Society news

New Honorary members for the Biochemical Society

Professor Sir Michael John Berridge, Kt, FRS

Professor Berridge is Honorary Professor of Cell Signalling at the University of Cambridge (1994–) and was Deputy Chief Scientist (from 1990) and Head of the Laboratory of Molecular Signalling at the Babraham Institute, Cambridge (from 1994 until his retirement earlier this year). He is a Fellow of Trinity College, Cambridge (1972–) and was elected as a Fellow of the Royal Society in 1984. In 1997, he was knighted in the New Year's Honours List for his contributions to science.

He graduated with a BSc (with First Class Honours) from the University College of Rhodesia and Nyasaland, Salisbury, Rhodesia (now Zimbabwe) in 1960, and trained as an insect physiologist at the University of Cambridge under the supervision of Sir Vincent B. Wrigglesworth (PhD 1965). He was a postdoctoral fellow with Professor D. Bodenstein (1965–1966, University of Virginia) and with Dr M. Locke (1966–1967, Case Western Reserve University), before spending another year as a Research Associate with Dr B. Schmidt-Nielsen, at Case Western. He then returned to Cambridge University, joining the Unit of Invertebrate Chemistry and Physiology (Director, Dr J.E. Treherne) as Senior Scientific Officer (1969–1972), then as Principal Scientific Officer (1972–1978), before his appointment as Senior Principal Scientific Officer at the Unit of Insect Neurophysiology and Pharmacology (1978–1990).

Michael Berridge began his distinguished career — as an insect physiologist — through elegant experiments in which he revealed the mechanisms controlling salivary secretion, later providing key evidence for the interactions between Ca^{2+} and cAMP in controlling the secretion of saliva in response to physiological stimuli. By ingeniously exploiting this relatively simple system, he was able to address — and to answer — fundamental questions on the interactions between second messenger pathways and on the relation between stimulus intensity and Ca^{2+} spiking. This led to the unifying concept that cells commonly use frequency-modulated Ca^{2+} spiking to encode intracellular information. In now classic experiments, using the salivary gland model, he provided unequivocal evidence that receptor-stimulated phosphoinositide hydrolysis preceded the elevation of cytosolic Ca^{2+} levels and evidence for inositol trisphosphate (IP_3) as a link between these two events. His seminal paper in 1983, co-authored by Irvine, Streb and Schultz, provided proof that IP_3 was indeed the intracellular messenger linking events at the plasma membrane with the release of Ca^{2+} from intracellular stores. His insightful reviews highlighted the significance of these findings and he went on to play a pivotal role, through numerous plenary lectures and reviews, in illuminating this rapidly expanding field of research to a wide audience.

Sir Michael has been honoured with numerous awards for his outstanding contributions and leadership in the field of Ca^{2+} signalling. These include the Feldberg Prize (1984), the

by John Lagnado
(Honorary Archivist)

Honorary members at the annual dinner with their salvers. From left to right: Professor Dame Louise Johnson, Professor Sir Edwin Southern, Professor Jean Thomas (President of the Society), Dr. Lionel Crawford and Professor Sir Michael Berridge.

King Faisal International Prize in Science and the Louis-Jeantet Prize in Medicine, both awarded in 1986, the Gairdner Foundation International Award (1988), and the prestigious Lasker Award in 1989. In 1991, he was awarded both the Gold Medal of the Royal Society and the Ciba–Geigy/Drew award in biomedical research. There followed the Heineken Prize for Biochemistry and Biophysics (1994), and the Ernst Schering Prize (1999) "for elucidating the role of calcium as a transmitter in the internal communication network of cells". Other honours include his election as Honorary Member of the Japanese Biochemical Society, the American Physiological Society and the Society for Experimental Biology; as member of the Academia Europaea, EMBO and The Academy of Medical Sciences (London); and as Foreign Associate of the National Academy of Science (Washington).

In the words of one of his colleagues, "Mike … has pioneered a field that now infiltrates almost every area of biology, and he has served as a distinguished ambassador for all who work in Ca^{2+} signalling".

Dr Lionel Crawford, FRSE, FRS

Lionel Crawford was formerly a member of the scientific staff at the Medical Research Council (MRC) Institute of Virology, Glasgow (1960–1968), Head of the Department of Molecular Virology at the former Imperial Cancer Research Fund (ICRF), London (1968–1988), and Head of the ICRF Tumour Virus Group in the Pathology Department, University of Cambridge (1988–1995). He was elected Fellow of the Royal Society of Edinburgh in 1970 and Fellow of the Royal Society in 1988.

He was educated at Rendcomb College, near Cirencester, Gloucestershire (1941–1950) and, following his National Service (1950–1952), studied at Emmanuel College, Cambridge (1952–1958) as a recipient of a State Scholarship (1952) and an Emmanuel College Senior Scholarship (1954). In 1955, he was awarded the BA First Class, Tripos Part 1 (Botany, Zoology, Organic Chemistry and Biochemistry) and Part 2 (Biochemistry). He then joined the Department of Chemical Microbiology at Cambridge University as a graduate student, supported by an MRC studentship. He was awarded a PhD in Biochemistry in 1958, publishing his earliest papers on DNA synthesis in phage-infected bacteria in the same year.

Between 1958 and 1960, Dr Crawford was a Visiting Research Fellow, supported by a Rockefeller Foundation Travel Fellowship, at the prestigious Virus Laboratory (headed by H. Fraenkel-Conrat), at the University of California, Berkeley (1958), and in the Division of Biology at the California Institute of Technology, Pasadena (1959), where he worked on plant viruses (e.g. tobacco mosaic virus).

While Head of the Department of Molecular Virology at the ICRF, London, he was also Chairman of the Cellular and Molecular Biology Groups (1968–1970). By about this time, most of his research focused on animal tumour viruses. He was able to characterize biophysically both the DNA and protein shells of viruses belonging to the papova group [papilloma, polyoma and SV40 (simian virus 40)] and then went on to study the oncogenic transformation of cells by polyoma and SV40. At about the same time, he also discovered the archetypal parvovirus, MVM (minute virus of mice). By 1970, Lionel Crawford was recognized as the leading authority on the DNA of small DNA tumour viruses.

Lionel Crawford then went on to make the "remarkable discovery" that host cellular histones are complexed to the viral DNA in particles of polyoma virus — the first description of viral minichromosomes, which contributed significantly to the characterization of chromatin structure. In the 1970s, during his work on genome organization and the replication of polyoma and SV40, he made two major discoveries: the first, in 1977, was of p53 (with David Lane, his postdoctoral fellow); the other, with his colleague Alan Smith, of differential splicing in the T-antigen proteins of SV40 and polyoma virus (1978), shortly after the concept of splicing was first mooted. At about the same time, Dr Crawford (together with Bruce Ponder), published the first convincing evidence for specific nucleosome positioning on DNA (1977).

Among his other contributions, Dr Crawford was co-organizer of the first Tumour Virus Workshops (Cold Spring Harbor, 1969; EMBO, 1972) and Editor of the Journal of General Virology (1975–1980) and of Oncogene Research (1986).

Lionel Crawford was not only

internationally recognized as a world leader in the field of DNA tumour viruses, but also much appreciated for his extraordinarily unselfish attitude to nurturing younger scientists in his laboratory, many of whom went on to become 'big names' in their own right. It is in view of these exceptional contributions, made over some 40 years, that Lionel Crawford has had such a huge impact on British biomedical sciences and why he has been hailed, by a former colleague, as "one of the unsung heroes of British biochemistry and molecular biology".

Professor Dame Louise N. Johnson, FRS, DBE

Louise Johnson is David Phillips Professor of Molecular Biophysics in the Department of Biochemistry, Oxford University (1990–) and, since 2003, Science Director, Life Sciences, of the Diamond Light Source, a new synchrotron facility based in Oxford. She was elected as a Fellow of the Royal Society in 1990 and was awarded the Dames Commander Order of the British Empire in the 2003 New Year's Honours List, for services to Biophysical Science.

Professor Johnson was educated at Wimbledon High School for Girls and at University College London, where she graduated with a BSc (Hons.) in Physics in 1962. She began her work in structural biology as a graduate student with David Phillips at the Royal Institution, determining the crystal structure of a complex of lysozyme with its substrate (using a substrate analogue), for which she was awarded her PhD in 1965. In the same year, she published a seminal paper (Johnson and Phillips, *Nature* **206**, 761–763), which in 1966 led to the first structural explanation for an enzyme mechanism in stereochemical terms (Johnson, *Sci. Prog.* **54**, 367–385).

She then spent a year as a postdoctoral research assistant in F.M. Richards' laboratory in the Department of Biophysics, Yale University, before returning to Oxford as a Departmental Demonstrator (in the Zoology Department) and as Janet Vaughan Lecturer in Biophysics at Somerville College (1967–1973). She remained in Oxford as University Lecturer in Molecular Biophysics, and as Fellow and Janet Vaughan Lecturer at Somerville College (1973–1990) before taking up her present position as David Phillips Professor of Molecular Biophysics, as Professorial Fellow, Corpus Christi College (1990–) and as Honorary Fellow of Somerville College (1990–). In 2001, she was N. and B.L. Vallee Visiting Professor at Harvard University Medical School.

After her pioneering work on lysozyme, Louise Johnson focused her research on the large enzyme glycogen phosphorylase, first determining its structure at 1.9 Å resolution. This work led her and her team to provide the first molecular description of control of a co-operative enzyme by allosteric effectors, and how protein structure and function were controlled by reversible protein phosphorylation. Using time-resolved protein crystallography methods developed in their laboratory, they were also able to observe catalytic events with the enzyme crystal, revealing the hitherto unsuspected behaviour of protein crystals as dynamic entities. More recently, Johnson's group has extended its study of control by phosphorylation to the regulatory proteins that control the cell cycle and to phosphorylase kinase. More recently, she initiated a programme to apply knowledge of protein structure to rational drug design, e.g. in the design of inhibitors for Cdk2 (cyclin-dependent kinase 2).

Louise Johnson's pioneering (and continuing) contributions to science are complemented by her outstanding ability to illuminate complex scientific concepts through her writing, as illustrated by her monograph "Protein Crystallography" (first published in 1976, co-authored by Tom Blundell), now regarded as a classic text in this field, and her seminal 1996 review of protein kinases (Johnson, Noble and Owen, *Cell* **85**, 149–158).

She has served on numerous national and international committees, for example, on the Council of the Royal Society (1998–2001), as Scientific Adviser to EMBL (1994–2001), where she was Chair of the Scientific Advisory Committee between 1997–2001; as Member of EMBO (1991) and as Trustee of the Cambridge Crystallographic Data Base (1996–). She was also the Royal Society's representative on the Governing Body of Westminster School (1993–2001). Other honours include the award of the Kai Linderstrom-Lang Prize (1989) for "pioneering contributions to protein crystallography and to our under-

standing of the structural properties of enzymes, especially through the use of time-resolved X-ray crystallography"; of the Charmian Medal of the Royal Society of Chemistry (1996) and of the Datta Medal, FEBS (1998). Her contribution towards promoting science in developing countries led to her election as an Associate Fellow of the Third World Academy of Science (2000). She was elected Member of the Academia Europaea in 2001.

Her position as Director of Life Sciences at the Diamond Light Source (2003–) is viewed as critical to the future of structural biology in Britain.

Professor Sir Edwin Southern, FRS

Professor Southern is currently Whitley Professor of Biochemistry, as well as Director of the CRC Chromosome Molecular Biology Research Group in the Department of Biochemistry, University of Oxford (1985–). He was elected Fellow of the Royal Society in 1998, and was appointed Knight Bachelor in 2003 for services to the development of DNA microarray technologies.

He was born and educated in Burnley, Lancashire, and went on to read Chemistry at Manchester University (BSc Hons., 1958). He continued as a graduate student (then Demonstrator, 1963) in the Department of Chemistry, University of Glasgow, where he was awarded his PhD in 1962. After a spell as Research Assistant at the Antarctic Research Centre Low Temperature Research Station at Cambridge (1963–1967), Edwin Southern joined Peter Walker at the MRC Mammalian Genome Unit in Edinburgh as a Research Assistant (1967–1980). He was subsequently appointed Director of the Unit (1980–1985), as well as Deputy Director of the MRC Clinical and Population Cytogenetics Unit, where, in 1979, he set up the first project to map the human genome using molecular methods.

Edwin Southern is recognized worldwide as one of the pioneers of the science of genomics. He is the inventor of several generic technologies in this field, notably, the now classic 'Southern blot' technique (first published in 1975) for identifying functional sequences in the genome and, in 1988, 'DNA chips', created by combinatorial oligonucleotide synthesis, for the analysis of DNA sequences by molecular hybridization on a large scale. His pioneering work on the structure of satellite DNA, initiated while in Edinburgh, underpins our understanding of the mechanisms of repeat DNA evolution, leading directly to the recognition of concerted evolution as a fundamentally important process operating within gene families. His subsequent work on repeat DNA, using the Southern blot technique, paved the way for Jeffreys' discovery of minisatellite sequences which culminated in DNA fingerprinting [see *The Biochemist*, **25**(2), April 2003, p. 7]. Among their current activities, Professor Southern and his group are developing more effective antisense reagents for therapeutic applications. In 1995, Professor Southern founded Oxford Gene Technology to exploit patented technology developed in his research laboratory at Oxford University.

For these and several other signal contributions to biochemistry, Professor Southern has received numerous honours and awards. These include the Biochemical Society BDH Gold Medal for Analytical Biochemistry (1981), the Analytica Prize of the German Biochemical Society (1984), the IBM Prize for Science and Technology (1989), the Gairdner Foundation International Award for Medical Science (1998), the Royal Medal of the Royal Society (1998) and the CMB–Roche Award (1999). In 2002, he was awarded the Sir Frederick Gowland Hopkins Memorial Medal of the Biochemical Society "…for devising two of the most powerful and widely used methodologies employed in molecular biology and medicine". Other honours include his election as Fellow of the Royal Society (1983), Foreign Member of the American Academy of Arts and Science (1988) and Member of the Academia Europaea (1989). In addition, he has received an Honorary Doctorate in Medicine and Surgery from the University of Padua (1988), and an Honorary DSc from the Universities of Edinburgh (1991) and Lund (1995).

Professor Southern has played a leading role in developing national and international frameworks for the human genome project, for example, as a Founding Board Member of the Human Genome Organization and as member and chairman of the Scientific Advisory Group of the Sanger Centre, Hinxton.

