

India can contribute enormously to global R&D

How would you describe the current scene for R&D in the pharma, biotech industries and at research institutes?

Unambiguously it is positive! In the last decade, we can see increased awareness of investing in R&D in all sectors of the pharma or biotech. Investment means it may come in the form of funding, development, vision, building infrastructure and creating an enabling environment. As we are, R&D in these sectors need a long-term commitment and it is encouraging to see that individuals, institutes, government, are ready to



Indian R&D in pharma and biotech should focus on strategic funding and two building the ecosystem. We see demand for 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, 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?

India accounts for a considerable fraction of the world's scholarly output in terms of basic research publications and their citations. It is apparent that India's productivity is higher in a few sectors than others. For example, engineering, 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 generated is also being transferred and applied to solving real life problems. It is a delight to see basic and translational biology research is joining in this league and progressing with a lightning speed.

What are the visible trends on the Indian R&D landscape in pharma and biotech?

In a nutshell, academia and industry in India are in a deep conversation, now more than ever! That is a sign of progressive research. Such engagements lead to solving real life problems through an outstanding 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 developing technologies to solve designated need as their mandate, on the other hand, academia 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

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 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 developing early stage technologies, and post proof-of-concept demonstration, take those technologies into a pilot stage through start-ups. Then after de-risking, these technologies could be co-developed or merge with pharma/biotech giants to run massive trials and complete the development 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 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

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plays huge role in bringing down research timelines

FROM p 16 ►
 Equal 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
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 research. It is a responsi-
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much does technology
 Tenable bringing down
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your sight with IT in this
 space?

IT plays a huge role in bring-
 ing 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 imag-
 ing to big data analysis.
 Developing ultrafast comput-
 ing algorithms accelerate
 innovation as well well diag-
 nostics in a medical set-up. We
 are living in the era of cloud-
 sourcing drug discovery!
 Such initiatives are massively
 benefited by development in
 the IT space.

**What are your views on fund-
 ing for research be it govern-
 ment 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 develop-
 ment process, often a scarcity
 of funding could lead to innov-
 ative and affordable solu-
 tions. Therefore, funding alone
 does not create a wealth of
 knowledge or translatable
 technologies, but when gener-
 ous funding coupled with the
 right set of people and environ-
 ment can do wonders! A fabu-
 lous idea must not be prevent-
 ed 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 scen-
 ario will change for the better
 . Private sector funding either
 from VCs or PEs is entirely sec-
 tor dependent. For example;
 IT, mobile, and consumer sec-
 tors 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 pri-
 vate 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 ecosys-
 tem. Just pumping an enor-
 mous 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 pro-
 viding 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 innova-
 tion 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
 Regenerative Medicine
 (inStem), National Centre for
 Biological Sciences (NCBS) and
 Centre for Cellular and Molec-
 ular Platforms (C-CAMP). This
 ecosystem enables fundamen-
 tal discoveries and nurtures

translational path. While
 NCBS focuses on answering
 questions in fundamental biol-
 ogy across the scale, inStem
 focuses on uncovering transla-
 tional 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 knowl-
 edge 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. ◆








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