Eyes on the prize[1]

J. Michael Bishop, How to Win the Nobel Prize: An Unexpected Life in Science
Harvard University Press 2003, 320 pp

Istvan Hargittai

If offered reincarnation, the Nobel laureate J. Michael Bishop would choose to come back as a musician (with exceptional talent, to be sure), because he thinks that one life-time as a scientist is enough. The son of a Lutheran minister, he grew up in rural Pennsylvania, and became enchanted with research during his last years at Harvard Medical School. He has been at the University of California, San Francisco since 1968, and worked for 15 years with his former postdoctoral associate, and ultimately fellow Nobel laureate, Harold Varmus.

Their work had its roots in the discovery of a cancer-causing virus in chickens by Peyton Rous in 1911, who was awarded the Nobel Prize fully 55 years later. Five individuals then went on to win Nobel Prizes for related work. David Baltimore, Renato Dulbecco and Howard Temin won in 1975 "for their discoveries concerning the interaction between tumour viruses and the genetic material of the cell", and Varmus and Bishop became Nobel laureates in 1989 "for their discovery of the cellular origin of retroviral oncogenes". Baltimore and Temin found the viral enzyme reverse transcriptase, which allows RNA to be copied into DNA, a reversal of the normal flow of genetic information. This discovery could have been Bishop's had he been more daring. However, he learned his lesson and was fortunate enough to get another chance.

The discovery of oncogenes (cancer genes) raised the question of whether such genes might be present in the genetic composition of normal as well as cancerous cells. Locating them carried the promise of understanding human cancer at the genetic level. At first it was thought that oncogenes were viral genes, but Bishop and Varmus discovered that they were cellular genes that had been kidnapped by the virus. It took their team four years to identify them.

Bishop quotes a beautiful description of a moment of discovery by one of their post-docs, Dominique Stehelin: "The intensity of the emotion I experienced and the intellectual clarity induced by the situation at that moment were very special." Furthermore, "I suspect that few have the privilege of enjoying such a moment when one is intensely and profoundly aware that a major step forward in Science has been made, and that one has contributed to it." Alas, the quote was from an open letter to the Nobel Committee by Stehelin, who was not among the Nobel awardees. For every Nobel laureate there are others who might have also been included but were not, and every story about how to win the Nobel Prize may have its counterparts.

Bishop does not give a recipe for winning the prize, as any attempt to emulate a particular research career would be doomed to fail. However, throughout the book, he makes important points that budding scientists may find useful. For example, it is more useful to learn from one's peers than from one's teachers. Start a research career in a place where you feel genuinely needed, rather that choosing somewhere for its prestige. Being a pioneer in

[1] Nature 2003, 423:921

research is fun, although it may bring more fame to be part of a team completing a discovery. Give a name to your discovery as soon as it is made. And finally, Bishop points out, good scientists should also market their ideas well.

Nobel laureates often seem to be standard-bearers for good causes, usually by signing petitions or making statements about issues with which they may not even be too familiar. Bishop's involvement in public causes has been different. He actively organized the participation of scientists in a non-partisan movement to increase legislative attention for science. Their high-level lobbying helped to achieve record support for research from taxpayer's money in the United States.

Bishop compiled his experience and ideas in this book for the general public. He also provides a crash course on the microbial world that is a gem of instruction without being condescending. And his copious use of art, including poetry, is a statement about the unity of the two cultures.