

rides are often necessary for the correct functioning of important biological molecules such as antibodies and hormones. For example when the biological mechanism for the synthesis of sugar does not function correctly, this may give rise to a variety of diseases such as rheumatoid arthritis and cancer.

The research also has implications for the biotechnology industry by making it easier to produce effective therapeutic proteins, such as insulin. Present methods of synthesising them cannot necessarily ensure that the end product will have the desired biological effect. This is often because the proteins sometimes occur with the 'incorrect' oligosaccharides for the required 'correct' biological effect. By investigating the mechanism by which oligosaccharides are synthesised at the molecular level, it

will be possible to design novel compounds with the 'correct' oligosaccharide. It will also be necessary to investigate new automated methods to determine the structure of oligosaccharides. Current technology is slow and inefficient, and severely hinders research in this area.

The Carbohydrate Research Centre, which forms the core of the project, will also function as a national resource to train staff through 'hands-on' experience of the high-technology methods required for oligosaccharide research. There are at present only two such facilities worldwide. The research programme will be a collaborative venture with four leading British companies: Glaxo, Wellcome Foundation, Celltech and ICI. Together these companies have provided half of the research funds.

### **United Kingdom: Report on the Research Programme on AIDS supported by the Medical Research Council [MRC]**

In 1983, the Medical Research Council set up a Working Party on AIDS and began to support research in this field. Since 1987, the MRC has been receiving special allocations of funding from the government for AIDS research. So far, over the four financial years 1987/91, this has amounted to a total of £38.8 million, and work is likely to continue, at about the current level of activity, until at least the end of the century. Copies of the full report, 'MRC AIDS Research 1990', published in May 1990, are available from the Publications Group, 20 Park Crescent, London W1N 4AL, UK.

*A brief overview of current AIDS research:* The Acquired Immune Deficiency Syndrome, first described in 1981, is the final stage of infection with the human immunodeficiency virus (HIV), when there is substantial breakdown in immune function and increased susceptibility to a wide range of debilitating and ultimately fatal illnesses. Without treatment, the average life expectancy of a patient with AIDS is about one year and the great majority would die within two years of diagnosis. However, while AIDS is the most dramatic stage in the course of HIV infection, many people with HIV stay apparently healthy and lead normal lives for some years. During this time they are capable of transmitting infection to others through sexual intercourse or through transfer of blood or when drug addicts share needles. There is at present no cure for HIV infection or AIDS, thus treatment remains largely palliative. Research is needed to develop vaccines for prevention and new drugs for treatment; however, these aims can only be achieved in the medium and long term. More immediately, there is the need to control the spread of infection as much as possible through health education.

These are some of the projects which are being carried out under the auspices of the MRC AIDS Research Programme:

*AIDS research at the Centre for Applied Microbiology and Research (CAMR):* The Public Health Laboratory Service (PHLS) plays a leading role in monitoring the incidence of AIDS in Great Britain and in developing procedures by which this epidemic can be controlled; CAMR is part of the PHLS. In conjunction with the MRC, CAMR has developed a coordinated research programme on the HIV which builds on its facilities and in-depth experience of handling human pathogens. There are three major projects within this research programme: the characterization of HIV isolates, production of HIV and purification of HIV antigens and development of a non-human primate model of AIDS.

*MRC AIDS reagent project – establishment of the repository:* As part of its policy of providing centralized resources and facilities for scientists participating in the AIDS Directed Programme, the Steering Committee decided during 1988 to establish a central repository to collect, store, characterize and distribute a wide range of research reagents needed by MRC-funded scientists working in the AIDS field in the U.K. and abroad. The service has since been extended on a limited scale to other scientists worldwide through collaborative ventures with the WHO and the European Community, as well as through bilateral cooperative agreements with other national AIDS programmes.

*The European Collaborative Study on children born to HIV-positive women:* This prospective multicentre European study was set up in 1986 with the following objectives: to determine the rate of transmission of HIV infec-

tion from an HIV seropositive mother to her child; to assess factors such as mode of delivery, breast-feeding, and the mother's clinical status during pregnancy that might influence transmission; to elucidate the natural history of HIV infection and to identify precursors of AIDS onset in infected children.

*The Edinburgh Hemophiliac Cohort:* In Edinburgh a unique group of hemophiliacs became infected with HIV in the spring of 1984, by transfusion of a single batch of Factor VIII concentrate. Of the 32 patients only 18 developed antibodies to HIV. While all 14 anti-HIV-negative individuals are well, 10 of the 18 positive patients have progressed to Group IV (according to the Center for Disease Control grading system) disease in five years. This cohort provides a unique opportunity to investigate host factors that determine both the risk of seroconversion for HIV and the rate of progression to symptomatic disease after infection with HIV. The study has shown that the risk of seroconversion is related to the amount of the contaminated batch of Factor VIII used, but there is no clear-cut association with age, HLA type, severity of hemophilia or pre-exposure to circulating T cell subset numbers.

*Studies of HIV infection in The Gambia:* The most prevalent retrovirus in man in much of West Africa is HIV-2. Since cases of HIV-2 AIDS were shown to occur in The Gambia in 1986, a multidisciplinary and multinational team at the MRC Laboratories at Fajara has studied several aspects of HIV infection. The overall prevalence of HIV-2 seropositivity in the adult population was found to be 1.6% and that of HIV-1 0.1%, with both sexes being similarly affected. Studies of the clinical and immunological consequences of HIV-2 infection are be-

ing carried out. It is becoming apparent that the clinical features of AIDS due to HIV-2 and HIV-1 are similar.

*Biological properties of HIV:* This particular programme is designed to gain a clearer understanding of how HIV causes disease, varies in its biological and immunological properties, and interacts with cell surface receptors in early stages of infection. HIV-2, about which much less is known than about HIV-1, is being characterized. As with HIV-1, the ease of isolation and laboratory propagation of the seven HIV-2 isolates obtained from infected Gambians correlates broadly with the clinical status of the person from whom the virus was isolated. Those with AIDS yielded fast growing HIV strains that replicate to high titre in T cell lines, whereas those from asymptomatic individuals propagate slowly and only in fresh white blood cell lines.

*The cell-mediated immune response to human immunodeficiency virus:* HIV infects cells that carry the virus receptor, the CD4 glycoprotein, on their cell surface. CD4 is expressed on helper T lymphocytes and the antigen presenting cells of the monocyte series. Cells of the other major subset of T lymphocytes, which carry the CD8 glycoprotein instead of CD4, are not infected. In HIV-infected individuals who are still healthy, the CD8 T cells make a vigorous immune response.

*Magnetic Resonance Imaging of brain and spinal cord in HIV infection:* The MRC has recently agreed to provide Magnetic Resonance Imaging facilities for research of HIV infection both in London and Edinburgh. For the London team, the Council will provide support for a five-year research programme, whilst in Edinburgh the funds for research are being raised through an appeal.

## Announcement

### Ruzicka-Prize 1991

Every year, a prize from the Ruzicka-Prize Fund is awarded to a young research worker for an outstanding work in the field of general chemistry that has already been published and achieved in Switzerland or by a Swiss national abroad. Proposals for candidates (under

40 years) may be submitted before 31 March 1991 at the latest to the President of the Board of the Swiss Federal Institutes of Technology, ETH-Zentrum, CH-8092 Zürich.