



PHARMA INTERVIEW



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1. What are the most important rewards you expect in your career?

What really motivates me in my career as a Research Scientist is the passion to see next generation vaccines for unmet medical need being licensed and saving lives from these vaccine preventable diseases. This is true for both the developed and developing countries.

2. What do you think holds the key to your success?

Measuring success in one's career has many different meanings. What I have enjoyed doing for the last 20 or so years is better defining the role of Formulation Science within the Vaccine Industry. Till not so long ago, vaccine formulation approaches both in the industry and academic research were purely empirical in nature, driven by "look and see" and

“risk aversness”. I am glad to be a part of the new paradigm of “rational designing” of these complex formulations.

3. What was the turning point in your career?

My joining the *National Institute of Immunology* at New Delhi in 1989 for my PhD clearly for me was the turning point of my career. My project on vaccine delivery systems opened new doors for me. That is where I got hooked onto optimizing the next generation of macromolecules.

4. How has your research thrust evolved over the years?

Over the years I have worked with many cross-functional teams specializing in different aspects of vaccine development. Doing so, made me aware of many new and challenging disciplines beyond my own core expertise in formulation science.

5. What are the 2-3 achievements you are proud of? Why?

Both within Chiron Corporation and now Novartis Vaccines, I have been extremely proud of having built high quality research teams comprising of individuals who also carried the same passion towards vaccine research that I do. I am also very proud of the various novel delivery approaches for vaccines that we as a team have invented in the last 20 or so years.

6. What two or three things are most important to you in your jobs?

I have always believed that true success in Vaccine Research comes with - patience, consistency and due diligence.

7. What are the benefits of a multi-disciplinary team for a pharmaceutical organization?

Most of the low hanging fruits have been picked from a innovation point of view. Gone are the days when a project could be managed by a single skillset. Almost all Pharmaceutical Organizations these days require people with various backgrounds (Chemical engineers, Immunologists, Molecular Biologists, Biochemists and Pharmacists to say the least) to

better manage and deliver on challenging projects. Working within such teams also opens one's vision to seeing things from different point of view.

8. Which type of novel strategies can apply to improve innovations in vaccine development?

The next generation of vaccine technologies that are yet to emerge as commercial products, will be in the area of needle free vaccination both through the transdermal or oral route. Reducing the number of vaccinations by combining many existing ones will also be an area of extreme excitement in the near future.

9. How are excipients "approved" for use in vaccine formulation?

Excipients are not approved for vaccines, but each vaccine formulation needs to demonstrate two things to carry it forward. One is the "need" to have it and secondly is its "safety". The Vaccine Researcher will need to demonstrate the role of a particular excipient and its safety profile. Obviously, excipients that have been previously used in vaccines and other parenterals and shown to be well tolerated are easier to carry forward in new formulations.

10. What is the requirement of pharma manpower and professionals in the country?

We will need to bring in regular and need based modifications to our curriculum within our academic institutions so that they can better train the next generation of professionals to take up some of the challenges that face our industry in the foreseeable future (Biosimilars, Biogenerics, complex mixtures etc). This means an in depth understanding of basic molecular biology and biochemistry of macromolecules.