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Dr. Vijay K. Chaudhary

NASI Platinum Jubilee Senior Scientist*
Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET), University of Delhi

Advisor (Hon.), Delhi School for Skill Enhancement and Entrepreneurship Development (IoE-DSSEED), University of Delhi (Founder Director)

› **Former Professor of Biochemistry, Department of Biochemistry, University of Delhi**

Founder Director and Core Member, Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET),

Engineering Department Building, University of Delhi South Campus,

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Professor Vijay K. Chaudhary

Professor Chaudhary's career is a one of its kind examples of innovation, creativity and entrepreneurship. Besides being involved in imparting high-quality education and research training for the last 35 years, he has vast experience in governance, industry mentoring and successful execution of large research projects. At a young age of 26 (in 1981), he established the Clinical Biochemistry Department at Escorts Medical Center (Now Fortis), Faridabad, before he moved to National Institutes of Health (NIH), USA for advance training. At NIH, during 1985-90, he contributed with several distinctions in developing path-breaking research on recombinant immunotoxin for targeted therapy of cancer and AIDS, which won him **coveted NIH Directors' Award in 1991.** Incidentally, his pioneering basic work on immunotoxin-based therapy has culminated in the first US FDA-approved drug 'Lumoxiti' in 2018 for patients with hairy cell leukemia.

Upon joining Delhi University in 1990 as a Reader, he used his training at NIH to develop simple diagnostic solutions for infectious diseases, needed by our country. He was selected to the post of Professor in 1996 at the young age of 40 and served as Head of Department of Biochemistry for 3 terms of three years each. With his innovative thinking, he was instrumental in setting up of new facilities and work environment in the department and designed and supervised the coming up of Life Sciences Bachawat Block (Biochemistry). His experience became useful in University governance through serving on Governing Bodies of DU colleges to the extent that he was specially deputed to create the infrastructure for Aryabhatta college. He is deeply involved in several policy-making committees of DU.

To further industry-academia interaction and impart training for development of a critical mass of human resource in Biotechnology, he founded the Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET) at University of Delhi.

His scientific innovations include development of a 2-minute test for HIV (AIDS) (NEVA-HIV commercialized by M/s Cadila Pharmaceuticals, Ahmedabad), a 20-min test to confirm the presence of tuberculosis causing bacteria in culture (TBConform Test, licensed to M/s SPAN Diagnostics, Surat), and more recently a patented technology to produce human therapeutic antibodies. This technology has led to the selection of lead therapeutic molecules for M/s Gennova Biopharmaceticals, Pune and is now being applied for developing safer treatment solutions for snakebite and for the treatment of COVID-19. For his translational work, he has been felicitated with **Biotech Product and Process Development and Commercialization Award of Department of Biotechnology, Government of India three times for three different technologies in 2004, 2014 and 2019, Visitor's Award for Innovation conferred by the President of India in 2015**, National Research Development Corporation award (NRDC, DSIR, Ministry of Science & Technology, Government of India) and **WIPO (World Intellectual Property Organization, Geneva) Gold Medal for "Best Invention of the Year 2004"**. Hon'ble President Kalam included the Innovation of NEVA-HIV test in his address to the Nation.

Professor Chaudhary has nearly 90 publications in high-impact international journals and more than 20 US and several Indian patents. He is a Fellow of National Academy of Sciences of India (NASI). He has contributed as a Chairman/Co-Chairman/member of scientific/IPR & Tech Transfer committees of DBT, ICMR, BIRAC, IKP-knowledge Park etc., and serves/has served as consultant/Advisor to many Bio-pharmaceutical companies.

Academic and administrative distinctions

Positions Held

Institution/Place	Position	From	To
Centre for Innovation in Infectious Disease Research, Education and Training (CIIDRET), University of Delhi	NASI Platinum Jubilee Senior Scientist*	Jan. 2021	continuing
Delhi School for Skill Enhancement and Entrepreneurship Development	Advisor (Hon.)	May 2024	continuing
Regional Centre for Biotechnology (RCB), Faridabad	Adjunct Professor	Dec. 2020	Dec. 2022
CIIDRET, University of Delhi	NASI Honorary Scientist	Sept. 2020	Dec. 2020
Delhi School for Skill Enhancement and Entrepreneurship Development	Director (Hon.)	July 2020	May 2024
Department of Biochemistry, University of Delhi South Campus, New Delhi (UDSC)	**Professor***	1996	August 2020
Department of Biochemistry, UDSC	**Professor and Head of the Department**	2011	2014
Department of Biochemistry, UDSC	**Professor and Head of the Department**	1999	2002
Department of Biochemistry, UDSC	**Head of the Department**	1993	1996
Department of Biochemistry, UDSC	Reader	1990	1996
Laboratory of Molecular Biology, NCI, NIH, USA	Visiting Fellow & Visiting Associate	1985	1990
Escorts Medical Centre, Faridabad	Clinical Biochemist	1982	1985

* **Professor** by direct appointment in DU from 1996-2020

Academic and Administrative Assignments

› Assignments held at University of Delhi (DU)

- Joined University of Delhi in 1990 as a Reader.
- Professor by direct appointment in DU in 1996
- Head of Department of Biochemistry, DU for THREE terms of three years each.
- 34 years of teaching experience with post-graduate, MPhil and PhD courses.
- Supervised and co-supervised 18 Doctoral theses and 40 M.Sc. Dissertations.
- Member, University Court for 24 years.
- Founding Director, Centre for Innovation in Infectious Disease Research, Education and Training, DU.
- IPR Chair, DU.
- Member, Campus Development Committee of DU with Dr. Rajat Sharma as its Chairman.

- Member of committee for Institution of Eminence of DU (DU-IoE) and Proposer of DU-Institute of Innovation, Incubation and Entrepreneurship Development (DU-InSEED) under DU-IoE.
- Past Member of the DU Academic Council for 10 years.
- Serving/served as University representative in Governing Body of colleges of Delhi University.
- Past Chairman Building Committee, RLA and Aryabhatta College (for four years).
- VC Nominee for DRC of University Departments and Centres.
- Served as Chairman of the Interim Governing Council, WUS Health Center, University of Delhi.
- Member of selection Committees of several College Principals.
- Member, Faculty of Interdisciplinary and Applied Sciences (FIAS), University of Delhi.
- Member, Board of Research Studies, FIAS, University of Delhi, 2008-2014.
- Chairman Resource Mobilization Committee, University of Delhi.
- Chairman/Member on committees for Library, Engineering, Examination, Patents-IPR.
- Member of Award Committees, NAAC Review/ Tripartite agreement committees of DU.
- Member, Selection Committee for teaching/non-teaching posts in Delhi University Colleges.
- Member of Editorial committee 93rd - 95th Annual Report and Brochure Committee of DU.

› Assignments in other Academic & Scientific Organizations (Present and Past)

At Department of Biotechnology, Ministry of Science and Technology, Government of India (DBT)

- Co-Chairman, DBT-Technical Expert Committee (TEC) on "Infectious Disease Biology" 2018 to 2021.
- Chairman, DBT Patent Facilitation Committee.
- Member, Scientific Technical Appraisal Advisory Group (STAG), Medical Biotechnology,
- Co-Chairman, DBT NER Technical Expert Committee (TEC) Medical Biotechnology.
- Member of Scientific & Technical Appraisal & Advisory Group (STAG), Medical Biotechnology, DBT NER
- Member, DBT-Expert group on Technology Transfer Organization (TTO's).
- Member of IP & Tech. Management Advisory Committee – BIRAC
- Member, Committee for Innovative Young Biotechnologists Award (IYBA), 2005-2014.
- Co-Chairman, Task Force for Vaccines and Diagnostics in areas of health care, 2005-2009.
- Member, Task Force for Infectious Disease Biology, 2005-2009.

At Indian Council of Medical Research, Ministry of Health and Family Welfare, Govt of India (ICMR)

- Past Chairman, Health Technology Acceleration and commercialization' program (HTAC) for commercialization of ICMR technologies.
- Member, the 'Expert Committee on TB diagnostics'.
- Member, The Working Group on TB Diagnostics of India TB Research Consortium.

At other Government organizations

- Member, Joint Scientific Advisory Committee ICMR's NJIL&OMD, Agra and NIRT, Chennai.
- Mentor, Nexus @ American Center, New Delhi (https://startupnexus.net/mentors), since 2017.
- Member, IKP Knowledge Park committees to select and review projects under Grand Challenges Explorations India and Grand Challenges in TB Control etc.
- Member, Research Council of Indian Institute of Toxicology Research, Lucknow, 2006 -2009.
- Member, Academic Committee, Central Drug Research Institute, Lucknow, 2005- 2008.

• Member, Academic Committee, CCMB, Hyderabad, 2008-2011
• Member, SAC, Institute of Pathology, Safdarjung Hospital Complex, New Delhi, 2004-2008.

Assignments in Bio-Pharmaceutical Industries/Private Institutions:

• Chairperson/Member, Scientific Advisory Committee of Surat Raktadan Kendra and Research Centre, Surat.
• Advisor/Consultant, Yashraj Biotech, Navi Mumbai (2018-19)
• Member, Scientific Advisory Committee, Yashraj Biotech, Navi Mumbai, 2010-2022.
• Member, Scientific Advisory Committee, Indian Immunologicals Ltd., Hyderabad, 2013-2016.
• Member, Scientific Advisory Committee, SPAN Diagnostics Ltd., Surat, 2006- 2014.
• Advisor, Cadila Pharmaceuticals Limited, Ahmedabad, 2007-2011.
• Advisor, Century Pharmaceuticals Limited, Baroda, 2007-08.
• Advisor, Ranbaxy Laboratories Limited, Delhi, 1991-1995, 2000-2003.

Awards & Honours

Eminence

› Awards

- **2022, AMI-Lifetime Achievement Award Lecture -2021 (Sr. No.-AMI-Award 2021/15)** conferred by the Association of Microbiologists of India on 22nd September, 2022.
- **2019, Biotech Product and Process Development and Commercialization Award,** Department of Biotechnology, Government of India (for developing technology of Human Antibody Library)
- **2017, Outstanding Alumnus award** of the College of Basic Sciences and Humanities by the G.B.Pant University of Agriculture and Technology, Pantnagar.
- **2015, Visitor's Award for Innovation** – conferred by the President of India at a special ceremony at Rashtrapati Bhawan. (For TBConfirm, a rapid test for culture confirmation of tuberculosis)
- **2014, Biotech Product and Process Development and Commercialization Award,** Department of Biotechnology, Government of India. (For TBConfirm, a rapid test)
- **2009, B. K. Bachawat Memorial Lecture award** of National Academy of Sciences, India.
- **2005, WIPO (World Intellectual Property Organization, Geneva) Gold Medal** for "Best Invention of the Year 2004". (For NEVA HIV, a test for on-site detection of HIV)
- **2004, National Research Development Corporation award** (NRDC, DSIR, Ministry of Science &
- Technology, Government of India) of Rs. 1,50,000/-. (For NEVA HIV, a test for HIV)
- **2002, Biotech Product and Process Development and Commercialization Award,** Department of Biotechnology, Government of India. (For NEVA HIV, a test for on-site detection of HIV)
- **1999, All India Biotech Association (AIBA) Award.**
- **1997, VASVIK Award for Biological Science and Technology.**
- **1991, the National Institutes of Health, USA (NIH) Director's Award** [For developing path-breaking technology for recombinant Immunotoxins, that has led to the US FDA-approved drug 'moxetumomab pasudotox (Lumoxiti) in 2018 for patients with hairy cell leukemia].
- **1973, Gold Medal** for scoring highest marks in B.Sc. (Biology).

› Membership/Fellowship of academic bodies

- Fellow of National Academy of Sciences, India (NASI)
- Elected member of Guha Research Conference, India
- Member of Society of Biological Chemists (India)
- Member of Association of Clinical Biochemists of India
- Life member of Indian Science Congress Association

› Biotech Product and Process Development and Commercialization Award, 2019, by Department of Biotechnology, Government of India for developing technology of Human Antibody Library

सचिव
भारत सरकार
विज्ञान और प्रौद्योगिकी मंत्रालय
जैव प्रौद्योगिकी विभाग
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डॉ. रेणु स्वरूप
DR. RENU SWARUP

SECRETARY
GOVERNMENT OF INDIA
MINISTRY OF SCIENCE & TECHNOLOGY
DEPARTMENT OF BIOTECHNOLOGY
Block-2, 7th Floor, C.G.O. Complex
Lodhi Road, New Delhi-110003

D.O. No. BT/HRD/37/02/2018-19 17th June, 2019

Dear Dr Chaudhary

Heartiest congratulations on being selected for the **"Biotech Product and Process Development and Commercialization Awards 2019"**. This is a prestigious Award of the Department of Biotechnology, Govt. of India for new Biotech Process, Product Development or Commercialization of Technology or Product in the area of Biotechnology/Biological Sciences conferred under Individual/Team Category. Your selection has been made by an Expert Jury for your work on *"A Phage-displayed Naïve Human Antibody Library for the discovery of therapeutic antibodies"*.

The Award will be conferred in a function to be organized by the DBT, the date and venue will be informed subsequently. Dr. Kakali Dey Dasgupta, Scientist 'E', Department of Biotechnology, Govt. of India will be in touch with you for further details and required information.

Congratulations again.

With best wishes,

Yours sincerely,

(Renu Swarup)

› Visitor's Award for Innovation, 2015, conferred by the Hon'ble President of India at a special ceremony at Rashtrapati Bhawan. (For TBConfirm, a rapid test for culture confirmation of tuberculosis)

The President of India | Shri Pranab Mukherjee

Press Releases

VISITOR'S AWARDS FOR 'BEST UNIVERSITY', 'INNOVATION' AND 'RESEARCH' PRESENTED BY THE PRESIDENT OF INDIA AT RASHTRAPATI BHAVAN

Rashtrapati Bhavan : 06.02.2016

The President of India, Shri Pranab Mukherjee presented Visitor's Awards for Central Universities in the categories of 'Best University', 'Innovation' and 'Research' for the year 2015 at a function held at Rashtrapati Bhavan yesterday (February 4, 2015).

The University of Hyderabad received 'Best University' Award for academic excellence & overall outstanding work. 'Innovation' Award was presented to Prof. Vijay K. Chaudhary and Dr. Amita Gupta of University of Delhi for their invention of 'TB Confirm', a rapid diagnostic test for Tuberculosis. The 'Research' Award was received by Cosmology and Astrophysics Research Group, Centre for Theoretical Physics, Jamia Millia Islamia for path breaking research carried out in the field of Astrophysics and Cosmology. The Research Group comprises of Jamia Millia Islamia faculty - Prof. M. Sami, Prof. Sushant G. Ghosh, Prof. Sanjay Jhingan & Prof. Anjan Ananda Sen.

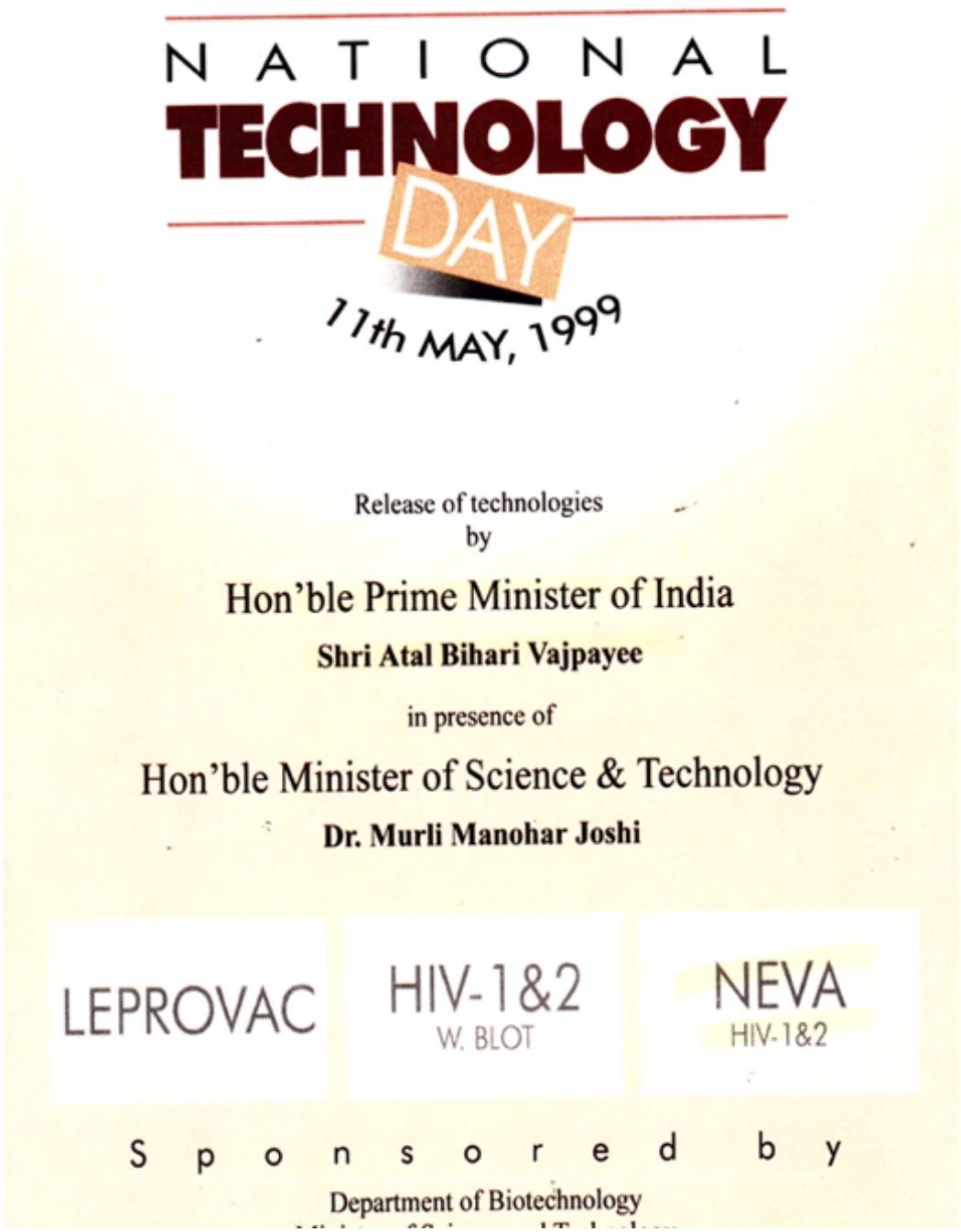
The 'Best University' received a Citation and Trophy while winners of Visitor's Award for 'Innovation' and 'Research' received a Citation and cash award of Rs. one lakh.

The President had announced institution of these awards at the Vice Chancellors' Conference last year with the aim of promoting healthy competition amongst Central Universities and motivating them to adopt best practices from across the world.

This release issued at 1050 hrs.

› Biotech Product and Process Development and Commercialization Award, 2014 by Department of Biotechnology, Government of India was awarded by Dr. Harshwardhan, Minister of Science and Technology for development of 'TB Confirm', A rapid diagnostic test for TB

› The technology of NEVA-HIV was released by Hon'ble Prime Minister of India, Shri Atal Bihari Vajpayee



› The NIH Director's Award 1991, for developing path-breaking technology for recombinant Immunotoxins. This has led to the US FDA-approved drug 'moxetumomab pasudotox (Lumoxiti) in 2018 for patients with hairy cell leukemia

Innovation, Technologies and Entrepreneurial attainments

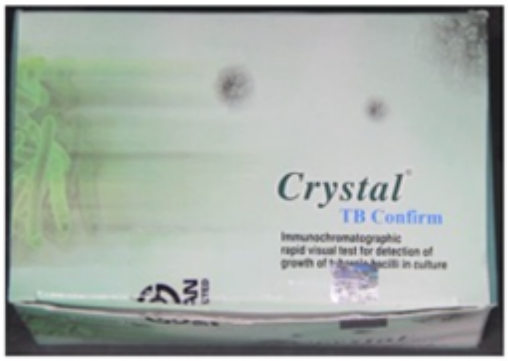
Technologies Transferred and Commercialized

- **"TBConfirm"** - a rapid test for culture confirmation of tuberculosis transferred to SPAN Diagnostics Limited, Surat. The Drug Controller General of India has approved for commercial production. This Immuno-chromatographic test allows for easy and rapid screening of specimen for confirmation of growth of tuberculosis causing bacterium Mycobacterium tuberculosis (Mtb). This test can be performed with minimal training and provides results in less than twenty minutes. The test is based on detection of two Mtb- specific antigens using high affinity monoclonal antibodies. It has been evaluated on clinical specimens with near 100% sensitivity and 100% specificity at laboratories of Dr Sarman Singh (AIIMS, New Delhi) and Dr. Camila Rodrigues (P.D.Hinduja Hospital, Mumbai).
- **"NEVA-HIV"** - a rapid test to detect antibodies to HIV in a drop of blood transferred to Cadila Pharmaceuticals Ltd. Ahmedabad, who manufactured and marketed it. This test detects antibodies to HIV-1 and HIV-2 in two minutes using a drop of blood. The test requires no instrument, electricity, not even water from outside, and can be performed by a semi- skilled technician in any primary health centre. This novel technology was introduced to the Nation by Hon'ble Vice President of India, on the occasion of the National Technology Day, the 11th May, 2001. NEVA HIV is a totally indigenous technology and has received wide appreciation in news articles and was cited by Hon'ble President Kalam.
- **Monoclonal antibodies** to phage M13 licensed to M/s Pharmacia (now GE HealthCare),1998. The technology for Monoclonal Antibodies (MAbs) against two coat proteins gIIIp and gVIIIp of filamentous phage M13 and a process for their preparation was licensed to Pharmacia Biotech. Inc., USA, presently GE Healthcare Life Sciences who manufactured and marketed it under product code 27-9420-01 and 27-9421-01. This project was supported by DBT and the transfer of technology happened in 1998. This fetched $20,000 as the one-time licensing fee and was perhaps the first technology transfer through DBT-supported project and one of the earliest Indian patents granted for a Biotech Product.
- **These technologies received Upfront fee and royalty of more than Rs. 50 lacs**
- **A recent patented technology** to produce human therapeutic antibodies has led to the selection of lead therapeutic molecules for M/s Gennova Biopharmaceticals, Pune.

> **Consultant /Advisor:-** to Bio-pharma companies - received consultancy fee of more than **Rs. 50 lacs**

> **Royalty:-** earned from US patents (for work done in US)- More than **100,000 USD**

TBConfirm, a rapid test for culture confirmation of tuberculosis was licensed to M/s Span Diagnostics Ltd. Surat who have received the approval of Gujarat FDA and Drug Controller General of India to commercialize the test



› The NEVA-HIV kit was commercially launched by Hon'ble Vice President of India and his team

› NEVA HIV received notable mention in address to the nation by Hon'ble President of India Dr. APJ Abdul Kalam on the Science Day in 2005

sident of India : Speech / Lecture : Details

THE PRESIDENT OF INDIA

SPEECHES / LECTURES

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ADDRESS TO THE NATION BY THE PRESIDENT OF INDIA ON THE SCIENCE DAY 2005

28-02-2005 : NEW DELHI

Can Indian science inspire youth?

Dear Citizens,

My greetings to all of you. I am indeed very happy to talk to you on this Science Day, which is celebrated on the 28th of February every year, the day one of our great scientists and Nobel Laureate Sir CV Raman made a landmark discovery. On this day, the nation pays tribute and expresses its gratitude to all the scientists who have made our dream of using the science and scientific discoveries as vehicles for economic development, a reality. If the nation?s science is celebrated, it will also attract many young children to take up science as a career. In addition, the Scientists of the nation may like to rededicate themselves to create high quality scientific research output from India and make the nation proud. Science day is a day to remind us that the important ingredient for societal transformation would mainly come from science. I would like to share with you particularly the youth, the scientific progress made in our country towards enriching the society and signifying our national spirit that "Can Indian science inspire youth".

International year of Physics - 2005

One of the major breakthroughs in science in the 20th century that had an everlasting impact on the human kind is the most celebrated work of Einstein. Einstein explained, for the first time in 1905, the principle of the inertia of energy as a universal law. The famous energy equation E=MC2 was given to the world. This equation has become the basis for converting matter into energy ? giving birth to a new avenue called the nuclear energy for producing electricity to light up our cities and villages. Science at times is a double-edged sword. While the E=MC2 of Einstein, changed the way the humanity looked at

Gene Chip

Fourth area, I would like to talk about is Gene Chip for curing heart diseases. Cardiomyopathy means "diseases of the heart muscle" which leads to heart failure or sudden death. There are 3 main types: Dilated, hypertrophic or restrictive Cardiomyopathy It progresses since childhood and the onset of the disease vary according to the family history. Although transplantation may be an effective strategy in these patients, its implementation is hindered by availability of donor as well as numerous ethical, social, economic and legal issues. Similarly the mechanical cardiac assist devices are also not cost-effective for long-term usage in our population.

The Human Genome Project has increased the impact of genetics in medical science and practice. Genetics of Cardiomyopathy remain unknown. Also, the molecular etiology is not known in many cases of Cardiomyopathies affecting children as well as adults, with an annual incidence of 2-8 per 10,000 in the United States and Europe. Though there are reports on association of mutations in nuclear genome and Cardiomyopathy, quite a number of cases do not show any such mutations. As there is a close relationship with the cardiac muscle contraction and energy metabolism, it is quite reasonable to speculate the role of mitochondrial DNA variations as possible cause of these cases. Recent reports have shown evidence in support of the role of mitochondrial mutation in the pathogenesis of Cardiomyopathies in western population. There is no large sample study have been carried out so far to find molecular etiology of Cardiomyopathy in Indian population.

The scientists from International Centre for Biomedical Sciences and Technology (Research & Applications), have reported several novel mutations that could be the possible cause of the disease, and some pathogenic mutations whose role is proved in other mitochondrial diseases, by sequencing the 5 unrelated individuals with severe Cardiomyopathies. This is the first report of the mitochondrial DNA analysis of the cardiac patients from the Indian subcontinent. Fortunately the administering stem cell has found cure in AIIMS for the specific type of Cardiomyopathy.

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Novel Detection Kit for HIV / AIDS

Fifth Area is about the development of a novel detection kit, NEVA-HIV to detect HIV (AIDS) in a drop of blood within three minutes. It is a single step test in which a drop of blood is mixed with a drop of a reagent on a glass slide. If the blood sample shows clumping, it is positive for HIV. This clumping of blood can be easily seen with the naked eye, hence the test is called the Naked Eye Visible Ag-gluti-nation assay or NEVA. This test uses recombinant proteins consisting of a monovalent fragment of an anti-human RBC monoclonal antibody fused to a specific protein antigen derived from HIV. These proteins cross-link RBCs in the presence of anti-HIV antibodies, which are present in the blood of HIV infected individuals. The test uses recombinant proteins consisting of NEVA-HIV is one of the very few tests in the world that can be performed on whole blood, even from a finger prick. Developed, keeping in mind the practical constraints of HIV testing in our country, NEVA-HIV is an instrument-free test. In addition, the simplicity and rapidity of the test, makes it suitable for use in a primary health centre of a village even in a remote part of our country.

The test has been evaluated at several national reference centres and has been found to have high sensitivity and specificity. This novel scientific development has been carried out by the faculty members of Department of Biochemistry, University of Delhi in collaboration with the Department of Bio-technology and Cadila Pharmaceuticals Ltd., Ahmedabad.

› NEVA HIV received notable mention in several news articles

Shrinet, Sh.Nilesh R.Pandya & Dr.M.Ramamoorty of Electrical Research & Development Association, Vadodara have been jointly awarded Rs 40,000 for development of "On-Line Fault Sensor for Transformers". It detects the incipient fault in power transformers during service. The fault sensor senses the presence of hydrogen gas concentration and accordingly gives alarm. It senses On-line Electrical and Thermal Faults and is simple and economical.

9. An Improved Mild Steel Handloom for Weaving Matting—Dr. Uma Sankar Sarma, Sh. T.A. Rajendrababu, Sh. C.R. Komala Kumar and Sh. A. Radhakrishnan of Central Coir Research Institute, Aleppey, Kerala have been jointly awarded Rs 40,000/- for the development of "An Improved Mild Steel Handloom for Weaving Matting (Geo-Textiles)". The pedaling system provided in the loom is unique in its design and is absolutely maintenance-free due to which women workers can also operate it. It can be used to weave a wide range of fabrics like coir, jute, sisal matting and mesh matting.

10. Multi-purpose Design Cutting/Sizing/Embossing Machine—Sh. M.M. Arif of Delhi has been awarded Rs 40,000/- for the development of "Multi-purpose Design Cutting/Sizing/Embossing Machine". The machine is capable of cutting paper, cloth, leather, canvas, card-board, cold forming plastic, disposable crockery, aluminium foils, gaskets, etc. It results in high production rate, lower power consumption, least material wastage and a user-friendly operation.

WIPO Awards

Two WIPO Gold Medals sponsored by the World Intellectual Property Organization (WIPO) were recommended for the year 2004—one medal to Prof. V.K. Chaudhary & Dr. (Mrs.) Amita Gupta of Department of Biochemistry, South Campus, University of Delhi, for their invention "A Whole-Blood Agglutination Assay for On-site Detection of Human Immunodeficiency Virus Infection" and another WIPO Gold Medal for best woman inventor of the year 2004 to Dr. (Ms) Kanika Trivedy for her invention "Process for the Extraction of Ecdysteroid (Sampoorna) from Caryophyllaceae Family of Plants".

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NEWSLINE ANCHOR The tests by Dr VK Chaudhary and Dr Amrita Gupta don't need heavy equipment or microscope and the results are out in 3-5 minutes

DU scientists bag 'Best Invention' award for rapid HIV-testing kit

TOUFIQ RASHID
NEW DELHI, JULY 4

ACCOLADES haven't stopped pouring in for Delhi University scientists Dr VK Chaudhary and Dr Amrita Gupta ever since they developed the rapid HIV-testing kit.

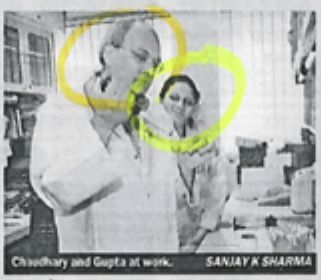
With the use of this kit, results are out in three to five minutes, while the traditional Elisa test takes 48 hours.

Recognition for the two scientists from the Biochemistry department has come in the form of awards and their kit being manufactured for hospital use.

Last week, the two received a gold medal from the National Research Development Corporation for the "Best Invention of the Year". Called the 'whole-blood agglutination assay for the on-site detection of human immunodeficiency virus infection', the test does not require any instrument or electricity or water. "Early detection is the answer to preventing the spread of HIV/AIDS in the world," says Prof Chaudhary.

In their laboratory, the two scientists demonstrate how with a few drops of blood, a glass slide and some reagents, the HIV status of a patient can be determined.

"If the blood shows clumping within three minutes of being mixed with reagents, then the sample is HIV positive," said Chaudhary. "Though the test is simple. The science behind it is novel. It involves long research in genetic engineering and recombinant DNA," he added.


Chaudhary and Gupta at work. SANJAY K SHARMA

The invention is based on a set of 'bi-functional molecules'. "The reagents are HIV antibodies which are fused with HIV antigens. These can bind to human RBCs on one end and anti-HIV antibodies from an infected person on the other end. This causes clumping which can be seen with naked eye," said Dr Gupta.

The rapid test doesn't need heavy equipment or a microscope as the results are visible to naked eye. According to the scientists, the tests can be done anywhere and need no laboratory settings. "However, HIV testing has to be done by authorised institutions and never at home," said Chaudhary.

The kit, manufactured by Cadila after approval from the Drug Control General of India, has proved successful in 150,000 tests "with no adverse reports" in the last two years.

The kit is 100 per cent sensitive and no positive sample will remain unidentified, however, sometimes a negative report may show as positive. "This means the universal rule of testing the sample twice is important," said Dr Gupta.

The research, funded by the Science and Technology Ministry, began in 1994 with a Phd thesis by Gupta under Chaudhary's guidance.

A paper in the International Journal of STD and AIDS 2003 — published jointly by Johns Hopkins University, National AIDS Research Institute, Pune, and NACO — certified that the kit was better than the other two used abroad.

5th JULY INDIAN EXPRESS

NEWS & REPORTS

NRDC Inventions Awards and Wipo Gold Medals for the year -2004

National Research Development Corporation (NRDC) on behalf of Department of Scientific & Industrial Research (DSIR), Ministry of Science & Technology announced Technology Day Awards 2004 for Innovative Inventions under its Invention Promotion Programme. The Prize Award Committee has recognized developments and inventions in the field of Agriculture, Biotechnology, Chemical & Allied, Electrical & Electronics and Mechanical.

Prof. V.K. Chaudhary and Dr. (Mrs.) Amita Gupta of Dept. of Biochemistry, University of Delhi, South Campus, New Delhi have been jointly awarded a sum of Rs.1,50,000/- and WIPO (World Intellectual Property Organisation) Gold Medals for the development of "A Whole-Blood Agglutination Assay for the on-site Detection of Human Immunodeficiency Virus Infection (HIV)". The invention describes a simple and rapid test for the detection of anti-HIV antibodies in blood. The test does not require any instrument or electricity or even a drop of water and as such it can be performed anywhere. Since the test results can be read by naked eyes, it is also known as Naked Eye Visible Agglutination assay (NEVA). Dr (Mrs.) Kanika Trivedy, Dr K. Sashindran Nair, Dr. S. Nirmal Kumar, Dr. Rajat Kumar Dutta (Rtd.) , Dr. Shankar B. Dandin Of Central Sericultural Research and Training Institute, Mysore (A constituent Laboratory of Central Silk Board) and Shri. Prabhat Kumar Chaya of Central Silk Board, Bangalore have been jointly awarded a sum of Rs. 1,00,000/- and WIPO Gold Medals for the development of innovative Technology Package for the "Extraction of Phyto-ecdysteroid from Caryophyllaceae family of plants" for the use of advanced maturity of silkworm and uniform spinning of cocoons. Use of plant based hormone in silkworm Rearing management is expected to give a boost to Sericulture Industry in India. The technology is commercially proven and product is already in the market with the trade name "Sampoorna".

Insect-derived Antimicrobial Peptides for Drug-Delivery Vehicles

Scientists at The Wistar Institute have spent several years studying an insect-derived antimicrobial peptide called pyrrhocoricin. Both pyrrhocoricin in its native state and lab-created analogs are capable of entering and killing a number of strains of bacteria, including E. coli. Initially interested in pyrrhocoricin and its analogs because of their antimicrobial properties, the research team is now exploring whether these peptides could be employed as delivery vehicles for other peptide or peptide-based drugs that would normally be unable to penetrate mammalian cell membranes and tissues. The researchers showed that native pyrrhocoricin can penetrate human dendritic cells, an important type of immune cell, and that the designer pyrrhocoricin analog can penetrate both dendritic cells and fibroblasts, a cell that produces the collagen fibers that make up connective tissue. The dendritic cells displayed signs of stimulation, which opens the question of whether this peptide delivery system could be used to create new vaccines or immune therapies. "Our results suggest that our designed pyrrhocoricin analogs are good candidates for transporting peptidic cargo across cell membranes in general, and for potential use in therapeutic applications as well as in vaccine development," Professor Laszlo Otvos says.

Dendritic cells are a type of antigen-presenting cell, which shows antigen on its surface to T cells to prompt an immune system response. Researchers have been exploring whether peptide-based vaccines can induce effective T cell responses, particularly in cancers. Otvos's research is only the begining, and it remains to be seen whether his designer antimicrobial peptide analogs will be useful in activating dendritic cells as part of an immune therapy. He continues to explore both its general use as a drug-delivery vehicle and its specific use in activating the immune system in future studies.

- *Molecular Pharmaceutics*

Engineered Virus provides clue for HIV Vaccine

Researchers from Baylor College of Medicine have proposed that a hybrid gene therapy vector that contains components of two viruses could provide a vehicle for producing a vaccine against a host of diseases, including the human immunodeficiency virus. In their work, a vaccine vector has been engineered that uses potent features of adenovirus that normally infects respiratory tissues and of reovirus that infects the mucosal membranes of the gut. To develop this potential vaccine vector, a key protein of reovirus that allows it to enter the gut has been exchanged into adenovirus to retarget this non-infectious gene therapy vector into mucosal surfaces. "This mucosal targeting vector may prove quite potent for repelling viruses like HIV-1 and infectious bioweapons, since the vast majority of pathogens enter the body at mucosal surfaces," said Dr. Michael Barry, an associate professor in BCM. "If it's useful for HIV-1, it may be useful for a wide variety of other pathogens since you can put any vaccine gene you want into this vector." "Beyond its potential as a vaccine vehicle, this hybrid vector will also have utility by allowing us to study the specific interactions of this reovirus protein in the host," said Barry. "This has previously been difficult due to the complex genetics of reovirus. Now we can study these complex interactions using the simpler genetic system provided by the adenoviral vector."

NRDC Awards for meritorious inventions (year 2004)

National Research Development Corporation (NRDC) on behalf of the Department of Scientific & Industrial Research (DSIR), Ministry of Science & Technology, Government of India has announced Technology Day Awards (2004) for inventions and innovations under its Inventions Promotion Program. These awards are being given on the recommendations of the Prize Awards Committee which has recognized inventions and innovations in the fields of Agriculture, Biotechnology, Chemicals & Allied Subjects, Electrical & Electronics and Mechanical.

The total package of Cash Awards amounted to Rs 7.70 lakhs for the ten inventions recognised on this occasion. A total of 28 inventors involved in the inventive activity are to be honoured.

WIPO gold medals for the year 2004 were also announced.

The NRDC invention awards are as below:

1. A Whole-Blood Agglutination Assay for On-site Detection of HIV Infection—Prof. V.K. Chaudhary and Dr. (Mrs.) Amita Gupta of Department of Biochemistry, University of Delhi, South Campus, Delhi have been jointly awarded Rs 1,50,000/- for the development of "A Whole-Blood Agglutination Assay for On-site Detection of Human Immunodeficiency Virus Infection". The invention enables a simple and rapid test for detection of antibodies in the blood produced against HIV. The test does not require any instrument or electricity or even a drop of water and as such it can be performed any where. Since the test results can be read with naked eye, it is also known as Naked Eye Visible Agglutination Assay (NEVA).

2. Process for Extraction of Ecdysteroid from Caryophyllaceae Family of Plants—Dr (Ms.) Kanika Trivedy, Dr. K. Sashindran Nair, Dr. S. Nirmal Kumar, Dr. Rajat Kumar Datta (Rtd.), Dr. Shankar B. Dandin of Central Sericultural Research and Training Institute, Mysore (A constituent laboratory of Central Silk Board) and Shri Prabhat Kumar Chinya of Seri Bio-tech Research Laboratory, Central Silk Board, Bangalore have been jointly awarded Rs 1,00,000/- for the development of an innovative technology package for "Extraction of Phyto-ecdysteroid from Caryophyllaceae Family of Plants" for the use of advanced maturity of silkworm and uniform spinning of cocoons. Use of plant based harmone in silkworm rearing management is expected to give a boost to sericulture industry in India. The teehnology is commercially proven and the product is already in the market with the trade name "Sampoorna".

3. On-Line Property Prediction System for Hot Rolled Coil—Dr. Ananya Mukhopadhyay, Dr.Sudipta Sikdar, Sh.Saurabh Kundu & Sh. Ashwin Pandit of Tata Steel, Bistupur, Jamshedpur (Jharkhand) have been jointly awarded Rs 1,00,000/- for development of "On-Line Property Prediction System for Hot Rolled Coil (OPPRESS)". The system predicts the

नई दिल्ली, रविवार, 04 जुलाई, 2004 5
www.hindustandainik.com

एड्स जांच किट के लिए दिविवि के शिक्षक पुरस्कृत

नई दिल्ली (ह.सं.)। दिल्ली विश्वविद्यालय(दक्षिणी परिसर) के जैव रसायन विभाग के डॉ वी.के चौधरी और डॉ. अमिता गुप्ता को वर्ल्ड इंटलेक्चुअल प्राप्टी आर्गेनाइजेशन(जेनेवा) की ओर से सर्वश्रेष्ठ आविष्कार के लिए गोल्ड मेडल प्रदान किया गया है। उन्हें यह पुरस्कार एड्स/एचआईवी की जांच के लिए तैयार किए गए एक ऐसे किट के लिए दिए गए हैं कि जिसमें बिना किसी उपकरण की मदद से दो मिनट के भीतर एचआईवी-एक और दो के संक्रमण का पता चल जाता है। जेनेटिक इंजीनयरिंग और रिकंबिनेंट टेक्नोलॉजी की मदद से विकसित होने के कारण इसमें जांच में काफी कम समय लगता है।

डॉ चौधरी और डॉ अमिता गुप्ता द्वारा विकसित किया गया यह किट आज बाजार में नेक्ता-एचआईवी के नाम से उपलब्ध है। इसमें संभावित रोगी के खून के एक बूंद में एन्टीबॉडी रिएजेंट के साथ मिलाकर स्लाईड पर रखा जाता है।

चरित्र प्रमाण पत्र को लेकर छात्रों में परेशानी

नई दिल्ली (ह.सं.)। सप्ताहांत को हेल्पलाइन पर फोन की घंटियां कम बजी। अधिकार लोगों के मामले उन विषयों व संस्थानों के बारे में थे जिसके सहारे वे आगे की राह तलाश सकें। तो कुछ को उन गलतियों के सुधारने के तरीके बारे में जानना था कि जिसके कारण उनका दाखिला नहीं हो रहा था।

कामना की परेशानी ये थी कि आईसीआर पार्ट भरते समय उसके पास सीबीएसई का पुराना अंकपत्र था उसके अनुसार उसके 49 फीसदी अंक थे। उसने इस बात दो विषयों गणित और लेखा में ईवूमेंट भरा था। नये अंकपत्र के हिसाब से उसके 58 फीसदी अंक हैं। बवजीत कामना उसकी परेशानी यह है कि उसके स्कूल(नू स्वीपल पब्लिक स्कूल) के पास उसका पुराना अंक पत्र है। स्कूल उसे नए अंकपत्र के मुताबिक सर्टिफिकेट नहीं दे रहा है। दाखिले की अंतिम तिथि बीती जा रही है और प्रमाणपत्र उसके पास है नहीं। कामना की अब यह आशंका सता रही है कि कहीं वह दाखिले से वंचित न हो जाए।

हिन्दुस्तान हेल्पलाइन फैक्स: 23704600 फोन नं : 55561263

कामना शेष की परेशानी है कि उसने प्राईवेट तौर पर 12वीं की परीक्षा दी थी। कॉलेज में दाखिले के लिए उसे चरित्र प्रमाणपत्र की जरूरत है। प्राईवेट छात्र के रूप में जिस स्कूल से उसने परीक्षा दिया था वह उसे चरित्र प्रमाणपत्र नहीं दे रहा। किसी राजपत्रित अधिकारी से उसकी निजी पहचान नहीं है इस कारण कट ऑफ सूची को लांघने के बावजूद वह कॉलेज में प्रवेश नहीं कर पा रहा है।

THE TRIBUNE, FRIDAY, SEPTEMBER 15, 1995

Faster AIDS test developed

NEW DELHI, Sept 14 (PTI) – Biochemists at the Delhi University have developed a blood test that takes less than 10 seconds to detect antibodies to human immunodeficiency virus (HIV).

The simplicity of the test and its low cost should make it a valuable tool in the battle against AIDS especially in poor countries that lack health care infrastructure.

But the scientists are refining their test to make sure that it detects both HIV-1 and HIV-2 with 100 per cent reliability before releasing it in the market. This will take one year. At present, the test detects only HIV-1.

The currently used method of enzyme-linked immunosorbent assays (ELISA) for testing HIV require a good laboratory with a centrifuge for separating sera from the whole blood. ELISA readers required for the testing are costly as well as need electricity to operate.

The DU test uses the whole blood, thereby avoiding the time-consuming process of separating the serum. A single drop of blood is enough for the test, i.e. a needle prick will do. All that is required for the diagnosis is a glass slide and a reagent prepared through recombinant DNA technique.

The "single step" test involves adding a drop of the reagent to a drop of blood on the slide and mixing the two with a plastic stick. The test result becomes dramatically visible to the naked eye within five to 10 seconds.

If the blood is from an HIV-infected individual the red blood corpuscles (RBCs) "clump" the way milk curdles on adding a drop of lime juice, otherwise there is no change.

"The rapidity and simplicity are the main virtues of this test," says Mr Vijay K. Chaudhary, who developed it in collaboration with Ms Shobha Sehgal of the PGI, Chandigarh.

Out of nearly 100 coded samples examined at random, the test failed only once. Mr Chaudhary wants to test at least 2,000 samples before commenting on the sensitivity and specificity of the test.

Mr Chaudhary says his team is now trying to develop a "cocktail" of reagents that will be able to detect both HIV-1 and HIV-2 infections.

The Department of Biotechnology (DBT), which has so far spent Rs 40 lakh on Mr Chaudhary's work, has sanctioned another Rs 20 lakh for development of other reagents. Work on this has already begun and Mr Chaudhary expects to have the "cocktail" ready in six months.

The DBT is hopeful that the rapid test kit based on the "final reagent" will be evaluated in at least 2,000 samples by three or four centres in the country and compared with the standard Western Blot test before going commercial some time in the middle of 1996.

'Joe Camel' advertising campaign. Indeed, one former tobacco lobbyist — now suffering from throat cancer he attributes to years of smoking — has described meetings where his tobacco industry colleagues discussed new ways to attract young smokers to replace older ones who were dying.

Ultimately, based on a voluminous accumulation of evidence, the agency decided that nicotine is indeed an addictive drug. Among other things, research reviewed by the FDA showed that smokers who try to quit suffer physical and psychological withdrawal symptoms, such as decreased heart rate, insomnia, irritability, lack of concentration and anxiety, which are all signs of drug dependence.

Also, Jack Henningfield, chief of the clinical pharmacology research branch of the National Institute on Drug Abuse, has pointed out that approximately one-third or more of smokers try to quit every year and "only about 7 percent make it." The 40 million people in the United States who have successfully stopped smoking represent only 2.5 percent per year since 1964, according to Henningfield.

The FDA also concluded that it had dual authority under its medical device statutes because cigarettes themselves are 'drug delivery systems', making them what the agency calls 'combination products'.

The proposals are subject to public comment and revision, and could take a year or more to implement. Challenges are certain. The friends of tobacco on Capitol Hill have promised to push for legislation that would remove the FDA's jurisdiction over tobacco. One measure currently being drafted would transfer it to the Federal Trade Commission and the US Attorney General.

Predictably, the nation's five major tobacco companies and an advertising agency have filed a lawsuit in a North Carolina court. Unlike product liability cases, however, which in the past have favoured industry, the courts traditionally have deferred to the agencies on questions of jurisdiction.

Matthew Myers, counsel to the Coalition on Smoking OR Health, one of the anti-smoking groups that first urged FDA action, predicts that the litigation could take two or three years, although the courts might well allow the FDA's proposals to go forward in the interim.

"I assume this one will reach the [US] Supreme Court," Myers says, "because the industry will never give up."

MARLENE CIMONS
Washington, DC

India refining simple HIV test

Scientists at Delhi University have developed a simple blood test that is said to detect antibodies to the human immunodeficiency virus (HIV) in seconds. The simplicity of the test and its low cost should make it a valuable tool in the battle against AIDS, especially in poor countries that lack health-care infrastructure. (India has more than 22,000 HIV-positive individuals, according to official estimates.)

But the university scientists, who are now refining the test, are in no hurry to market it until they can be sure that it detects both HIV-1 and HIV-2 with reliability. This may take six months.

Besides being expensive, conventional enzyme-linked immunosorbent assays (ELISAs) involve multiple steps and require trained technicians, centrifuges and ELISA readers, and, as a consequence, a source of electricity. Sample processing can also take hours.

The new test uses whole blood, thereby eliminating the need for time-consuming separation steps. All that is required for diagnosis is a glass slide and a reagent prepared through recombinant DNA technology, which the government's Department of Biotechnology — the project's sponsor — is hoping to patent.

The single-step test involves adding a drop of the reagent to a drop of blood on a slide and mixing the two. Results are obtained within 5–10 seconds. If the red blood cells clump, the test is positive.

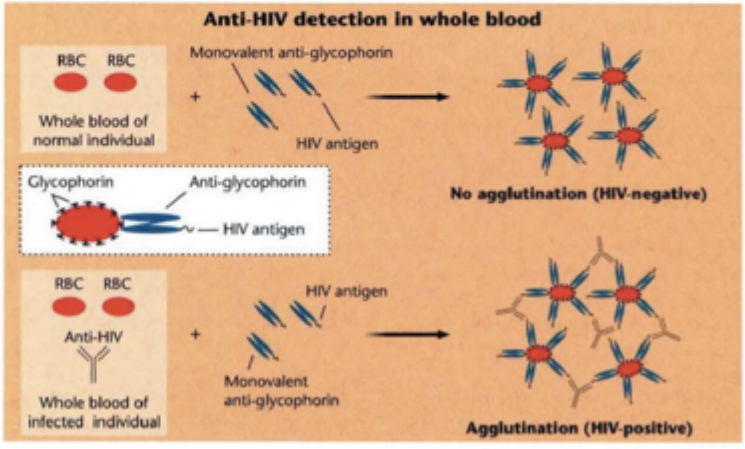
"Rapidity and simplicity are the main virtues of this test," says Vijay K. Chaudhary, who developed it in collaboration with Shobha Sehgal of the Postgraduate Institute for Medical Education and Research in Chandigarh. Chaudhary wants to test at least 2,000 samples before commenting on sensitivity and specificity, but in a limited trial of 100 samples, he says it failed only once.

Most of India's 1,100 blood banks do not screen blood for want of imported kits or because of non-functioning equipment. Only two months ago, the government ordered the closure of a blood bank in Bombay run by the Indian Red Cross Society after learning that it had been supplying tainted blood to city hospitals for as long as two years.

The key to the new test is the recombinant reagent, a fusion protein obtained by fusing an antibody fragment, which binds to the surface of red blood cells, with a synthetic peptide antigen corresponding to the gp41 sequence in the HIV-1 envelope. HIV-1 antibody, if present in the blood sample, binds to the peptide portion of the fusion protein, causing crosslinking between red blood cells and visible agglutination.

Although Chaudhary has received many offers to commercialize the new test, he prefers instead to wait until his team is able to make a 'cocktail' of fusion proteins carrying all the other antigens of HIV-1, and those of HIV-2. The government, which has so far spent $150,000 on Chaudhary's work, has sanctioned a further $100,000 for development of other fusion proteins. Work on this is under way and Chaudhary expects to have a commercially available test next year.

K.S. JAYARAMAN
New Delhi



TECHNOLOGY

Biotechnology Looks at New Frontiers

Biotechnology transfers to industry have a dismal record, but a clutch of research projects holds promise for the future

THE bold new face of Indian biotechnology: MuJ-7. No, it isn't a code name for an arcane chemical. MuJ-7 is an anti-cancer agent named after its discoverers, Rama Mukherjee and Manu Jaggi. Nearly two years ago they modified peptides — protein fragments — that held the promise of inhibiting the growth of certain cancerous tumours. But years of development lay ahead.

A few years ago, such a promise would have meant little to Indian companies. But Dabur, the Rs 400 crore company known better for its ayurvedic formulations, believed in the promise of MuJ-7. So the company agreed to pay Rs 50 lakh as front money, and apart from a 12.5% royalty on future sales for a decade, agreed to donate Rs 20 lakh to further research at the National Institute of Immunology (NII), where Mukherjee and Jaggi worked. Jaggi was later hired by Dabur; today he works out of a custom-built laboratory, which cost Dabur a few crores. And he also keeps in close touch with new research at his alma mater. Within Dabur, the MuJ-7 project is shrouded in secrecy, and the cancer laboratory's scientists report directly to company head Anand Burman.

Dabur is one of a host of companies closely watching developments in biotechnology in public research institutions. As in the case of MuJ-7, some of this research might only bear fruit many years down the road — the work of University of Delhi biochemist Debi Sarkar, for example. Sarkar is working on a genetically altered animal virus that is used to piggyback genes into liver cells. The promise: gene therapy. Gene therapy lies at the cutting edge of biotechnology, but even though it's years from fruition, what's notable is that it's being studied in India.

Dabur's relationship with the NII is a case of how public research laboratories and industries can collaborate in exploring the frontiers of biotechnology, an industry with a Rs 280 crore turnover in 1995 and poised to double by the year 2000. But this is just a start. For long, the realms of theoretical knowledge gathered by Indian biotechnology researchers remained just that: knowledge.

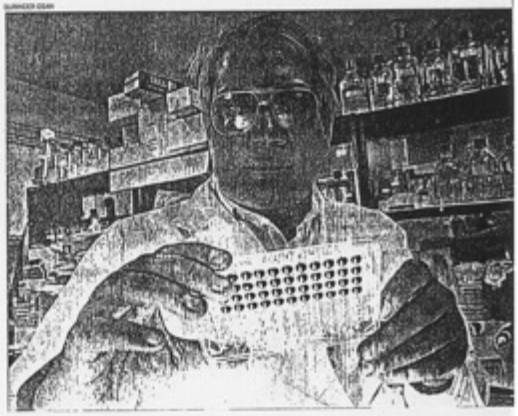
A major reason for that was India's refusal to accept product patents, acknowledging only process patents, or recognition of a method of making a product. So researchers simply didn't apply for patents. "The transfer of process technology was never a problem," notes Central Drug Research Institute director V.K. Kamboj. But that's history.

Now, companies are trying to establish relationships with leading scientists, as the number of patents being filed rises. "We expect to file another 12 patents in the next six months," says P.K. Ghosh, an advisor in the government's department of biotechnology (DBT). That's double the number in the previous six months, itself a record. Similarly, biotechnology divisions of leading Indian companies are going ahead with their own patent applications, most of them shrouded in secrecy. "We've learnt a lot of lessons from our failures," says Ghosh. "If there's no patent, there's no point in technology." The DBT identifies research projects that show commercial promise and provides funding. It also helps promising researchers build ties with industry.

One of these researchers is Vijay Chaudhary, whose bunch of biological molecules was sold for $20,000 (Rs 7.4 lakh) by the DBT last year to Pharmacia, a US company, the first such biotechnology sale to a foreign company. The molecules, called monoclonal antibodies, will be used in laboratories to make designer proteins, the building blocks of the next generation of drugs.

"We never realised it could fetch money," admits Chaudhary, head of the department of biochemistry at Delhi University's south campus. Without Pharmacia, his monoclonals would have

■ Chaudhary has developed a new blood test to detect the HIV virus



अनुसंधान

एड्स की जांच, हाथों हाथ

दिल्ली के वैज्ञानिक डा. विजय कुमार चौधरी ने ऐसी किट बनाई है जो 25 रुपए में एड्स की जांच लगभग तुरंत कर देगी

The Indian EXPRESS
NEW DELHI ■ THURSDAY ■ APRIL 6, 2000

New kit to make HIV screening cheaper

■ Developed by a Delhi professor, NEVA will bring down cost of single test to Rs 25

SANCHITA SHARMA
NEW DELHI, APRIL 5

A UNIVERSITY of Delhi professor has developed a testing kit aimed at making detection of HIV/AIDS both quicker and cheaper. Dr Vijay Chaudhary, Professor of Biochemistry, University Of Delhi, South Campus, has developed a set of reagents which will reduce by almost half the cost of HIV screening.

Called NEVA (Naked eye visible agglutination assay), the test would bring down the cost of a single test to Rs 25. Currently, the cheapest screening test is ELISA, which costs about Rs 40 at government centres, with private screening centres charging anything between Rs 80 and Rs 120 for a single test. Three tests are a must to confirm an HIV infection. Cadilla Pharmaceuticals would be manufacturing and marketing the NEVA kit.

"The good thing about NEVA is that it does not need elaborate instruments and can be conducted by using a glass slide, with the readings (results) being similar to blood groupings," says Chaudhary. The less number of instruments makes it easy for the test to be carried out anywhere, even at temporary camps, emergency clinics and trauma centres.

The test takes only two minutes to be conducted, and compares favourably to an ELISA test, which can take up to several hours because it requires serum separation. "Another test for HIV which can be done very quickly is the saliva test, but this is very expensive and is conducted by using imported kits," informs Chaudhary.

NEVA, however, is a screening test like ELISA and needs two more confirmatory tests.

Another boost to HIV control in the country is the new wonder drug, Nevirapine, which was launched in the Indian market by Cipla yesterday. Priced at Rs 135 per tablet, a single dose of this drug can drastically reduces mother-to-child transmission of AIDS.

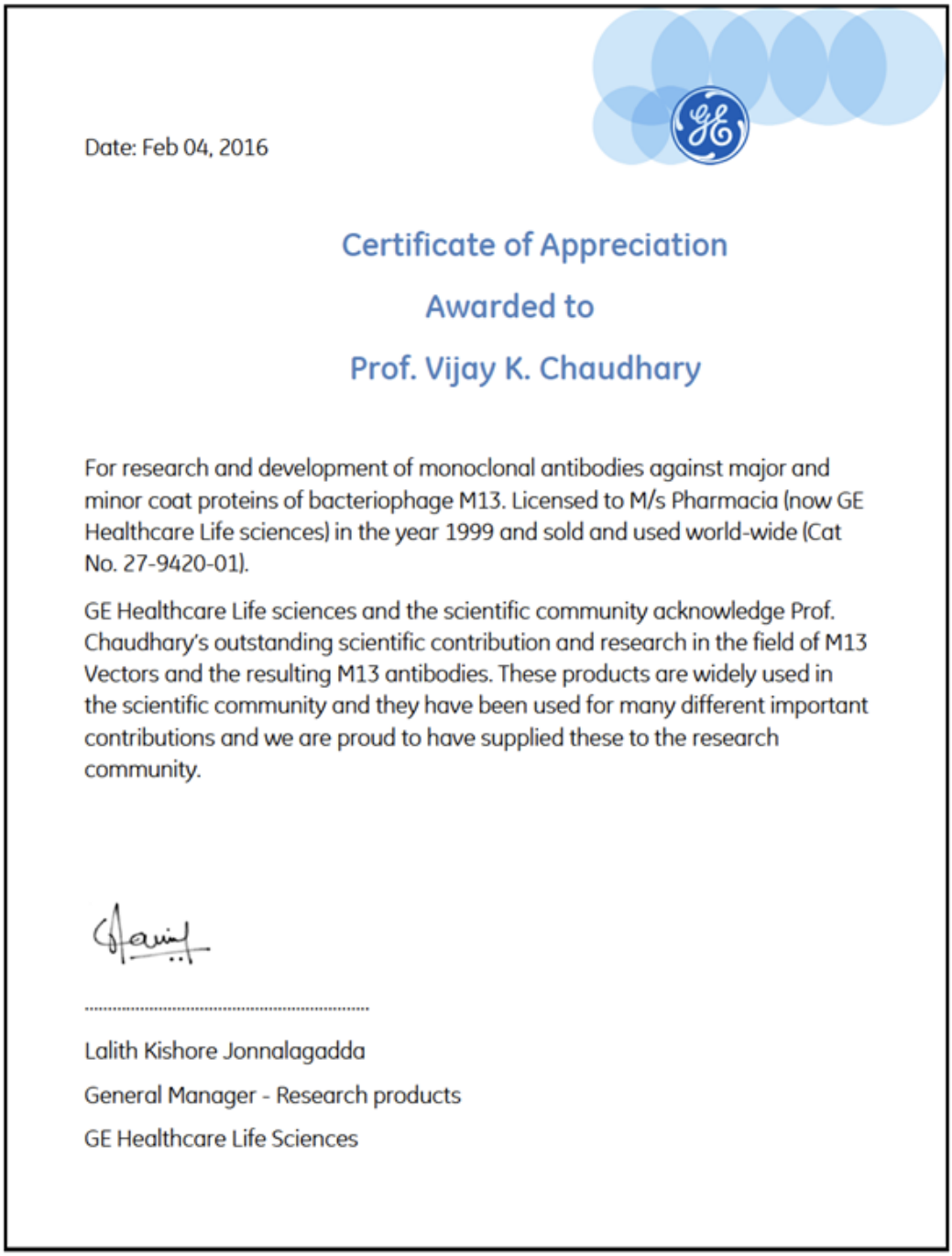
"A single dose to the mother at any stage of pregnancy, or to the child a few hours after it is born, can reduce mother-to-child transmission by 50 per cent," says Dr J.N. Pande, Head, Department of Medicine, All India Institute of Medical Sciences. About 40 per cent babies born to HIV positive mothers also get the disease. Nevirapine has passed through extensive trials, and studies had reported its spectacular success in Africa in *The Lancet* late last year.

It is difficult to determine whether a baby has AIDS in the first nine months after birth because screening tests screen the antibodies against HIV in an infected person, and in a new born, it is difficult to detect whether the antibodies testing positive are his own or those of the infected mother. In extreme cases, the period can extend up to 18 months.

"The only other time it's difficult to detect AIDS is when a person is in a terminal state and has almost no antibodies left to be detected," says Dr Lalit M. Nath, consultant with the WHO, New Delhi.

About 3.5 million people are living with HIV in India. Ranbaxy Science Foundation hosted its 'Sixth Round Table Conference on HIV/AIDS in India' to bring together scientists, clinicians, policymakers and public health professionals to assess and control further spread of HIV.

› Monoclonal antibodies to bacteriophage M13 licensed to M/s Pharmacia (now GE HealthCare) in 1998. This was perhaps the first technology transferred to an international company for a DBT-supported project



Date: Feb 04, 2016

Certificate of Appreciation

Awarded to

Prof. Vijay K. Chaudhary

For research and development of monoclonal antibodies against major and minor coat proteins of bacteriophage M13. Licensed to M/s Pharmacia (now GE Healthcare Life sciences) in the year 1999 and sold and used world-wide (Cat No. 27-9420-01).

GE Healthcare Life sciences and the scientific community acknowledge Prof. Chaudhary's outstanding scientific contribution and research in the field of M13 Vectors and the resulting M13 antibodies. These products are widely used in the scientific community and they have been used for many different important contributions and we are proud to have supplied these to the research community.

Lalith Kishore Jonnalagadda

General Manager - Research products

GE Healthcare Life Sciences

Skill India initiatives

Professor Chaudhary established the Centre for Innovation in Infectious Disease Research, Education, and Training (CIIDRET)at University of Delhi South Campus. CIIDRET has been established under the ordinance XV-A of the University of Delhi since October 2015 has received due approvals of the Academic Council and the Executive Council. As per Its Mandate, CIIDRET has been carrying out work

- To harness Innovative approaches towards developing diagnostics, prophylactics and therapeutics for infectious diseases plaguing India, such as Tuberculosis, Malaria, Typhoid HIV (AIDS), Chikungunya and Dengue infections etc.
- Utilize available, and create new state-of-the-art Proteomic and Genomic facilities, and train undergraduate, post-graduate students, Research Scholars, scientists and teachers to enhance their skills in advance techniques and technologies, beyond their regular classroom learning, through short-term and long-term courses.
- Interact with Biotech Industries to provide consultancy and to provide solutions through expertise and facilities available with scientists / teachers involved at CIIDRET.

Training Workshops/ Skill Enhancement and Outreach Activities /Lectures/ Conferences Organized

SKILL ENHANCEMENT AND OUTREACH ACTIVITIES:

CIIDRET was established in 2015 by the University of Delhi under ordinance XV-A as an inter-disciplinary Research Centre and has been carrying out research and Skill Enhancing training activities in Life Sciences and Biotechnology. Dr. Chaudhary was the Founding Director and served CIIDRET in the same capacity till 31st August 2020, the date of his superannuation. In July 2020, Dr Chaudhary was appointed as the Director (Hon.) for the Delhi School of Skill Enhancement & Entrepreneurship Development (DSSEED), a Centre established by the University under Ordinance XX-U. Since DSSEED and CIIDRET found synergy in the field of Life Sciences and Biotechnology, many Hands-on Training workshops were conducted as soon as the COVID subsided in March 2022 and in-person gatherings/meetings were permitted in the University. The following Hands-on workshops were conducted at the CIIDRET premises. In this, Dr. Chaudhary was involved as an organizer and also as a faculty to teach about Genomics and ELISA.

Dates of the Workshop	Description	No of participants	Purpose of the Workshop
11 March – 21 March 2022,	Techniques for manipulation of nucleic acids for applications in genomics	20 (UG, PG students)	To provide hands-on exposure to methods for isolation and nucleic acid manipulation techniques for genomics.

20 April 2022 (Timing: 10:00 am - 5:00 pm)	Bacterial genome identification, sequencing and Characterization	20 (PG students and Research scholars)	To impart knowledge and hands on Learning experience in bacterial genome sequencing and data analysis
14 June – 21 June 2022	ELISA (enzyme-linked immunosorbent Assay) and its applications"	20 (UG, PG students)	To provide hands-on exposure to methods for use of Immunological techniques employed in diagnostics.

In the second half of 2022, to align with the centenary celebrations of the University of Delhi, DSSEED and CIIDRET organised '100 days festival of Training and Skill Enhancement' (The Skill Festival). The Skill Festival began from 17 December 2022 and successfully completed with the valedictory ceremony on 9th May 2023. **The valedictory event was graced by Shri Atul Kumar Tiwari, Secretary, Ministry of Skill Development & Entrepreneurship, Govt. of India, Prof. Balram Pani, Dean of Colleges, DU, Prof Payal Mago, Director, Campus of Open Learning, DU and Prof. Sanjeev Singh, Joint Director, South Campus, DU.** In the 100-days festival, 13 training workshops including One Faculty Development Programme (FDP) were conducted (brochure attached). **400 participants from 90 different institutions and courses across the nation were trained on different technologies in sciences with the contribution of 50 resource persons from academia and industry.** This massive programme was successful due to whole-hearted intellectual and logistic contribution from 9 academic institutions including colleges of the University, and 9 Industry partners. This 100-day festival created an ecosystem that encouraged learning, collaboration, and networking by bringing together students, instructors, academicians, industry, and facilitators on one platform. The festive spirit of this event was truly realized. The table below lists all the workshops organised in the festival.

S. No.	Topic	Resource Partner
1.	Basic Techniques in Microbiology	Ram Lal Anand College, DU
2.	Techniques for Manipulation of Nucleic Acids for Application in Genomics	Shivaji College, DU
3.	Python for Biology & Its Practical Approach	Hansraj College, DU
4.	Genomic Data Science & Analysis	• Theomics International Pvt. Ltd. • Premas Life Sciences Pvt. Ltd.

S. No.	Topic	Resource Partner
		• Thermo Fisher Scientific Pvt. Ltd.
5.	Python for Physical Science	Rajdhani College, DU
6.	Phage Biology – Discovery & Analysis	Acharya Narendra Dev College, DU
7.	Basic Statistics for Biological Sciences	Ram Lal Anand College, DU
8.	Advanced Technologies in Life Sciences (FDP) with HRDC, Hansraj College, DU	• Tata Memorial Centre, Mumbai • CDFD, Hyderabad • Biochemistry Department, UDSC • Gennova Biopharmaceuticals Ltd., • BD Biosciences (I) Pvt. Ltd. • Cytiva Life Sciences Pvt. Ltd. • Premas Life Sciences Pvt. Ltd. • Thermo Fisher Scientific Pvt. Ltd. • Merck Life Science
9.	Immuno-Biology Techniques & Their Application	Thermo Fisher Scientific Pvt. Ltd.
10.	Recombinant Protein Expression & Characterization	Thermo Fisher Scientific Pvt. Ltd.
11.	PCR, RT-PCR & Its Application	Thermo Fisher Scientific Pvt. Ltd.
12.	IPR & Technology Transfer	Campus Law Centre, DU
13.	Semiconducting Device Fabrication	Miranda House, DU

While the majority of the Hands-on workshops were devoted to Life Sciences and Biotechnology covering Proteomics, Genomics, Immunobiology, Bioinformatics and Data Science, a two week-long Hands-on Training **Workshop on "Semiconductor Devices Fabrication" was unique** and was very timely when the country is investing heavily in the manufacturing of semiconductors, which will require trained manpower and the same is not taught in regular classroom teaching.

In the era of Creativity and Innovation, knowledge about IPR & Technology Transfer is very important. The **one-day IPR workshop** at the South Campus Auditorium contained lectures from renowned experts in the field and included Dr. K.S. Kardam, Former Joint Controller of Patents, Prof. Raman Mittal and Dr. Kshitz Kumar Singh of campus law centre, DU, Patent experts from IITD and BIRAC. Some of the teachers of the University shared their experience about filing of the Patents and the Technology Transfer within the University ecosystem.

The ambitious "100 Day Skill Festival" celebrated 100 years of Delhi University. The festival was conceived to evaluate the effectiveness of **"Beyond Classroom Learning**", which has been the organisers' (CIIDRET) motto since its establishment. The Hon'ble Prime Minister stated, "Central government is focused on offering internships and apprenticeships to give **'beyond the classroom exposure'** to its students," at a post-budget webinar on February 25, 2023, titled "Harnessing Youth Power - Skilling and Education". He applauded the National Internship Portal's assistance, urging businesses and educational institutions to use it to interact with young people. He continued by saying that as part of the New Educational Policy, equal focus is being placed on both education and skill development. This endorses the vision of CIIDRET and substantiates its efforts over the past seven years.

This effort will not end at the festival's 100 days, rather it is the beginning of a new endeavour. Dr. Chaudhary as NASI Senior Scientist at CIIDRET & Director (Hon.) DSSEED will continue to contribute in the activities at CIIDRET for Skilling, Upskilling, and Reskilling of the youth through tailored courses and internship programmes in collaboration with other organisations, government initiatives, and industry partners. In addition to preparing the workforce for the future, the goal is to foster a culture of innovation and entrepreneurship to enable solutions and restore India to its Vishwa Guru status and make it Atmanirbhar.

While the undergraduate and postgraduate education in universities, including the Delhi University, is focused on strengthening the basics, our country needs to apply this knowledge to address both strategic and societal challenges. Generally, the primary leads are converted into utilizable solutions with the involvement of Industry. Also, in the current ecosystem, it has become pertinent that competent individuals with leadership quality and passion for innovation and self-utilization of available and self-generated knowledge may consider to take the path of becoming entrepreneurs and become job givers rather than job seekers.

Dr. Chaudhary also initiated another unique activity in collaboration with the Shaheed Sukhdev College of Business Studies (SSCBS), University of Delhi to support this concept in the form of GENERIC ELECTIVE courses (ENTREPRENEURSHIP) through a set of 7 papers for the undergraduate programmes under UGCF 2022. The syllabus for a set of seven papers has been approved by all the Statutory committees/Councils of the University [(E.C. (1267)-25.08.2023; 27-1-9/) in the last EC held on 25th August, 2023]. It is a matter of pride and satisfaction that at SSCBS, in the BBA and in BMS courses, approximately 70 & 130 students have registered for Entrepreneurship Essentials-1, the first paper in the series of seven. These students recently completed the examination for this paper.

Dr. Chaudhary as a NASI Senior Scientist at CIIDRET, University of Delhi, will continue to support and facilitate designing of similar courses and others including Skill Enhancement courses (SECs) in other subjects that are not covered ordinarily in the syllabus. Eventually, it is all about acquiring Knowledge and Skill, be it through Classroom or 'Beyond Classroom' learning. DSSEED and CIIDRET have established virtues of 'Beyond Class Room' and will create an ecosystem to integrate it with the classroom learning for the students.

The workshops conducted during 2015-2019 are listed below.

- Organized Teachers Summer Workshop on "Recombinant proteins: Expression, Purification, Characterization" from July 2-16, 2019 at University of Delhi South Campus, New Delhi. In this, theory lectures covering cloning, expression and purification of recombinant proteins, their applications, methods to study protein-protein interactions and protein characterization were held. Hands-on training was provided for recombinant protein expression, protein purification and characterization using SPR Technology on Biacore 3000.
- Organized Summer Workshop on "Techniques for manipulation of nucleic acids for applications in Genomics", from June 10-22, 2019 at University of Delhi South Campus, New Delhi. In this, Hands-on training was provided for isolation and purification of Chromosomal and plasmid DNA, and Automated Capillary based Sanger Sequencing
- Organized lecture by Dr Mark Feinberg, President and CEO, International AIDS Vaccine Initiative titled "Enabling Global Access to Monoclonal Antibodies Through Innovative Technology and Partnerships" on 28th March 2019, at 3.30 P.M at UDSC.
- Organized lecture by Dr. Ashutosh Pastor, Manager, Foundation for Innovation and Technology Transfer (FITT), the Indian Institute of Technology Delhi on "Bio-Entrepreneurship: How to Kick Start your Startup" and by Dr. Sarita Ahlawat, the BIRAC_BIG Innovator, TBIU, IIT-Delhi & Head- Living Science Group, on "Life in the start-up world: developing new technologies and a science communication platform" on 28 January 2019 at 4.00 P.M at UDSC.
- Organized DBT-sponsored brain storming meeting on "Strategies for Treatment Modalities for Snake Bite with special focus on Recombinant Antibodies" at CIIDRET under the aegis DBT- funded Centre of Excellence on "Antibody Technology Research for Therapeutic and Diagnostic applications".
- Organized lecture by Dr. Devin Sok, the Director of Antibody Discovery and Development for IAVI (International AIDS Vaccine Initiative), at Scripps Research Institute, la Jolla, California, USA, on " Antibody Discovery against variable pathogens " at UDSC on 14th November 2018 at 3.30 PM.
- Organized lecture by Prof. Christopher Broder, Director, Emerging Diseases Graduate Programme, Uniformed Services University of Health Sciences, Bethesda Maryland, USA entitled "Nipah virus and Hendra virus: Basic Science to Global Countermeasures" on 9th August 2018.
- Organized 1st National Workshop on Protein Purification and Characterization in association with GE Healthcare Lifesciences on 6-9th February, 2018 for Biologists interested in learning chromatographic techniques suitable for production-scale protein purification.
- Organized lecture by Dr. Renu Swarup, Senior Adviser, Department of Biotechnology, Ministry of Science & Technology, Government of India entitled "Igniting Minds....Spurring Innovations" as a part of Entrepreneurship Guest Public Lecture Series to promote Industry - Academia Interaction Initiative on 3rd July 2017.
- Organized lecture by Mr. Nilesh Mehta, CEO & President, Premier Medical Corporation Ltd., Nani Daman, India entitled "Biotech Industry in India - Opportunities and Challenges" as a part of

Entrepreneurship Guest Public Lecture Series to promote Industry - Academia Interaction Initiative on 7th April 2017

- Organized 2nd National Workshop on Genome Informatics, on March 6-8, 2017 at University of Delhi South Campus, New Delhi. In this, Hand-on training was provided in collaboration with M/s Bionivid Technology Private Limited, Bangalore

Custom services offered by CIIDRET to scientific community

› Sanger DNA Sequencing for the last 23 years

› Microarray Experiment and Analysis

› Next Generation Sequencing & Data Analysis






Scientific achievements

Professional Attainment

Research

Professor Chaudhary has more than 30 years of research experience in the field of Antibody technology with interest to generate Novel Reagents and Test Devices for Diagnosis of Infectious Diseases (AIDS, Tuberculosis, Malaria and Typhoid). He has vast experience in Phage display, directed Evolution of Therapeutic Antibodies and Proteins, High throughput genome-wide cloning, expression and Purification of Proteins, Production of Therapeutic Proteins and Antibodies.

› **Publications:-** **>90** (mostly International; more than 4000 citations), Dozens of papers in High impact international journals including Nature, PNAS, USA, JBC etc

› **Patents:-** Indian and International (filed / Awarded): **20**

› **Research grants:** >20 projects with funding exceeding **Rs. 30 crores** during the past **32 years**

Complete List of Publications

1. Varsha Dwivedi, Rakesh Kumar Gupta, Amita Gupta, **Vijay K Chaudhary**, Sanjay Gupta, and Vandana Gupta (2022), Repurposing Novel Antagonists for Targeting p7 Viroporin of HCV Using *In Silico* Approach, Letters in Drug Design & Discovery, 2022, 19, pp. 969-981(13), (https://doi.org/10.2174/1570180819666220124112150)
2. Singh A, Kaur SP, Shahanshah MFH, Sharma B, **Chaudhary VK**, Gupta S, Gupta V**. "**COVID-19 Vaccination: A clinical Perspective" (2023) Chapter in the textbook 'Coronavirus Disease 2019 (COVID-19): A Clinical Guide' ed. Ali Gholamrezanezhad, pgs 472-493; publisher Wiley-USA. https://doi.org/10.1002/9781119789741.ch22.
3. 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. **Nat Commun**. 12(1):6912. doi: 10.1038/s41467-021-27275-8.
4. Verma, V., Gopal Joshi, Gupta, A., **Chaudhary, V.K.** (2020) An efficient ORF selection system for DNA fragment libraries based on split beta-lactamase complementation PlosOne 15, e0235853; 2020
5. Verma, V., Gupta, A., **Chaudhary, V.K.** Emulsion PCR made easy. Biotechniques. 69: 421; 2020.
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Books/Reviews

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Awarded/Filed Patents

1. An antibody fragment library, and uses thereof; EP application number - EP3717682A4 (published on 01.09.2021)
2. An antibody fragment library, and uses thereof; US patent US11725306B2 (published and Patent granted on 15.08.2023)
3. An antibody fragment library, and uses thereof; Indian Patent no. 320566 granted on 16th September 2019.
4. An antibody fragment library, and uses thereof; PCT application no. PCT/IN2018/050802. Publication No. WO/2019/106694 (06.06.2019).
5. A process for immobilizing polypeptides; Indian Patent application no. 201711040047 filed on 9th November 2017.
6. A process for immobilizing polypeptides; PCT no. PCT/IN2018/050722; Publication No: WO/2019/092742 (16.05 2019)
7. Process for purifying emulsion PCR mixture, and implementations thereof; Indian Patent Application no. 201811038157, 8 October 2018
8. A process of producing ORF-enriched phage display library and uses thereof. (Application no. 2346/Del/2013)
9. Improved process for expression, purification and enhanced recovery of mycobacterial recombinant proteins. Indian Patent No IN263766 awarded on 17.11.2014
10. Lambda phage display system and The Process, Vijay Kumar Chaudhary, Amita Gupta, Sankar Adhya, Ira H. Pastan, US 7,410,801, August12, 2008.
11. A process of obtaining recombinant lambdoid bacteriophage and the resultant novel phage display system (No: PCT/IN03/00193; 18th Nov 2004, WO03/096969)
12. A process of displaying functional proteins on Bacteriophage Lambda. (No. IN199578, 2005)
13. A process for preparation of an agglutination reagent for rapid detection of Typhoid under a collaborative project with DRDE Gwalior (European patent EP 1575520 B1- awarded on 7.11.07).
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16. A non-aggregating derivative of HIV-1 p24 for haemagglutination based rapid detection of antibodies to HIV in whole blood (application no.1149/Del/2001).
17. A process for preparing proteins used for the detection of anti-HIV antibodies (No. IN199888; 2007).
18. A Process for the Isolation and High Yield Purification of Protein p17 of HIV-1 subtype B and C (Number: IN191365, 2003).
19. A process for the isolation and purification of protein p24 of HIV-1 subtype C. (No. IN191365; 2004)
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21. CD-4/cytotoxic gene fusions. US Patent No.5,206,353.
22. Cytotoxic agent against specific virus infection. US Patent No.5,428,143
23. Pseudomonas exotoxin fusion proteins have COOHG220101 al alterations, which increase cytotoxicity. US Patent No.5,458,143.
24. Pseudomonas exotoxins (PE) and conjugates there of having lower animal toxicity with high cytocidal activity through substitution of positively charged amino acids. US Patent No.5,512,658.
25. Cytotoxic agent against specific virus infection, US Patent No.5,587,455
26. Monoclonal Antibodies (MAbs) against two coat proteins gIIIp and gVIIIp of filamentous phage M13 and a process for their preparation. Patent No.764/Del/94, dated 20 October, 1997
27. Target-specific, Cytotoxic, Recombinant Pseudomonas Exotoxin, US Patent No.5,705,163, January 6, 1998.
28. Pseudomonas Exotoxins of Low Animal Toxicity and High Cytocidal Activity, US Patent No. 5,705,156, January 6, 1998.
29. Recombinant antibody-toxin fusion protein, US Patent No.5,696,237, December, 9, 1997.

Details of research projects

24 projects with **funding** exceeding **Rs. 30 crores** during the past **32 years**

› Ongoing Government of India-funded Research Projects as PI/Co-PI

S No.	Title of Project	Funding Agency	Amount	Duration
1.	Therapeutic Antibodies for COVID-19 (with Gennova Biopharmaceuticals Ltd. as CO-PI)	DBT-BIRAC	16.5 crores	12/2020-11/2023
2.	Centre of Excellence entitled "Antibody Technology: Research for therapeutic and diagnostic application	DBT	6.08 crores	12/2017-12/2023
3.	DBT-supported Genomic Facility at University of Delhi South Campus	DBT	2.47 crores	2/2018- 2/2022
4.	Identification of mycobacterial proteins and novel antigenic epitopes having immunodiagnostic potential and development of reagents for	DBT	81.9 lacs	2/2018- 2/2022

	point of care test for tuberculosis (with NITRD as collaborator)			

› Completed Government of India-funded Research Projects as PI/Co-PI

S. No.	Title of Project	Funding Agency	Amount	Duration
1.	Development of reagents for simple immunochemical tests for the detection of Chikungunya infection (with Dr. Sanjay Gupta, JIIT, NOIDA and Dr Shymelendu Chatterjee, ICMR Virus Unit Kolkata)	DBT	~86.4 lacs	2014 - 2017
2.	DNA Sequencing facility at UDSC (Phase V)	DBT	~175.0 lacs	2014 - 2017
3.	"Development and production of a therapeutic monoclonal antibody against eNAMPT, a novel inflammatory target with Gennova Biopharmaceuticals, Pune	CSIR NMITLI	~275 lacs	2011-2016
4.	Ready-to-use Microfluidic Cartridges for Affordable Point of-care Diagnostics "ReDia"	DBT: Indo Finland	~74.23 lacs	2012 - 2014
5.	High performing lateral-flow type assay concepts for cardiac and infectious disease testing (ICGEB, New Delhi and University of Turku, Finland,	Indo (DBT)-Finland (TEKES)	89.0 lacs	2010- 2013
6.	DNA sequencing facility at UDSC (Phase (IV)	DBT	160.0 lacs	2006- 2013
7.	"Doctor's office diagnostic instrument for detection of *M. tuberculosis* under "in the field" conditions adapted for use by unskilled personnel" Indo (DBT) -Sweden bilateral collaboration	DBT	Rs.80 lacs	2009-2012

8.	"Development of reagents for simple and rapid immunochemical test for culture confirmation of *Mycobacterium tuberculosis* complex" & Multi Centre Evaluation of TBConfirm test (A rapid Immuno-chromatography test) for culture confirmation of *M. tuberculosis*.	DBT and SPAN Diagnostics	Rs.268.94 lacs	2006- 2014
9.	Reagents for Immunological detection of SARS associated Coronavirus (SARS-CoV)	DBT	Rs. 36.15 lacs	2004 - 2007
10.	Strengthening of DNA sequencing facility at UDSC	DBT	Rs.48 lacs	2000 for two years
11.	Phage display based structure-function analysis of human immunodeficiency virus-1 capsid protein p24)	DST	Rs.17.93 lacs	2001 - 2004
12.	Programme support for immuno-proteomics-based Diagnostics of infectious diseases	DBT	Rs. 356.008 lacs	2004 -2008
13.	Assistance for carrying out work on limited improvement of the reagent being used in the NEVA kit.	Cadila Pharma-ceutical Ltd.	Rs.25.68 lacs	2000 - 2002
14.	Identification of specific immunodominant epitopes using phage displayed fragmented genome library of *M. tuberculosis*.	DBT	Rs.67 lacs	2001 - 2004
15.	Development of phage display based protein engineering systems for diagnostics, prophylactics and therapeutics	DBT	Rs.127 lacs	1996 - 2001
16.	Technology perfection and transfer of agglutination-based detection of HIV-1/2 antibodies in human blood	DBT and Cadila Pharma-ceutical Ltd.	Rs.69 lacs	1998 –2001
17.	Improvement of NEVA-HIV test reagents using protein engineering and phase display technology	DBT	Rs. 58.92 lacs	2002 -2005

18.	Cloning, Expression & Humanization of Murine Antibodies for Targeted Drug Delivery	CSIR	Rs. 11.91 Lacs	1995 - 1997
19.	Development of a recombinant reagent for AIDS diagnostics with a drop of blood	DBT	Rs. 51.72 lacs	1993 - 1997
20.	Cloning, expression and mutagenesis of a thermostable DNA polymerase: its application, in PCR-based amplification of antibody genes to make antibody-enzyme fusion proteins	DBT	Rs. 49.63 lacs	1990 - 1993

Lectures/Oration delivered in Conferences/Seminars/ Scientific Session chaired (since 2015)

- Delivered Lecture "My Story of Learning Technology Development: Translating Innovative Science to Products for Society", NATIONAL TECHNOLOGY DAY – 2023, Amity University Gurugram, Haryana, 16th May 2023
- Delivered Lecture "Our Story of Learning about Patent, Trade Mark and Technology Transfer", 100 Days Skill Festival WORKSHOP ON IPR & TECHNOLOGY TRANSFER, University of Delhi South Campus, 18th March 2023.
- Delivered Lecture "Science of Antibody - Lab to Market", 63rdAnnual International Conference of Association of Microbiologists of India (AMI) "Microbial Technologies for Sustainable Biosphere", Maharshi Dayanand University, Rohtak, Haryana- 124001, 2nd to 4th February 2023.
- Delivered Lecture "From Innovations to Products: Translating Science for Society", 62nd Annual International Conference of Association of Microbiologists of India (AMI) "Microbes and Society: Current Trends and Future Prospects", University of Mysore, 21 - 23rd September 2022. **This was a AMI-Lifetime Achievement Award Lecture -2021 (Sr. No.-AMI-Award 2021/15) conferred by the Association of Microbiologists of India on 22nd September, 2022.**
- Delivered Lecture "Recombinant antibodies based ASV: A step towards next generation Snakebite Therapy" at ANNUAL SNAKEBITE CONFERENCE-2022, Indian Society for Toxinology and Snakebite Mitigation (ISTSM) & AMRITA HOSPITALS, 27th May 2022 (Online).
- 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).

- Delivered Lecture "Antibodies, Ek Naam, Anek Kaam" at "Mikrovitae 2022, the Annual Festival of Mikrobiologika" organized by Department of Microbiology, Ram Lal Anand College, University of Delhi, 25th February, 2022. (Online).
- Delivered lecture "Phage-Displayed Human Antibody Library – A resource for discovery of next generation antibody therapeutics" at the 90th Annual meeting Society of Biological Chemists of India 2021 (SBCI-2021), Amity University Gurugram, 18 December 2021 (Online).
- Delivered Lecture "Antibodies, Ek Naam, Anek Kaam" at "International Microorganism Day" organized by Microcosm Association in collaboration with AMI, SGT UNIVERSITY, Gurugram, 16-17 September, 2020. (Online).
- Delivered Lecture "Antibodies, Ek Naam, Anek Kaam" at National Science Day – 2020, Celebrations, School of Studies in Biochemistry, Jiwaji University, Gwalior, 27-28 February, 2020.
- Delivered Lecture "Phage-Displayed Human Antibody Library"-A resource for discovery of next-generation antibody therapeutics" at Tata Memorial Centre, Advanced Centre for Treatment, Research and Education in Cancer (ACTREC), 2nd January 2020.
- Chaired a session at National Symposium on Challenges in Snakebite management held at University of Mysore, Karnataka, December 16-17, 2019.
- Delivered a lecture on "Recombinant Antibodies for Snakebite Treatment" at National Symposium on Challenges in Snakebite management held at University of Mysore, Karnataka, December 16-17, 2019
- Chaired a session at Guha Research Conference-2019 (GRC-2019) held at Jaisalmer, Rajasthan, December 6-10, 2019.
- Delivered Lecture "Phage Display- Based Technologies for Human Health" at INDO-US VACCINE ACTION PROGRAM (VAP), JOINT WORKING GROUP (JWG), Thirty First Meeting, November 15-16, 2019, New Delhi.
- Delivered Foundation Day Lecture "Antibodies, Ek Naam, Anek Kaam" at Institute of Advanced Study in Science and Technology (IASST), Guwahati, Assam on 3rd November 2019.
- Delivered Plenary Lecture "Antibodies, Ek Naam, Anek Kaam" at AMITY University Campus, Manesar, 4th September, 2019.
- Delivered a Lecture "AN INDIGENOUS PHAGE-DISPLAYED NAÏVE HUMAN ANTIBODY (scFv) LIBRARY… A potential source of recombinant antibody-based therapeutics for human diseases including AMR, Sepsis and snake bite treatment!" at Cadila Zydus Ltd., Ahmedabad on 12th February 2019.
- Presentation "Research Profile- University of Delhi" made in the meeting on R&D Ecosystem in Higher Educational Institutions under the Chairmanship of Shri. Ratan P. Watal, Principal Adviser, NITI Aayog and Member Secretary, EAC to PM meeting on R&D Ecosystem in Higher Educational Institutions on 30 January 2019 at NITI Aayog New Delhi.

- Delivered lecture “Antibodies” The Wonder Biologics – Making Difference in the Human Life at Haffkine Institute for Training, Research and Testing, Mumbai on 4 January, 2019.
- Delivered lecture “Antibodies in Diagnostics: Rapid Tests for Rural India” at 88th Annual Session of The National Academy of Sciences, India (NASI) in a symposium in Science, Technology and Ecosystem for Sustainable Rural Development jointly organized by Mahatma Gandhi Chitrakoot Gramoday Vishwavidyalaya (MGCGV) & Deendayal Research Institute (DRI), Chitrakoot, Satna, M. P on 6-8th December 2018.
- Delivered lecture “Genome Sequencing - Gel to NGS and Beyond” at Department of Biotechnology (DBT), Ministry of Science & Technology, Govt. of India, Lodi Road New Delhi on 17th September 2018
- Delivered lecture “The Magic of Antibodies” at National Conference on Recent Trends in Zoological Research in North-East India, North-Eastern Hill University, Shillong, Meghalaya, India, jointly organized by Department of Zoology (NEHU) & Zoological Society (Kolkata) on 19th April 2018.
- Delivered Key note address entitled “Antibodies: Wonder Molecules” at Symposium on Translational Science, Lab2Life, organized by Sri Venkateswara College, New Delhi on 15 February, 2018.
- Delivered a lecture entitled “An indigenous phage-displayed naïve human antibody (scFv) library: A potential source of recombinant antibody-based therapeutics including snakebite treatment!” at the Symposium on “Development of advanced biologics for the treatment of human diseases” Hotel Hycinth, Trivandrum, Kerala on 2nd February 2018.
- Delivered a lecture entitled “Human Antibodies: their production and applications” at the International Conference on Advances in Biosciences and Biotechnology organised by Department of Biotechnology, Jaypee Institute of Information Technology, NOIDA at JIIT campus on February 1, 2018.
- Delivered a lecture entitled “An indigenous phage-displayed naïve human antibody (scFv) library: A source of recombinant anti-snake venom molecules!” at SNAKSYMP 2017-Conference on Recent Advances in Research on Snake Venom and Snakebite Therapy: National and International Perspectives organized by CSIR-CCMB on 1st December 2017.
- Delivered a lecture entitled “Recombinant Antigens and Antibodies for improved immunoassays” at Indo-Iran Workshop to Develop Cooperation in Biotechnology organized by International Centre for Genetic Engineering & Biotechnology on 4th August 2017.
- Delivered a lecture entitled “The Magic of Antibodies” under Faculty Development Program on “Recent Advances in Diagnostics and Therapeutics” at Department of Biotechnology, Jaypee Institute of Information Technology, NOIDA on July 18, 2016.
- Delivered the plenary lecture entitled “The Magic of Antibodies” on the occasion of ‘National Science Day’ at Central University of Haryana, Mahendragarh on February 28, 2017.

- Delivered a lecture in a symposium on "Breakthrough and New Challenges in the Diagnosis and Management of Tuberculosis", held at MGM Institute of Health Sciences, Navi Mumbai from 18-19 March 2016.
- Made a presentation in Global Biotechnology Summit – 2016 celebrating 30 years of Biotechnology on 5-6 February 2016 in section Swatch Bharat Swasth Bharat: Innovation for a healthy nation.
- Prof. Vijay K. Chaudhary and Dr. Amita Gupta displayed a competitively selected poster describing "TB Confirm test" at exhibition on "Innovation in Medical Science and Biotechnology" held at the Lawn of Rashtrapati Bhawan, New Delhi on 16th March 2016.
- Participated in round table discussion "Innovation in Medical Science and Technology" held at West Hall, Rashtrapati Bhawan Conference Centre, New Delhi on 16th March 2016.
- Delivered Foundation Day Lecture "The Magic of Antibodies" at National Institute for Research in Tribal Health, Jabalpur (ICMR – NIRTH), March 1, 2016
- Attended as the Chief Guest and delivered Inaugural Lecture "Science: My Inspiration" under INSPIRE (Innovation in Science Pursuit for Inspired Research) Internship Program, an initiative of Department of Science and Technology (DST), Govt. of India at AMITY University Campus, Manesar, November 24, 2015.

Date and Place of Birth

22 August 1955; Chandausi, Distt. Moradabad, UP

Education

Degree (Subject)	Institution/Place	Year
Ph.D. Biochemistry	University of Delhi, V.P. Chest Institute,	1983
M.Sc. Biochemistry	G.B. Pant University of Agriculture, & Technology, Pantnagar, UT	1975
B.Sc. Life Sciences (Z,B,C)	Agra University, Agra	1973