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INTERVIEW

Interview with Prof. Richard J. Roberts
Nobel Laureate in Physiology/Medicine- 1993

Sir Richard J. Roberts is a British molecular biologist and Nobel Laureate renowned for his pioneering discoveries in the field of genetics. Born in 1943 in Derby, England, he was awarded the 1993 Nobel Prize in Physiology or Medicine (shared with Phillip Allen Sharp) for the discovery of split genes and RNA splicing in eukaryotes. This breakthrough fundamentally transformed our understanding of gene structure and expression, revealing that genes are not continuous stretches of DNA but contain non-coding sequences (introns) removed during mRNA processing. His work opened new frontiers in molecular biology, biotechnology, and medical research, including genetic therapies and precision medicine. Roberts has also been a strong advocate for open science and equitable access to vaccines and medicines. As Chief Scientific Officer at New England Biolabs, he has promoted ethical biotechnology practices. He is also widely known for championing evidence-based policy and defending genetically modified crops for global food security. Dr Meher Wan, Editor-*Journal of Scientific Temper* got an opportunity to interview him on his scientific journey and his ideas about different aspects of science.



Figure 1 Prof Richard J Roberts, Nobel Laureate-1993

Meher Wan: You grew up in post-war England, far from the laboratories where molecular biology was taking shape. What first drew you toward science — was it curiosity, chance, or a defining moment that made you say, "This is what I want to do"?

Prof. Richard Roberts: Definitely a mixture of all three. When I was about 8 or 9, I wanted to be a mathematician. Then I read a book entitled "How I became a detective" and I wanted to be a detective. Then my father bought me a chemistry set (in the days when chemistry sets were interesting and I could make fireworks and explosives). That made me want to be a chemist, which I pursued until the end of my Ph.D. However, in the 3rd and last year of my Ph.D. I read a book called "The thread of Life" by John Kendrew about the early days of molecular biology and I decide to switch to molecular biology for my postdoc. That has continued to this day, first doing experimental science and then doing bioinformatics, which includes everything I ever wanted to be – a mathematician, a detective, a chemist and a molecular biologist.

Meher Wan: The discovery of RNA splicing revolutionized our understanding of genes. Could you take us back to that moment in your lab - what was the question you were asking, and how did serendipity or intuition play a role in this

breakthrough?

Prof. Richard Roberts: Discovering RNA splicing was luck. We were actually looking to sequence the first eukaryotic promoter using the 5'-ends of Adenovirus late mRNAs as the signal to tell us where the start of transcription must be. The experiment, we were trying, failed in a quite spectacular way and we did an extensive post-mortem to find out why. The answer was eventually revealed as RNA splicing.

Meher Wan: You have often said that "nature is trying to tell you something" when results don't fit expectations. How important has openness to surprise been in your own scientific career?

Prof. Richard Roberts: Incredibly. When experiments fail, it is usually because your basic hypothesis was wrong and the underlying facts behind the hypothesis need revising or you simply messed up the experiment. I am always an optimist and favour the former. However, I do make sure the experiment is and results are repeatable.

Meher Wan: As a mentor and leader, what qualities do you look for in young scientists? Do you believe curiosity and integrity matter more than technical skill?

Prof. Richard Roberts: I always look for enthusiasm first and other skills later. Curiosity is and integrity definitely matter, but technical skill less so. It is relatively easy to learn new techniques if people are enthusiastic.

Meher Wan: After the Nobel Prize, you moved into applied molecular biology at New England Biolabs. How did your philosophy of science evolve — from pursuing pure discovery to creating tools that empower others to do science?

Prof. Richard Roberts: The move to NEB was motivated by several facts. The first is that when I was discovering restriction enzymes in the period from 1973-1975, we discovered about 30 and everybody wanted them. We were giving away large number and also the strains and protocols to make them. It was quite time-consuming helping others and it was clear there was a potential business opportunity here. I tried to persuade Jim Watson to set up a company at Cold Spring Harbor, but he refused saying it was dirty to be associated with industry. I

looked around and found a person, Dr. Don Comb, who had not been given tenure at Harvard when his time as an Associate Professor ran out and who was disillusioned with the academic system as a result. He started a small company selling some molecular biology reagents through Miles Laboratory, a distributor. I spoke with Don and convinced him that there were a lot of restriction enzymes in addition to the one he was thinking of selling and also that he should sell directly to the molecular biology community rather than through a distributor. I became his chief consultant at a time when his company (at the time called Biolabs) consisted of Don, his wife Marilyn and one technician operating from a make-shift lab in the basement of a hairdressing salon in Beverly, MA. In the first year we sold $200,000 worth of products and have been able to expand to a company that has >750 employees around the world and 100 of whom are doing basic research all paid for by the profits from the company.

Meher Wan: Biology today is merging with computation, AI, and synthetic design. How do you see this transforming the way we understand life — and what philosophical questions does it raise about control, creation, and ethics?

Prof. Richard Roberts: AI is something that is of great concern among many professionals. While I believe it has great promise, I believe we need to be very careful about how we roll it out and avoid the ethical problems that it can cause. The potential loss of jobs (for instance has said that by using robots it may decrease its workforce by 5,00,00 people) can have enormous impact as I don't currently see AI is providing a way to produce more jobs to replace those lost. We must be very careful, not to cause chaos in the workforce by using AI as an easy way to make more money by replacing paid jobs with automation. I have no problem with increasing AI in these spheres, but we must pay close attention to the consequences and mitigate them as quickly as possible.

Meher Wan: Winning the Nobel Prize is a rare privilege. How did it change your outlook - not just your career, but your sense of purpose as a scientist and communicator?

Prof. Richard Roberts: The biggest single change came

when I realized that people not only listened to me more carefully, but often would act on what I suggested. While this is a very good outcome, it does mean that one has to be more careful about what one says to ensure that truth is paramount. It is sometimes very easy to respond quickly to a question without checking the facts. This is unfortunately, a great problem with people who use social media for their source of facts.

Meher Wan: Finally, what would you like to say to young Indian researchers and science students — many of whom look up to you — about curiosity, courage, and the joy of discovery?

Prof. Richard Roberts: I always say that science is a wonderful profession and worth pursuing. It depends on curiosity, courage and is rewarded by the joy that comes when discoveries are made. They don't have to be big discoveries, indeed most aren't, but seeing something for the first time that no-one else has ever seen is unbeatable. It make every day of research a beautiful experience. Finally, when you meet another scientist, you have a friend. We can disagree, sometimes, vehemently, but we never find it necessary to shoot one another to show who is correct. The rest of society have a lot to learn from us.

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