Sir Richard John Roberts

Distinguished University Professor, Northeastern University, Boston, USA

Degrees/Education

PhD, Organic Chemistry, University of Sheffield, England
B.Sc., Chemistry, University of Sheffield, England

*Nobel Prize in Physiology or Medicine (1993)

Curriculum vitae (pdf)

Area(s) of Expertise

Restriction endonucleases, DNA methylases, computational molecular biology

Research Interests

Dr. Richard J. Roberts is the Chief Scientific Officer at New England Biolabs. He was educated in England, attending St. Stephen's School and the City of Bath Boys' School in Bath before moving to the University of Sheffield where he obtained a B.Sc. in Chemistry in 1965 and a PhD in Organic Chemistry in 1968. His postdoctoral research was carried out in Professor J.L. Strominger's laboratory at Harvard, where he studied the tRNAs that are involved in the biosynthesis of bacterial cell walls.

From 1972 to 1992, he worked at Cold Spring Harbor Laboratory, reaching the position of Assistant Director for Research under Dr. J.D. Watson.

He began work on the newly discovered Type II restriction enzymes in 1972 and in the next few years more than 100 such enzymes were discovered and characterized in Dr. Roberts' laboratory.

His laboratory has cloned the genes for several restriction enzymes and their cognate methylases and studies of these enzymes has been a major research theme. Dr. Roberts has also been involved in studies of Adenovirus-2 beginning

with studies of transcription that led to the discovery of split genes and mRNA splicing in 1977. This was followed by efforts to deduce the DNA sequence of the Adenovirus-2 genome and a complete sequence of 35,937 nucleotides was obtained.This latter project required the extensive use of computer methods, both for the assembly of the sequence and its subsequent analysis.

His laboratory pioneered the application of computers in this area and the further development of computer methods of protein and nucleic acid sequence analysis continues to be a major research focus.

The field of DNA methyltransferases is also an area of active research interest and crystal structures for the *Hha*I methyltransferase both alone and in complex with DNA have been obtained in collaboration with Dr. X. Cheng. The latter complex is quite remarkable as the protein causes the target cytosine base to flip completely out of the helix so that it is accessible for chemical reaction.

This extreme, but elegant, distortion of the double helix had not been seen previously. A major interest at present is the semi-automatic identification of restriction enzyme and methylase genes within the GenBank database and the development of rapid methods to assay function. Already several new specificities have been found and it is clear that there are many more restriction enzyme genes in Nature than had been previously suspected.

Most recently, he is one of the leaders of the COMBREX project that is concerned with the functional annotation of prokaryotic genomes.

If you have an interest in exploring co-op or undergraduate research opportunities with Sir Richard or New England Biolabs, please contact Dan Distel at d.distel@northeastern.edu or Vanecia Harrison-Sanders at v.harrison@northeastern.edu.

Location

New England Biolabs

240 County Road

Ipswich, MA

Pro-GMO: Nobel laureate makes the case for genetic modification

Nobel laureate and Distinguished University Professor Sir Richard John Roberts argues that despite what you may have heard, GMOs are safe and have the potential to save lives in developing countries.