Maclyn McCarty, 1911–2005

Maclyn McCarty, known to all of his friends as Mac, died on 2 January 2005 at the age of 93. He was born in South Bend, Indiana, USA, in 1911 as the second of four sons in a very close-knit and supportive family. By the time he reached his teens, he already aspired to study medicine and to become a medical investigator. He attended college at Stanford University, where he obtained unusually advanced training in biochemistry. Following this, he studied medicine at Johns Hopkins University (1933–1937). Here, in addition to following the medical curriculum, he further enriched his biochemical background. It was also at this time that the groundbreaking reports of the effectiveness of sulpha drugs against streptococcal infections strongly influenced Mac's decision to pursue paediatrics and infectious diseases at the Harriet Lane Service from 1937 to 1940, followed by a year as a Fellow in Medicine at New York University with William S. Tillett.

In 1941, Mac joined Oswald T. Avery's laboratory at the Rockefeller Institute, where the hereditary transformation of pneumococcal capsule expression was being pursued. Mac's formidable biochemical skills resulted in this programme's stunning conclusion. On 1 February 1944, the *Journal of Experimental Medicine* published a groundbreaking paper — authored by Avery, MacLeod and McCarty, and entitled *Studies on the chemical nature of the substance-inducing transformation of pneumococcal types*. It was the first of a series of three papers that provided decisive evidence that DNA was the carrier of genetic information and thus provided heredity with its chemical basis. This feat not only opened a new era in biology, but has fundamentally affected Western thought and culture. His book *The Transforming Principle: Discovering that Genes are made up of DNA* is inspiring, and provides an accessible and exciting view of this research.

In 1946, Mac accepted the leadership of a laboratory working on streptococci and rheumatic fever, and so returned to clinical disease-oriented research. For Mac, the mystery of a child suffering with acute rheumatic fever as a result of a prior streptococcal throat infection was an irresistible scientific challenge. He led groundbreaking work that established the cell-wall architecture of streptococci and the nature and location of its important antigens. His immunochemical characterization of the cell-wall polysaccharides of group A, group C and variants was a magnificent scientific achievement. He made major contributions to the characterization and purification of many of the extracellular products that are secreted by streptococci.

His laboratory became one of the most desirable centres for young investigators to obtain research training. He fostered and encouraged independence, and when it was time to publish he would accept authorship only if he felt that he had contributed to the execution of the experiments. Pioneering findings on streptococcal L forms, lysogeny and erythrogenic toxin production, teichoic acids, group A and group C lytic phages, chemistry of the group A and group C streptococcal, as well as the pneumococcal cell-wall polysaccharides, sprang from his leadership. His clinical studies on patients with rheumatic fever provided a remarkably complete description of the immune response to the newly characterized antigens. These immunological studies also led him to purify human C-reactive protein (CRP) by crystallization, and

he introduced the measurement of this acute-phase reactant into the clinical management of patients. Subsequently, his associates extended these studies by the recognition and crystallization of rabbit Cx-reactive protein, and by defining the subunit structure and binding specificity of the human protein. CRP has recently recaptured much attention as a predictor of heart disease.

In 1960, Mac began his service as a statesman of academic medicine both at Rockefeller University and in the world at large. He led the clinical research programme as Physician-in-Chief of the Rockefeller Hospital for 14 years, served as Vice President for 13 years and as editor of the *Journal of Experimental Medicine* for 40 years. Outside of the university, he has given generous amounts of his wisdom and sound judgement to innumerable organizations, and these have come to love and respect him. This is reflected in the many high honours that have been bestowed on him — among these are honorary doctorates from Rockefeller, Harvard, Columbia and Johns Hopkins Universities, and election to the National Academy of Sciences, the American Philosophical Society and the American Academy of Arts and Sciences. Notable prizes awarded were the Robert Koch Gold Medal, the Jessie Stevenson Kovalenko Medal, the George M. Kober Medal, the Wolf Prize and the Albert Lasker Special Achievement Award.

On a personal level, Mac had a warm and winning persona — a trait shared in equal measure by his dear wife Marjorie. He enjoyed a large circle of friends all over the world, all of whom treasured his companionship and conversation. With these friends, Mac shared his love of Dickens novels, the theatre and classical music. They also shared nice dinners, often preceded by a Tanqueray Gibson on the rocks and capped by whichever dessert had chocolate as the main active ingredient. We will miss him very much.

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