quency of cell excitation corresponds very closely to cyclic nucleotide flux. This flux is independent of any changes in the steady state concentrations of the cyclic nucleotides. In contrast, the second-messenger hypothesis envisions that cyclic nucleotides exert their effects by changes in their intracellular concentration. The relationship was studied most extensively in retinal photoreceptors. In this case, the hydrolysis of cGMP, tightly coupled to regenerative synthesis, appears to represent a biochemical event essential for phototransduction. **—Harvey Bialy**

RESEARCH FUNDING

BRITISH PROTEIN ENGINEERING

LONDON—Robert Freedman, a biochemist from the University of Kent at Canterbury, has been appointed program manager for the Protein Engineering Research Council, which was recently established by Britain's Science and Engineering Research Council (SERC). This is the latest in a series of such projects, financed partly out of the public purse and partly by a group of companies that have some control over the research as well as privileged access to the results.

SERC's Biotechnology Directorate has announced that over the next four years at least £2 million will be made available to support the protein engineering program, including £30,000 per annum each from Celltech, Glaxo, Sturge, ICI, Unilever, and Tate & Lyle. Freedman, whose specialties are enzymology, membrane biochemistry, and protein synthesis, will be responsible for developing and coordinating a multidisciplinary program at five or six U.K. centers. These will include Imperial College (London), where Alan Fersht and his colleagues are systematically dissecting the structure and activity of certain enzymes and exploring the possibility of using site-directed mutagenesis to develop novel enzymes, and Tom Blundell's department at Birkbeck College (London), which is specializing in protein modeling and computer graphics. With additional funds to spend on protein engineering, SERC's Biological Sciences Committee has also been soliciting proposals for fundamental research projects in this area.

Over the next few months both SERC and the Department of Trade and Industry will probably announce further Club projects—including one concerned with bioreactor control—as part of their drive to foster closer links between industry and publicly funded research. **—Bernard Dixon**

RESEARCH FUNDING

IRISH LOOK TO MILK BIOTECH

DUBLIN—In a move designed to modernize one of Ireland's traditional industries, Allied Irish Banks are allocating £240,000 over five years for research aimed at reducing milk and cheese production costs and at developing chemicals and other new products from milk.

Liam Donnelly and Tim Cogan will lead the project, based at the Agricultural Institute in Fermoy, County Cork, and the Institute's Moorepark Research Centre. They point out that although Ireland's dairy industry has gone through two decades of unprecedented growth in terms of output, its range of products has hardly changed during that time. Today, 80 percent of production consists of butter and skim milk, compared with 70 percent ten years ago. Future profitability depends on diversification, Donnelly and Cogan believe, and this in turn hinges on the application of biotechnology.

One aim of the project will be to harness recombinant DNA techniques in developing greatly improved starter cultures for yogurt and continental varieties of cheese—including organisms that will hasten maturation while retaining or heightening the cheese's flavor. Cultures evolved by the staff at Moorepark and University College, Cork, over the past four years are already being used to produce 65 percent of all Irish cheddar.

A second research goal will be to offer the dairy industry innovative and profitable ways of exploiting the whey which is otherwise a relatively wasted by-product of cheese-making. Donnelly and Cogan are particularly attracted by the possibility of genetically engineering special strains of lactic acid bacteria to generate innovative, high-value chemicals from milk by-products.

—Bernard Dixon