cytopathology (Coordinator)

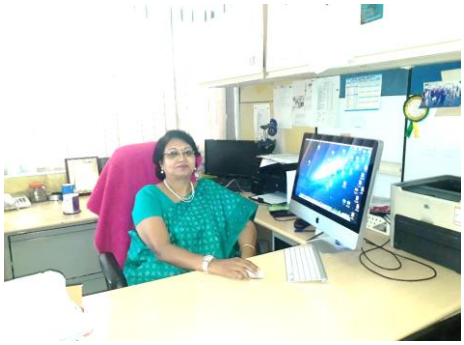
Main areas of work: Cancer Screening, Cost-Effective Strategies to augment Cervical Cancer Screening/ Early Detection, Adverse Health Effects of Smokeless Tobacco, Translational Research, Diagnostics, Capacity Building in Cytopathology and Cancer Screening

Current projects (16th May 2022 – 31st May 2023): 05

- Extramural: 03
- Intramural: 02
- PI/Co-PI/Mentor/Nodal Officer/ Site Investigator: 03
- Co-I: 02

Total number of publications during the period under report: **07**

Cumulative Impact Factor of publications during the period under report: **25.445**



Name: Dr. Mausumi Bharadwaj, PhD, FAScT, FNASc

Designation: Scientist G

Division: Molecular Biology Group

Main areas of work: Molecular cancer Biology; Cancer Genetics & Epigenetics; Development of pre-diagnostic marker and DNA based vaccines; cancer microbiome

Current projects (16th May 2022 – 31st May 2023): 07

- Extramural: 07
- Intramural: 00
- PI/ Co-PI/ Mentor: 07
- Co-I: 00

Total number of publications during the period under report: 06

Cumulative Impact Factor of publications during the period under report: 29.356

Name: Ms. Rekha Saxena, MSc

Designation: Scientist G

Date of Joining NICPR: 01.04.2022

Main areas of work: Geographical Information System (GIS)

Current projects (16th May 2022 – 31st May 2023): Nil

Total number of publications during the period under report: Nil

Cumulative Impact Factor of publications during the period under report: Nil

Name: Dr Smita Asthana

Designation: Scientist F

Division: Epidemiology and Biostatistics

Main areas of work:

Current projects **(16th May 2022 – 31st May 2023): 03**

- Extramural: 03
- Intramural: 00
- PI/Co-PI/Mentor/Nodal Officer/ Site Investigator: 03
- Co-I: 00

Total number of publications during the period under report:

1. Indrayan A, Vishwakarma G, Malhotra R K, Gupta P, Sachdev H P S, Karande S, **Asthana S** , Labani S . The development of QERM scoring system for comprehensive assessment of the Quality of Empirical Research in Medicine - Part 1. J Postgrad Med. 2022 **[IF: 1.57]**
2. Gupta S, **Asthana S**, Gupta AK. Health care utilization among geriatric patients with respiratory diseases – An Indian perspective. Curr Med Res Pract 2022;12:249-56.
3. P Kumar, S Gupta, **S Asthana**, J Batra.Impact of chronic exposure to air pollution on health of people of Delhi/NCR. Bull. Env.Pharmacol. Life Sci., Spl Issue [2]: 2022: 115-119

Cumulative Impact Factor of publications during the period under report: **1.57**

Name: Dr. Subhash M Agarwal, PhD

Designation: Scientist E

Division: Bioinformatics

Main areas of work: Cancer informatics, Structure based drug design, Database development and Machine learning

Current projects (16th May 2022 – 31st May 2023): 02

- Extramural: 02
- Intramural: 00
- PI/ Co-PI/ Mentor: 02
- Co-I: 00

Total number of publications during the period under report: 03

Cumulative Impact Factor of publications during the period under report: 12.04

Name: Dr. R Suresh Kumar, PhD

Designation: Scientist E

Division: Molecular Biology Group

Main areas of work: Experimental Chemoprevention strategies in preventing and treatment of cancers , Epigenetics of carcinogenesis, Histone modulation, Drug resistance reversal, Tobacco microbiome, tobacco mediated carcinogenesis

Current projects (16th May 2022 – 31st May 2023): 04

- Extramural: 04
- Intramural: 00
- PI/ Co-PI/ Mentor: 03
- Co-I: 01

Total number of publications during the period under report: 01

Cumulative Impact Factor of publications during the period under report: 6.5

Name: Dr. Suresh T Hedau, PhD

Designation: Scientist E

Division: Molecular Biology Group

Main areas of work: Therapy-resistance in breast cancer; Nano-material based drug delivery system; Metabolic stress linked signal transduction; Epigenetics

Current projects (16th May 2022 – 31st May 2023): 06

- Extramural: 06
- Intramural: 00
- PI/ Co-PI/ Mentor: 06
- Co-I: 01

Total number of publications during the period under report: 03

Cumulative Impact Factor of publications during the period under report: 8.42

Name: Dr. Ekta Gupta, MD, DNB, PGDDHM

Designation: Scientist E

Division: Clinical Oncology

Main areas of work: Cancer screening and prevention, tobacco and maternal health

Current projects (16th May 2022 – 31st May 2023): 05

- Extramural: 02
- Intramural: 03
- PI/ Co-PI/ Mentor: 04
- Co-I: 01

Total number of publications during the period under report: 05

Cumulative Impact Factor of publications during the period under report: 14.2

Name: Dr. Kavitha Dhanasekaran, MD

Designation: Scientist D

Division: Clinical Oncology

Main areas of work: Cervical Cancer Prevention, diagnostics (Colposcopy examination) and treatment (thermal ablation), capacity building of healthcare providers

Current projects (16th May 2022 – 31st May 2023): 04

- Extramural: 02
- Intramural: 02
- PI/ Co-PI/ Mentor: 04
- Co-I: 00

Total number of publications during the period under report: 03

Cumulative Impact Factor of publications during the period under report: 10.883

Name: Dr. Prashant K Singh, PhD

Designation: Scientist D

Division: Preventive Oncology and Population Health

Main areas of work: Social determinants of health, tobacco control, non-communicable diseases, gender gaps in health and survival, maternal and child health

Current projects (16th May 2022 – 31st May 2023): 05

- Extramural: 04
- Intramural: 01
- PI/ Co-PI/ Mentor: 04
- Co-I: 01

Total number of publications during the period under report: 08

Cumulative Impact Factor of publications during the period under report: 18.1

Name: Dr. Showket Hussain, PhD

Designation: Scientist D

Division: Molecular Biology Group

Main areas of work: Cancer biology, Tumor virology, HPV diagnostics, Cancer signaling pathways, Cancer genomics and immune-oncology

Current projects (16th May 2022 – 31st May 2023): 11

- Extramural: 11
- Intramural: 00
- PI/ Co-PI/ Mentor: 11
- Co-I: 00

Total number of publications during the period under report: 06

Cumulative Impact Factor of publications during the period under report: 18.86

Name: Dr. Ruchika Gupta

Designation: Scientist-D

Division: Cytopathology

Main areas of work: Cervical cancer screening, Gall bladder cancer, Oncopathology, Pediatric tumors

Current projects (16^{th} May 2022 – 31^{st} May 2023): 06

- Extramural: 04
- Intramural: 02
- PI/Co-PI/Mentor/Nodal Officer/ Site Investigator: 04
- Co-I: 02

Total number of publications during the period under report: **08**

Cumulative Impact Factor of publications during the period under report: **26.776**

Name: Dr Shamsuz Zaman

Designation: Scientist-D

Division: Cytopathology

Main areas of work: Cytopathology/Histopathology

Current projects (16th may 2022 – 31st May 2023): NIL

- Extramural: Nil
- Intramural: NIL
- PI/ Co-PI/ Mentor: NIL
- Co-I: NIL

Total number of publications during the period under report: NIL

Name: Dr Nazneen Arif

Designation: Scientist D

Division: Molecular Biology

Main areas of work: Infection and cancer

Current projects (16th May 2022 – 31st May 2023): 4

- Extramural: 2
- Intramural: 2
- PI/ Co-PI/ Mentor: 2
- Co-I: 2

Total number of publications during the period under report: 2

Cumulative Impact Factor of publications during the period under report: 11.2

Name: Dr. Raj Narain, MBBS

Designation: Scientist D

Division: Epidemiology and Biostatistics

Main areas of work: Primary and Secondary preventable risk factors and modification of lifestyle risk factor in prevention of cancer in community

Current project (16th May 2022 – 31st May 2023): Nil

Total number of publications during the period under report: 01

Name: Dr. Malasha Kumari, MBBS

Designation: Scientist C

Division: Preventive Oncology & Population Health

Main areas of work: Non-communicable diseases, tobacco-related diseases, women health

Current projects (16th May 2022 – 31st May 2023): Nil

Total number of publications during the period under report: Nil

Name: Dr. Pramod Kumar, PhD

Designation: Scientist C

Division: Molecular Biology Group

Main areas of work: Microbiome and cancer, Tumor immunology, chronic viral hepatitis in development of hepatocellular carcinoma

Current projects (16th May 2022 – 31st May 2023): 01

- Extramural: 01
- Intramural: 00
- PI/ Co-PI/ Mentor: 01
- Co-I: 00

Total number of publications during the period under report: 03

Cumulative Impact Factor of publications during the period under report: 10.488

Name: Dr. CP Yadav

Designation: Scientist C

Division: Epidemiology and Biostatistics

Main areas of work: Epidemiology and Biostatistics

Current projects (16^{th} may 2022 – 31^{st} May 2023).

- Extramural: 0
- Intramural: 0
- PI/ Co-PI/ Mentor: 2 (Ph.D. student); 5
- (Trainee) Co-I: 2

Total number of publications during the period under report: 12

Cumulative Impact Factor of publications during the period under report:16

Name: Dr Anuj Kumar

Designation: Scientist C

Division: Molecular Biology Group

Main areas of work: Oral Cancer and Tobacco, Hepato-Cellular Carcinoma, Proteins and Structural Biology

Current projects (16^{th} may 2022 – 31^{st} May 2023).

- Extramural: 3
- Intramural: 2
- PI/ Co-PI/ Mentor: 2
- Co-I: 3

Total number of publications during the period under report: 4

Cumulative Impact Factor of publications during the period under report: 13.5

Name: Dr. Dinesh Kumar, PhD

Designation: Scientist C

Division: Molecular Biology Group

Main areas of work: Drug resistance in cancer cells and Therapeutic use of Regenerative Medicine

Current projects (16th may 2022 – 31st May 2023). **01**

- Extramural: 00
- Intramural: 01
- PI/ Co-PI/ Mentor: 01
- Co-I: 00

Total number of publications during the period under report: 01

Name: Dr Kakoli Borkotoky

Designation: Scientist-C

Division:

Main areas of work: Non-Communicable Disease, Nutrition and child health, Water Sanitation and Hygiene (WASH), monitoring and evaluation of public health programs

Current projects (16th may 2022 – 31st May 2023): NIL

- Extramural: NIL
- Intramural: NIL
- PI/ Co-PI/ Mentor: NIL
- Co-I: NIL

Total number of publications during the period under report: NIL

Name: Dr. Sandeep Kumar

Designation: Scientist B

Division: Molecular Diagnostics, Molecular Biology Division

Main areas of work: Cancer functional genomics and epigenomics, exploring liquid biopsy based non-invasive ways for early and precision cancer detection.

Current projects (16th may 2022 – 31st May 2023): 2

- Extramural:
- Intramural:1
- **PI**/ Co-PI/ Mentor: 1
- Co-I: 1

Total number of publications during the period under report: Nil

Name: Dr. Sudhir Tanwar

Designation: Scientist B

Division: Division of Preventive Oncology and Population Health

Main areas of work: Tobacco Cessation, Oral Cancer Screening and capacity building

Current projects (16th may 2022 – 31st May 2023): 3

- Extramural: NIL
- PI: Intramural: 02
- Co-I: Intramural: 01

Total number of publications during the period under report: NIL

DIVISIONS AT A GLANCE

DIVISION OF CLINICAL ONCOLOGY

Front Row (L to R): Mr. Bhupal Ram Arya, Ms. Amita, , Dr. Neeta Sawhney, Dr. Shalini Singh (Head of the Division), Dr. Ekta Gupta, Dr. Jigisha Choudhary, Ms. Reena Dwivedi
Back Row (L to R): Ms. Kulvinder Kaur, Dr. Rubby Raina, Ms. Sarita, Mr. Sunil, Mr. Ravi Kumar

DIVISION OF PREVENTIVE ONCOLOGY & POPULATION HEALTH

Left to Right: Sanchita, Mahesh Kumar, Chandresh Pragya Verma, Dr. Shalini Singh (Head of the Division), Dr. Prashant Kumar Singh, Dr. Sudhir Tanwar, Santosh Srivastava,

DIVISION OF CYTOPATHOLOGY

Front (L-->R): Dr. Shamsuz Zaman, Dr. Sanjay Gupta (Divisional Coordinator) , Dr. Ruchika Gupta, Mrs. Kalpana Verma, Ms. Shivani Bansal.
Back (L-->R): Mr. Gaurav Sharma , Mr. Anil Verma, Mr. Jitender , Mr. Rajpal Suman.

DIVISION OF EPIDEMIOLOGY & BIOSTATISTICS

Front (L to R): Sanjay Yadav, Swati Jain, Rajshri, Dr Shalini Singh, Dr. Smita Asthana (Head of the Division), Rajani Yadav, Suhail Ahmed
Back (L to R): Satendra Singh Yadav, Dr. Raj Narain, Deepanshu Bhatia, Manoj Kumar

DIVISION OF BIOINFORMATICS

Left to Right: Gaurab Kumar Jha, Dr. Subhash Mohan Agrawal (Head of the Division), Agneesh Pritam Das, Yasmin Fatima

MOLECULAR BIOLOGY GROUP

Left to Right: Mr. Dilip Kumar Roy, Dr. Suresh Hedau, Dr. Sandeep Kumar, Dr. Showket Hussain, Dr. Pragya Sharma, Dr. Mausumi Bhardawaj (Head of the Division), Dr. Nazneen Arif, Dr. R. Suresh Kumar, Dr. Pramod Kumar, Dr. Dinesh Kumar, Dr. Anuj Kumar

MOLECULAR GENETICS & BIOCHEMISTRY LAB

Left to right: Dr. Mohd. Sajid, Dr. Vedvrat Verma, Dr. Upma Sharma, Dr. Pragya Sharma, Dr. Mausumi Bharadwaj, Miss Lata Joshi, Mrs. Heena Gautam and Mr. Dilip Kumar Roy

MOLECULAR GENETICS LAB

Left to Right Standing: Dr. Anita, Mayank Maheshwari, Dr. R Suresh Kumar (Lab Head), Dr. Nivedita Mishra

MOLECULAR ONCOLOGY LAB

Left to Right Standing: Chandan Govind, Pratibha Agnihotri, Dr. Soni Kumari, Dr. Suresh T. Hedau (Lab Head), Ram Krishan Sahu, Dr. Binayak Kumar, Arjun

CELLULAR & MOLECULAR DIAGNOSTICS LAB

Left to Right Standing: Shagufta, Mehreen Aftab, Sandeep Sisodiya, Dr. Showket Hussain (Lab Head), Jyoti Rani, Vishaka Kasherwal

NEXT GENERATION SEQUENCING LABORATORY

Left to Right Standing: Dr Sristy Shikha, Dr Pramod Kumar, Mr Mukesh Kumar, Mr Shreyansh Kumar

ICMR-NICPR STAFF

SCIENTIFIC STAFF

Sl. No.	Name	Designation
1	Dr. Shalini Singh	Director
2	Dr. Sanjay Gupta	Scientist –G
3	Dr. Mausumi Bharadwaj	Scientist –G
4	Ms. Rekha Saxena	Scientist –G
5	Dr. Smita Asthana	Scientist –F (w.e.f. 01.09.2022)
6	Dr. Subhash M. Agarwal	Scientist –F (w.e.f. 01.09.2022)
7	Dr. R. Suresh Kumar	Scientist –E
8	Dr. Suresh T. Hedau	Scientist –E
9	Dr. Roopa Hariprasad	Scientist –E (On study leave)
10	Dr. Ekta Gupta	Scientist –E
11	Dr. Kavitha Dhanasekaran	Scientist–E (w.e.f. 01.09.2022)
12	Dr. Prashant Kumar Singh	Scientist–E (w.e.f. 01.09.2022)
13	Dr. Showket Hussain	Scientist–E (w.e.f. 01.09.2022)
14	Dr. Raj Narain	Scientist–D
15	Dr. Ruchika Gupta	Scientist–D
16	Dr. Shamsuz Zaman	Scientist–D
17	Dr. Nazneen Arif	Scientist–D
18	Dr. Malasha Kumari	Scientist–C
19	Dr. Pramod Kumar	Scientist–C
20	Dr. Anuj Kumar	Scientist–C
21	Dr. Dinesh Kumar	Scientist–C
22	Dr. C. P. Yadav	Scientist–C (Transferred from NIMR & joined on 01.12.22 at NICPR, Noida)
23	Dr. Kakoli Borkotoky	Scientist–C **Joined on 09.02.2023**
24	Dr. Sandeep Kumar	Scientist–B
25	Dr. Sudhir Tanwar	Scientist–B

TECHNICAL STAFF

Sl. No.	Name	Designation
1	Smt. Latha Sriram	Principal Technical Officer & Administrative Officer-in-Charge
2	Smt. Rajshri	Technical Officer-C
3	Mr. Shailendra Kumar	Sr. Technical Officer (2)
4	Dr. Pragya Sharma	Technical Officer-C
5	Mrs. Amita	Technical Officer-B
6	Mrs. Chandresh P. Verma	Technical Officer-B
7	Mrs. Reena Diwedi	Technical Officer-B
8	Mr. Himanshu Rohilla	Technical Officer-B
9	Mrs. Kalpana Verma	Technical Officer-A
10	Mr. Dharmender Kumar Sharma	Technician-1
11	Mr. Mritunjay Kumar	Technician-1
12	Mr. Rajpal Suman	Technician -1 Joined on 20.03.2023 transferred from NJIL&OMD Agra
13	Mr. D.K.Roy	MTS (LT)
14	Mr. Anil Kumar Verma	Lab. Assistant
15	Mr. Jitender Singh	Lab.Attendant-1
16	Mr. Sandeep Sharma	Lab. Attendant-1
17	Mr. Bhupal Ram Arya	Field Worker
18	Mr. Gaurav Sharma	Lab. Attendant-1

ADMINISTRATIVE STAFF

Sl. No.	Name	Designation
1	Mr. Jaibir Singh Mr. Krishanadittan	Sr AO - On Additional Charge AO (Jr) - On Additional Charge
2	Mr. Pramod Kumar	Sr. Accounts Officer
3	Mr. Sanjeev Kumar	Sr. Private Secretary & Accounts Officer-in-Charge
4	Mr. Rajveer Singh	Section Officer
5	Mr. Sanjay Kumar Gupta	Section Officer
6	Mrs. Krishna Magoo	Personal Assistant
7	Mr. Monu Sharma	Assistant
8	Mr. Vijay	Assistant
9	Mr. Sant Ram	Assistant
9	Ms. Jyoti	Assistant Joined on 23.05.2023
10	Mr. Avinash Malhotra	UDC
11	Mr. Naveen Kumar	UDC
12	Mr. Paras	UDC
14	Ms. Neha Kaushik	UDC
15	Mr. Vikas Kumar	UDC
16	Mr. Kailash Kumawat	Staff Car Driver (Ordinary Grade)
17	Mr. Tarachand Gurjar	Staff Car Driver (Ordinary Grade)
18	Mr. Dheeraj Rajaura	Staff Car Driver (Ordinary Grade)
19	Mrs. Anoop Devi	MTS (Gen.)
20	Mr. Jai Prakash	MTS (Gen)
21	Mr. Sandeep Singh	MTS (Gen) (DOJ-Compassionate Ground 14.10.22 (A.N.))

SUPERANNUATED TECHNICAL STAFF

Mr. Ramesh Kumar, UDC—November, 2022

Mr. Bhopal Singh, Technician-C – January, 2023

Mr. Danial Das, Lab. Assistant – April, 2023.

RESIGNED SCIENTIFIC STAFF

Dr. Rakesh Meena, Scientist-B – September 2022.

VRS TAKEN BY TECHNICAL STAFF

Mr. Deep Kumar, Sr. Technician (3) – February, 2023

STAFF TRANSFERRED OUT OF NICPR

Mr. Kishore Kumar, Accounts Officer—August, 2022

Mr. Neeraj Dubey, Technical Assistant – February, 2023

Mr. Yogesh Kumar, Administrative Officer – April, 2023

LIST OF SAC MEMBERS

Prof. (Dr.) Sanjiv Kumar, Chairperson Founder Chairperson and Managing Trustee (Three Domain Leadership Foundation), Adjunct Professor, INCLEN Institute of Global Health, New Delhi
Dr R Sankarnarayanan Advisor, Reserch Trinagle International 43, Padma Nabha Nagar, Airport Road, Coimbatore - 641014
Dr. Shantanu Sengupta Senior Principal Scientist, Institute of Genomics and Integrative Biology, New Delhi
Prof. Rashmi Bagga Professor, Obstetrics & Gynaecology, PGIMER Chandigarh
Dr. D. N. Sinha Director, School of Preventive Oncology, Patna
Dr. Sonu Subba Professor and Head, Department of Community Medicine, AIIMS Bhubaneshwar
Dr. Neelam Sood Consultant Pathologist and HOD, Department of Pathology, DDU Hospital, New Delhi
Dr. Debasisa Mohanty Staff Scientist-VII, National Institute of Immunology, New Delhi
Dr. R S Dhaliwal Scientist- G and Head, NCD , Indian Council of Medical Research, Ansari Nagar, New Delhi-110 029.
Member Secretary **Dr. Shalini Singh** Director ICMR-NICPR, I-7, Sector 39, NOIDA.

ICMR – NATIONAL INSTITUTE OF CANCER PREVENTION AND RESEARCH

Ministry of Health & Family Welfare, Government of India

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