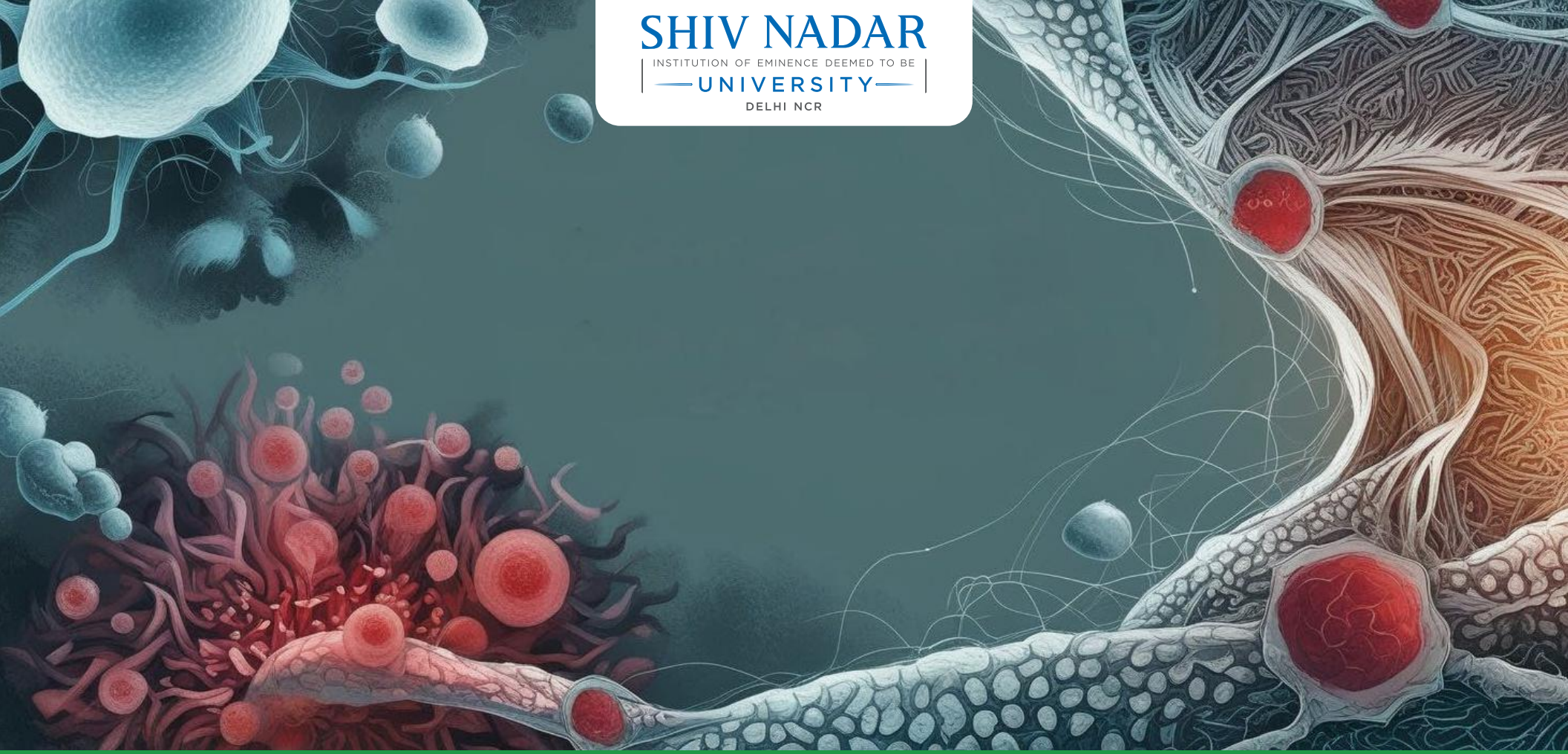
SHIV NADAR
INSTITUTION OF EMINENCE DEEMED TO BE
UNIVERSITY
DELHI NCR



SUSTAINABLE DEVELOPMENT GOAL 3

Good Health and Well-Being

Ensuring healthy lives and promoting well-being at all ages is essential to sustainable development.

Overview

Sustainable Development Goal 3 has 13 targets and 28 indicators and aims to achieve universal health coverage while ensuring healthy lives and promoting well-being at all ages. Universities have a significant role in addressing specific health conditions and promoting societal well-being.

At Shiv Nadar University, we do not have medicine as a program; however, the School of Natural Sciences excels in cutting-edge research and partnerships across themes that push the frontiers of knowledge to achieve research excellence across diverse disciplines, such as virology, neurobiology, protein structural biology, Medicinal Chemistry, and Biotechnology, to name a few. The research is enabled by state-of-the-art laboratories and computational facilities established in the school.

We contribute to SDG 3 through teaching, research, institutional practices, and partnerships.
Here is a glimpse of some of our work.

Teaching and Learning

The University offers many undergraduate courses at the Department of Life Sciences, such as Immunology (BIO 207) and Biology of Infectious Diseases (BIO 306), which deliver on the history of infectious diseases, concepts of disease dynamics, parasite diversity, evolution & ecology of infectious diseases besides emergence of diseases. Recombinant DNA Technology (BIO 307), Drug Design & Drug Development (BIO 308), Cancer Biology (BIO 309), Biology of Infectious Diseases (BIO 310), Host-Pathogen Interaction (BIO 314), Epigenetics (BIO 323), Neuroscience and Cognition (BIO 332) to name a few. The Department of Chemistry offers a course in Informatics and Drug Discovery (CHY 522), which explores the field of Bioinformatics and Cheminformatics to find new drugs with specific physiological effects.

Research

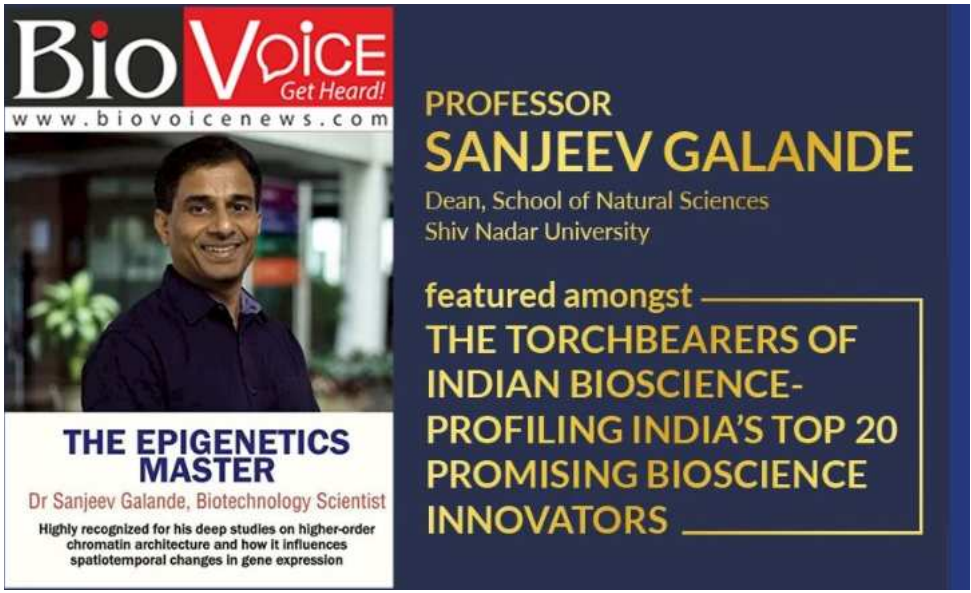
Center for Integrative and Translational Research ("CITRES")

We have set up a state-of-the-art facility - the Centre for Integrative and Translational Research (CITRES). The facility is equipped to import, maintain, serve as a repository, and generate in-house transgenic/knock-out mice, rats, and zebrafish. Serving as a National Facility, the center will offer exceptional benefits to the scientific community in India and beyond. It will accelerate the transition of basic science discoveries efficiently into practice, especially those that directly benefit human health. The CITRES will address a major national need by encouraging and promoting multidisciplinary collaboration among laboratory and clinical researchers, incorporating the needs of the public, with local communities being engaged to determine their needs for health innovation, and identifying and supporting the adoption of best medical and health practices.

The Epigenetics Master

Prof. Sanjeev Galande, Dean of the School of Natural Sciences at Shiv Nadar Institution of Eminence, is conferred with the title 'The Epigenetics Master' for his comprehensive studies on higher-order chromatin architecture and its influences. The title was conferred by BioVoice, an independent media outlet providing the latest Indian bioscience sector news.

The research in Galande Lab includes research areas such as Molecular Systems Immunology, Embryonic development, Regeneration Biology, Neuroepigenetics, and Cancer Biology.



Exploiting the fitness cost of transforming growth factor-b signaling pathway dependency of chemotherapy-resistant, senescent triple-negative breast cancer cells: An evolution-guided therapeutic approach.

Dr. Anindita Chakrabarty, Associate Professor, Department of Life Sciences, is working on a SERB-CRG-funded project of INR 5,903,786.

The project explores the possibilities of targeting a specific cell-to-cell communication pathway, known as the transforming growth factor-b signaling, in a systematic manner to prevent the evolution of drug-resistant tumors. If successful, such a strategy can have an important impact on the overall quality of life and clinical outcomes of patients with triple-negative breast cancer.

This project explains the phenomenon of adaptive resistance. It follows the core principles of Darwinian evolution - just as antibiotics and antivirals, anticancer drugs also often lose their efficacies due to the gradual emergence of resistance. Breast cancer, being the most prevalent cancer in women worldwide, is responsible for a significant number of mortalities due to the development of drug resistance. Patients with triple-negative breast cancer are at the highest risk of death within five years of diagnosis due to treatment failure.

MRI tractographic validation of drug-enhanced hepatic clearance of amyloid-beta and the therapeutic potential for Alzheimer's Disease: A pilot study

Alzheimer's disease (AD) may require alternative therapeutic perspectives as current interventions may sometimes be sub-optimal. Amyloid-beta 42 (Aβ42) is mainly eliminated by hepatic clearance, which diminishes in AD. Hence hepatomodulatory drugs enhancing this clearance may have the potential for therapeutic implications. This project clinically substantiates systems-biology investigation on repurposed hepatomodulating drugs (metformin, cilostazol, and rifampicin), which enhance brain insoluble Aβ42 clearance through the liver-bile-feces route.

The MRI-tractographic analysis formulated a three-segmental basis of brain Aβ42 spread: fronto-thalamic region (segment-1), temporo-occipital region (segment-2), and dorso-cingulate region (segment-3). This segmental pattern is histopathologically corroborated by Braak's stages A, B, and C. Observations showed that three pharmaceuticals acted on those three segmental regions differently. Analyzing MRI and DTI images of 15 healthy controls (CDR: 0; MMSE: 24–20) and 15 AD patients (CDR: 0.5–1.0; MMSE: 20–26), it was found that, tractographically, there is a significant reduction in neuronal integrity in the three regions above in untreated AD compared to controls.

Bhattacharjee, Anindita, and Prasun K. Roy. "MRI tractographic validation of drug-enhanced hepatic clearance of amyloid-beta and the therapeutic potential for Alzheimer's Disease: A pilot study." Brain Disorders 13 (2024): 100112.

Alleviating Help-Seeking Stigma Among Depressed College Students Through Shadow Social Marketing: A Meso-Level Intervention to a Wicked Problem

This study addresses the issue of societal stigma attached to mental health issues of college students, which strongly suppresses their attempts at help-seeking. The study designs a meso-level midstream intervention to effect a behavior change in mentally depressed students, who, due to internalized societal stigma attached to mental health issues, strongly evade help-seeking. The study explores addressing a complex problem that does not have a direct, clear-cut solution at either the micro or the macro level. Hence, it investigates whether an SSM meso-intervention performs better than micro-interventions in alleviating the social stigma attached to mental health issues.

Result: The study hypothesis that stigmatized individuals are more likely to avail of wellbeing-related services offered by a platform based on an SSM meso-intervention rather than by one that does not adopt such a strategy is empirically supported strongly. Hence, a meso-level intervention is an essential prerequisite to bring about macro-level changes to address the stigma attached to mental health issues. Consequently, changes in social norms at the community level have a strong potential for bringing about societal macro-level changes with modifications and enhancements of institutional norms and eventual micro-level help-seeking behavior.

Goswami, Paromita, and Jaideep Ghosh. "Alleviating Help-Seeking Stigma Among Depressed College Students Through Shadow Social Marketing: A Meso-Level Intervention to a Wicked Problem." *Social Marketing Quarterly (2024)*: 15245004231225457.

Interaction between spatial perception and temporal perception enables preservation of cause-effect relationship: Visual psychophysics and neuronal dynamics.

Visual perception of moving objects is integral to our day-to-day life, integrating visual-spatial and temporal perception. Most research studies have focused on finding the brain regions activated during motion perception. However, an empirically validated general mathematical model is required to understand the modulation of motion perception. The study develops a mathematical formulation of the modulation of the perception of a moving object due to a change in speed under the formulation of the invariance of causality.

The study analysis is the first likely significant study that establishes a mathematical linkage between motion perception and causality invariance.

Purohit, Pratik, and Prasun K. Roy. "Interaction between spatial perception and temporal perception enables preservation of cause-effect relationship: Visual psychophysics and neuronal dynamics." Mathematical Biosciences and Engineering 20, no. 5 (2023): 9101-9134.

Nutrinest: Extending A New Sustainable Product Line

The School of Management and Entrepreneurship (SME) publishes many case studies addressing the broad theme of Sustainability: ESG and SDG collection within Ivey Publishing Canada.
One case study is titled: *https://www.iveypublishing.ca/s/product/nutrinest-extending-a-new-sustainable-product-line/01tOF000001d1TVYAY*

NutriNest, founded by Le Danh Hoang, was the first company to introduce farmed bird's nest products in Vietnam. In January 2018, the company launched a sustainable product line under a new brand called the Green Bird. The Green Bird product line was positioned to meet consumers' sustainability and health concerns and quickly became the company's best-selling product. To continue to grow NutriNest, Hoang was facing a crucial decision. Should he focus on the current portfolio of the Green Bird line or add new products? If he chooses to introduce new products, how should he ensure that these products will attract new segments of customers and increase sales? Addressing SDG 3 and 12, the case study can also be used in a sustainable management/ sustainable marketing course to teach product management, helping students understand business dilemmas in introducing new sustainable products and how to create differentiation.

Dr. Sundar Venkatesh

Dr. Nguyen Quynh Phuong

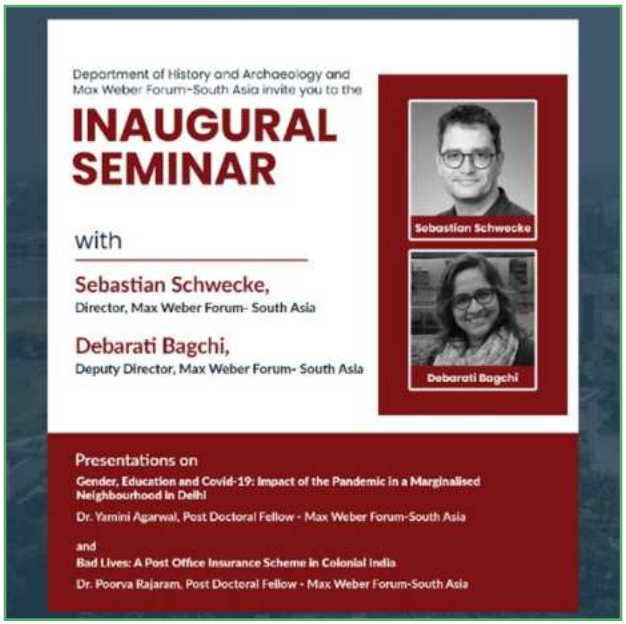
Dr. Bikramjit Rishi

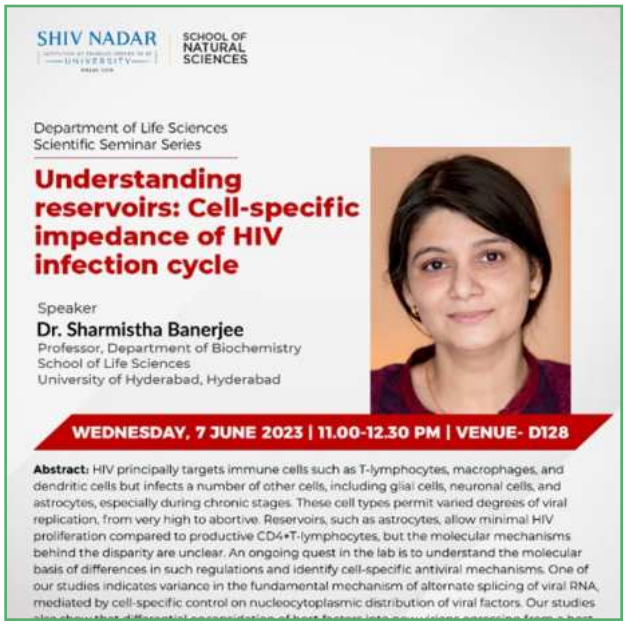
The Case Authors are faculty from the School of Management and Entrepreneurship, Dr. Nguyen Quynh Phuong, Dr. Bikramjit Rishi, and Dr. Sundar Venkatesh.

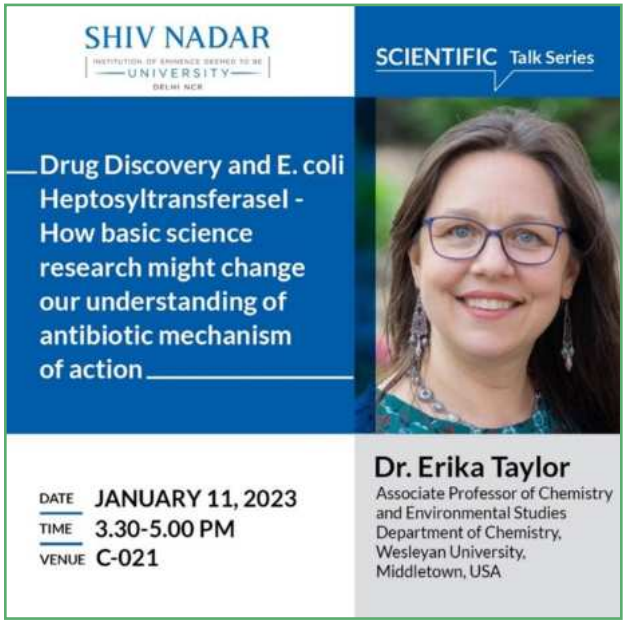
Conversations on Campus

3-day Genomics India Conference 2024 (GIC2024) held at Shiv Nadar University, Delhi NCR

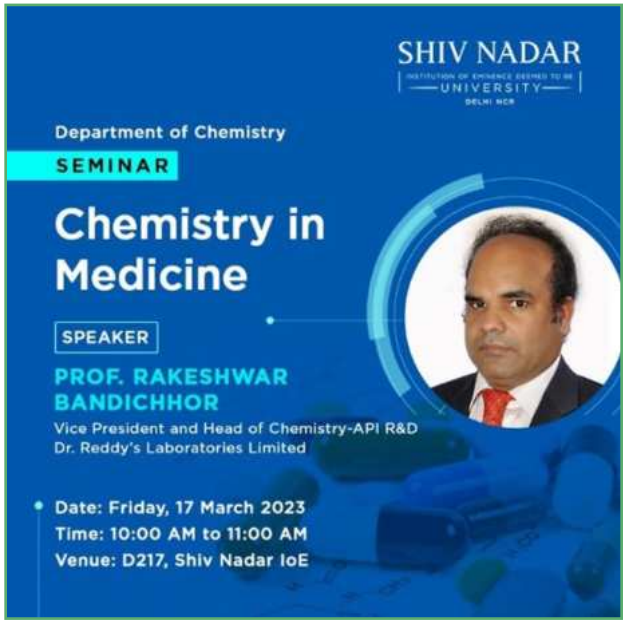
The Genomics India Conference 2024 was held from February 1-3, 2024. Fourth, in the Genomics India series, the conference theme focused on 'Harnessing Genomics for A Sustainable Future.' It featured cutting-edge research into the latest advances in genetic technologies, focusing on sharing path-breaking findings. Dedicated to showcasing the latest research, technologies, breakthroughs, challenges, and strategies in genomics, the conference was attended by Dr. Rajesh Gokhale, Secretary of the Department of Biotechnology, Government of India, and over 500 leaders in genomics from the USA, UK, Europe, and the Asia Pacific region.

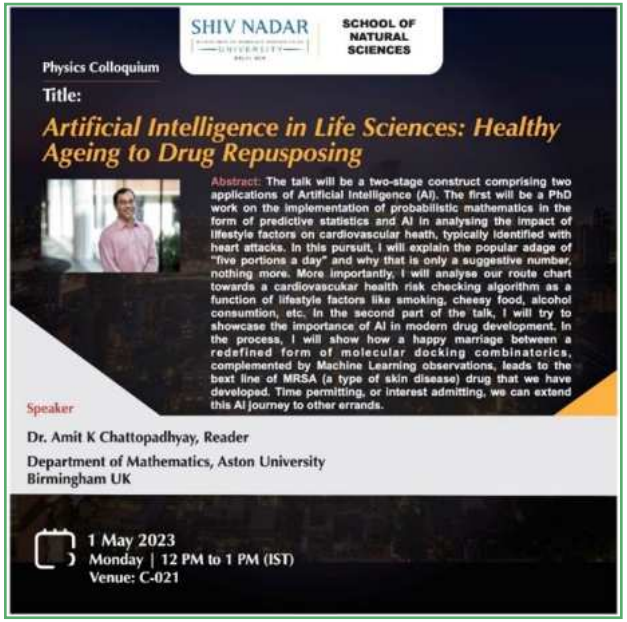


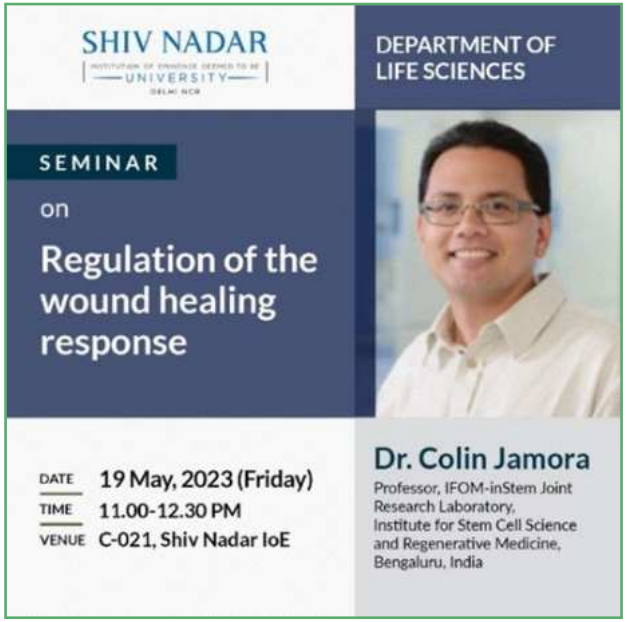


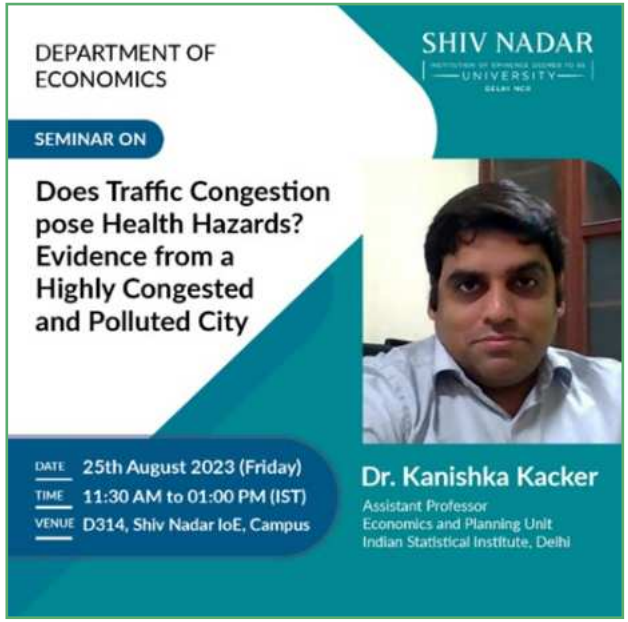

SHIV NADAR
UNIVERSITY
DELHI NCR
SCIENTIFIC Talk Series
Drug Discovery and E. coli Heptosyltransferasel - How basic science research might change our understanding of antibiotic mechanism of action
DATE JANUARY 11, 2023
TIME 3.30-5.00 PM
VENUE C-021
Dr. Erika Taylor
Associate Professor of Chemistry and Environmental Studies
Department of Chemistry,
Wesleyan University,
Middletown, USA


SHIV NADAR
UNIVERSITY
DELHI NCR
DEPARTMENT OF ECONOMICS
VIRTUAL TALK
on
Family planning practices: Examining the link between contraceptives and child health
DATE 8th February 2023
TIME 03:00 - 04:30 PM (IST)
Joining Link: bit.ly/3wZ3adm
Dr. Manini Ojha
Associate Professor
O. P. Jindal Global University


SHIV NADAR
UNIVERSITY
DELHI NCR
Department of Chemistry
SEMINAR
Chemistry in Medicine
SPEAKER
PROF. RAKESHWAR BANDICHHOR
Vice President and Head of Chemistry-API R&D
Dr. Reddy's Laboratories Limited
Date: Friday, 17 March 2023
Time: 10:00 AM to 11:00 AM
Venue: D217, Shiv Nadar IoE


SHIV NADAR
SCHOOL OF NATURAL SCIENCES
Physics Colloquium
Title:
Artificial Intelligence in Life Sciences: Healthy Ageing to Drug Repusposing
Abstract: The talk will be a two-stage construct comprising two applications of Artificial Intelligence (AI). The first will be a PhD work on the implementation of probabilistic mathematics in the form of predictive statistics and AI in analysing the impact of lifestyle factors on cardiovascular heath, typically identified with heart attacks. In this pursuit, I will explain the popular adage of "five portions a day" and why that is only a suggestive number, nothing more. More importantly, I will analyse our route chart towards a cardiovascukar health risk checking algorithm as a function of lifestyle factors like smoking, cheesy food, alcohol consumtion, etc. In the second part of the talk, I will try to showcase the importance of AI in modern drug development. In the process, I will show how a happy marriage between a redefined form of molecular docking combinatorics, complemented by Machine Learning observations, leads to the bext line of MRSA (a type of skin disease) drug that we have developed. Time permitting, or interest admitting, we can extend this AI journey to other errands.
Speaker
Dr. Amit K Chattopadhyay, Reader
Department of Mathematics, Aston University
Birmingham UK
1 May 2023
Monday | 12 PM to 1 PM (IST)
Venue: C-021


SHIV NADAR
UNIVERSITY
DELHI NCR
DEPARTMENT OF LIFE SCIENCES
SEMINAR
on
Regulation of the wound healing response
DATE 19 May, 2023 (Friday)
TIME 11.00-12.30 PM
VENUE C-021, Shiv Nadar IoE
Dr. Colin Jamora
Professor, IFOM-inStem Joint Research Laboratory,
Institute for Stem Cell Science and Regenerative Medicine,
Bengaluru, India


DEPARTMENT OF ECONOMICS
SHIV NADAR
UNIVERSITY
DELHI NCR
SEMINAR ON
Does Traffic Congestion pose Health Hazards? Evidence from a Highly Congested and Polluted City
DATE 25th August 2023 (Friday)
TIME 11:30 AM to 01:00 PM (IST)
VENUE D314, Shiv Nadar IoE, Campus
Dr. Kanishka Kacker
Assistant Professor
Economics and Planning Unit
Indian Statistical Institute, Delhi

Institutional practices

At Shiv Nadar, we believe that health and well-being are absolutely essential to academic, professional, and personal success. We have put in place essential health and support services. Deliver regular workshops to train students and staff. And provide the necessary education and training for our contractual support staff.

Health and Wellness

The University has a health center with residential para-medic staff and visiting doctors. It provides physical and mental health support through a primary health care setup and an OPD. The center has general and emergency wards with necessary equipment, managed by professionally qualified and well-trained paramedic staff, 24x7 nursing staff & an ambulance. All members of the University can avail of services and book appointments through a well-defined process. A committed team of doctors (general physicians), counselors, dentists, physiotherapists, and visiting psychiatrists provides a safe, welcoming, and affirming environment for all students while supporting and enhancing all students' psychosocial well-being and development.

Medical insurance

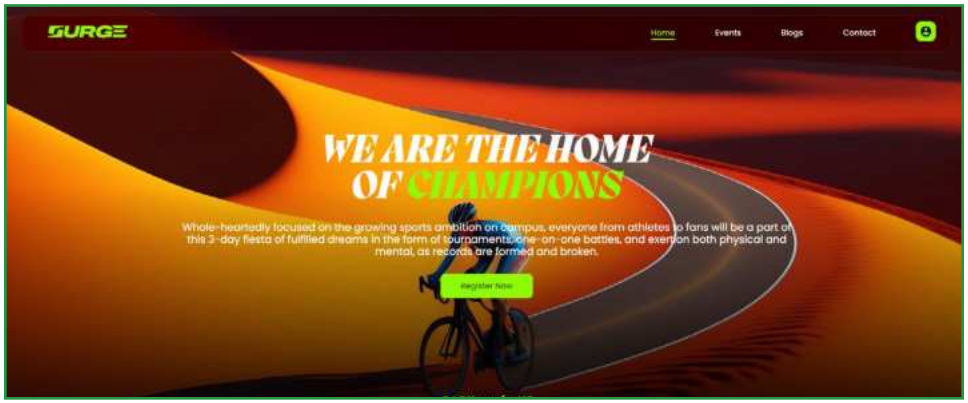
All students and staff are eligible to avail medical insurance policy covering medical issues requiring hospitalization beyond the on-campus services.

Indoor Sports Complex (ISC)

We have a uniquely designed, state-of-the-art Indoor Sports Complex (ISC). ISC has a fully equipped unisex fitness center (Gym) with high-end cardio machines, weight stations, strengthening equipment, and a 200-meter-long indoor running track. Regular yoga and meditation sessions are organized at the meditation and yoga hall. The University offers other indoor and outdoor sports facilities: horse riding, golf, cricket, basketball, badminton, tennis, football, billiards, etc.

The Department of Physical Education regularly hosts events

Over 2000+ participants, 55 institutions participated in the 2nd edition of Surge – flagship sports meet of Shiv Nadar University, Delhi NCR
The second edition of our flagship sports meet – Surge, saw 2000+ participants, 55+ institutions, and over 550 matches, making it the most awaited sporting event in the region.

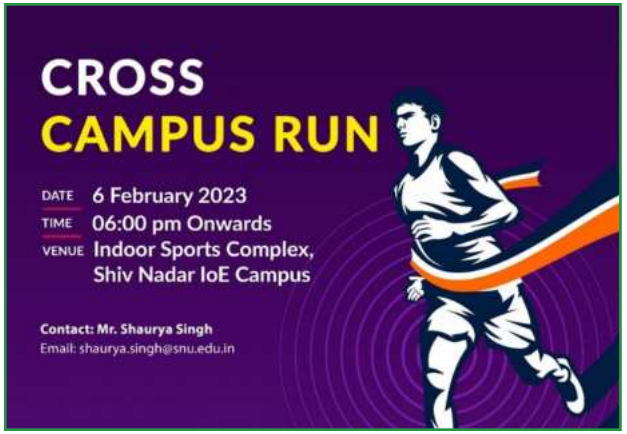


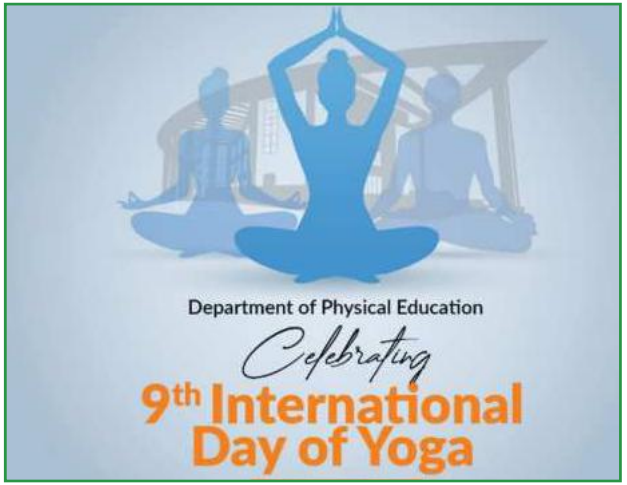
1200+ participants join the inaugural Shiv Nadar 10K Challenge 2023

The Shiv Nadar 10K Challenge 2023 was envisioned to improve Delhi-NCR's running and fitness culture and provide athletes a platform to shine and test their mettle. 1200+ participants, with 30% women, participated in the highly anticipated first edition of the Shiv Nadar 10K Challenge 2023. The event had three categories – 5K walk, 5K run, and 10 K run. The event was held on September 3, 2023, at the 286-acre biodiverse campus of Shiv Nadar University.

Fit India Week

'Fit India School Week' was conceived in 2019 with the imperative need to create awareness about fitness among children, parents, teachers, and school staff. Continuing with the enthusiasm of the schools and in pursuit of spreading the message of fitness among various segments of the population, this year, the Fit India Mission decided to expand the outreach of Fit India School Week to include colleges, universities, and higher education institutions. Therefore, the 5th edition of Fit India School Week was renamed 'Fit India Week' for schools and universities. In coordination with the University Grants Commission (UGC), in collaboration with the Sports Authority of India (SAI) and the Ministry of Youth Affairs and Sports, the Government of India, the university celebrated Fit India Week from November 15-21, 2023. During the week, Badminton, Basketball, and Football tournaments were organized for the students.





Zero tolerance policy

At Shiv Nadar, we observe zero tolerance for Procuring and, Possessing, Consumption and Aiding and Selling of any narcotic drug or psychotropic substances and have a set of rules and policies.

Health advisories and blood donation camp

The University organizes advisories on wellness and preventive measures, peer support groups, online awareness programs, and global mental wellness series. Regular blood donation camps are organized that allow many students, staff & faculties to donate blood.

Metanoia, a student club

Metanoia is a mental health awareness and wellness club that aims to create a safe space to discuss mental and physical health issues. The club invites experts and organizes many engaging seminars, workshops, and activities on themes such as mental health and emotional well-being, managing stress and building resilience, strategies for enhancing emotional Intelligence, and suicide prevention. The medical personnel on campus supervise the club activities.

Student support system

The Office of the Dean of Students (ODS) selects Family Groups to support first-year undergraduate students. A family head is selected from the senior classes to aid in a seamless and friendly transition during the initial settling phases of first-year students. These groups help students get support and guidance and facilitate them to access necessary information.

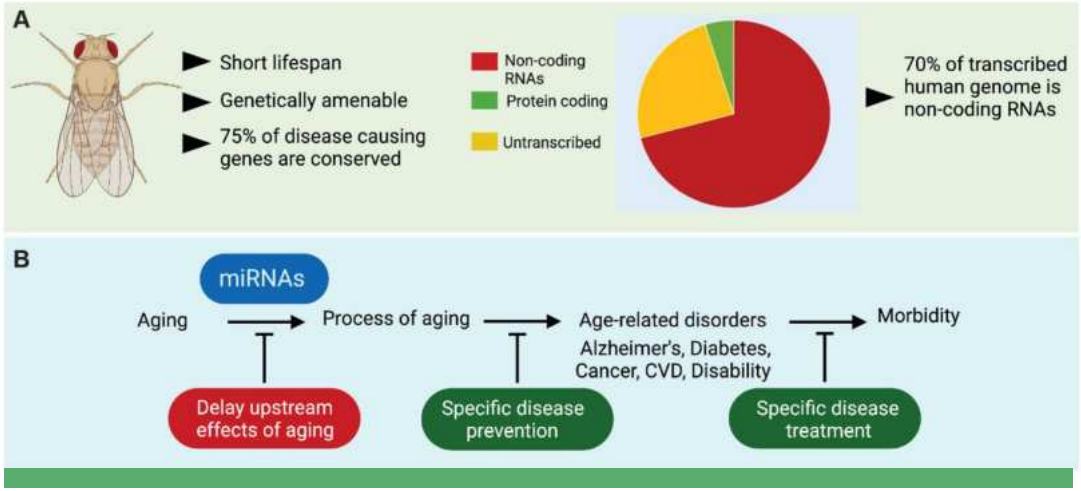
Other Initiatives

Training contractual support staff on sexual health and clean sanitation Regular workshops are conducted to train and educate our contractual support staff on sexual health and clean sanitation. Restrooms are provided with sanitary pads and safe disposal machines.

Partnerships

Post-transcriptional regulators of aging and dietary restriction – Collaboration with Kapahi lab at the Buck Institute for Research on Aging in California

Dr. Geetanjali Chawla, Associate Professor, Department of Life Sciences, is working on interesting research. Aging is characterized by a progressive accumulation of cellular damage and an increased risk of diseases. Dietary restriction (DR)-reduced nutrient intake without incurring malnutrition is a non-genetic intervention that extends lifespan and is associated with improved metabolic fitness. The beneficial effects of this nutritional intervention are conserved, indicating that the molecular mechanisms that underlie DR are evolutionarily conserved. Noncoding Ribonucleic acids (ncRNAs) are emerging as key regulators of gene expression and are being recognized as key modulators of aging and late-onset diseases. In contrast to the protein machinery that represents only ~2% of the transcribed genome, the expansion of the noncoding transcriptome in higher eukaryotes reflects greater regulation of cellular processes through control of protein function. The research program combines the genetically amenable fruit fly model with high throughput technologies such as RNAseq, proteomics, and metabolomics to identify and characterize the role of conserved miRNA-mediated networks that operate during aging and dietary restriction. This research program is directly relevant to the study of human age-associated diseases, as the inappropriate expression of miRNAs has been linked to several pathogenic states and molecules that alter the function or abundance of miRNAs emerging as potential therapeutic agents to treat diseases.



The project, in collaboration with the Kapahi lab at the Buck Institute for Research on Aging in California, aims to uncover the role of evolutionary conserved miRNAs in mediating DR-dependent lifespan extension (Pandey et al., 2021; Wilson et al., 2021). In a more recent collaborative study, the research has uncovered the role of a gene mustard *(mtd)* in *Drosophila*. Genetic variants in the human homolog of mtd, OXR1, are associated with DR-dependent longevity. Identifying the dietary and genetic factors that regulate mtd/OXR1 and demonstrate its necessity for the maintenance of the retromer, a heteropentameric complex of proteins necessary for recycling transmembrane proteins and lipids from endosomes to the trans-Golgi network or the cell membrane. This is further reiterated to show that mtd/OXR1 regulates a network of genes essential for protecting against brain aging and neurodegenerative diseases across flies and humans (Wilson et al., 2024).

Partnership to perform Clinical studies to assess the role of dietary interventions and RNA signatures

Dr. Geetanjali Chawla, Associate Professor, Department of Life Sciences is initiating has collaborated with the Central University of Kerala (CUK), Kerala, and the Saint John Research Institute (SJRI), Bengaluru, to perform clinical studies to assess the role of dietary interventions and RNA signatures in the context of two significant health and nutrition challenges faced by the Indian population i.e. Type 2 Diabetes mellitus and the Double Burden of Malnutrition (DBM). The DBM grant has been approved by DBT for 2023-26, and the Type 2 Diabetes mellitus will be supported by CSIR-ASPIRE for two years.

Dr. Geetanjali Chawla

Poverty, migration, and ITN are used to control malaria in SSA

Insecticide Treated Net (ITN) is the most effective control use for malaria in sub Saharan Africa. However, it is seen that poor people use the ITN for fishing and fencing to increase daily productivity instead of proper use.

Although ITNs have been widely distributed to malaria-endemic regions in the past, their success has been threatened by misuses (in fishing, agriculture, etc.) and decay in ITN efficacy. Decision-making in using the ITNs depends on multiple coevolving factors: malaria prevalence, mosquito density, ITN availability and efficacy, and other socio-economic determinants. While ITN misuse increases as the efficacy of ITNs declines, high efficacy impedes proper use due to free riding. This irrational usage leads to increased malaria prevalence, thereby worsening malaria control efforts. It also remains to be seen if the optimum ITN use for malaria elimination can be achieved under such an adaptive social learning process. Here, we incorporate evolutionary game theory into a disease transmission model to demonstrate these behavioral interactions and their impact on malaria prevalence. We show that social optimum usage is a function of transmission potential, ITN efficacy, and mosquito demography. Under specific parameter regimes, our model exhibits patterns of ITN usage similar to observed data from parts of Africa. Our study suggests that the provision of financial incentives as prompt feedback to improper ITN use can reduce misuse and contribute positively towards malaria elimination efforts in Africa and elsewhere.

Dr. Samit Bhattacharyya, Associate Professor, School of Natural Sciences, in partnership with the University of Heidelberg (Germany), is pursuing a Game-theoretic approach to modeling and estimating the impact of human migration behavior on malaria endemicity in Sub-Saharan Africa. (2022-2025)

Dr. Samit Bhattacharyya

Laxmi, Calistus N. Ngonghala, and Samit Bhattacharyya. “An evolutionary game model of individual choices and bed net use: elucidating key aspect in malaria elimination strategies.” *Royal Society Open Science* 9.11 (2022): 220685.

Inter-Departmental Partnership to Explore the Modulatory Role of Vms1 During Mitochondrial Proteotoxic Stress

Dr. Koyeli Mapa (PI), Associate Professor, School of Natural Sciences, and **Dr. Richa Priyadarshini** (Co-PI), Associate Professor, **Dr. Rajan Vyas,** Assistant Professor, School of Natural Sciences, have been awarded a grant from SERB-CRG, Government of India for three years Amount: INR 47,12,400.

This project aims to understand the role of a protein named Vms1 during protein-misfolding-induced stress in mitochondria, the cellular powerhouse. The ongoing work supported by this grant suggests that Vms1 plays an essential role in protecting mitochondria from protein-misfolding-induced stresses and protects the function of this important organelle. Knowledge generated from this project will set the stage for a new field of research in the area of mitochondrial stress response pathways. The role of Vms1 during mitochondrial proteotoxic stress is a nearly unexplored area of research, and this project may shed new light on the role of this protein in protecting mitochondria from stresses.


Dr. Koyeli Mapa


Dr. Richa Priyadarshini


Dr. Rajan Vyas

The Biopolitics of Global Health After Covid: New Frontier Grant, Cornell University - Shiv Nadar IoE - University of Salerno, 2023-25


Professor Yasmeen Arif

The New Frontiers Grants Program at Cornell University has awarded the project "The Biopolitics of Global Health After Covid" for 2023-25. **Yasmeen Arif,** Professor of Sociology/Social Anthropology, SHSS, is the partnership lead at the Shiv Nadar University with Prof. Timothy Campbell (PI), Italian Studies, Cornell University, USA, and Prof. Davide Tarizzo, Philosophy, at the University of Salerno, Italy. The project brings together sociologists, philosophers, and anthropologists from different parts of the world to discern the COVID-19 pandemic's effect on how global health is understood and practiced today. The collaborators will investigate how the pandemic changed perceptions of illness, health, science, and ethics and reconfigured relationalities between doctors and patients, institutions and subjects, among neighborhoods and communities, and in politics and governance. By situating part of the investigation in the Global South, the project challenges the Global North perspective that continues to dominate accounts of the pandemic and highlights the importance of local knowledge; advances research on biophilosophies and anthropology by creating a dialogue among the qualitative human sciences; elaborates frameworks able to renew perspectives on global health that rely less on exclusion and more on inclusion; and articulates a quest for a future in which institutions are better able to meet the challenges presented by the next pandemic.

Partnership to understand the mode of action of various experimental and approved anti-cancer drugs and natural products.

Dr. Anindita Chakrabarty, Associate Professor at the Department of Life Sciences, works on the mode of action of various experimental and approved anti-cancer drugs and natural products - to devise effective and less toxic therapeutic strategies for cancer patients.

A unique feature of this research is to tackle the problem of anticancer drug resistance in real-time, which will help prevent it early and save patients from unwanted toxicity and disease recurrence. By collaborating with electrical engineers, they are developing a technique for controlling unresectable cancers through high-voltage nanosecond electric pulses, also marketed as nanoknife in the USA. Dr. Chakraborty's team is also working to explore the possibilities of repurposing a few synthetic and naturally occurring anti-cancer agents as SARS-CoV-2 antivirals that may be significant in the use of nontoxic alternatives to the currently available antiviral paxlovid, marketed by Pfizer.

This is an ongoing research collaboration with Dr. F. Peter Guengerich, a world-renowned biochemist at the Vanderbilt University Medical Center, who helps in drug development, metabolism, and toxicity studies. Dr. Goutam Chowdhury, Assistant Professor and an expert in chemistry, biochemistry, and molecular toxicology, guides us in the areas of drug metabolism, toxicity, biochemistry, and analytical chemistry (LC-MS, LC-MS/MS, and NMR).

Next-generation membrane-active glycopeptide antibiotics that also inhibit bacterial cell division

Dr. Richa Priyadarshini, Associate Professor, Department of Life Sciences, in collaboration with Prof. Jayanta Haldar at the New Chemistry Unit and School of Advanced Materials, Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore, India, is researching the resistance to vancomycin, a life-saving drug against Gram-positive bacterial infections necessitates developing alternative therapeutics.

The team reports on vancomycin derivatives that assimilate mechanisms beyond D-Ala–D-Ala binding. The role of hydrophobicity towards the structure and function of the membrane-active vancomycin showed that alkyl-cationic substitutions favored broad-spectrum activity. The lead molecule, VanQAmC10, delocalized the cell division protein MinD in *Bacillus subtilis*, implying an impact on bacterial cell division. Further examination of wild-type, GFP-FtsZ, or GFP-FtsI producing- and *ΔamiAC* mutants of *Escherichia coli* revealed filamentous phenotypes and delocalization of the FtsI protein. The findings indicate that VanQAmC10 also inhibits bacterial cell division, a property previously unknown for glycopeptide antibiotics. The conjunction of multiple mechanisms contributes to its superior efficacy against metabolically active and inactive bacteria, wherein vancomycin is ineffective. Additionally, VanQAmC10 exhibits high efficacy against methicillin-resistant *Staphylococcus aureus* (MRSA) and *Acinetobacter baumannii in mouse models of infection.*

Sarkar, Paramita, Kathakali De, Malvika Modi, Geetika Dhanda, Richa Priyadarshini, Julia E. Bandow, and Jayanta Haldar. "Next-generation membrane-active glycopeptide antibiotics that also inhibit bacterial cell division." Chemical Science 14, no. 9 (2023): 2386-2398.

Community Initiatives Dadri Development Program (DDP)

Shiv Nadar University, in collaboration with the Shiv Nadar Foundation, conducts many community-focused programs focusing largely on education (school /community sports), healthcare, skilling and livelihood, agriculture, social safety (with a special emphasis on women), and nature conservation. This year, we launched two dedicated interventions across eight villages of Dadri. These were as follows:

Non-communicable Diseases (NCD) Awareness Campaigns: The Dadri Development Program (DDP) team, along with its onboarded NGOs, implemented community-based intervention for improving health outcomes in 8 villages of Dadri, Uttar Pradesh. Eighty awareness camps on non-communicable diseases (NCD) were organized in 8 intervention villages in Dadri, targeting prevalent NCDs like stroke, cancer, COPD, cardiac health, and diabetes. This initiative directly benefited 3,922 community members and had a broader impact on a population of over 26,000.

Health Chaupal: designed to raise awareness about six critical health conditions, namely women's health, diabetes, cardiac health and hypertension, orthopedics, dental issues, and eye care. The DDP team and NGO partners conducted 48 Health Chaupals, focusing on crucial healthcare areas such as diabetes, cardiac health, cancer, orthopedics, eye care, and dental care. These sessions, led by specialist doctors, attracted 3,811 community members. Diagnostic blood tests were carried out for 2,828 community members in the eight intervention village members in the eight intervention villages.

Public access to university sports facilities - Khelo Dadri

At Shiv Nadar, we provide sports facilities to train students from schools and host tournaments and championships. Training for specific sports is offered to students from VidyaGyan School, Bulandshahar.

Khelo Dadri is a university initiative to engage with the youth of its neighboring communities. The initiative promotes sporting events to help school children excel nationally and internationally. These students further participate in many state and zonal championships.

Emotional wellness sessions in collaboration with YourDOST

Understanding the importance of Emotional Wellness and mental health among students and staff, we organize interactive sessions on Emotional Wellness in collaboration with YourDOST, an Online Emotional Wellness platform. There are 800+ counselors on the platform offering to counsel in regional languages. This is a free-of-cost service for all Shiv Nadar IoE students, who can use the portal online and make an appointment with counselors for an online chat-based/ audio or video session.

In commemoration of World Mental Health Month in October 2023, the team, in partnership with YourDOST, orchestrated an exciting event to engage and educate the student community.

Faculty on Advisory Role with the Government, Not-for-Profit, or specialized body

1. **Dr. Anindita Chakrabarty, Associate Professor, Department of Life Sciences**
   Frontiers in Oncology: Associate editor.
   BMC Cancer: Associate editor.
   Frontiers in Endocrinology, Frontiers in Medicine: Guest Associate editor.

2. **Geetanjali Chawla, Associate Professor, Department of Life Sciences**
   Member of the Technical Evaluation Committee (TEC) on Women & Child Health and Nutrition-Department of Biotechnology.

Shiv Nadar Institution of Eminence is fully committed to the UN Sustainable Development Goals (SDGs). We have embraced a four-pronged strategy for SDGs through **teaching, research, our core institutional practices, and partnerships.**

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