




Sydney Brenner (1927–2019): The opening game

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In his memoir, *My Life in Science* (BioMed Central Limited; 2001), Sydney Brenner described his greatest skill as ‘getting things started’. Throughout his life, he inspired breathtaking research projects and ambitious scientific institutes that are thriving today across several continents.

Brenner was born in Germiston on 13 January 1927. His curiosity and quest for knowledge was apparent at an early age, and led to him being awarded a scholarship to study medicine at the University of the Witwatersrand at the age of 15. He was a pioneer and explorer at heart and did not seriously consider a medical career. Thus, as a young man, he left South Africa for the UK to pursue scientific ideas, and joined the laboratory of Cyril Hinshelwood (a future Nobel laureate) and completed a DPhil at the University of Oxford in 1954.

His first view of the structure of the DNA model built by Jim Watson and Francis Crick at Cavendish Laboratories (Cambridge, UK) had a profound effect on his career. In 1956, he moved to Cambridge where he shared an office with Francis Crick, during which time they, together with many collaborators, contributed groundbreaking work towards elucidating the triplet code and the role of mRNA in protein synthesis, resulting in seminal publications from 1961 to 1965.

Seeking the challenge of working with whole organisms, Brenner chose the transparent fast-growing nematode worm, *Caenorhabditis elegans*, and started the work in the mid-1960s. Much of his research was done at the UK Medical Research Council’s famous Laboratory of Molecular Biology at the University of Cambridge. Here he worked closely with John Sulston to map the entire nervous system and the development of each of the cells of *C. elegans* from fertilised egg to 959-cell adult; and with Robert Horvitz to identify the genes for programmed cell death – which led to the three of them sharing the 2002 Nobel Prize in Physiology and Medicine.

Brenner thought deeply about the impact of research on society and the responsibility of scientists at different levels: informing the public, protecting the public, sharing resources and developing guidelines to promote scientific discovery. During the Asilomar conference on recombinant DNA (California, 1975), he took the lead in discussions on the ethics and appropriate use of these technologies. He was a proponent of the Human Genome Project and the need for more inclusive participation in this international project, and was a founding member of the Human Genome Organisation (HUGO).

In 1989, he initiated the Fugu Genome Project, having long known that the genome of this fish (the puffer fish) was about an eighth the size of the human genome. After an initial slow start, the project came to rapid fruition – and therein lies a tale. The complete sequence of the genome was published in 2002 in *Science* and a woodcut sketch of *Fugu rubripes* appeared on the cover.

Brenner garnered respect and admiration from influential people in the governments of Singapore and Japan, which led to his ‘institution-building years’. When invited to meet with the Prime Minister of Singapore in 1983, Brenner urged him to get involved in cutting-edge research in biotechnology and presented a half-page vision. The government of Singapore promptly funded the establishment of the Institute of Molecular and Cell Biology at Singapore National University. When invited to become its director, Brenner suggested that it would be preferable to have a well-respected Singaporean leader. And when the Institute officially opened in 1987, Brenner had a laboratory in which he pursued the *Fugu* research. In 2003, he became an honorary citizen of Singapore in recognition for his critical role in the inspiration and planning of the Agency for Science, Technology and Research for the promotion, funding and oversight of all biomedical research in the country.

In 1992, Brenner was invited to take part in an international review of the University of Tokyo to explore educational and research reform in Japan. Following much debate and planning, he became the Founding President of the Okinawa Institute of Science and Technology (OIST) in 2005 and then handed over the reins in 2007 to local leadership. The OIST has developed into a thriving English-language institution with well over half its staff and students recruited from outside Japan. OIST paid tribute to Brenner at a Memorial on 26 May 2019.

In 2004, South Africa bestowed on Brenner the Order of Mapungubwe (Gold). Also in 2004, Brenner established the Sydney Brenner Postdoctoral Fellowship, administered by the Academy of Science of South Africa. On 28 March 2008, he agreed to the use of his name for the Sydney Brenner Institute for Molecular Bioscience at his alma mater, the University of the Witwatersrand, to establish a research hub for genomics and bioinformatics studies in African populations. Brenner aptly referred to African genomes as a treasure trove. When meeting with him in April 2011, I asked him what was occupying his mind and he proceeded to explain that he was trying to figure out what came first – the ability to smell or the ability to taste. A vexing conundrum, indeed.

Brenner married May Covitz Balkind, a student of psychology at Wits where they met, and together they raised four children. May died in 2010 and her son Jonathan in 2018. Brenner spent his last years in Singapore, still exploring the mysteries of life, and recently bringing together a stellar cast for *Sydney Brenner’s 10-on-10: The Chronicles of Evolution*, published in 2019 (Wildtype Books).

His mischievous wit, razor-sharp intellect, edgy commentary and relish for ruffling feathers will be missed. To echo the words of Alan Christoffels (who worked with Brenner in Singapore before returning to South Africa): ‘A baobab has fallen’. Brenner’s memory lives on in all the people he inspired and challenged over his lifetime and in the research institutions he ‘got started’ and nurtured.