

Antibody diversity singled out

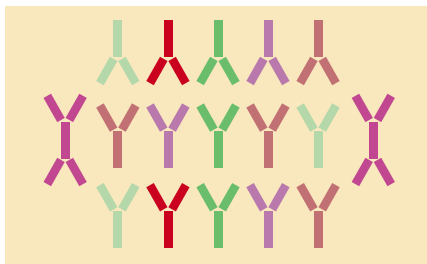
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The Royal Society (<http://www.royalsoc.ac.uk>) has rewarded molecular biologist Michael Neuberger, Professor at the University of Cambridge's Laboratory of Molecular Biology (<http://www.cam.ac.uk>), for his work on antibody diversification – highlighting the protective, as well as the destructive, role of DNA mutation.

This year saw the 13th anniversary of what is now known as the Royal Society GlaxoSmithKline prize. The prize, first established following a donation from The Wellcome Foundation, consists of a gold medal and a gift of £2500. The prizewinner delivers an evening lecture at the Royal Society. The prize is awarded biennially for original contributions to medical and veterinary sciences published within ten years from the date of the award, and was first awarded in 1980 – the centenary year of The Wellcome Foundation. The prize has evolved along with the foundation, and was renamed the GlaxoSmithKline (GSK) prize in 2002.

Molecular mechanisms

This year the award was presented to Neuberger, who presented a lecture outlining his work on resolving the molecular mechanism of somatic antibody diversification, a key component of the immune response. Acquired



immunity relies on the production of antibodies to a seemingly infinite range of targets. It would be impossible, notes Neuberger, for the human genome to contain the information necessary to code for every possible target that the body could encounter.

Neuberger highlighted how the body deals with the problem. 'We have developed the 'trick' of attacking our own DNA to give us the diversity in antibodies that we need,' he said. In essence, deamination of a cytosine to a uracil base at various points allows the change in DNA that produces vast numbers of different antibodies. This allows the body to protect itself against the wide range of possible infectious agents but also allows the formation of 'autoantibodies', which can cause diseases like multiple sclerosis and rheumatoid arthritis.

Monoclonal antibodies

The award ceremony was touched by sadness as conference delegates, and

Neuberger himself, paid tribute to the late Cesar Milstein, Nobel laureate and first winner of the Royal Society prize in 1980. Milstein pioneered the production of monoclonal antibodies from hybrid cell lines, and was responsible for allowing their introduction to the fields of biology and medicine worldwide.

Milstein's work was instrumental in allowing researchers such as Neuberger to reach the heights they have. His wife, Celia Milstein, was present at the event. 'Cesar would have been overjoyed and so excited to be here today,' she said. Indeed, the work presented by Neuberger is built on decades of research by many groups, which were graciously acknowledged throughout the lecture.

Presenting the prize was GSK President Peter Goodfellow. 'There is so much funding for biomedical research because people believe that there will be improvements in healthcare from this research,' said Goodfellow. 'We must keep the faith, keep investing in basic research and make sure that this research is converted into new treatments.'

Neuberger agrees. 'One would hope that this [work] would have a significant impact on autoimmune diseases such as multiple sclerosis,' he concluded.

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