

# CENTRE FOR INNOVATION IN INFECTIOUS DISEASE RESEARCH, EDUCATION, AND TRAINING (CIIDRET)

## Annual Report 2021-22

### Major Activities and Achievements

Centre for Innovation in Infectious Disease Research, Education, and Training (CIIDRET) was established under the ordinance XV-A of the University of Delhi in October 2015. In the six years since inception, as per its mandate, CIIDRET has carried out path-breaking Innovation-driven translational research in Infectious diseases for improved human health. This has included development of novel therapeutic antibodies for COVID-19, innovative diagnostics for tuberculosis and chikungunya. Besides this, CIIDRET has been carrying out outreach activities involving interaction with college students of science stream to inspire them to take up research as their career. CIIDRET has organized Public Lectures by international and national scientists who are leaders in their field in different research areas. CIIDRET also encourages Industry-Academia Interaction through 'Entrepreneurship Guest Public Lecture Series', wherein Entrepreneurs and the facilitators of Innovation have given lectures. CIIDRET provides state-of-the-art Proteomic and Genomic analytical services along with expert advice to scientists, and offers consultancy to the Biotech Industry. CIIDRET organizes Hands-on training courses covering different aspects of Genomics and Proteomics in collaboration with Industry Experts under the scheme 'Continuing Education and Skill Enhancement for Innovation in Biotechnology (CIIDRET-CESEIB). These courses are attended by college students, graduate students, research scholars, scientists and teachers from colleges and universities.

Professor Vijay Chaudhary is the Founder Director of CIIDRET and following his superannuation, is continuing his association and work at CIIDRET as NASI Platinum Jubilee Senior Scientist.

Professor Yogendra Singh, Department of Zoology, Delhi University who has been a member of CIIDRET since its inception, took over as Director in September 2020 and continued till March 2022.

Professor Amita Gupta, a founding core member of CIIDRET, is the current Director.

### Honors/Distinctions

Dr. Vijay Chaudhary is

- NASI Platinum Jubilee Senior Scientist at CIIDRET.
- Member of Governing Council for Institution of Eminence of DU (DU-IOE), University of Delhi
- Director (Hon.), Delhi School for Skill Enhancement & Entrepreneurship Development (DSSEED), University of Delhi
- Adjunct Professor at Regional Centre for Biotechnology (RCB), Faridabad.
- Member of IP & Tech. Management Advisory Committee-BIRAC.
- Mentor, Nexus @ American Center, New Delhi. (<https://startupnexus.net/mentors>).

During 2021-22, Dr. Vijay Chaudhary has been

- Co-Chairman of the DBT Task Force on "Infectious Disease Biology."
- Co-Chairman of the DBT NER Technical Expert Committee (TEC) Medical Biotechnology-II.
- Member of Scientific & Technical Appraisal & Advisory Group (STAG), Medical Biotechnology, DBT.
- Member of Scientific & Technical Appraisal & Advisory Group Medical Biotechnology, DBT NER.
- Member, DBT Expert Group on Technology Transfer Organization (TTO).

Prof. Amita Gupta is

- University representative in Governing Body of Rajdhani College of Delhi University
- Vice President of the Society for Bacteriophage Research and Therapy (SBRT).

### Awards

Dr. Amita Gupta has been awarded Elizabeth Martin Kutter Young Scientist Award in July 2021 by the Society for Bacteriophage Research and Therapy for contributions in the field of bacteriophage research.

### Research Projects (New/Ongoing)

Department of Biotechnology- has funded project in July 2021 on “Understanding the Role of Ser/Thr Protein Kinases in the regulation of Toxin-Antitoxin Loci in Mycobacterium tuberculosis for a total cost of Rs. 1.23 crores for three years.

Title of the Project	Funding Agency	Amount (Rs. In lacs)	Duration
Understanding the Role of Ser/Thr Protein Kinases in the regulation of Toxin-Antitoxin Loci in Mycobacterium tuberculosis (with SVC as collaborator)	DBT	123	7/2021-7/2024
Therapeutic Antibodies for COVID-19 (with Gennova Biopharmaceuticals Ltd. As collaborator)	DBT-BIRAC	1650	12/2020-8/2023
Centre of Excellence entitled “Antibody Technology: Research for therapeutic and diagnostic application	DBT	608	12/2017-12/2022
DBT-supported Genomic Facility at University of Delhi South Campus	DBT	247	2/2018-2/2022
Identification of mycobacterial proteins and novel antigenic epitopes having immunodiagnostic potential and development of reagents for point of care test for tuberculosis (with NITRD as collaborator)	DBT	82	2/2018-8/2022

### Publications/ Patents / provisional patents / technology transfers

#### Publications:

- Arun Sharma, Kalpana Sagar, Neeraj Chauhan, Balaji Venkataraman, Nidhi Gupta, Tannu Priya Gosain, Nikhil Bhalla, Ramandeep Singh and Gupta, A. (2021) HlgB1 Toxin in Mycobacterium tuberculosis is upregulated during stress and required to establish infection in Guinea pigs. **Frontiers in Microbiology** 12:748890 (doi: 10.3389/fmicb.2021.748890).
- Koh, C.Y., Koh CY, Shih N, Yip CYC, Li AWL, Chen W, Amran FS, Leong EJE, Iyer JK, Croft G, Mazlan MIB, Chee YL, Yap ES, Monroe DM, Hoffman M, Becker RC, de Kleijn DPV, Verma V, Gupta A, Chaudhary VK, Richards AM, Kini RM, Chan MY. (2021) Efficacy and safety of next-generation tick transcriptome-derived direct thrombin inhibitors. **Nature Communications** 12(1):6912. doi: 10.1038/s41467-021-27275-8.

#### Book Chapters:

- Shahanshah, FH., Sehrawat, H., Wijewardana, C., Pal, S., Gupta, A., Diwan, P., Gupta, S., and Gupta, V. Recent Advances in Chikungunya Virus Therapeutics: An Overview. Chapter in book entitled "

Chikungunya: Epidemiology, Transmission and Therapeutics" published by Nova Science Publishers, Inc. (USA). 2021. Page: 83- 109. ISBN: 978-1-53619-978-9.

- Sehrawat, H., Shahanshah, FH., Wijewardana, C., Pal, S., Chaudhary VK., Gupta, S., and Gupta, V. Recent Progress on Immunotherapy and Immunoprophylaxis of Chikungunya Virus. Chapter in book entitled "Chikungunya: Epidemiology, Transmission and Therapeutics" published by Nova Science Publishers, Inc. (USA). 2021. Page: 57- 82. ISBN: 978-1-53619-978-9.

#### **Patents granted/ published:**

- An antibody fragment library, and uses thereof; EP application number - 18882787.7, Filed on 29/06/2020
- An antibody fragment library, and uses thereof; US patent application number -16/768,116, Filed on - 29/05/2020

#### **Presentation in Conferences**

- Prof. Vijay K. Chaudhary delivered Lecture “Phage-Displayed Recombinant Antibodies- A Disruptive Technologies for Novel Therapeutic Molecules”, International Conference “Biotechnological Interventions to Overcome the Challenges of Covid/Post-Covid Era “BIOCoPE-2022” Amity Institute of Biotechnology, Amity University Rajasthan, March 24-25, 2022 (Online).
- Prof. Amita Gupta delivered an inspiring lecture (online mode) on Science Day, 28 February 2022, at Miranda House, DU on the topic: “NEVA – A Technology for rapid diagnostics”.
- Prof. Vijay K. Chaudhary delivered a lecture on “Antibodies”- Ek Naam, Anek Kaam (Antibodies- एक नाम, अनेक काम)” at Mikrovitae 2022, the Annual Festival of the Department of Microbiology, Ram Lal Anand College, University of Delhi, 25th of February, 2022.
- Prof. Vijay K. Chaudhary delivered a lecture on “Phage-Displayed Human Antibody Library – A resource for discovery of next-generation antibody therapeutics” at the Society of Biological Chemists, India 2021, Amity University Gurugram, 18 December 2021.

#### **National/International Collaborations/ MoUs**

- Collaboration with Professor M. Kini at National University of Singapore to develop human antibodies for clinically relevant peptide. This work led to a publication recently in Nature Communications.
- Collaboration with Professor Ramandeep Singh at THSTI, NCR Biotech Cluster, Faridabad to understand role of TA loci in Mycobacterium pathogenicity. This work led to a publication recently in Frontiers in Microbiology.
- MoU signed between University of Delhi South Campus (UDSC) and Gennova Biopharmaceuticals Limited, Pune for development of Therapeutic antibodies to COVID-19.

#### **Extension and Outreach Activities**

- One M.Sc student of Jamia Millia Islamia carried out dissertation research work at CIIDRET, UDSC. She was trained in cloning, expression and purification of SARS-CoV2 proteins.
- Organized Student Workshop on “Techniques for manipulation of nucleic acids for applications in Genomics”, from March 11-21, 2022 at University of Delhi South Campus, New Delhi. In this, Hands-on training was provided to 20 students for isolation and purification of chromosomal and plasmid DNA, and Automated Capillary-based Sanger DNA Sequencing.