ISSN: 2454-6968
RNI No. UPENG/2013/54102

Volume 8
Issue 88
November 2020

Rs. 800

BIOTECHNOLOGY EXPRESS

The only magazine of Bi

Prof Ashok Pandey under top 10 in World's Ranking of top 2% scientists, no.1 from India

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Publisher : Kamal Pratap Singh

Printed at : Monex offset, B-12 SD complex, near MMG hospital, Ghaziabad- 201005.

Individual rates available to subscribers paying by personal cheque or NEFT. Order for Students, PhDs, postdoc subscription must be accompanied by a copy of student ID.

The Biotech Express magazine publishes between 10th to 15th of every month.

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From the very first issue, Biotech Express team has been delivering what's best for Biosciences community. The audience of this magazine includes students, researchers, faculties and executives of highly prestigious organizations of India. In year 2016, BEM has made new editorial Board combining experience of eminent Advisory Board Members who have been into Award winning Research and head prestigious Administrative positions.

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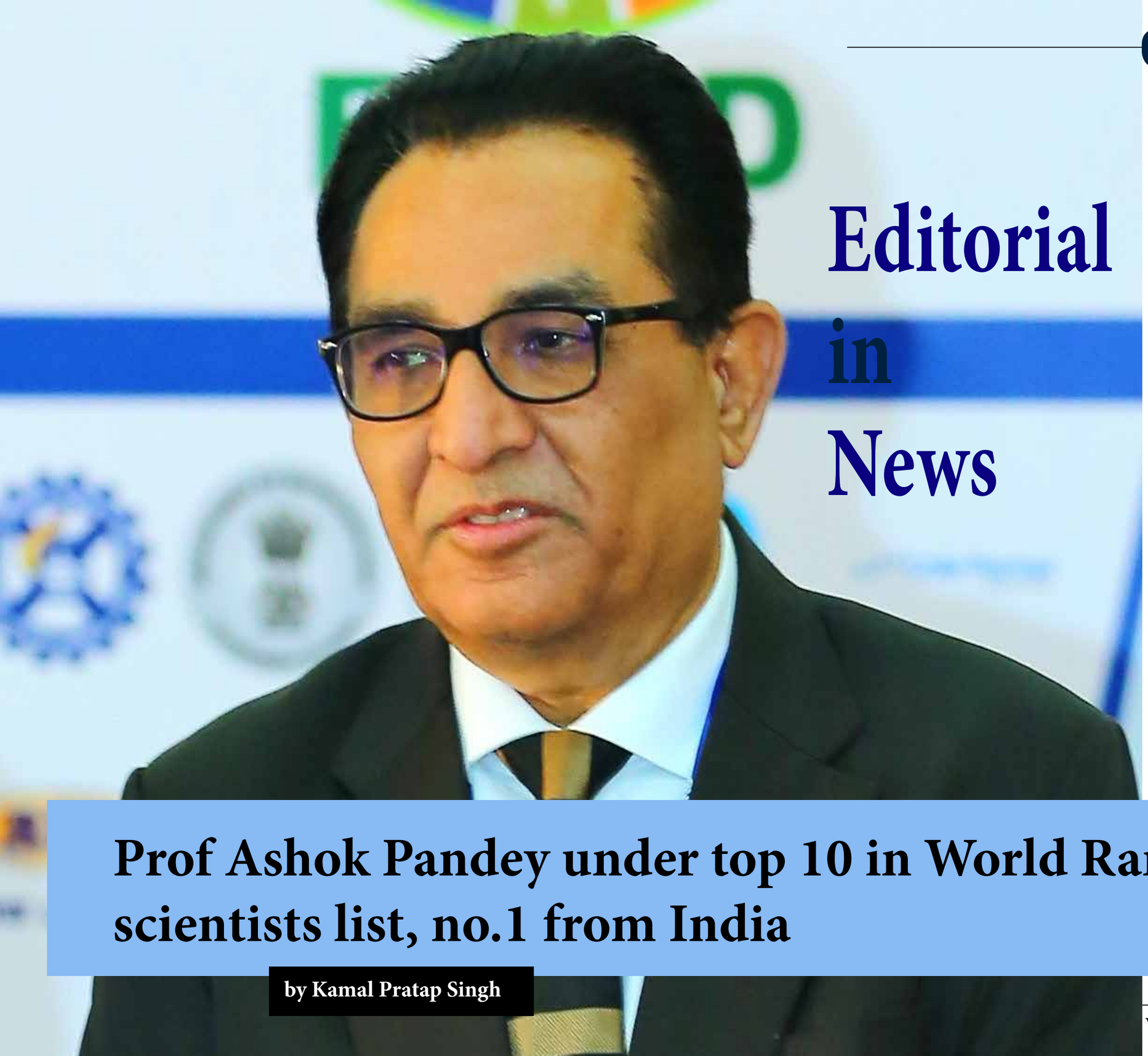

Editorial in News

Prof Ashok Pandey under top 10 in World Ranking of top 2% scientists list, no.1 from India

by Kamal Pratap Singh

In the study the scientists of Stanford University created a database of more than 100,000 top scientists of the world and made ranking on the basis of standardised citation indicators such as citations, H-index, co-authorship and a composite indicator. The database, a work of John Ioannidis, Kevin Boyack and Jeroene Bass from the departments of Medicine, Epidemiology and Public Health and Biomedical Data Science, University of Stanford, California, USA has been published in the October 16 issue of PLos Biology. These scientists are from across all scientific fields based on their ranking of a composite indicator that considers six citation metrics to measure impact of research publications. Scientists have been classified into 22 scientific fields and 176 sub fields.

The list includes about 1,500 scientists from India. Subject-wise ranking of top 2 percent scientists from India is available at http://shorturl.at/bdix8.

About Professor Ashok Pandey

Professor Pandey is eminent biotechnologist and Founder of BRSI. He is currently Distinguished Scientist at Centre for Innovation and Translational Research, CSIR-Indian Institute of Toxicology Research (IITR), Lucknow, India and Honorary Executive Director at the Centre for Energy and Environmental Sustainability- India. Formerly, he was Eminent Scientist at the Center of Innovative and Applied Bioprocessing (CIAB), Mohali and Chief Scientist & Head of Biotechnology Division at CSIR's National Institute for Interdisciplinary Science and Technology (NIIST) at Trivandrum.

Details of methodology on preparing the list of top 2% scientists in the world by Stanford Researchers

- Authors used updated analyses that use citations from Scopus with data freeze as of May 6, 2020
- Assessed scientists for career-long citation impact up until the end of 2019
- Assessed for citation impact during the single calendar year 2019

Updated databases and code are freely available in Mendeley (https://dx.doi.org/10.17632/btchxktzyw).
The original database (version 1) can be found in https://data.mendeley.com/datasets/btchxktzyw/1,
The updated (version 2) can be found in https://data.mendeley.com/datasets/btchxktzyw/2
Any subsequent updates that might appear in the future will be generally accessible in https://dx.doi.org/10.17632/btchxktzyw

- Primary list contains all scientists who are among the top 100,000 across all fields according to the composite citation index.
- Fields also contain names who are not in top 100,000 but within top 2%.
- Field and subfield discipline categories use the Science-Metrix classification
- Specific field and subfield have been assigned using a character-based convolutional deep neural network.
- Derived the 25th, 50th, 75th, 90th, 95th, and 99th percentile thresholds for each field and each subfield for career-long and single year 2019 impact based on citations and, separately, based on the composite indicator.
- The formula to calculate the composite indicator for career-long impact is derived by summing the ratio of log of 1 + the indicator value over the maximum of those indicator logs for 6 indicators (NC, H, Hm, NCS, NCSF, NCSFL)
- The formula to calculate the composite indicator for single year 2019 impact follows the same principle and only uses citations from publications published in 2019. Maximum log values across the population are in separate tables for career and single year 2019.

Professor Pandey is Adjunct/Visiting Professor/Scientist in universities in France, Brazil, Canada, China, Korea, South Africa, and Switzerland and also in several universities several in India. He has ~1400 publications/communications, which include 16 patents, 87 books, 700 papers and book chapters, etc. with h index of 100 and >45,000 citations (Goggle scholar). He has transferred several technologies to industries and has done industrial consultancy for about a dozen projects for Indian/international industries.

Professor Pandey is Editor-in-chief of Bioresource Technology, Honorary Executive Advisors of Journal of Water Sustainability and Journal of Energy and Environmental Sustainability, Subject editor of Proceedings of National Academy of Sciences (India) and editorial board member of several international and Indian journals.

Professor Pandey is the recipient of many national and international awards and honours, which include Distinguished Professor of Eminence with global impact in the area of Biotechnology, Precious Cornerstone University, Nigeria (2020), Highest Cited Researcher (Top 1% in the world), Clarivate Analytics, Web of Science (2019); IconSWM Life-time Achievement Award 2019, International Society for Solid Waste Management, KIIT, Bhubaneshwar, India (2019);

Korea (2019), Highest Cited Researcher (Top 1% in the world; Top 10 in India), Clarivate Analytics, Web of Science (2018); Life-Time Achievement Award from the Biotech Research Society, India (2018); Life-Time Achievement Award from Venus International Research Awards (2018), Most Outstanding Researcher Award from Career360 (2018), Life-Time Achievement Award from the International Society for Energy, Environment and Sustainability (2017); Academician of European Academy of Sciences and Arts, Austria (2015); Honorary Doctorate degree from Univesite Blaise Pascal, France (2007); Thomson Scientific India Citation Laureate Award, USA (2006); UNESCO Professor (2000); Raman Research Fellowship Award, CSIR (1995); GBF, Germany and CNRS, France Fellowships (1992) and Young Scientist Award (1989), etc. He is Fellow of various academies, which include Royal Society of Biology, UK (2016); International Society for Energy, Environment and Sustainability (2016); National Academy of Sciences, India (2012); Association of Microbiologists of India (2008), International Organization of Biotechnology and Bioengineering (2007) and the Biotech Research Society, India (2005).

Professor Pandey is Founder President of the Biotech Research Society, India (www.brsi.in); Founder & International Coordinator of International Forum on Industrial Bioprocesses, France (www.ifibiop.org), Chairman of the International Society for Energy, Environment & Sustainability (www.isees.in), Editor-in-chief of Bioresource Technology (http://ees.elsevier.com/bite/), Honorary Executive Advisor of Journal of Energy and Environmental Sustainability (www.jees.in), Journal of Systems Microbiology and Biomanufacturing (https://www.springer.com/journal/43393), Journal of Environmental Sciences and Engineering (http://neerijese.org/editorial-board/), Subject Editor, Proceedings of National Academy of Sciences, India (https://www.springer.com/life+sciences/journal/40011) and Associate Editor, Biologia – Section Cellular and Molecular Biology (https://www.springer.com/journal/11756/editors) and editorial board member of several international and Indian journals.

Last but not the least, Prof Ashok Pandey is Advisory Member of Biotech Express Magazine Editorial Board. Prof Sir Ashok Pandey is among the first few scientists (Prof Kambadur Muralidhar, and few others) who joined our board in 2013 when the magazine was launched and since then providing valuable advice and critics toward the content selection and publication. Prof Pandey and his NGO BRSI and Biotech Express share a common goal i.e. Promotion of Indian Science. We proudly congratulate Prof Ashok Pandey on this unprecedented achievement on behalf of of Biotech Express Magazine.

Women in Science

Ranked at 886, Reeta Rani Singhania is a Chief Scientist at Centre for Energy and Environmental Sustainability, Lucknow. She has worked at CSIR-NIIST, Trivandrum, India; EPFL, Lausanne, Switzerland, University Blaise Pascal, Clermont-Ferrand, France and DBT-IOC Centre for Advanced Bioenergy Research, Faridabad, India. Her major research interest is in the areas of microbial and enzyme technologies, with current focus on biofuels from lignocellulosic biomass. She is the recipient of DBT-Bioscience Energy Overseas fellowship in 2013, Elsevier Best Paper award in 2007, AU CBT Excellence award of BRSI in 2008 and IFIBiop Young Scientist award for the year 2013. She is an editorial board member of Bioresource Technology, Biofuel Research Journal and Journal of Energy and Environmental Sustainability. Dr Singhania has more than ~6000 citations and an h index of 29 (Google scholar).

Table: Indian Scientists from Biotechnology and other Allied Subjects who have appeared in world's top 2% scientists list

Subjects and their given codes - Biotechnology - BT | Biochemistry & Molecular Biology – BMB | Bioinformatics – BI | Biophysics – BP | Genetics & Heredity – GH | Immunology – IM | Marine Biology & Hydrobiology –MBH | Ecology –Eco | Microbiology MB | Mycology & Parasitology - MYP | Biomedical Engineering – BME | Dairy & Animal Science – DAS | Oncology & Carcinogenesis – ONC | Toxicology – Tox | Virology - Vir | Medicinal & Biomolecular Chemistry – MBC | Plant Biology & Botany – PBB | Zoology - Zoo

Author	Field	Institute	Rank	C-score	Top %	Number of papers
Pandey, Ashok	BT	Indian Institute of Toxicology Research	8	4.47889562	0.015890988	600
Venkata Mohan, S.	BT	Indian Institute of Chemical Technology	29	4.19389623	0.057604831	337
Gupta, Munishwar Nath	BT	Indian Institute of Technology Delhi	84	3.90383257	0.166855372	280
D'Souza, S. F.	BT	Bhabha Atomic Research Centre	90	3.88919306	0.178773613	196
Rathore, Anurag S.	BT	Indian Institute of Technology Delhi	112	3.81313664	0.22247383	277
Ghose, Tarun K.	BT	Birla Institute of Scientific Research	115	3.81080115	0.22843295	72
Husain, Qayyum	BT	Aligarh Muslim University	130	3.77351667	0.258228552	120
Malik, Anushree	BT	Indian Institute of Technology Delhi	154	3.72545969	0.305901516	113
Sen, Ramkrishna	BT	Indian Institute of Technology Kharagpur	193	3.67914128	0.383370081	143
Mallick, Nirupama	BT	Indian Institute of Technology Kharagpur	215	3.6440721	0.427070298	102
Annadurai, G.	BT	Manonmaniam Sundaranar University	240	3.59236358	0.476729635	114
Pundir, C. S.	BT	Maharshi Dayanand University	245	3.58569428	0.486661502	249
Banerjee, Uttam Chand	BT	National Institute of Pharmaceutical Education and Research, Mohali	294	3.52355239	0.583993803	218
Kuhad, Ramesh Chander	BT	University of Delhi	325	3.4906838	0.64557138	170
Gupta, Rani	BT	University of Delhi	374	3.44615792	0.742903681	133
Roy, Ipsita	BT	National Institute of Pharmaceutical Education and Research, Mohali	386	3.43224436	0.766740162	207
Cameotra, Swaranjit Singh	BT	Institute of Microbial Technology India	440	3.39158295	0.87400433	122
Singh, R. S.	BT	Punjabi University	449	3.38186882	0.891881692	132
Purohit, Hemant	BT	National Environmental Engineering Research Institute	456	3.37593987	0.905786306	284
Abraham, T. Emilia	BT	National Institute for Interdisciplinary Science and Technology	481	3.35640139	0.955445643	57
Das, Nilanjana	BT	Vellore Institute of Technology, Vellore	497	3.33861451	0.987227619	96
Thakur, Indu Shekhar	BT	Jawaharlal Nehru University	503	3.33451794	0.999145859	158
Patnaik, Pratap R.	BT	Gharda Institute of Technology	551	3.30080383	1.094491786	138
Satyanarayana, Tulasi	BT	Netaji Subhas Institute of Technology	580	3.28610166	1.152096617	186
Naik, Satya Narayan	BT	Indian Institute of Technology Delhi	584	3.28386563	1.160042111	136
Zinjarde, Smita	BT	Savitribai Phule Pune University	642	3.24876685	1.275251773	106
Paknikar, K. M.	BT	Agharkar Research Institute	654	3.23855286	1.299088255	124
Ahmad, Iqbal	BT	Aligarh Muslim University	716	3.21289759	1.42224341	182
Karmee, Sanjib Kumar	BT	Sardar Patel Renewable Energy Research Institute	726	3.20731004	1.442107145	33
Arora, Daljit Singh	BT	Guru Nanak Dev University	737	3.20162262	1.463957253	84
Madamwar, Datta	BT	Sardar Patel University	749	3.19735178	1.487793735	230
Chirmule, Narendra	BT	Biocon Limited	754	3.19606244	1.497725602	108
Saxena, Rajendra Kumar	BT	University of Delhi	756	3.19495289	1.501698349	145
Panesar, Parmjit Singh	BT	Sant Longowal Institute of Engineering and Technology	781	3.18022966	1.551357686	117
Nigam, J. N.	BT	Harcourt Butler Technological Institute	783	3.17904391	1.555330433	28
Sukumaran, Rajeev K.	BT	National Institute for Interdisciplinary Science and Technology	791	3.17690515	1.571221421	96
Nath, Sunil	BT	Indian Institute of Technology Delhi	808	3.1674773	1.60498977	55
Singhania, Reeta Rani	BT	Indian Oil Corporation Limited	886	3.12896559	1.759926901	56
Das, S.	BT	National Institute of Technology Rourkela	901	3.12246607	1.789722504	110
Divakar, Soundar	BT	Central Food Technological Research Institute India	924	3.11399125	1.835409094	131
Ghangrekar, M. M.	BT	Indian Institute of Technology Kharagpur	984	3.08817696	1.954591502	141
Venkatesh, Kareenhalli V.	BT	Indian Institute of Technology, Bombay	996	3.08499929	1.978427984	111
Desai, J. D.	BT	Indian Petrochemicals Corporation Limited	1027	3.07047573	2.040005562	49
Chakrabarti, Pinak	BMB	Bose Institute	1516	3.81407261	1.116051709	143

Srivastava, Deepak Kumar	BMB	University of Lucknow	1706	3.77375129	1.255926264	208
Snyderman, Ralph	BMB	Duke University School of Medicine	2094	3.70282657	1.541564828	301
Udgaonkar, Jayant B.	BMB	National Centre for Biological Sciences	2523	3.63831113	1.857386849	170
Mukherjee, Ashis Kumar	BMB	Tezpur University	2564	3.63160676	1.887570305	107
Manna, Sunil Kumar	BMB	Centre for DNA Fingerprinting & Diagonostics (CDFD)	2843	3.58834385	2.092965046	111
Vijayan, Mamannamana	BMB	Indian Institute of Science, Bengaluru	3007	3.5645988	2.213698872	248
Jana, Nihar R.	BMB	Indian Institute of Technology Kharagpur	3446	3.50635701	2.536882712	93
Srinivasula, S. Murty	BMB	Indian Institute of Science Education and Research Thiruvananthapu-ram	3978	3.44810211	2.928531464	88
Gromiha, M. Michael	BI	Indian Institute of Technology Madras	61	4.00016172	0.328876429	257
Raghava, Gajendra P.S.	BI	Indraprastha Institute of Information Technology, Delhi	192	3.64954989	1.035152038	248
Chattopadhyay, Joydev	BI	Indian Statistical Institute, Kolkata	298	3.47659444	1.606642226	185
Sharma, Chandra P.	BME	Sree Chitra Tirunal Institute for Medical Sciences and Technology	303	3.64156032	0.602014663	341
Ramalingam, Murugan	BME	Vellore Institute of Technology, Vellore	719	3.30716177	1.428543045	133
Jayakrishnan, A.	BME	Indian Institute of Technology Madras	1027	3.16253523	2.040491943	103
Panduranga Rao, K.	BME	Chalapathi Institute of Pharmaceutical Sciences	1073	3.14420134	2.131886909	47
Balaram, P.	BP	National Centre for Biological Sciences	58	4.04478892	0.315200261	665
Chattopadhyay, Amitabha	BP	Centre for Cellular and Molecular Biology india	62	4.03121874	0.33693821	257
Khaneja, Navin	BP	Indian Institute of Technology, Bombay	341	3.39320377	1.853160154	116
Ahmad, Faizan	BP	Jamia Millia Islamia	347	3.3867188	1.885767078	244
Kumar, Sanjeev	DAS	Sri Guru Granth Sahib World University	69	3.81968457	0.143621339	582
Patra, Amlan Kumar	DAS	West Bengal University of Animal and Fishery Sciences	131	3.66377878	0.272672398	105
Kumar, Ashok	DAS	Indian Veterinary Research Institute	167	3.62449204	0.34760527	552
Sharma, Deepak Kr	DAS	Netaji Subhas Institute of Technology	307	3.45671933	0.639010886	442
Kamra, Devki Nandan	DAS	Indian Veterinary Research Institute	684	3.1980873	1.42372458	113
Guraya, Sardul S.	DAS	Punjab Agricultural University	753	3.16558177	1.567345919	247
Suresh, K. P.	DAS	ICAR - National Institute Of Veterinary Epidemiology And Disease Informatics, Bengaluru	1105	3.03910101	2.300022896	57
Nagendra, Harini	Eco	Azim Premji University	508	3.88708983	1.054685878	130
Singh, J. S.	Eco	Banaras Hindu University	555	3.86715346	1.152265083	192
Sukumar, R.	Eco	Indian Institute of Science, Bengaluru	1021	3.65410688	2.119752523	142
Majumder, Partha P.	GH	National Institute of Biomedical Genomics	416	3.61464572	1.274470758	225
Srivastava, P. K.	IM	Birla Institute of Technology, Mesra	189	4.36489058	0.1741791	373
Atassi, M. Zouhair	IM	Department of Biochemistry and Molecular Biology	2141	3.58730921	1.973108221	380
Singh, Mahavir	IM	Himachal Pradesh University	2150	3.58646204	1.981402464	421
Ghosh, Kanjaksha	IM	Institute of Immunohaematology Mumbai	2217	3.57453258	2.043148495	749
Kathiresan, Kandasamy	MBH	Centre of Advanced Study in Marine Biology, Parangipettai	391	3.71513395	1.036420506	178
Raghukumar, C.	MBH	National Institute of Oceanography India	837	3.48400816	2.218629062	73
Roy, Kunal	MBC	Jadavpur University	81	3.99493773	0.100468855	309
Kamal, Ahmed	MBC	Indian Institute of Chemical Technology	83	3.98183938	0.102949567	537
Mukherjee, Pulok K.	MBC	Jadavpur University	128	3.84045865	0.158765597	211
Patwardhan, Bhushan	MBC	Savitribai Phule Pune University	215	3.69685548	0.26667659	156
Ghosal, Shibnath	MBC	Natreon Inc.	237	3.66483362	0.293964427	200
Kumar, C. Ganesh	MBC	Indian Institute of Chemical Technology	358	3.54273491	0.44404753	215
Doble, Mukesh	MBC	Indian Institute of Technology Madras	511	3.44507749	0.633822034	266
Saxena, A. K.	MBC	Central Drug Research Institute India	531	3.42987689	0.658629158	277
Sriram, Dharmarajan	MBC	Birla Institute of Technology and Science, Pilani	533	3.42892094	0.661109871	391
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Chattopadhyay, R. R.	MBC	Indian Statistical Institute, Kolkata	789	3.29455812	0.978641066	33
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Yogeeswari, Perumal	MBC	Birla Institute of Technology and Science, Pilani	849	3.27161021	1.05306244	309
Tripathi, Y. B.	MBC	Banaras Hindu University, Institute of Medical Sciences	870	3.26222992	1.07910992	110
Tiwari, Ashok Kumar	MBC	Indian Institute of Chemical Technology	878	3.25742824	1.08903277	80
Dhuley, J. N.	MBC	Hindustan Antibiotics Ltd.	897	3.25138744	1.112599539	47

Bharate, Sandip B.	MBC	Indian Institute of Integrative Medicine, Srinagar	913	3.24436303	1.132445238	143
Govindachari, T. R.	MBC	Spic Science Foundation India	918	3.24288385	1.138647019	135
Singh, Bimal P.	MBC	Institute of Minerals and Materials Technology India	983	3.22245397	1.219270174	63
Rao, A. R.	MBC	Jawaharlal Nehru University	1046	3.19865044	1.297412617	106
Prakash, Om	MBC	Indian Institute of Technology Banaras Hindu University	1067	3.19172754	1.323460098	357
Chauhan, Prem M.S.	MBC	Central Drug Research Institute India	1096	3.18072532	1.359430428	116
Bhattacharya, Sanjib	MBC	West Bengal Medical Services Corporation Ltd.	1117	3.17487284	1.385477909	106
Jain, Rahul	MBC	National Institute of Pharmaceutical Education and Research, Mohali	1261	3.13563443	1.564089206	110
Jachak, Sanjay	MBC	National Institute of Pharmaceutical Education and Research, Mohali	1270	3.13310072	1.575252412	63
Grover, J.	MBC	Institute Rotary Cancer Hospital India	1273	3.13116275	1.578973481	54
Kumar, Vijay L.	MBC	All India Institute of Medical Sciences, New Delhi	1277	3.13028112	1.583934906	100
Banerjee, Sanjay K.	MBC	Translational Health Science and Technology Institute	1278	3.12982786	1.585175262	81
Johri, R. K.	MBC	Indian Institute of Integrative Medicine, Srinagar	1398	3.09805907	1.73401801	59
Mandal, S.	MBC	Jadavpur University	1439	3.08488672	1.784872615	190
Rao, J. V.	MBC	Indian Institute of Chemical Technology	1475	3.07616469	1.82952544	59
Chanda, Sumitra V.	MBC	Saurashtra University	1476	3.07593944	1.830765796	140
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Gacche, Rajesh N.	MBC	Savitribai Phule Pune University	1658	3.03724649	2.05651063	70
Chakrabarti, Arunaloke	MB	Postgraduate Institute of Medical Education & Research, Chandigarh	1037	3.78929946	0.77175539	333
Sharma, S. K.	MB	All India Institute of Medical Sciences, New Delhi	1053	3.78625005	0.783662898	341
Nautiyal, Chandra Shekhar	MB	National Botanical Research Institute India	1326	3.71063225	0.986834761	114
Singh, Sarman	MB	All India Institute of Medical Sciences, New Delhi	1552	3.66344046	1.155028318	267
Shivaji, Sisinthy	MB	L.V. Prasad Eye Institute India	1555	3.66250637	1.157260975	319
Gugnani, Harish C.	MB	University of Delhi	1649	3.64227396	1.227217587	199
Bhattacharya, Sujit K.	MB	Glocal Hospital	1807	3.6107196	1.344804233	350
Nair, G. B.	MB	Rajiv Gandhi Centre for Biotechnology	1909	3.58905844	1.420714599	434
Narayanan, P. R.	MB	Tuberculosis Research Centre India	1926	3.58602202	1.433366327	191
Kang, Gagandeep	MB	Christian Medical College, Vellore	2200	3.53509183	1.637282409	380
Katoch, V.	MB	Rajasthan University of Health Sciences	2473	3.48852441	1.840454271	295
Uplekar, M.	MB	Organisation Mondiale de la Santé	2767	3.44289377	2.059254739	80
Roberts, Terry A.	MB	National Institute of Nutrition India	2809	3.43675457	2.090511948	122
Govindarajan, Marimuthu	MYP	Annamalai University	83	3.76465689	0.396635764	151
Suryanarayanan, T. S.	MYP	Vivekananda Institute of Tropical Mycology	315	3.39203994	1.505304406	87
Sridhar, Kandikere Ramaiah	MYP	Mangalore University	341	3.36081477	1.629551754	202
Sankaranarayanan, Rengaswamy	ONC	RTI International	511	4.17895667	0.221520908	312
Kumar, Rakesh	ONC	Rajiv Gandhi Centre for Biotechnology	696	4.09365593	0.30171928	351
Kuttan, Girija	ONC	Amala Cancer Hospital and Research Centre	2142	3.74523341	0.928567094	217
Sharma, Atul	ONC	Rajiv Gandhi Institute of Petroleum Technology	2440	3.68982214	1.057751498	191
Shukla, Y.	ONC	Indian Institute of Toxicology Research	2761	3.6455453	1.19690651	193
Nagini, S.	ONC	Annamalai University	2764	3.64536985	1.198207025	197
Baliga, Manjeshwar Shrinath	ONC	Mangalore Institute of Oncology	3188	3.58595809	1.382013022	168
Somasundaram, Kumaravel	ONC	Indian Institute of Science, Bengaluru	3290	3.57074242	1.426230503	110
Kuttan, Ramadasan	ONC	Amala Cancer Hospital and Research Centre	3424	3.55234805	1.484320135	205
Pandey, Manoj	ONC	Banaras Hindu University	4360	3.44066581	1.890080545	163
Tuteja, Narendra	PBB	International Centre for Genetic Engineering and Biotechnology	79	4.20356395	0.069321961	390
Varshney, Rajeev K.	PBB	International Crops Research Institute for the Semi-Arid Tropics	123	4.11067492	0.107931661	474
Yadav, Sudesh Kumar	PBB	Center of Innovative and Applied Bioprocessing	447	3.82704337	0.39223945	172
Subbarao, E. C.	PBB	Tata Research Development and Design Centre	524	3.78791376	0.459806425	116
Jain, Mukesh	PBB	Jawaharlal Nehru University	591	3.75134376	0.518598468	94
Gupta, P. K.	PBB	Ch. Charan Singh University	629	3.73308898	0.551943209	137
Upadhyaya, Hari D.	PBB	International Crops Research Institute for the Semi-Arid Tropics	652	3.71945882	0.572125552	300
Vadez, Vincent	PBB	International Crops Research Institute for the Semi-Arid Tropics	680	3.70863294	0.596695361	213
Gadgil, Sulochana	PBB	Indian Institute of Science, Bengaluru	696	3.70129133	0.610735252	73
Khan, Nafees A.	PBB	Aligarh Muslim University	746	3.67866337	0.65460991	139

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Rout, Gyana R.	PBB	Orissa University of Agriculture & Technology	857	3.63716736	0.752011653	157
Tuteja, Renu	PBB	International Centre for Genetic Engineering and Biotechnology, New Delhi	924	3.6154769	0.810803696	158
Ignacimuthu, Savarimuthu	PBB	St. Xavier's College, Palayamkottai	933	3.61316994	0.818701135	418
Valdiya, K. S.	PBB	Jawaharlal Nehru Centre for Advanced Scientific Research	1051	3.57478401	0.92224533	74
Prathap, Gangan	PBB	A P J Abdul Kalam Technological University	1070	3.56844706	0.9389177	292
Datta, Swapan K.	PBB	University of Calcutta	1073	3.56800013	0.941550179	148
Dubey, Rama Shanker	PBB	Banaras Hindu University	1080	3.5657299	0.947692632	108
Mahato, S. B.	PBB	Indian Institute of Chemical Biology	1088	3.56252348	0.954712577	129
Gadgil, Madhav	PBB	Goa University	1192	3.53246671	1.045971868	78
Panda, S. K.	PBB	Assam University	1212	3.52627585	1.063521731	75
Tyagi, Akhilesh K.	PBB	University of Delhi	1311	3.49566924	1.150393556	205
Kumar, Sushil	PBB	Anand Agricultural University	1319	3.49379746	1.157413501	406
Kumar, Amar	PBB	University of Delhi	1334	3.4917221	1.170575899	68
Nayyar, Harsh	PBB	Panjab University	1381	3.48112705	1.211818078	98
Lakhotia, Subhash C.	PBB	Banaras Hindu University	1677	3.41175577	1.471556059	176
Sharma, Sanjeev	PBB	ICAR - Central Potato Research Institute, Shimla	1730	3.40064805	1.518063197	862
Pandian, T. J.	PBB	Annamalai University	1805	3.38344727	1.583875185	133
Grover, Anil	PBB	University of Delhi	1872	3.37036702	1.642667228	98
Varma, Ajit	PBB	Amity University, Noida	1916	3.35791453	1.681276928	266
Jha, Bhavanath	PBB	Central Salt and Marine Chemicals Research Institute India	1978	3.34654683	1.735681505	244
Siddiqui, Zaki A.	PBB	Aligarh Muslim University	2018	3.33770131	1.770781232	81
Eapen, Susan	PBB	Bhabha Atomic Research Centre	2028	3.33494395	1.779556164	93
Sharma, Tilak R.	PBB	ICAR - Indian Institute of Agricultural Biotechnology, Ranchi	2092	3.32545513	1.835715727	148
Singh, Harminder Pal	PBB	Panjab University	2146	3.31416335	1.883100359	122
Raghavendra, Agepati S.	PBB	University of Hyderabad	2186	3.30734304	1.918200086	142
Sinha, Rajeshwar P.	PBB	Banaras Hindu University	2215	3.30155504	1.943647388	149
Akhtar, Mohd Sayeed	PBB	Gandhi Faiz-e-Aam College	2221	3.30051322	1.948912347	82
Singh, Kuldeep	PBB	Government Medical College Srinagar	2316	3.27954837	2.032274199	121
Martin, Kottackal Poulose	PBB	University of Calicut	2609	3.23132436	2.2893797	44
Flora, Swaran Jeet Singh	Tox	National Institute of Pharmaceutical Education and Research, Raebareli	44	4.16778159	0.097509086	252
Devasagayam, T. P.A.	Tox	Bhabha Atomic Research Centre	228	3.7714592	0.505274355	137
Jagetia, Ganesh Chandra	Tox	Mizoram University	231	3.7694913	0.511922702	138
Bhattacharya, S. K.	Tox	Banaras Hindu University, Institute of Medical Sciences	239	3.76397228	0.529651627	274
Banerjee, Basu Dev	Tox	University College of Medical Sciences	428	3.56295195	0.948497474	204
Augusti, K. T.	Tox	Kannur University	434	3.56018442	0.961794167	102
Sharma, O. P.	Tox	Indian Veterinary Research Institute	438	3.55756466	0.97065863	131
Kakkar, Poonam	Tox	Indian Institute of Toxicology Research	555	3.47771409	1.229944154	89
Giri, Ashok K.	Tox	Indian Institute of Chemical Biology	560	3.47443933	1.241024732	140
Uma Devi, P.	Tox	Pathirissery Mana	604	3.44503395	1.338533818	101
Menon, Venugopal P.	Tox	Annamalai University	611	3.44233773	1.354046627	200
Anuradha, C. V.	Tox	Annamalai University	662	3.41023393	1.467068522	124
Guha Mazumder, Debendra Nath	Tox	D.N.G.M Research Foundation	748	3.36931245	1.657654463	55
Dev, Sukh	Tox	Malti-Chem Research Centre	754	3.36613306	1.670951157	198
Raisuddin, S.	Tox	Jamia Hamdard	837	3.32342166	1.854888751	159
Chinoy, N. J.	Tox	KSKV Kachchh University	842	3.32153568	1.865969329	153
Chatterjee, Indu B.	Tox	University of Calcutta	852	3.3168223	1.888130485	74
Abraham, Suresh K.	Tox	Jawaharlal Nehru University	893	3.29661198	1.978991224	68
Barik, Sailen	Vir	Bose Institute	232	3.92692991	0.397151465	148
Jameel, Shahid	Vir	Wellcome Trust/DBT India Alliance	940	3.50243379	1.609148179	126
Kumarasamy, Nagalingeswaran	Vir	Chennai Antiviral Research and Treatment Clinical Research Site	963	3.49342733	1.648520953	337
Arankalle, Vidya A.	Vir	Bharati Vidyapeeth (Deemed to be University)	1101	3.44342616	1.884757601	174
Kunte, Krushnamegh	Zoo	National Centre for Biological Sciences	280	3.03582881	2.113207547	49

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ISSN: 2454-6968 RNI No. UPENG/2013/54102

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Guest Article

Indian Medical Institutions need to break the bottleneck of their research activities: Unmet need for health care

By SaurabhMandal

Email- mandalsaurabh93@gmail.com

The COVID-19 pandemic has turned the attention of everyone, toward scientists and researchers across the globe. Because, the general public is eagerly waiting for a vaccine or any targeted therapy, no other disease outbreak had seen such a situation before. It was 11th-March 2020, when the World Health Organization (WHO) has announced COVID-19 as a pandemic. Since then, India is trying hard to suppress the virus spread. India became the second worst-hit nation in the world by the second week of September 2020, which has now crossed 8 million total cases and in the worldwide number reached around 47 million. It is observable that India's daily testing capacity has increased drastically. Simultaneously, the country's recovery rate has also started increasing every past day.

The mortality rate of India is still among the lowest in the world. The question here arises, how it is happening? Many researchers have deciphered the enigma which possibly playing a diverse role within the Indian population in providing immunity coverage against Coronavirus. Critical research literature reviewed the role of the Bacillus Calmette Guerin (BCG) vaccine from different perspectives. In particular, about India, researchers see a profound correlation between hidden immunity against COVID-19 and the BCG vaccine which is given to every child born in India. Therefore, researchers recognize the BCG vaccination as a reason for lower fatality among Indians.

However, WHO has avoided endorsing the possible effect of BCG vaccination, said there is no evidence found in their study that the BCG vaccine protects people against the COVID-19. While, many organizations worldwide are conducting clinical trials and India's medical governing body, the Indian Council

	Candidate	Mechanism	Sponsor	Trial Phase	Institution
	Ad5-nCoV	Recombinant vaccine (adenovirus type 5 vector)	CanSino Biologics	Phase 3	Tongji Hospital; Wuhan, China
	AZD1222	Replication-deficient viral vector vaccine (adenovirus from chimpanzees)	The University of Oxford; AstraZeneca; IQVIA; Serum Institute of India	Phase 3	The University of Oxford, the Jenner Institute
	CoronaVac	Inactivated vaccine (formalin with alum adjuvant)	Sinovac	Phase 3	Sinovac Research and Development Co., Ltd.
	Covaxin	Inactivated vaccine	Bharat Biotech; National Institute of Virology	Phase 3	
	JNJ-78436735 (formerly Ad26.COV2-S)	Non-replicating viral vector	Johnson & Johnson	Phase 3	Johnson & Johnson
	mRNA-1273	mRNA-based vaccine	Moderna	Phase 3	Kaiser Permanente Washington Health Research Institute
	No name announced	Inactivated vaccine	Wuhan Institute of Biological Products; China National Pharmaceutical Group (Sinopharm)	Phase 3	Henan Provincial Center for Disease Control and Prevention
	NVX-CoV2373	Nanoparticle vaccine	Novavax	Phase 3	Novavax
	Bacillus Calmette-Guerin (BCG) vaccine	Live-attenuated vaccine	University of Melbourne and Murdoch Children's Research Institute; Radboud University Medical Center; Faustman Lab at Massachusetts General Hospital	Phase 2/3	University of Melbourne and Murdoch Children's Research Institute; Radboud University Medical Center; Faustman Lab at Massachusetts General Hospital
	BNT162	mRNA-based vaccine	Pfizer, BioNTech	Phase 2/3	Multiple study sites in Europe and North America

Table: A list of drugs/vaccines reached Phase 3 of a clinical trial. (Source: raps.org)

of Medical Research (ICMR) has also approved the clinical trial for the BCG vaccine on elderly patients for coronavirus treatment.

Further, Indians are exposed to a wide range of microorganisms throughout their life which in response provides heavy immune protection. On top of that, an unexpected immune-boosting coming from the ingredients used in the Indian foods which are basically phytochemicals, that exerts enormous biological properties. Interestingly, Indian has distinctive genetic makeup from any other ethnic group such as (1) Indian population immune response genes are genetically diverse (2) There is allelic variation in SARS-CoV-2 receptor angiotensin-converting enzyme 2 (ACE2) which affecting the susceptibility (3) Role of specific small Non-coding RNA (miRNAs) playing critical role (4) Natural killer (NK) cells percentage among Indian is higher in compared to other ethnic groups.

Despite all, the COVID-19 pandemic has exposed the country's inadequate healthcare infrastructure, poor access to medical facilities, high-cost treatment, and shortage of doctors, medical staff w.r.t population. Well, health inequality is not new for the global population but it is not inevitable. We need to accept that India was unprepared for this havoc. Moreover, the low health investment within the country can't be ignored. Anyhow, the country's healthcare budget, that needs to be boosted.

The COVID-19 outbreak has also changed the way of doing research work around the world. A different level of pace and momentum can be seen. This is for the first time when so many researchers in the world are working on the same topic. Even, India somehow

managed to shine in the global coronavirus research dashboard on the number of research papers.

The Dimension database analysis by November 2, 2020, shows that 5,041,986 academic publications have been published till now in which, coronavirus research publications consist of 1,86,288. The United States of America (USA), France, and the United Kingdom (UK) are the leading contributors followed by Spain, Italy, Canada, etc. including India. While, in 2019, the total research publications were 5, 590, 041.

What is impeding India in leading the global coronavirus research? Somewhere down the line, it is the serious biomedical research bottleneck at medical institutions across the country. 'The Lancet' in 2016 has published a report and described the sorry state of medical research in India.

The Lancet report figures have shocked everyone, that from 2005 to 2014, 332 out of 576 (~57%) medical institutions have not published even a single research paper. Over the same ten years, the total research output of the Massachusetts General Hospital, USA, and Mayo Clinic, USA has 46311 and 37633 publications respectively. These many publications were nearly four times more than what India's prestigious medical Institute, All India Institute of Medical Sciences (AIIMS), New Delhi has published at that time.

However, it was also estimated that whatever the publications coming in medical science, those are from some of India's medical institutes who always holds the top-ranking position. Even today, according to the Microsoft Academic database, it is only AIIMS, India who has marked its presence at rank 55th in the list of institutions working on coronavirus research worldwide. However, this particular rank is only in the publication category. Since, there are other categories too like saliency, prestige, citation, and H-index. Unfortunately, in other categories, no Indian Institutes got rank.

The Lancet report has withdrawn huge criticism, and then the Medical Council of India (MCI) in 2018 has made necessary changes in the syllabus of medical education after more than two decades. One of the key changes is 'introduction of elective subject' in which before the final year, medical students can opt for 8-week training in the various areas of medical science like genetic engineering, biomedical engineering, psychology, health economics, and research. These changes are like a seed that will bear fruits only if planted in the right way.

Similarly, MCI has brought new guidelines in 2019, stressing the need for research papers as a minimum requirement for the postgraduate teacher of medical institutions. Later, due to an unhappy response from the medical fraternity, MCI has relaxed the norms.

The habitual reasons cited by the medical institutions are lack of funds, infrastructure, and overburden of patient care duties. At a certain limit only, such reasons sustain, but at a deeper level, it appears a dearth of research spirit and scientific temperament in the medical institutions. Medical education needs continuous research activities and that will keep evolving the domain.

Well, some strategies can give momentum to the stagnant situation. Research-based learning should be adopted from the beginning of the undergraduate program. Research methodology and Publications should be prioritized. The faculties should focus on building inter-institutional collaboration with life sciences, biotechnology, or other applied science researchers. There is a need for a hassle-free platform for researchers and the health practitioners basically to address the funds acquisition process, project proposal clearance, research work-related ethical concerns followed with awards, rewards, and incentives to keep the morale up.

India is the second-largest populated country and the population is regionally diverse and ethnically vari-

ant. The Indian population disease profile, their susceptibility, immunity level, and drug response have peculiar characteristics and such a patient pool makes it, a Holy Grail for whole Indian medical research.

In this unprecedented COVID-19 situation, the medical professionals are the frontline corona warriors who are leading the battle from the front. Concurrently, doctors say that they have learned a lot and made them more confident.

But, some questions remain unanswered that why we were not prepared or how much we were prepared?

From the beginning, if the intense research activities would have been there in medical institutions then perhaps the scenario could have been different. Firstly, one could have expected that the drug development process could be faster based on the information gleaned by the medical scientists on severe acute respiratory syndrome (SARS) viruses which caused the epidemic in 2002. From the beginning of SARS-CoV-1 infection followed with SARS-CoV genome sequencing project completion, the Chinese researchers were actively involved in SARS virus research to channelize the vaccine development process. This is one of the reasons, why Chinese organizations seem to be front runners in the new vaccine development race.

Secondly, India is recurrently facing the shortage of testing centers and skilled manpower to carry out the Real-time Polymerase Chain Reaction (RT-PCR), regarded as the gold standard COVID-19 test. Therefore, the test reports are not being generated timely. RT-PCR is a highly sensitive and widely used molecular biology technique especially among life science and biotechnology researchers.

The chances of mistakes remain high when agencies try to train the general technical persons to do RT-PCR. So, cell and molecular biology techniques must be taught in every medical course robustly with exhaustive practical experiments.

On the other side of the coin, the story is evident, India is the third country in the world after China (Rank 1) and the United States of America (Rank 2) in the publication of the scientific articles in science and engineering, says recent National Science Foundation (NSF), USA report. In that, research publications contribution are majorly comes from different research labs under the Department of Biotechnology (DBT), Department of Science & Technology (DST), Council of Scientific and Industrial Research (CSIR), Institutes of National Importance such as the Indian Institute of Technology, Indian Institutes of Science Education and Research (IISER), National Institutes of Technology (NIT), Indian Institutes of Information Technology (IIITs) and many public and private universities, etc. Although, India's National Gross Expenditure on Research and Development (GERD) in science and technology is just around 0.7% of Gross Domestic Product (GDP). This spending is extremely low in comparison to many developed nations and even emerging economies.

Today, various research labs are finding new ways to diagnose, and treat all types of diseases with potential drugs, devices, methodologies, and protocols but medical professionals need to coordinate to translate those new findings for clinical purposes. Unless, medical institutions do not develop generous intent for research, till then it will remain unfeasible to flourish evidence-based treatment and to accomplish better patient care. However, the government also needs to invest strenuously in the research ecosystem to encourage researchers and public health practitioners for translating the discoveries from bench-to-bedside.

Otherwise, it will always remain tough to confront a situation like COVID-19 which is challenging the survivability of the human race.

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Disclaimer: These are the author's personal views.

Saurabh Mandal is a 4th year Ph.D student at Manipal Institute of Regenerative Medicine, Manipal Academy of Higher Education, Bangalore, Karnataka, India.

Featured News

American Medical Association declares racism an 'urgent public health threat'

The American Medical Association on Monday announced a new policy recognizing racism as a public health threat and committed to "dismantling" racist policies and practices across healthcare.

Adopted by physicians at the AMA's special meeting of its house delegates, this new policy goes beyond previous calls to eliminate health disparities and violence. Instead, it acknowledges racism's role in perpetuating such harms in society as a whole, according to the association.

"The AMA recognizes that racism negatively impacts and exacerbates health inequities among historically marginalized communities," AMA Board Member Willarda V. Edwards, MD, MBA, said in a statement. "Without systemic- and structural-level change, health inequities will continue to exist, and the overall health of the nation will suffer."

During the meeting, delegates outlined five specific steps the AMA must take to combat racism, including (1) acknowledging the harms caused by racism within medical care and research; (2) pinpointing tactics to mitigate racism's health effects; (3) encouraging medical education to spread awareness of the topic; (4) backing policy and funding for research into racism's health risks; and (5) preventing racism and bias from influencing technological innovations.

"As physicians and leaders in medicine, we are committed to optimal health for all, and are working to ensure all people and communities reach their full health potential," Edwards concluded. "Declaring racism as an urgent public health threat is a step in the right direction toward advancing equity in medicine and public health, while creating pathways for truth, healing, and reconciliation."

WHO shows no effect on patients but Veklury has become the First FDA Approved Treatment for COVID-19

The WHO's SOLIDARITY clinical trial evaluated remdesivir and three other drugs in 11,266 hospitalized COVID-19 patients and found that none of the drugs "substantially affected mortality" or decreased the need to ventilate patients, reported the Financial Times.

Veklury (remdesivir; GS-5734) is a nucleotide analog with broad-spectrum antiviral activity. Gilead's Veklury has demonstrated in vitro and in vivo activity in animal models against the viral pathogens MERS and SARS, which are also coronaviruses, and are structurally similar to SARS-CoV-2, which causes COVID-19.

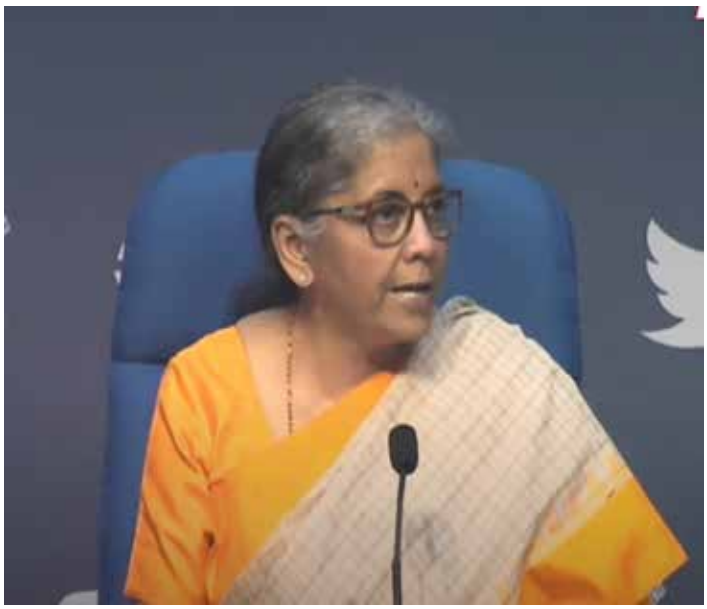
Gilead Sciences, Inc. announced on October 22, 2020, that the U.S. Food and Drug Administration (FDA) has approved the antiviral drug Veklury® (remdesivir) for use in adult and pediatric patients 12 years of age and older and weighing at least 40 kilograms (about 88 pounds) for the treatment of COVID-19 requiring hospitalization.

On May 12, 2020, Mylan N.V. announced a license agreement signed with Gilead, to manufacture and distribute Veklury (remdesivir) in 127 low- and middle-income countries, including India. In India, Mylan launched the drug under the brand name DESREM.

Gilead Science first received a patent (US9724360B2) for the drug as a treatment for Ebola in 2017. In fall 2015, Gilead applied for two patents for remdesivir, one for combating coronaviruses and another for filoviruses, the family of pathogens that includes Ebola. Both were approved in spring 2019. Gilead Science, Inc. is located in Foster City.

FM Nirmala Sitharaman announces Rs 900 crore grant for COVID-19 vaccine research

November 13, 2020



Finance Minister Nirmala Sitharaman on Thursday announced a Rs 900 crore stimulus towards research and development of the Covid-19 vaccine. The funds for research have been allocated to the Department of Biotechnology as part of the stimulus package announced by the finance minister.

"India is waiting for an effective vaccine to come - one or many more. We are spending on research and development apart from what we will give when the vaccine is ready to be bought and distributed. We are also keeping abreast of the developments around the vaccine," Sitharaman said.

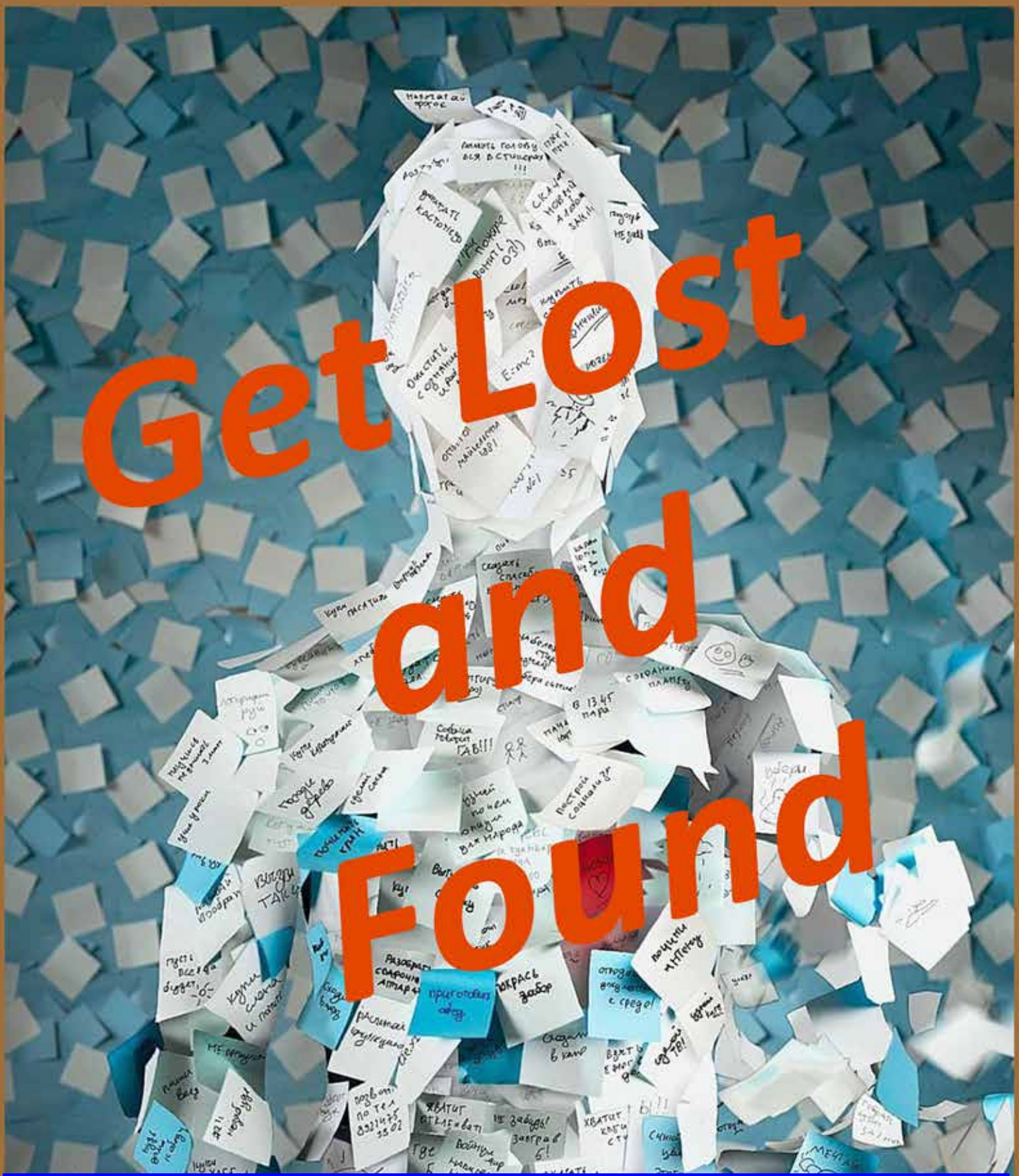
Prasanna Deshpande, deputy managing director at the Hyderabad based Indian Immunologicals Ltd, welcomed the step and said that it would certainly help find new projects. "If companies are working on new technology, new adjuvants etc , this would come as a shot in the arm if DBT allocates funds for these projects," he said.
Deshpande, however, added that it was not clear if the funds would be used to aid clinical trials of Covid-19 vaccines as well.

This is the first financial package towards the coronavirus vaccine announced by the government. A national committee headed by V K Paul, member-health, Niti Aayog is drawing up the plan for the process of vaccine procurement and distribution.

Many rich countries such as the US, Japan and UK, among others, have already paid drug companies upfront to secure billions of doses of vaccines.

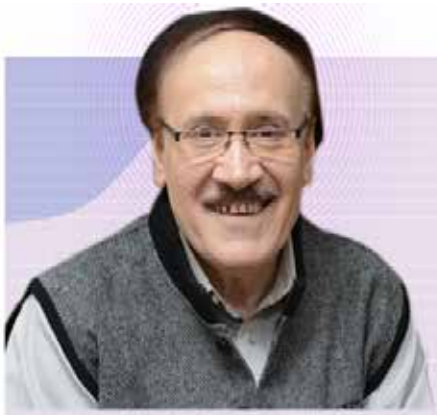
Gavi, the Vaccine Alliance has raised around $ 1.7 billion through contributions by countries including the United Kingdom, Canada, Germany, Italy and Sweden. The Gavi Covax, a financing mechanism, will support 92 low and middle-income countries' access to safe and effective Covid-19 vaccines. India is part of the Covax - Covid-19 Vaccine Global Access.

There are five front-running vaccine candidates in India currently under development by Serum Institute of India, Bharat Biotech, Zydus Cadila, Dr Reddy's Laboratories and Biological E in India. Sitharaman also announced the launch of a credit guarantee support scheme for the healthcare sector and 26 sectors stressed due to covid-19. The companies will get additional credit up to 20 per cent of outstanding credit with repayment possible in 5 years including a first-year moratorium on repayments.



Biotech Express magazine put forward all the news and articles related to biotechnology in front of its diverse audience. Since Biotechnology is amalgamation of different branches of science, we also try to include updates from several disciplines. This magazine would like to take you near the greatest people from field through interviews which will surely help to carve out the decision process by knowing nitty-gritty of the field.

DBT started M K Bhan Young Researcher Fellowship Programme



सत्यमेव जयते

Department of Biotechnology
Government of India

MK BHAN

Young Researcher Fellowship Program 2020 - 21

The MK Bhan-Young Researcher Fellowship Program is launched with an aim to encourage young bright researchers to continue their research in the country after Ph.D. The scheme offers an independent research grant to young Post-Doctoral Fellows to enable them to emerge as future leaders and take up cutting edge research focused on issues of national relevance. This fellowship will be awarded for Research work to be carried out at DBT-Autonomous Institutes.

ELIGIBILITY

Indian citizen having PhD degree/thesis submitted in any branch of Life Sciences/Biotechnology/allied areas and does not have a permanent position.

The applicant should have an excellent track record as evident by peer reviewed publications, technologies developed, patent (if any).

Each applicant must identify a host institute and a mentor

The upper age limit will be 35 years as on the closing date of the submission of the application.

NATURE OF SUPPORT

Monthly Renumeration - ***Rs 75,000/month***

Research grant - ***Rs 20,00,000/year***

Duration: ***3 Years***

HOW TO APPLY

Application in the prescribed proforma should be submitted mandatorily online through DBT portal (ePromis) (http://www.dbtepromis.nic.in) ***on or before December 31st, 2020.***

One hard copy of application along with requisite documents should also be sent to ***Dr. Deo Prakash Chaturvedi, Scientist-C, Department of Biotechnology, Ministry of Science & Technology, Room No.814, 8th Floor, Block-2, CGO Complex, Lodhi Road, New Delhi -110003***

For details of the award, nomination proforma and steps for online submission of nomination please log on to DBT website (*www.dbtindia.gov.in*)

NATURE OF SUPPORT

(i) The scheme provides a consolidated monthly remuneration of Rs. 75,000/- p.m.

(ii) MKB-YRFP fellows in addition will receive a research/contingency grant of Rs. 20.00 lakh per year for hiring manpower, purchase of consumables, minor equipment, domestic travel and other contingent expenditure to be incurred for the implementation of research proposal selected for the fellowship.

(iii) Can engage one manpower (JRF/SRF/Project Assistant/ Project Associate) under him/her. Capital equipment will be procured in the name of the institute where the fellow proposes towork and value of the whole set of the equipment should not exceed Rs.10.00 lakh.

(iv) MKB-YRFP fellows will be eligible for regular research grant through extra mural and other schemes of various S&T agencies of the Govt. of India, provided that Co-PI is a regular faculty. However, they can take research grant from anywhere but salary from only one source.

J&J Secures Additional $1 Billion in Funding for COVID-19 Vaccine

Nov 19, 2020

Johnson & Johnson secured more than $1 billion in additional funding for its COVID-19 vaccine research through an expansion of its partnership with the Biomedical Advanced Research and Development Authority (BARDA), a division of the U.S. Department of Health and Human Services.

Over the weekend, life sciences giant J&J said BARDA will provide an additional $454 million to the Phase III ENSEMBLE trial evaluating the company's investigational vaccine for the novel coronavirus. These funds are on top of additional funding of more than $1 billion the company previously received from the federal government for the development of the COVID-19 vaccine candidate.

The federal dollars will be paired with $604 million invested by J&J pharmaceutical subsidiary Janssen. The finances will be used to continue the late-stage study of the company's single-dose vaccine treatment in up to 60,000 volunteers across the globe.

J&Js experimental vaccine JNJ-78436735 began Phase III testing in September. However, in October, the trial was briefly paused following an "unexplained illness" in a trial participant. The trial resumed later that month after the independent Data Safety and Monitoring Board recommended the trial resume. The company said there was no evidence that its experimental vaccine was the cause of the unexplained illness in the patient.

J&J's Ad26.COV2-S is an investigational SARS-CoV-2 vaccine built using the AdVac recombinant technology. The AdVac and PER.C6 technology have been used to develop and manufacture the company's Ebola vaccine as well as to develop its vaccine candidates for Zika, RSV and HIV.

Moderna's COVID-19 Vaccine Interim Readout Suggests 94.5% Efficacy

Nov 20, 2020

Only a week after Pfizer and BioNTech's preliminary data readout of its COVID-19 vaccine suggested a 90% efficacy rate, Moderna reported interim efficacy data for its vaccine of 94.5%. This is particularly excellent news given the surge of the disease and the distribution difficulties surrounding the Pfizer-BioNTech effort.

Both of these vaccine candidates require two doses about 28 days apart. The Pfizer-BioNTech vaccine requires storage at about -94 degrees F, which requires specialized freezers. The Moderna vaccine is stable at 36 to 46 degrees F, about the temperature of a standard home or medical refrigerator, for up to 30 days and can be stored for up to six months at -4 degrees F.

If both of these vaccines receive emergency use authorization (EUA) from the U.S. Food and Drug Administration (FDA) in the upcoming weeks, it will provide health care providers with flexibility and more manufacturing capabilities.

Moderna's Phase III trial underwent its first independent, interim data analysis conducted by a National Institutes of Health (NIH)-appointed Data Safety Monitoring Board (DSMB). The DSMB informed Moderna the trial had met the statistical criteria in the study design for efficacy, demonstrating efficacy of 94.5%. The COVE Phase III trial enrolled more than 30,000 patients in the U.S. and was being run in collaboration with the National Institute of Allergy and Infectious Diseases (NIAID) and the Biomedical Advanced Research and Development Authority (BARDA).

The primary endpoint of the trial was based on analysis of COVID-19-positive cases confirmed two weeks after the second vaccine dose. The first interim analysis was built on 95 cases, with 90 cases of positive COVID-19 in the placebo group compared to five cases seen in the vaccinated group.

AstraZeneca's Calquence Fails Pair of Phase II COVID-19 Trials

AstraZeneca reported that the CALAVI Phase II trials of Calquence (acalabrutinib) in hospitalized patients with respiratory symptoms of COVID-19 failed to meet the trials' primary efficacy endpoint.

Nov 16, 2020

Bruton's tyrosine kinase (BTK) inhibitors are used to suppress autoimmune diseases. In COVID-19 patients with severe symptoms that include pneumonia, their symptoms are believed to be an immune system reaction, such as the cytokine storm. The goal was to test if Calquence, which suppresses some of the immune system, can be effective in controlling that aspect of COVID-19.

The CALAVI Phase II program is made up of two trials of Calquence with best supportive care (BSC) compared to BSC alone in patients hospitalized with respiratory complications of COVID-19. Patients were randomized 1:1. The patients were hospitalized, but not on mechanical ventilation and were not in the intensive care unit. The primary endpoint measured respiratory failure or death. The trial was run in the U.S. (CALAVI US) and in several other countries (CALAVI). The AstraZeneca-University of Oxford COVID-19 vaccine program is running about third in U.S. and European development programs, behind the Pfizer-BioNTech group and Moderna.

In mid-October, AstraZeneca inked a $486 million deal with the U.S. government to fund two Phase III trials of its anti-SARS-CoV-2 antibody cocktail, AZD7442. AstraZeneca's approach uses half-life extending technologies, and the company believes it could prevent infection against the virus for up to 12 months. The deal secured up to 100,000 doses for the U.S. supply by the end of the year, with an option to buy up to 1 million doses in 2021.

WORKSHOP ON

BIO-INFORMATICS

MULTI OMICS BOX

IMPORTANT DATES:

01 NOV, 2020	>	START OF REGISTRATION
22 NOV, 2020	>	LAST DATE OF REGISTRATION
23 NOV, 2020	>	BEGINNING OF WORKSHOP
05 DEC, 2020	>	END OF WORKSHOP

WHO CAN PARTICIPATE:

Students (B.Sc./B.Tech/M.Sc./M.Tech),
Research Fellows (Ph.D. fellows)
Faculty, Scientists, and Company Personals.

Introduction:

Multiomics, or integrative omics is a biological analysis approach in which the data sets are multiple "omes", such as the genome, transcriptome, epigenome, in other words, the use of multiple omics technologies to study life in a concerted way. This comprehensive online training will provide an in depth analysis of multiomics technology using Next-gen sequencing data set

- **30 Days access to video recording**
- **E- Certificate will be provied**

Topics to be covered:-

Module 1:- Core Skills

- Introduction to working with Linux
- Basics of Python

Module 2:- Genomics

- Whole genome annotation and assembly
- Whole - Exome sequencing data analysis

Module 3:- Transcriptomics

- Single cell RNA seq using NGS datasets
- Bulk - RNA seq using NGS datasets
- Identification of small RNAs using NGS datasets and long non coding RNA identification
- Fusion transcripts detection from RNA seq datasets

Module 4:- Epigenomics

- CHIP-Seq dataanalysis

COURSE FACULTY:

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Research Scientist, Saint Jude Children,s Research Hospital, Tennesse,USA.

Dr. Surendra Vikram
Post Doctoral Fellow, Centre For Microbial Ecology and Genomics, University of Pretoria, South Africa.

Dr.Shailesh Kumar
Scientist, National Institute of Plant Genome Research, New Delhi, India.

Dr. Rahul Kumar
Associate Research Scientist, Institute for Cancer Genetics, Columbia University, New York, USA.

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SCAN TO REGISTER

Novartis' Ilaris Fails to Meet Endpoints in COVID-19 Study

Novartis' Ilaris (canakinumab), an IL-1β inhibitor, came up short in a Phase III COVID-19 study, the company reported, following an interim analysis of data.

Nov 06, 2020

This morning, the Swiss pharma giant announced Ilaris plus standard of care did not demonstrate a significantly greater chance of survival for patients without the need for invasive mechanical ventilation, compared with placebo plus the standard of care. Ilaris is also failed to meet the key secondary endpoint of reducing mortality in COVID-19 patients, Novartis said.

In the trial, the primary endpoint of survival without the need for mechanical ventilation was 88.8% for Ilaris plus standard of care compared to 85.7% for placebo and standard of care. The key secondary endpoint of COVID-19-related mortality up to four weeks was 4.9% for Ilaris and standard of care compared to 7.2% for placebo. Both the primary and key secondary endpoints trended in favor of canakinumab but did not reach statistical significance.

John Tsai, head of Global Drug Development and chief medical officer for Novartis, said that although the Phase III CAN-COVID trial failed to meet endpoints, it did improve the scientific understanding of COVID-19 and the role of interleukin-1β inhibition.

Dr Harsh Vardhan launches CSIR partnered clinical trials website "CUReD" on Repurposed Drugs for Covid- 19

Oct 25, 2020 | Biotech Express Bureau

Dr Harsh Vardhan, Minister of Science & Technology, Health and Family Welfare and Earth Sciences, today launched a website that gives comprehensive information about the numerous COVID-19 clinical trials that CSIR is engaged in partnership with Industry, other government departments and ministries.

Called CuRED or CSIR Ushered Repurposed Drugs, the website provides information about the drugs, diagnostics and devices including the current stage of the trials, partnering institutions and their role in the trials and other details. The site can be accessed at https://www.iiim.res.in/cured/ or http://db.iiim.res.in/ct/index.php.

CSIR is exploring multiple combination clinical trials of anti-virals with host-directed therapies for the potential treatment of COVID-19. CSIR is also working with the Ministry of AYUSH for clinical trials of AYUSH drugs and has undertaken safety & efficacy trials of AYUSH prophylactics and therapeutics based on individual plant-based compounds and in combination. Five clinical trials involving Withaniasomnifera, Tinosporacordifolia + Piper longum(in combination), Glycyrrhizaglabra, Tinosporacordifolia & Adhatodavasica (individually and in combination) and AYUSH-64 formulation are undergoing safety and efficacy trials.

A key clinical trial of CSIR is the Sepsivac (Mw) against COVID -19 in partnership with Cadila. The phase 2 clinical trial has been completed successfully on critically ill COVID-19 patients, and more extensive Phase 3 trial is on the anvil. Further, the Phase 2 trial of phytopharmaceutical AQCH on Covid-19 patients with Sun Pharma and DBT is underway.

Dr. Shekhar C Mande, Secretary, DSIR and DG-CSIR, Dr.Ranjana Aggarwal, Dir, NISTADS and Dr. Geetha Vani Rayasam, Senior Principal Scientist & Head, Science Communication and Dissemination Directorate CSIR HQ, were present on the occasion. CSIR Directors, Heads of Departments, and Scientists involved in Clinical Trials joined the event virtually.

News in Focus

Bayer Acquires AskBio for Up to $4 Billion to Expand Gene Therapy Platform

Oct 26, 2020

Bayer is making a big bet on gene therapy with the acquisition of North Carolina-based Asklepios BioPharmaceutical (AskBio). Bayer is paying $2 billion upfront for AskBio's AAV-based gene therapy pipeline of treatments for Pompe disease, among others, and could pay an additional $2 billion in potential milestones.

AskBio's Pro10 AAV manufacturing process has become something of a standard across the industry. The platform is used by multiple companies, including Pfizer, Takeda and Viralgen Vector Core SA. The company holds over 500 patents in areas such as AAV production, chimeric vectors and self-complementary DNA. AskBio's technology has already seen regulatory success. It initially developed the gene therapy for spinal muscular atrophy that Illinois-based AveXis, a subsidiary of Novartis, won approval for from the U.S. Food and Drug Administration in 2019. AskBio's lead research programs, which are focused on Pompe disease, Parkinson's disease and congestive heart failure are currently in early phases of clinical development.

Under terms of the deal, Bayer will own full rights to AskBio's pipeline of treatments for Pompe disease, Parkinson's disease, as well as therapies for neuromuscular, central nervous system, cardiovascular and metabolic diseases. AskBio will remain an autonomous company under the Bayer umbrella and will operate on an "arms-length basis," Bayer said this morning. AskBio Chief Executive Officer Sheila Mikhail noted that her company will retain its independent structure, which she said will allow them to "provide accelerated development of gene therapies to treat more patients who can benefit from them."

The addition of AskBio will complement Bayer's other cell and gene therapy company, BlueRock Therapeutics, which it acquired last year. BlueRock is developing induced pluripotent stem cells (iPSC), with its most advanced program aimed at Parkinson's disease.

Werner Baumann, chairman of the Board of Management at Bayer, said the acquisition of AskBio "significantly advances the establishment of a cell and gene therapy platform" that can be at the forefront of breakthrough science and contribute to the development of therapies that can prevent or cure diseases caused by genetic defects. Baumann said the goal is in line with the company's purpose of "science for a better life."

FDA COVID-19 Vaccine Advisory Committee: Lots of Talk, No Decisions

October 22, 2020

Typically, the U.S. Food and Drug Administration (FDA)'s advisory committees meet ahead of a decision on whether to approve a drug or therapy to provide expert recommendations.

Advisory committee meeting held by the Vaccines and Related Biological Products Advisory Committee was a little bit different, as the group held a nine-hour virtual meeting to discuss the COVID-19 vaccine development programs and where to go next.

There is, as of yet, no vaccine that has been submitted to the agency for approval, although there are high hopes for several: Pfizer and BioNTech's, which may be submitted for emergency use authorization (EUA) by Thanksgiving; Moderna, which is predicting submission sometime in December; and AstraZeneca and the University of Oxford, possibly by the end of the year, with the U.S. arm of their Phase III trial restarting after being placed on a clinical hold when a UK patient reported a serious side effect.

In the meeting, both the FDA and the U.S. Centers for Disease Control and Prevention (CDC) presented details about COVID-19 and the requirements for a vaccine. Although there was a definite emphasis on effectiveness and safety, Marion Gruber, director of CDC's office of Vaccine Research & Review, pointed out that about 700 Americans die from COVID-19 every day, so there is pressure to come up with a vaccine.

Paul Offit, one of the committee members, who is director of the Vaccine Education Center and an attending physician at Children's Hospital of Philadelphia, has been a noted critic of the efforts so far, particularly the Trump administration's optimistic timelines. However, he did say, after the meeting, "I'm reassured." The EUA process the FDA described was "much much closer" to the full licensing process than he had thought earlier.

IAVI, Merck KGaA, Darmstadt, Germany, and Serum Institute of India Join Forces to Develop Monoclonal Antibodies for COVID-19

Oct 23, 2020

Today, IAVI, a nonprofit scientific research organization dedicated to addressing urgent, unmet global health challenges, and Serum Institute of India Pvt. Ltd., a leading manufacturer of vaccines and biologics, announced an agreement with Merck KGaA, Darmstadt, Germany, a leading science and technology company, to develop SARS-CoV-2 neutralizing monoclonal antibodies (mAbs) co-invented by IAVI and Scripps Research as innovative interventions to address the COVID-19 pandemic.

The agreement builds on the advanced antibody discovery and optimization expertise of IAVI and Scripps Research, gained from years of experience in HIV broadly neutralizing antibody research and development, and on Merck KGaA, Darmstadt, Germany's and Serum Institute's significant capabilities in design and scale up of accelerated manufacturing processes for mAb production. The global development plan is being led by the three organizations in partnership.

Dennis Burton, Ph.D., professor and chair of the Department of Immunology and Microbiology at Scripps Research and scientific director of the IAVI NAC said, "The accelerated discovery of highly potent SARS-CoV-2 neutralizing antibodies by IAVI and Scripps Research scientists was achieved by a tremendous collaborative effort of a team committed to translating state-of-the-art monoclonal antibody science into public health interventions that we all hope will have an important role in ameliorating the individual and societal impact of the COVID-19 pandemic."

Lilly and NIAID Halt COVID-19 Antibody Trial in Hospitalized Patients

Oct 27, 2020

In mid-September, Eli Lilly and Company announced interim proof-of-concept data from its BLAZE-1 Phase II clinical trial of LY-COV555 (bamlanivimab), its neutralizing antibody therapy for COVID-19. That study enrolled mild-to-moderate COVID-19 patients who had been diagnosed in the outpatient setting. This study is continuing.

However, a separate study of the antibody in hospitalized patients has been halted. About two weeks ago an independent Data Monitoring Committee paused enrollment in this trial because of a potential safety issue. The National Institute of Allergy & Infectious Diseases (NIAID), the study sponsor, could not verify

the safety issue, but their analysis also indicated there was little likelihood the antibody would help the hospitalized patients.

As a result, they have halted the study in hospitalized patients.

LY-CoV555 is a potent, neutralizing IgG1 monoclonal antibody directed against the spike "S" protein on SARS-CoV-2, the virus that causes COVID-19. The antibody came out of a collaboration between Lilly and AbCellera.

The NIAID stated, "bamlanivimab is unlikely to help hospitalized COVID-19 patients recover from this advanced stage of their disease."

Eli Lilly is continuing their other trial in mild-to-moderate COVID-19 patients and stated they "remain confident … that bamlanivimab monotherapy may prevent progression of disease for those earlier in the course of COVID-19."

Lilly also inked a deal with the Bill & Melinda Gates Foundation, as part of the COVID-19 Therapeutics Accelerator, to improve access to future Lilly therapeutic antibodies under development for prevention and treatment of COVID-19 to benefit low- and middle-income countries. And both Lilly and Incyte Corporation presented data demonstrating baricitinib in combination with Gilead's remdesivir decreased time to recovery and improved clinical outcomes for patients with COVID-19 compared to remdesivir alone. Lilly, based on that data, submitted an initial request to the FDA for EUA.

For the quarter, Lilly's global revenue was $5.741 billion, an increase of 5% compared to the same period in 2019. It was driven by a 9% increase in volume and a 1% increase from favorable foreign exchange rates, but was partially offset by a 5% decrease from lower realized process.

Key growth products launched since 2014 included Taltz, Trulicity, Verzenio, Jardiance, Olumiant, Emgality, Tyvyt, Baqsimi, Cyramza, Retevmo and Basalgar. They represented approximately 52% of total revenue for the quarter.

However, the figures were below analysts' expectations because of increased costs for developing COVID-19 therapies and a lower demand for some of its drugs. It projects 2020 COVID-19 R&D expenses to hit about $400 million.

Merck Snaps Up VelosBio and its ROR1 Inhibitor in $2.75 Billion

Nov 05, 2020

Merck is dropping $2.75 billion to acquire a promising cancer therapy that targets receptor tyrosine kinase-like orphan receptor 1 (ROR1) in both hematological and solid tumors.

Merck announced it will acquire San Diego-based VelosBio in an all-cash deal. VelosBio's lead investigational candidate is VLS-101, an antibody-drug conjugate (ADC) targeting ROR1 that is currently being evaluated in a Phase I and Phase II clinical trial for the treatment of patients with hematologic malignancies and solid tumors, respectively.

Merck struck following promising Phase I data announced earlier this year that VelosBio intends to share in full at the American Society of Hematology meeting next month. Results from that study showed treatment with VLS-101 resulted in objective clinical responses, including complete responses, in 47% of patients with mantle cell lymphoma (MCL) and 80% of patients with diffuse large B-cell lymphoma. The U.S. Food and Drug Administration granted VLS-101 orphan drug and fast track designations for the treatment of MCL.

Roger Perlmutter, president of Merck Research Laboratories who announced his retirement from the company last month, said the acquisition of VelosBio will complement the company's current portfolio of cancer treatments and will also strengthen the company's long-term growth potential.

"Pioneering work by VelosBio scientists has yielded VLS-101, which in early studies has provided notable

evidence of activity in heavily pretreated patients with refractory hematological malignancies, including mantel cell lymphoma and diffuse large B-cell lymphoma," Perlmutter said in a statement.

ROR1 is a cell-surface protein expressed during development in the womb, but disappears before birth. It is usually not expressed on normal cells in children or adults. However, ROR1 can reappear on malignant tissues, including on solid tumors. By targeting ROR1, VLS-101 is designed to deliver cancer-fighting therapeutics selectively to tumor cells, while sparing normal cells, VelosBio said. Last month, VelosBio initiated a Phase II study of VLS-101 for the treatment of patients with solid tumors, including patients with triple-negative breast cancer, hormone receptor-positive and/or HER2-positive breast cancer, and non-squamous non-small-cell lung cancer. The primary endpoint of the study will be objective response rate as determined by standard response criteria in patients who were previously treated.

Novo Nordisk Acquires Emisphere Tech in $1.8 Billion Deal

Nov 06, 2020

Denmark's Novo Nordisk is acquiring New Jersey-based Emisphere Technologies in a deal worth about $1.8 billion. Novo Nordisk specializes in diabetes-related therapeutics. Emisphere is a drug delivery company, with products such as Eligen B12, the first and only once-daily oral non-prescription medical food to normalize B12 levels without injection.

Under the terms of the deal, Novo Nordisk is picking up all outstanding Emisphere shares for $1.35 billion. It is also picking up related Eligen SNAC royalty stream obligations owed to MHR Fund Management, Emisphere's largest shareholder, for $450 million. That brings the total deal price to $1.8 billion.

Eligen SNAC allows oral formulations of otherwise injected drugs. Novo Nordisk and Emisphere have been partnered since 2007. Novo Nordisk uses the Eligen SNAC for the oral formulation of Rybelsus (semaglutide), its GLP-1 receptor agonist for type 2 diabetes. Now it'll have full access to the Eligen SNAC technology platform without future royalty obligations, which will allow it to move further into oral biologics.

"I don't think we will ever completely get rid of the needles," Mads Krogsgaard Thomsen, Novo Nordisk's chief scientific officer, told Reuters. "We have been making injection drugs for a hundred years, but we just have to admit that if we want patients to get treatment quickly in order to optimize the long-term course of the illness, then it requires tablets if possible."

The timing is good, as Novo Nordisk's Rybelsus, a first-of-its-kind non-injectable diabetes pill was re-

cently approved by regulators in the U.S., European Union and several Asian countries.

Novo Nordisk reported its third-quarter financials on October 30, citing a sales increase of 6% in Danish kroner and 7% at CER to $14.3 billion (U.S.). The Diabetes and Obesity care sales increased by 5% to $12.1 billion (U.S.), driven by GLP-1 sales, reflecting Ozempic and the Rybelsus launch.

Regeneron's Inmazeb becomes first Ebola treatment approved by FDA

Oct 18, 2020

Inmazeb is made up of three monoclonal antibodies: atoltivimab, maftivimab and odesivimab-ebgn. The cocktail was engineered using the company's VelocImmune platform and associated VelociSuite technologies. The antibodies have similar structure, but bind to different, non-overlapping antigens on Zaire ebolavirus glycoprotein. They neutralize the virus by blocking its ability to invade patients' bodies and by recruiting other immune cells to target infected cells.

Ebola is rare and deadly and typically causes outbreaks in sub-Saharan Africa, although there were 11 people treated in the U.S. during the 2014 to 2016 epidemic. There is currently an ongoing outbreak in the Democratic Republic of the Congo (DRC). The disease spreads through contact with blood, body fluids and tissues of animals, and through contact with infected people, as well as through sexual contact with someone sick with the disease, as well as after recovery from the disease. The early signs of the disease include fever, aches and pains, severe headache, and abdominal pain, weakness, diarrhea and vomiting, then moves onto hemorrhaging, bleeding or bruising. The average case fatality rate of Ebola virus disease (EVD) is about 50%.

"We are incredibly proud that the FDA has approved Inmazeb, which is also known as REGN-EB3," said George D. Yancopoulos, president and chief scientific officer of Regeneron. "This is the first time the FDA has approved a treatment specifically for Ebola, which has caused a number of deadly outbreaks. Decades of investment in our VelociSuite rapid response technologies, the dedication of world-class scientists, and the courageous contributions of healthcare providers and

patients, together with remarkable cooperation between leading international health organizations and govenrments, have led to this important moment."

As part of a deal announced in July, Regeneron will produce a specific number of Inmazeb doses over six years to the Biomedical Advanced Research and Development Authority (BARDA). In response to the 2018 outbreak in the DRC, Regeneron worked with the World Health Organization (WHO), FDA and other global health organizations to provide Inmazeb under a compassionate use protocol and include it in the four-arm PALM (Pamoja TuLinde Maisha) Trial. With BARDA, Regeneron plans to continue to offer the therapy for free in response to outbreaks in the DRC through the MNEURI protocol for compassionate use.

"Since 2015, BARDA has partnered with Regeneron to develop a life-saving treatment for Ebola Zaire," said Gary Disbrow, acting director of BARDA. "The Food and Drug Administration's approval of Inmazeb shows the power of public private partnerships to bring forward these critical treatments and improve global public health. BARDA is continuing our collaboration with Regeneron on other life-threatening diseases such as MERS and COVID-19, and we look forward to continued success."

The therapy's safety and efficacy were demonstrated in the 681-patient PALM Trial, which was initiated in 2018 in the DRC. The trial was jointly sponsored by the WHO, the National Institutes of Health (NIH) and the Institut National de Recherche Biomedical (INRB) in the DRC. The trial was halted early after a pre-specified interim analysis showed Inmazeb was superior to Gilead's remdesivir, currently the only approved therapy for COVID-19, and Mapp Biopharmaceutical's ZMAPP.

Perceptive Advisors Close on $1.1 Billion Credit Fund for Life Sciences Investments

September 23, 2020

Perceptive Advisors announced it has completed fundraising for its third credit fund, Perceptive Credit Opportunities Fund III (PCOF III). The fund had an original target of $750 million, but was so enticing to investors that it hit its $1.1 billion hard cap.

The firm's second credit fund closed two years ago with $675 million. With this new fund, it expects to make 20 investments, including nine that have previously been invested in companies such as C4 Therapeutics and Pear Therapeutics.

They typically partner with small and medium-sized companies to provide capital solutions in the range of $10 million to $200 million per investment. Perceptive indicates they provide tailored private credit financing

to both public and private healthcare companies at all stages and all subsectors, including biopharma, medical devices, diagnostics, life sciences research and digital health technologies.

"We are excited to continue to fund life sciences companies with alternative capital to power the innovation and commercialization of products and solutions addressing the healthcare markets," said Sam Chawla, Portfolio Manager of Perceptive's Credit Opportunities Funds. "Our focused credit strategy is well suited to the current investment environment and we have a formidable capital base to invest in compelling healthcare companies."

Founded in 1999, Perceptive has about $8.5 billion of assets under management. It launched the first Credit Opportunities Fund in 2014, "designed to integrate Perceptive's longstanding investment research expertise and investment capabilities in life sciences with credit-based investments."

PCOF III brings Perceptive's capital solely focused on private credit in the funds to $2.1 billion. The commitments for PCOF III were from a diverse range of investors around the world, including foundations, endowments, pension funds, insurance companies, family offices and financial institutions.

"We are proud to continue to build our industry leading platform at Perceptive Advisors and are fortunate to have the support of a great set of global investors to continue our strategy of funding life sciences companies," said Joseph Edelman, founder and chief executive officer of Perceptive Advisors.

In the last year, Perceptive has made 91 direct investments, including Solid Biosciences and Acerta Pharma. One of the most important was a 2019 investment in ArcherDx, a company based in Boulder, Colorado that is developing molecular diagnostics for cancer. In May 2019, Perceptive led a $60 million investment round for ArcherDx. Archer was then acquired by Invitae for $1.4 billion in June 2020.

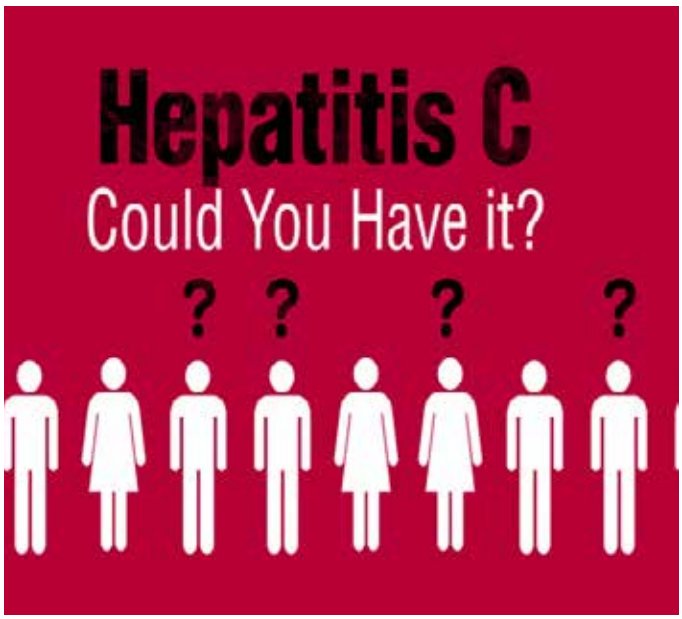
Invita was a leader in diagnostics and hereditary risk testing. ArcherDX's platform was based on its proprietary Anchored Multiplex PCR chemistry, which allowed it to develop products and services for cancer monitoring in liquid and tissue samples. ArcherDX had developed and commercialized more than 325 unique products, including research products and services used by more than 300 laboratories around the world, as well as collaborating with more than 50 biopharma companies and contract research organizations (CROs). Its partners included AstraZeneca, Bristol Myers Squibb and Bayer.

In August 2020, Perceptive launched Shanghai, China-based LianBio, which was founded, seeded and incubated by Perceptive. LianBio has three clinical oncology and cardiorenal product candidates in its pipeline. LianBio partnered with BridgeBio Pharma, MyoKardia, and BridgeBio Pharma affiliate companies Navire Pharma and QED Therapeutics to develop therapeutics in China and major Asian markets.

Research Highlights

A discovery to lead better treatment for Hepatitis C

October 22, 2020



Virologists at Institut national de la recherche scientifique (INRS) have identified a critical role played by a cellular protein in the progression of Hepatitis C virus infection, paving the way for more effective treatment. No vaccine currently exists for Hepatitis C virus infection, which affects more than 130 million people worldwide and nearly 250,000 Canadians. Antivirals exist but are expensive and not readily available in developing countries, where the disease is most prevalent.

Professor Terence Ndonyi Bukong and his team of virologists, in partnership with Professor Patrick Labonté, discovered this potential therapeutic target. They unveiled that the cellular protein RTN3 was involved in mediating an important pathway essential in Hepatitis C virus disease development, and progression. This promising discovery could lead to better treatments for the disease, which kills approximately 500,000 people annually.

Normally, the immune system needs to recognize a virus to attack it and prevent infection. The Hepatitis C virus, however, is a master of disguise. It moves around, undetected, in exosomes, which are cell-released microvesicles vesicles that normally function in cellular communication, transport, and cellular waste disposal. This novel research revealed that the Hepatitis C viruses interact with a key area of the RTN3 protein utilizing it to insert their viral RNA into exosomes.

"We are the first researchers to demonstrate the exosomal role that this protein plays in hepatitis C pathogenesis," said Dr. Bukong, who led the study published in the journal PLOS One. "By identifying the areas of the protein that lead to the formation of an infectious exosome, we can now look for distinctive molecules that block the interaction with the viral RNA." He went on to say, "This would prevent the viral RNA from being able to enter exosomes and hide from the body's immune system."

The discovery of this interaction between the virus and the RTN3 protein opens the door to more research on other viruses that use exosomes to evade detection. "For example, studies have shown that HIV, Zika, and Hepatitis B viruses also hide inside exosomes. This disguise creates a problem for the optimal function of vaccines because even if antibodies are developed, they are unable to block viral infection or transmis-

sion," Dr. Bukong explained. "If the RTN3 protein also plays an important role in these other illnesses, it could help us make more effective treatments, and, potentially, more effective vaccines."

Journal Reference:
Jingjing Li, Ebtisam Abosmaha, Carla S. Coffin, Patrick Labonté, Terence Ndonyi Bukong. Reticulon-3 modulates the incorporation of replication competent hepatitis C virus molecules for release inside infectious exosomes. PLOS ONE, 2020; 15 (9): e0239153 DOI: 10.1371/journal.pone.0239153

COVID-19 deaths in under-65s for better insights into infection rates

November 4, 2020

The research, conducted by scientists at the University of Cambridge and the Institut Pasteur, was published today in the leading journal Nature.

It highlights how large COVID-19 outbreaks in European nursing homes, and the potential for missing deaths in some Asian and South American countries, have skewed COVID-19 death data for older age groups, rendering cross-country comparisons of the scale of the pandemic inaccurate.

The researchers say that reporting of deaths from COVID-19 among those under the age of 65 is likely to be far more reliable, and can therefore give clearer insights into the underlying transmission of the virus and enable better comparisons between countries -- crucial in guiding government strategies to try to get COVID-19 under control.

"Simply comparing the total number of deaths across countries can be misleading as a representation of the underlying level of transmission of SARS-CoV-2. Most deaths are in older people, but they are the least comparable across countries," said Megan O'Driscoll, a PhD researcher in the University of Cambridge's Department of Genetics and first author of the paper.

In countries including the UK, Canada and Sweden, the COVID-19 pandemic has disproportionately affected nursing home residents, who account for over 20% of all reported COVID-19 deaths. The level of SARS-CoV-2 transmission among the general population can be difficult to disentangle from these large outbreaks.

By contrast, some countries in Asia and South America have far fewer reported COVID-19 deaths in older people than expected. One potential explanation for these 'missing deaths' is that causes of deaths in elderly populations may be less likely to be investigated and reported as countries struggle to contain the epidemic.

Journal Reference:
Megan O'Driscoll, Gabriel Ribeiro Dos Santos, Lin Wang, Derek A. T. Cummings, Andrew S. Azman, Juliette Paireau, Arnaud Fontanet, Simon Cauchemez, Henrik Salje. Age-specific mortality and immunity patterns of SARS-CoV-2. Nature, 2020; DOI: 10.1038/s41586-020-2918-0

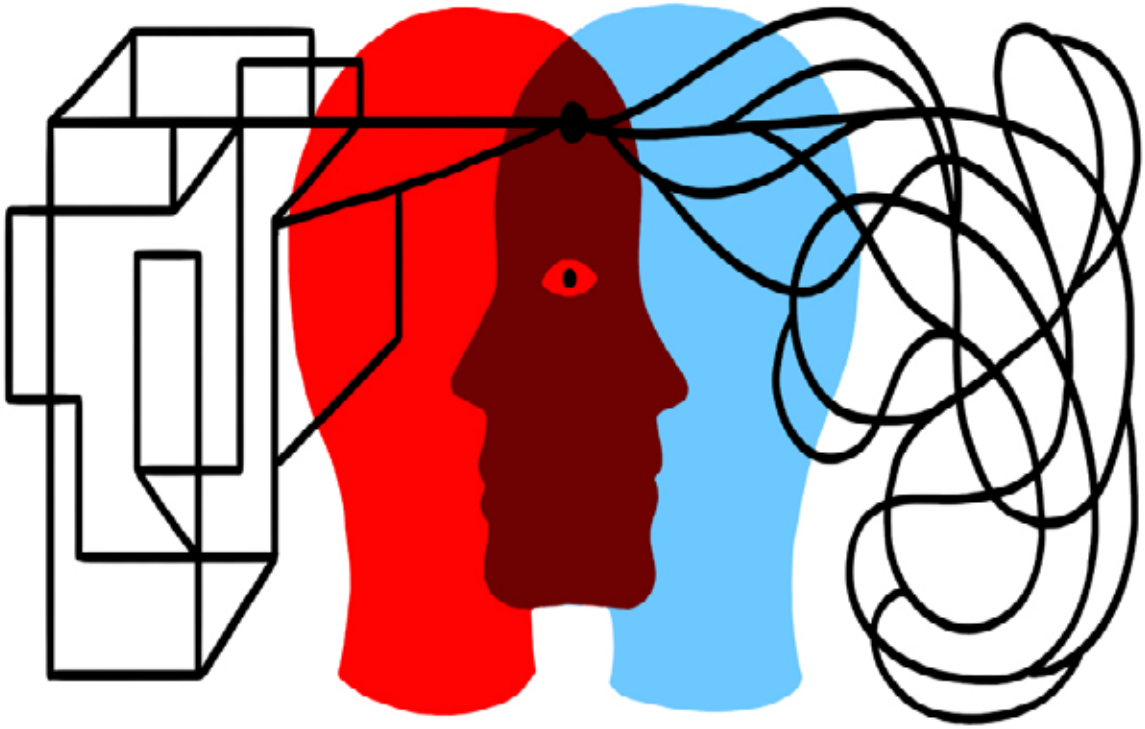
Gene therapy trial for autism-linked condition is put on hold

A small clinical trial of a gene therapy for Angelman syndrome — a rare genetic condition related to autism — is on hold after two participants temporarily lost the ability to walk. The safety issue is important to resolve, experts say, given that the therapy otherwise appears to be effective, and the trial could guide treatment strategies for similar brain conditions.

Biopharmaceutical company Ultragenyx in Novato,

California, in collaboration with Florida-based biotech startup GeneTx, launched the trial in February to assess the safety of a therapy for Angelman syndrome, a neurodevelopmental condition characterized by intellectual disability, balance and motor problems, seizures, sleep problems and, in some cases, autism.

Angelman syndrome results from the mutation or absence of a gene called UBE3A. People inherit two copies of UBE3A. Typically, only the maternal copy is active in neurons and the paternal copy is silent. But in people with Angelman syndrome, the maternal copy is mutated or missing, so their brain cells express no active UBE3A protein.



The drug developed by Ultragenyx and GeneTx, called GTX-102, is a short snippet of RNA called an antisense oligonucleotide that activates the paternal copy of UBE3A and aims to restore the protein to typical levels. Three other companies — Roche, Biogen and Ionis — are pursuing similar therapies for the syndrome.

On 26 October, Ultragenyx and GeneTx reported that the clinical trial had enrolled five individuals with Angelman syndrome, aged 5 to 15. The plan had been to administer to each participant a dose of GTX-102 once a month over four months. Researchers injected the drug directly into the nutrient-rich solution that envelops the brain and spinal cord through a site in the lower back.

The participants were to receive increasing doses, but all started with different amounts: Two began at the lowest dose, two started with the second-lowest dose, and one started at the second-highest dose. The final dose was about 10 times higher than the lowest dose.

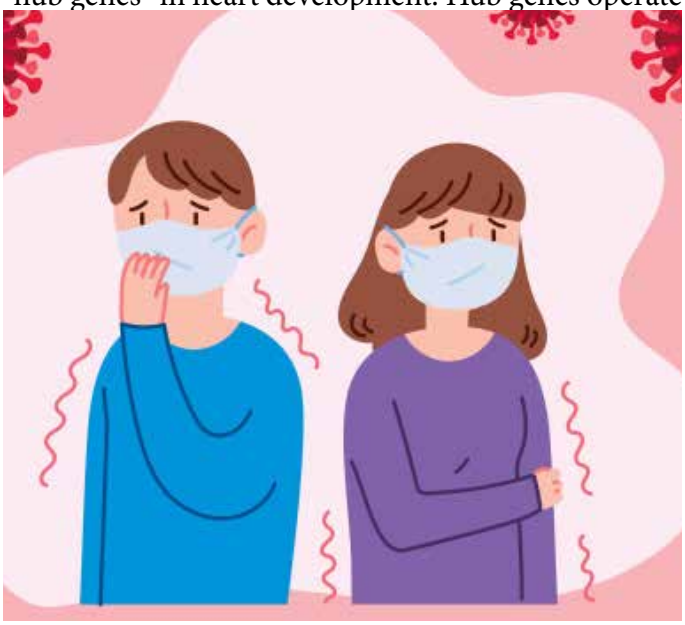
After a single dose at the second-highest level, one participant developed leg weakness. The other four participants experienced the same adverse effect after taking the highest dose. The symptoms emerged one to four weeks after the participants' last dose.

"Two of the patients were not able to support themselves to walk and three were, but they were weaker," says Elizabeth Berry-Kravis, professor of child neurology at Rush University Medical Center in Chicago, Illinois, where the five children were treated.

Genetic elements involved in heart development identified

Researchers have identified a suite of genes and regulatory elements critical to normal heart development. Their study outlines the importance of 'hub genes' in heart development.

In a paper published in the October issue of Circulation Research, Cotney outlines the importance of "hub genes" in heart development. Hub genes operate



like the hub of a wheel; they serve as the center from which many other "spokes" radiate and follow their lead in terms of when and to what extent they are expressed.

By studying a massive dataset of 125,000 control patients' genomes amassed from other studies in the Genome Aggregation Database (gnomAD), Cotney and his team identified a set of genes and regulators critical for heart development. These genes experience infrequent mutations, leading the researchers to conclude they are important to healthy development.

Cotney's team identified more than 100,000 regulatory sequences that are active during human heart development. More than 13,000 of these, around 10% of the total, had never been annotated as active in any human tissue or developmental stage. Their analysis of these regulatory elements and gene expression implicated more than 200 novel genes for heart development many likely to involved in congenital heart defects.

The researchers have filed a patent for their findings that can be useful for companies that use genetic screening to diagnose congenital heart defects. Until now, they have been looking at other genes which are less precise indicators of the underlying problems. Furthermore, the industry lacks agreement on which genes are most relevant.

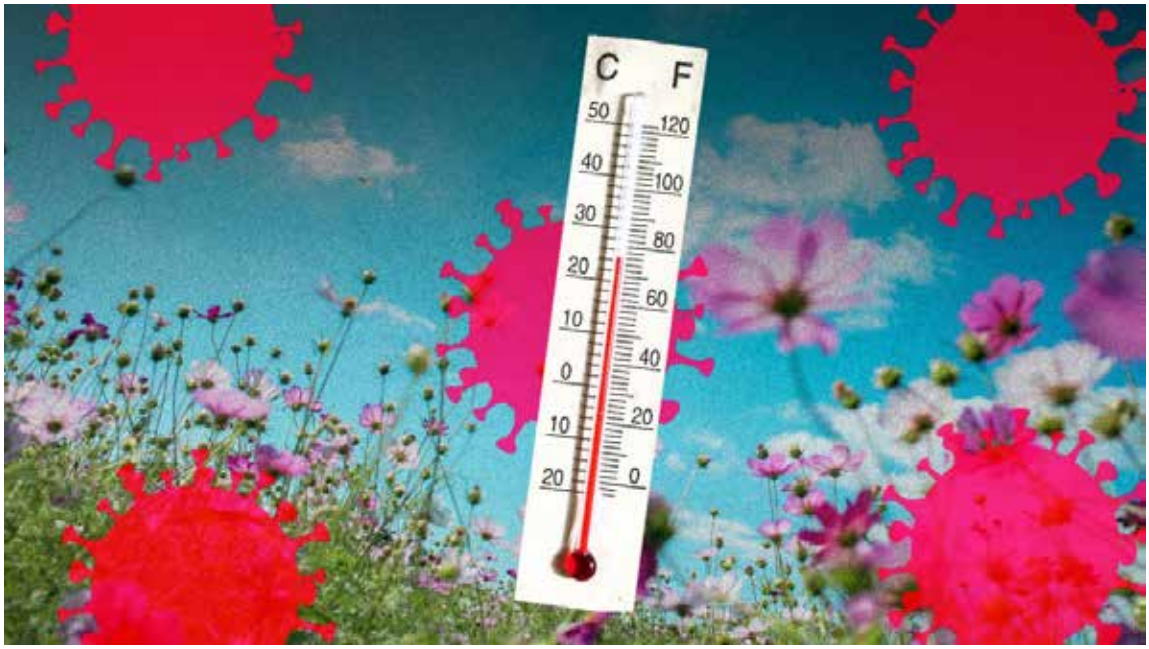
"What we found is quite novel," Cotney says. "We think the combination of these genes will be important in the future for the diagnosis of congenital heart defects."

The next step for this research is to look at the affected population to see if these genes are mutated as the researchers predict they will be. The team will also conduct experiments mutating certain parts of the genome to determine the influence they have on development.

Journal Reference:
Jennifer VanOudenhove, Tara N. Yankee, Andrea Wilderman, Justin Cotney. Epigenomic and Transcriptomic Dynamics During Human Heart Organogenesis. Circulation Research, 2020; 127 (9) DOI: 10.1161/CIRCRESAHA.120.316704

Hot or cold, weather alone has no significant effect on COVID-19 spread

Research led by The University of Texas at Austin is adding some clarity on weather's role in COVID-19



The study examined human behavior in a general sense and did not attempt to connect it to how the weather may have influenced it. At each scale, the researchers adjusted their analyses so that population differences did not skew results.

infection, with a new study finding that temperature and humidity do not play a significant role in coronavirus spread.

That means whether it's hot or cold outside, the transmission of COVID-19 from one person to the next depends almost entirely on human behavior.

"The effect of weather is low and other features such as mobility have more impact than weather," said Dev Niyogi, a professor at UT Austin's Jackson School of Geosciences and Cockrell School of Engineering who led the research. "In terms of relative importance, weather is one of the last parameters."

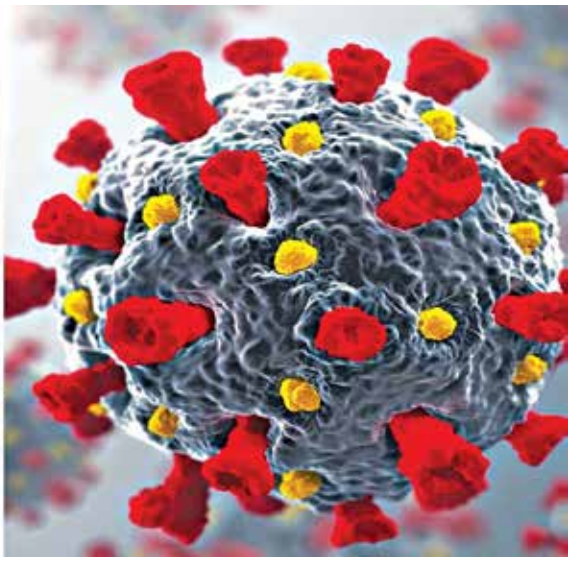
The research was published Oct. 26 in the International Journal of Environmental Research and Public Health. The study defined weather as "equivalent air temperature," which combines temperature and humidity into a single value. The scientists than analyzed how this value tracked with coronavirus spread in different areas from March to July 2020, with their scale ranging from U.S. states and counties, to countries, regions and the world at large.

At the county and state scale, the researchers also investigated the relationship between coronavirus infection and human behavior, using cellphone data to study travel habits.

Across scales, the scientists found that the weather had nearly no influence. When it was compared with other factors using a statistical metric that breaks down the relative contribution of each factor toward a particular outcome, the weather's relative importance at the county scale was less than 3%, with no indication that a specific type of weather promoted spread over another.

In contrast, the data showed the clear influence of human behavior -- and the outsized influence of individual behaviors. Taking trips and spending time away from home were the top two contributing factors to COVID-19 growth, with a relative importance of about 34% and 26% respectively. The next two important factors were population and urban density, with a relative importance of about 23% and 13% respectively.

Journal Reference:
Sajad Jamshidi, Maryam Baniasad, Dev Niyogi. Global to USA County Scale Analysis of Weather, Urban Density, Mobility, Homestay, and Mask Use on COVID-19. International Journal of Environmental Research and Public Health, 2020; 17 (21): 7847 DOI: 10.3390/ijerph17217847



Is the COVID-19 pandemic affecting dengue virus case numbers?

The ongoing COVID-19 pandemic has resulted in dramatic changes to human mobility, which has the potential to change the transmission dynamics of other infectious diseases. Now, researchers reporting in PLOS Neglected Tropical Diseases have found that social distancing has led to a significant increase in dengue infections in Thailand but no change in dengue in Singapore or Malaysia.

The dengue virus is transmitted by Aedes mosquitos and can cause severe fever, headache, muscle and joint pain, fatigue and nausea and vomiting. An estimated 105 million dengue infections occur every year, with the majority of cases concentrated in Southeast Asia and the Western Pacific region. In this region, COVID-19 has led to workplace closings, bans on mass gatherings and, at times, complete shutdowns. This provided a natural experiment to estimate the effects of reduced human mobility and workplace exposure on dengue transmission.

In the new work, Jue Tao Lim of the National University of Singapore, and colleagues analyzed dengue case counts for Thailand, Singapore and Malaysia using national surveillance data available through mid-2020. Information was also obtained on climate, COVID-19 interventions, and overall population census data.

In Thailand, the researchers found that social distancing is expected to lead to 4.32 additional cases per month per 100,000 individuals. This rise in cases, largely attributable to increased exposure in residences compared to workplaces, equates to 2,008 additional cases of dengue nationwide. However, no significant impact on dengue transmission was found in Singapore or Malaysia.

"Across country disparities in social distancing policy effects on reported dengue cases are reasoned to be driven by differences in workplace-residence structure, with an increase in transmission risk of arboviruses from social distancing primarily through heightened exposure to vectors in elevated time spent at residences," the researchers say. "[This demonstrates] the need to understand the effects of location on dengue transmission risk under novel population mixing conditions such as those under social distancing policies."

Journal Reference:
Jue Tao Lim, Borame Sue Lee Dickens, Lawrence Zheng Xiong Chew, Esther Li Wen Choo, Joel Ruihan Koo, Joel Aik, Lee Ching Ng, Alex R. Cook. Impact of sars-cov-2 interventions on dengue transmission. PLOS Neglected Tropical Diseases, 2020; 14 (10): e0008719 DOI: 10.1371/journal.pntd.0008719

Over 80 percent of COVID-19 patients have vitamin D deficiency, according to a study

Vitamin D is a hormone the kidneys produce that controls blood calcium concentration and impacts the immune system. Vitamin D deficiency has been linked to a variety of health concerns, although research is still underway into why the hormone impacts other systems of the body.

Many studies point to the beneficial effect of vitamin D on the immune system, especially regarding protection against infections. "One approach is to identify and treat vitamin D deficiency, especially in high-risk individuals such as the elderly, patients with comorbidities, and nursing home residents, who are the main target population for the COVID-19," said study co-author José L. Hernández, Ph.D., of the University of Cantabria in Santander, Spain. "Vitamin D treatment should be recommended in COVID-19 patients with low levels of vitamin D circulating in the blood since this approach might have beneficial effects in both the musculoskeletal and the immune system."

The researchers found 80 percent of 216 COVID-19 patients at the Hospital Universitario Marqués de Valdecilla had vitamin D deficiency, and men had lower vitamin D levels than women. COVID-19 patients with lower vitamin D levels also had raised serum levels of inflammatory markers such as ferritin and D-dimer.

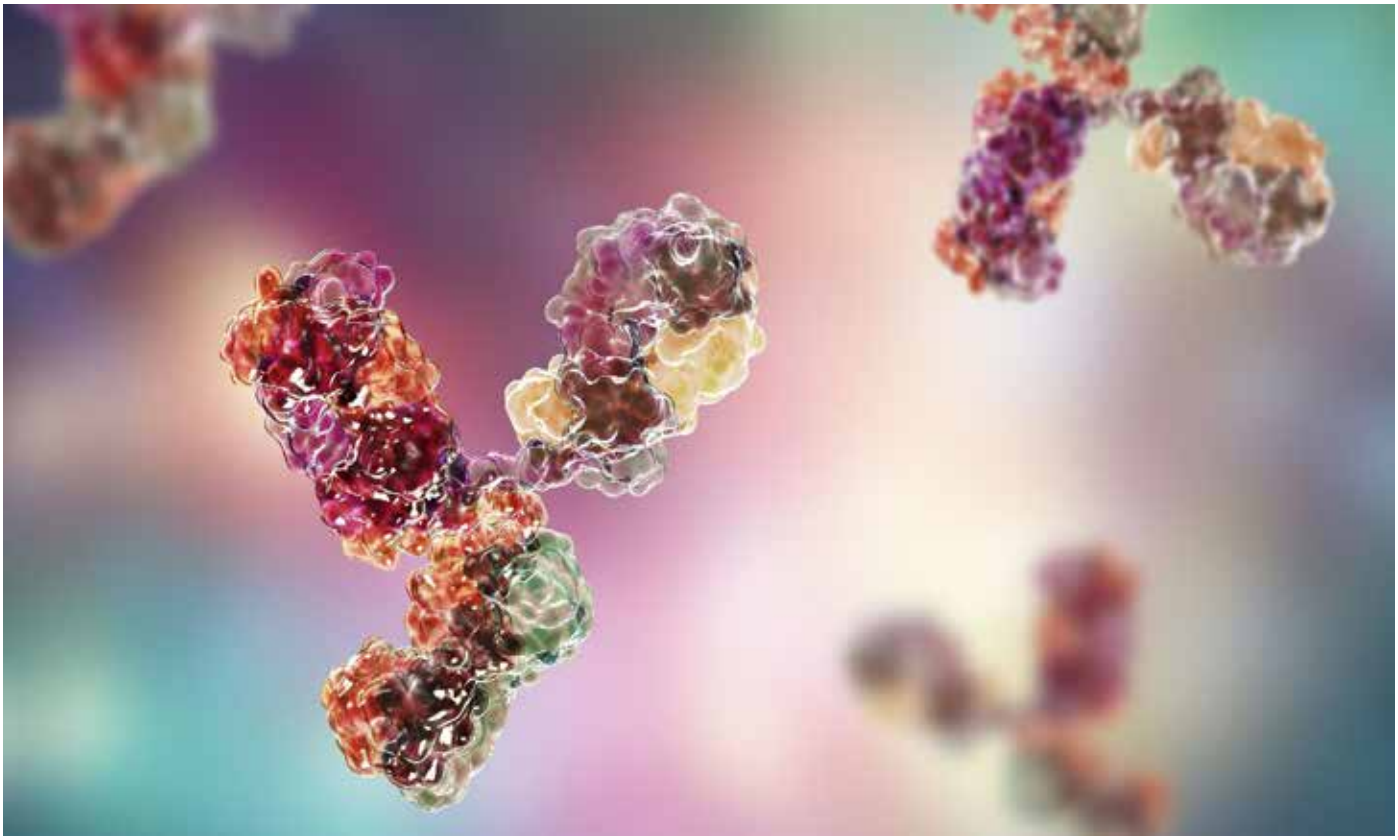
Synthetic mini-antibody to combat COVID-19

By screening hundreds of synthetic mini-antibodies called sybodies, a group of scientists has identified one that might stop SARS-CoV-2 from infecting human cell.

Nanobodies, small antibodies found in camels and llamas, are promising as tools against viruses due to their high stability and small size. Although obtaining them from animals is time consuming, technological advances now allow for rapid selection of synthetic nanobodies, called sybodies. A technology platform to select sybodies from large synthetic libraries was recently developed in the lab of Markus Seeger at the University of Zurich, and made available for this study. EMBL Hamburg's Christian Löw group searched through the existing libraries to find sybodies that could block SARS-CoV-2 from infecting human cells. First, they used the viral spike protein's RBDs as bait to select those sybodies that bind to them. Next, they tested the selected sybodies according to their stability, effectiveness, and the precision of binding. Among the best binders, one called sybody 23 turned out to be particularly effective in blocking the RBDs.

To learn exactly how sybody 23 interacts with the viral RBDs, researchers in the group of Dmitri Svergun at EMBL Hamburg analysed the binding of sybody 23 to the RBDs by small-angle X-ray scattering. In addition, Martin Hällberg at CSSB and Karolinska Institutet used cryo-EM to determine the structure of the full SARS-CoV-2 spike bound to sybody 23. The RBDs switch between two positions: in the 'up' position the RBDs poke out, ready to bind ACE2; in the 'down' position they are furled to hide from the human immune system. The molecular structures revealed that sybody 23 binds RBDs in both 'up' and 'down' positions, and blocks the areas where ACE2 would normally bind. This ability to block RBDs regardless of their position might explain why sybody 23 is so effective.

Finally, to test if sybody 23 can neutralise a virus, the group of Ben Murrell at Karolinska Institutet used a different virus, called a lentivirus, modified such that it carried SARS-CoV-2's spike protein on its surface. They observed that sybody 23 successfully disabled the modified virus in vitro. Additional tests will be necessary to confirm whether this sybody could stop SARS-CoV-2 infection in the human body.



Journal Reference:
Tânia F. Custódio, Hrishikesh Das, Daniel J. Sheward, Leo Hanke, Samuel Pazicky, Joanna Pieprzyk, Michèle Sorgenfrei, Martin A. Schroer, Andrey Yu. Gruzinov, Cy M. Jeffries, Melissa A. Graewert, Dmitri I. Svergun, Nikolay Dobrev, Kim Remans, Markus A. Seeger, Gerald M. McInerney, Ben Murrell, B. Martin Hällberg, Christian Löw. Selection, biophysical and structural analysis of synthetic nanobodies that effectively neutralize SARS-CoV-2. Nature Communications, 2020; 11 (1) DOI: 10.1038/s41467-020-19204-y

Ultrapotent COVID-19 vaccine candidate designed via computer

An ultrapotent nanoparticle candidate vaccine against COVID-19 has been developed with structure-based vaccine design techniques invented at UW Medicine. It is a self-assembling protein nanoparticle that displays 60 copies of the SARS-CoV-2 Spike protein's receptor-binding domain in a highly immunogenic array. The molecular structure of the vaccine roughly mimics that of a virus, which may account for its enhanced ability to provoke an immune response.

Compared to vaccination with the soluble SARS-CoV-2 Spike protein, which is what many leading COVID-19 vaccine candidates are based on, the new nanoparticle vaccine produced ten times more neutralizing antibodies in mice, even at a six-fold lower vaccine dose. The data also show a strong B-cell response after immunization, which can be critical for immune memory and a durable vaccine effect. When administered to a single nonhuman primate, the nanoparticle vaccine produced neutralizing antibodies targeting multiple different sites on the Spike protein. Researchers say this may ensure protection

against mutated strains of the virus, should they arise. The Spike protein is part of the coronavirus infectivity machinery.

The findings are published in Cell. The lead authors of this paper are Alexandra Walls, a research scientist in the laboratory of David Veesler, who is an associate professor of biochemistry at the UW School of Medicine; and Brooke Fiala, a research scientist in the laboratory of Neil King, who is an assistant professor of biochemistry at the UW School of Medicine.

The vaccine candidate was developed using structure-based vaccine design techniques invented at UW Medicine. It is a self-assembling protein nanoparticle that displays 60 copies of the SARS-CoV-2 Spike protein's receptor-binding domain in a highly immunogenic array. The molecular structure of the vaccine roughly mimics that of a virus, which may account for its enhanced ability to provoke an immune response.

The lead vaccine candidate from this report is being licensed non-exclusively and royalty-free during the pandemic by the University of Washington. One licensee, Icosavax, Inc., a Seattle biotechnology company co-founded in 2019 by King, is currently advancing studies to support regulatory filings and has initiated the U.S. Food and Drug Administtion's Good Manufacturing Practice.

To accelerate progress by Icosavax to the clinic, Amgen, Inc. has agreed to manufacture a key intermediate for these initial clinical studies. Another licensee, SK bioscience Co., Ltd., based in South Korea, is also advancing its own studies to support clinical and further development.

Journal Reference:
Alexandra C. Walls, Brooke Fiala, Alexandra Schäfer, Samuel Wrenn, Minh N. Pham, Michael Murphy, Longping V. Tse, Laila Shehata, Megan A. O'Connor, Chengbo Chen, Mary Jane Navarro, Marcos C. Miranda, Deleah Pettie, Rashmi Ravichandran, John C. Kraft, Cassandra Ogohara, Anne Palser, Sara Chalk, E-Chiang Lee, Kathryn Guerriero, Elizabeth Kepl, Cameron M. Chow, Claire Sydeman, Edgar A. Hodge, Brieann Brown, Jim T. Fuller, Kenneth H. Dinnon, Lisa E. Gralinski, Sarah R. Leist, Kendra L. Gully, Thomas B. Lewis, Miklos Guttman, Helen Y. Chu, Kelly K. Lee, Deborah H. Fuller, Ralph S. Baric, Paul Kellam, Lauren Carter, Marion Pepper, Timothy P. Sheahan, David Veesler, Neil P. King. Elicitation of potent neutralizing antibody responses by designed protein nanoparticle vaccines for SARS-CoV-2. Cell, 2020; DOI: 10.1016/j.cell.2020.10.043

सीडीएफडी
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डी एन ए फ़िंगरप्रिंटिंग एवं निदान केन्द्र
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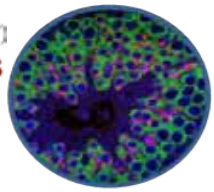
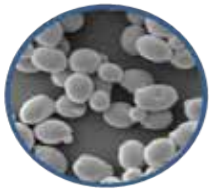
CENTRE FOR DNA FINGERPRINTING AND DIAGNOSTICS
(An autonomous institute of the Dept. of Biotechnology, Ministry of Science & Technology, Govt. of India)
इनर रिंग रोड, उप्पल, हैदराबाद - 500039, तेलंगाना, भारत
Inner Ring Road, Uppal, Hyderabad - 500039, Telangana, India

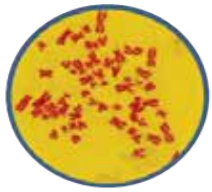
दूरभाष / Tel : +91-40-2721 6000, फैक्स / Fax: +91-40-2721 6006
वेबसाईट / Website : http://www.cdfd.org.in





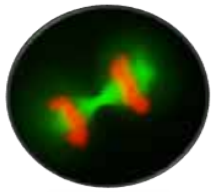
Advertisement No 02/2020 Dated 25.09.2020

Last Date for Receipt of the applications 30.11.2020

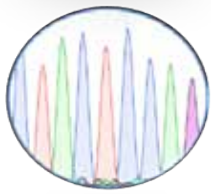


A unique opportunity for research careers in Science & Technology

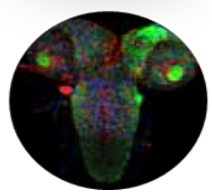
The Centre for DNA Fingerprinting and Diagnostics (CDFD; www.cdfd.org.in), Hyderabad is a premier autonomous R & D Institute under the Societies Act funded by the Department of Biotechnology, Ministry of Science and Technology, Government of India, that has been established to provide services in DNA fingerprinting and diagnosis of genetic disorders, and to undertake high quality basic research in different areas of modern biology.



Applications are invited from enthusiastic, young Indian researchers with an excellent academic record and proven scientific achievements, along with requisite experience, a high degree of motivation, and desire to lead a research group in different areas of modern biology, to fill the vacancy in the following posts of Scientists on **Deputation failing which on Direct Recruitment basis** as per the following details. The emoluments and age limit for various posts as per norms is summarized below:



Designation	Pay Matrix	No. of Posts & reservation	Total Monthly Emoluments	Upper Age limit not exceeding (as on last date)
Scientist - V	Level 13	01 -OBC	Rs.181995/-*	50 years**
Scientist - E-II	Level 13	01-UR	Rs. 181995/-*	50 years**
Scientist - IV	Level 12	01 - OBC 01 - SC	Rs. 119532/-*	45 years**
Scientist - III	Level 11	01 - OBC	Rs. 103881/-*	40 years**



***Total Emoluments means approximate total emoluments on minimum of scale including House Rent Allowance in Class 'X' City.**

****Please see age relaxation under Relaxation column.**

***** Upper age limit for the deputation posts is not more than 56 years**

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DEPARTMENT OF BIOTECHNOLOGY

Ministry of Science & Technology, Govt. of India

BIOTECH INDUSTRIAL TRAINING PROGRAMME (BITP) 2020-21 UNDER DBT-SKILL VIGYAN

Applications are invited from bonafide Indian citizens residing in India for hands-on training in industry. The programme provides opportunity to students who have completed their education and intend to start their career in industry to acquire practical skills and experience working on projects alongside industry experts as well as an opportunity to industry to identify potential candidates for their human resource requirements. The training will be for a period of six months during which stipend will be paid to trainees and bench fee will be paid to companies to cover expenses towards training.

ATTN: BIOTECHNOLOGY INDUSTRY

Requisitions are invited from biotechnology & life sciences companies interested to provide hands-on training for six months. The companies will also have to pay stipend to the trainees as per the apprenticeship norms in addition to stipend paid by DBT. For filling "**Requisition Form**" please visit **www.biotech.co.in**. Companies also need to register on **www.apprenticeshipindia.org**. Life Science Sector Skill Development Council (LSSSDC) will help the companies in registering on the apprenticeship India portal. Trainees would be provided to companies subject to availability.

ATTN: BIOTECHNOLOGY STUDENTS

ELIGIBILITY: B.E./B.Tech./M.Sc./M.Tech./MBA Bio-technology/Bio-informatics and students admitted under DBT supported post-graduate teaching programs. Candidates appearing in the final semester/ year examination are also eligible to apply. The degree should be from an Indian recognized university with minimum 50% marks or equivalent grade completed in the year 2018 / 2019 or completing in 2020.

MODE OF APPLICATION: Students may apply online by visiting website **www.biotech.co.in**. The details regarding filling of form, payment of application fee and uploading of documents is given on the website.

MODE OF SELECTION: Candidates will be selected through computer-based test conducted in multiple cities/centers. Selection would be subject to meeting the eligibility criteria. Trainer company would be provided subject to availability.

CERTIFICATION: After completion of training, trainees will have to undergo an online `**Assessment**' conducted by Life Science Sector Skill Development Council (LSSSDC). Trainees who will qualify the `**Assessment**' will be awarded **"Apprenticeship Certificate"** under National Skill Qualification Framework (NSQF) by LSSSDC.

APPLICATION WILL OPEN ON	AND CLOSE ON
November 3, 2020 at 11:00 am	**December 3, 2020 at 05:00 pm**

International Conference on Biotechnology for Sustainable Agriculture, Environment and Health

XVIIth Convention of BRSI

(BAEHS-2021)

ISSN: 2454-6968
RNI No. UPENG/2013/54102

April 4-8, 2021 Jaipur

Details: http://brsi2020jaipur.in/

The event will be jointly organized by the MNIT, Jaipur; CDC India, Jaipur, BISR, Jaipur and NIT-Uttarakhand in association with the International Solid Waste Association (ISWA), The Institute of Chartered Waste Managers (ICWM) and B Lal Institute of Biotechnology, Jaipur. This will be supported by the International Bioprocessing Association, France; Centre for Energy and Environmental Sustainability (CEES)-India and Amity University, Jaipur. The event will be held at BISR, Jaipur. Prof TP Singh, Prof AB Gupta and Dr Vivek Agarwal are conference chairs. Dr V Vivekanand is the convener of BAEH-2020 and Dr P Binod, COE, BRSI; Dr Krishna Mohan, BISR, Jaipur and Dr B Lal, BIB, Jaipur, Dr Rakesh Kumar Mishra, NIT-Uttarakhand are its co-conveners. Details can be found at http://brsi2020jaipur.in/