India can contribute enormously to global R&D

would you describe the scene for R&D in at the pharma, biotech mies and at research tes?

biguously it is positive! last decade, we can see creased awareness of in R&D in all sectors the pharma or biotech. ment means it may come form of funding, develvision, building infrare and creating an environment. As we are, R&D in these sectors d a long-term commitand it is encouraging to individuals, institutes, vernment, are ready to



Indian R&D in pharma and biotech should focus on strategic funding and two building the ecosystem. We see demand a long-term commitment, and it is encouraging to see that individuals, institutes, and government, are ready to invest time and money on to build a strong foundation in R&D,

India accounts for a consider-

able fraction of the world's

scholarly output in terms of

basic research publications

and their citations. It is appar-

ent that India's productivity is

higher in a few sectors than

others. For example, engi-

neering, materials science,

chemistry, and pharmacology

tends to be significantly cited

in research publications and patents. Encouragingly, in

these fields, a comparatively

high proportion of research

publications are resulting

from collaboration between

academia and industry in

India. This is a positive sign to

assume that a fair amount of

basic knowledge that is gener-

ated is also being transferred

and applied to solving real life

problems. It is a delight to see

basic and translational biolo-

gy research is joining in this

league and progressing with a

What are the visible trends on

the Indian R&D landscape in

In a nutshell, academia and

industry in India are in a deep

conversation, now more than

ever! That is a sign of progres-

sive research. Such engagements lead to solving real life

problems through an out-

standing research. In the past,

it used to be segmented, and

the focus of R&D was different

in industry and academia. Of

course, R&D in either the

pharma or biotech industries

have been focusing on devel-

oping technologies to solve

designated need as their man-

date, on the other hand, acade-

mia has been focused on

knowledge building-driven

research. However, from a

decade or so, the trend has

changed. Now, a significant

percentage of the basic

pharma and biotech?

lightning speed.

says PRAVEEN KUMAR VEMULA, Research Investigator, Institute for Stem Cell Biology and Regenerative Medicine, in an email interaction with **NANDITA VIJAY.** Excerpts:

invest time and money on to build a strong foundation in R&D. We do understand that successful translational science programs are built on a strong foundation in R&D. At present, the biotech sector is flourish-

ing, where an enormous amount of encouragement for start-up culture is coming from public and private sectors.

What are India's key strengths in research?

research scientists are willing to ask research questions which could yield a solution for existing unmet need. Merging curiosity with an eye for developing technologies to solve real life problems is the recent trend in our science community.

How is India positioned to offer its expertise to the global R&D players?

India has a lot to contribute to oping early stage technologies, demonstration, take those technologies into a pilot stage through start-ups. Then after could be co-developed or merge with pharma/biotech giants to run massive trials and process. In a short-term, through this approach, India can enormously contribute to the global R&D players. In the long run, India should focus on building this entire development process engine domestically, and bring global players

the global R&D. However, we need to be strategic and play to our strength. For instance, we do not have much precedence in demonstrating developing new investigative drugs and take them through complete development process till it comes to the regulatory approvals. This entire process needs billions of dollars' investment, which I believe, is not trivial to raise either from the private or public sector. India should leverage on its enormous pool of basic research knowledge and focus on develand post proof-of-concept de-risking, these technologies complete the development here, if necessary.

How much does academia and industry partnerships benefit commercialization of the research efforts?

This partnership is critical, for successful translation of the technologies into commercial products, particularly in the beginning stage of technology development. It is akin to a relay race involving multiple sprinters who pass the baton to next sprinter after they finish their lap. Typically, academia will be the early sprinter, and industry partners will be the finishers. Although they are

COMPLETE DISSOLUTION INSTRUMENTATION AND **ACCESSORIES WITH HARDNESS TESTER**



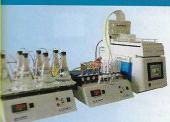
Automated USP APPARATUS 1,2,5,6

- Color touch screen for speed, temperature and time control
- Automation ready for online analysis with UV, HPLC and Fiber Optic systems
- Three speed zones for 3 groups of 4 spindles, each zone may have different speeds
- In shaft cameras to record the sample dissolving in baskets



Automated USP APPARATUS 3,7

- App 3 and App 7 on one unit
- Switch App 3 and App 7 with one
- Syringe pump sampling
- No evaporation top covers
- Password protection
- Large color touch screen display



Automated USP APPARATUS 4 & Suspension

Unique cell holder design:

Vertical position or horizontal position

LOGAN Automated diffusion cell System for IVPT/ IVRT studies of topical formulations



- Samples from 12 bubble free cells for up to 20 sampling time points
- Open air system, no pressure build up during the test, no leak system
- Sampling takes place before media replacement to avoid sample dilution

SANGUINE BIO INSTRUMENTS

Flat No.103, Sai Vinayaka Residency, Road No.2, NBR Colony, Meerpet, Sarror Nagar Mandal, R.R.Dist, Hyderabad - 5000097 Phone No +91 9989077785

> Email: raj@sanguinebio.net, sanguinebio@gmail.com Web: www.sanguinebio.net

CONTINUED ON p 17 >

plays huge role in bringing down research timelines

UED FROM p 16

tual entities, having team interactions and ng from the beginning the path little easier is success.

re the young researchers in the country?

young researchers are participating in a highsearch. It is a responsiof senior scientists and tions to share their pheal research that can the young minds of the If we can ignite their asm and curiosity at an ge and communicate the ted possibilities that for them in research h which they can conto the society, it would ially bring a lot of young into the research. Once re motivated, there are tits to what they can E Institutes like Indian te of Science Education search (IISERs) are proopportunities to stuat the undergraduate to do a world-class h which certainly is ing a lot of young people e research.

is the interest level the Millennials or the keen on pursuing in

mentioned, it is our sibility to engage with at an early stage. It is ant to showcase the poss that exist across the mes be it in academia or or other careers. th is one career, that not ay your way and gives a al satisfaction, and in term, you can impact people's lives through access. This can be motifor anybody who wants a change in the society. sters who are mindful quisitive, are keen on ng a career in research e motivated to take big ges to provide a meancontribution to their

much does technology Tenable bringing down rug research timelines hat are the key benefits your sight with IT in this space?

IT plays a huge role in bringing down the drug research timelines. IT and high-end technologies are inseparable! The utility of IT ranges from small scale high throughput screening and high-end imaging to big data analysis. Developing ultrafast computing algorithms accelerate innovation as well well diagnostics in a medical set-up. We are living in the era of cloudsourcing drug discovery! Such initiatives are massively benefited by development in the IT space.

What are your views on funding for research be it government or VCs and PEs?

Funding enterprise is always like a roller-coaster ride. While generous funding can spark the innovation and provide fuel to accelerate the development process, often a scarcity of funding could lead to innovative and affordable solutions. Therefore, funding alone does not create a wealth of knowledge or translatable technologies, but when generous funding coupled with the right set of people and environment can do wonders! A fabulous idea must not be prevented from being pursued due to the scarcity of funding. Even with a recent fluctuation in the situation, funding for research has been generous from the government. However, the quantum of funds we spend is minuscule compared to the global R&D players. The scenario will change for the better . Private sector funding either from VCs or PEs is entirely sector dependent. For example; IT, mobile, and consumer sectors might receive generous funding while raising same capital for pharma or biotech industry would be a little tough path. Because, as we are aware these sectors need a large amount of investment but with a long wait for the returns, it is therefore not an attractive prospect for the private sector funders. However, the scenario might change in the future.

What are the challenges that

you can pinpoint in R&D in India?

Specifically, there are two areas: We can improve to make a big impact in R&D sector in India. One, strategic funding, and two building the ecosystem. Just pumping an enormous amount of money not necessarily leads to innovation. Instead, agencies should focus on identifying core areas and highly motivated inventors and build programs around such inventors along with providing generous funding to generate breakthrough research/technologies, which could be translatable to solve unmet needs. Such targeted

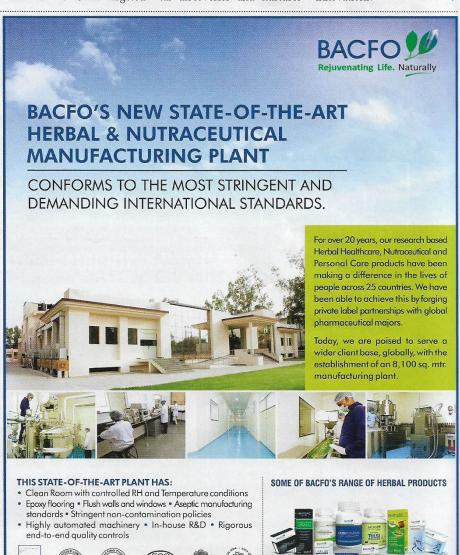
funding should be done with a high-level due diligence and a long-term vision.

Second, we need to focus on building a vibrant scientific environment to spark innovation and create an ecosystem to translate such discoveries to the next level to reach end users. One such example is the Bangalore Life Sciences Cluster which consists of the Institute for Stem Cell Biology and Medicine Regenerative (inStem), National Centre for Biological Sciences (NCBS) and Centre for Cellular and Molecular Platforms (C-CAMP). This ecosystem enables fundamental discoveries and nurtures translational path. NCBS focuses on answering questions in fundamental biology across the scale, inStem focuses on uncovering translational science which is relevant to human health. Aptly, C-CAMP enables translation of such discoveries to the next level and further develops technologies to be considered by the large industry partners. A seamless free-flow of knowledge between these entities feed each other which enables them to be at the forefront of innovation. Developing such coherent ecosystems across the country can lead to sustainable innovations.

HERBAL SUPPLEMENTS | ORGANIC HERBS

NUTRACEUTICALS | PERSONAL CARE

Follow us on



BACFO Pharmaceuticals (India) Limited, C-46, Phase-II, Noida-201 305, Uttar Pradesh, India

E-mail: bacfo@akcgroup.com | Website: www.bacfo.com | H.O. Delhi, Tel: +91-11-24339900

Every BACFO product has won the trust of thousands of customers,

and is born of a deep-rooted commitment to make the world

a better place to live in.