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News and Notes

New, improved 'genetic vaccines' for tropical diseases

The following is extracted from *The Guardian* newspaper, 27 September 1991:

A new application of genetic engineering has resulted in a better way to make vaccines for tropical parasitic diseases.

Conventional vaccines are made from viruses or bacteria grown outside the body and chemically killed or weakened to render them harmless, but in some such vaccines a few organisms may escape the treatment and emerge still able to cause disease; and with parasitic diseases, parasites cannot usually be grown in bulk outside the human body, because they are so well adapted to it.

An alternative method involves taking genes for individual antigens—proteins that stimulate immunity strongly—from micro-organisms, implanting the genes in laboratory cell cultures and using the cultures to produce the antigens to use in vaccines. But the problem in the case of tropical parasitic diseases is that single antigens generally do not stimulate immunity nearly as strongly as vaccines from whole organisms. For immunity to be strongly stimulated, parasite antigens need to be 'seen' by the immune system in the context of neighbouring antigens.

Instead of taking genes out of parasites to produce vaccines, Professor Lex van der Ploeg and Dr Mary Gwo-Shu Lee at Columbia University in New York, are inserting genes into parasites. The genes are targeted so precisely that they either delete or replace one or more of the parasite's own selected genes. In this way, Ploeg and Lee have shown they can produce parasites which, while perfectly healthy living in the laboratory, are doomed to die after only a day or two in their human host. The deletion of a gene for a vital enzyme has left them unable to feed themselves in the human body.

Such vaccines, being made of whole parasites, should stimulate immunity more strongly than vaccines made from individual antigens, and should stimulate cell-mediated as well as antibody-mediated immunity. And because the techniques used to insert or delete genes are so precise, the vaccines should end any risk of people contracting diseases from imperfectly treated micro-organisms.

By deleting specific genes in known sites on chromosomes, and observing the effect of each deletion on the organisms, Ploeg and Lee are building up information about the roles of different genes in the life of the parasite. As well as identifying genes which, when deleted, make it impossible for a parasite to survive long in its human host, this work will, it is hoped, identify genes which when deleted or replaced, may allow the parasites to breed and grow outside the human body so they can be cultured on the large scale needed to make vaccines.

The technique has been used by other scientists to target genes to specific sites on the chromosomes of sheep and cattle to create new breeds of transgenic farm animals able to produce valuable pharmaceutical proteins in their milk. The technique, called homologous recombination, depends on the natural ability of two identical sequences of DNA to join together. This can be used to replace a gene with a very similar gene but one which has one or two vital alterations. Or, by using just a short homologous sequence to target a so-called anti-sense sequence of the gene, it can delete

the gene completely. (Anti-sense genes are mirror images of genes which have the effect of literally cancelling out the corresponding gene's message.) This work will also be useful in identifying new targets for drugs. By specifically deleting genes and so discovering the functions of the proteins they code for, the enzymes that a parasite possesses that are different from those of its human host can be identified. Drugs to attack these enzymes could then be designed which would be harmless to the human host and so free of side effects.

The Columbia team have worked mainly with trypanosome parasites, one species of which causes African sleeping sickness and others leishmaniasis and Chagas' disease, conditions common in central and Latin America and the Middle East.

ActionAid *Disability News*, India

ActionAid *Disability News* is a bi-annual newsletter of the Disability Division, ActionAid-India. The newsletter is meant for private circulation only, for planners, administrators, professionals, funding organizations and implementing agencies involved in disability and rehabilitation programmes.

The major emphasis of the newsletter would be on articles related to policy development, concept clarification, development of methodology in areas of service delivery, training of manpower and programme evaluation, and development of technology related to rehabilitation.

Other information related to rehabilitation of disabled people that may be of use to funding organizations and implementing agencies are also welcome.

The views expressed in the newsletter are those of contributors and not necessarily of ActionAid.

Copies of the newsletter are mailed free of cost on request.

We are interested in exchanging copies of this newsletter on a reciprocal basis, with other rehabilitation publications and in gathering information on programmes and research findings related to disability and rehabilitation.

Articles sent to us will be published subject to their suitability and may also be published elsewhere if so desired. Two copies each (typewritten, double spaced, on bond paper) of articles, letters, comments and other communications meant for publication may be sent to the address given below.

Disability Division, ActionAid, P.B. 5406, 3, Resthouse Road, Bangalore 560 001, India.

Psoriatic lesions measure, Thames Laboratories, UK

Thames Laboratories of Abbey House, Wrexham Industrial Estate, Wrexham, Clwyd LL13 9PW, Wales, UK have produced a 'psoriatic lesion' measure, which consists of a piece of thin Perspex (or similar) material, into which are traced a number of black concentric rings. The centre ring is 10 mm in diameter, the next 15 mm, and so on, until the outer ring reaches a diameter of 45 mm. By simply placing this device over a lesion, even if it is not circular or regular in outline, diameters can be easily measured and recorded. Intended for use in psoriasis, this measure might have other applications, e.g. monitoring the changes in size of a skin lesion that is suspected to be early or indeterminate leprosy.

International Leprosy Seminar, Istanbul, Turkey, September 1991

The first International Leprosy Seminar was held in Istanbul on 2–3 September 1991 and was jointly organized by the Leprosy Centre of the Istanbul Medical Faculty, University of Istanbul (Professor Turkan Saylan) and the Regional Office of the World Health Organization for Europe. The main objective of the meeting was to bring together people working in leprosy from the neighbouring countries of Eastern Europe, the Middle East, North Africa and Malta, to exchange information,

with particular emphasis on the following: 1, a review of the present state of knowledge, including new approaches to leprosy control, epidemiology and social aspects; and 2, the teaching of leprosy in medical schools and the wider involvement of teaching staff.

Delegates came from Albania, Egypt, Greece, Iran, Israel, Kuwait, Malta, Romania, the USSR and the Yemen. Dr S. K. Noordeen, Chief, Leprosy, Division of Control of Tropical Diseases, WHO, Geneva, opened the meeting with a review of the present state of leprosy worldwide, including a description of the remarkable changes which have resulted from the implementation of multiple drug therapy (MDT). From a total world figure for registered cases, i.e. the world prevalence, of 5·3 million in 1986, the figure declined to 3·7 million in 1990 and is currently 3·4 million. It is expected that there will be a steady decline towards about 400,000 cases by the year 2000. Dr Colin McDougall (Oxford, UK) described basic diagnosis, classification, reactions, treatment and the evaluation of patients in leprosy control programmes. Miss Jean Watson (London, UK) spoke on the prevention and treatment of disability and Professor Turkan Saylan the social aspects of leprosy. The second day was devoted to a visit to the Istanbul Leprosy Hospital at Bakirkoy with full discussion of the facilities available there for diagnosis, drug treatment, disability prevention and management, eye examination and prosthetics. The final session dealt with the teaching of leprosy to students in medical schools and the greater involvement of medical staff in various faculties. Regardless of the extent of the leprosy problem, it transpired, from information presented by delegates, that medical schools in the countries represented at this meeting allocated about 1 hour to leprosy in the entire curriculum. Recommendations were made for: 1, a longer period, including clinical or field work in countries with a continuing and significant problem; 2, the greater involvement of teachers in departments such as neurology, dermatology, orthopaedics and community medicine; and 3, the wider of use of videos, especially in situations where experienced and capable teachers are not readily available. The entire range of TALMILEP teaching and learning materials for leprosy was on display throughout the seminar, including the video catalogue.

Implementing multiple drug therapy for leprosy, OXFAM, UK

OXFAM's description of this 45-pp paperback is as follows:

'The system of multiple drug therapy for leprosy recommended by the World Health Organization in 1982 is an extremely effective treatment which, if widely introduced and effectively operated, could result in a dramatic reduction of the incidence and severity of leprosy throughout the world. This book, written in the form of extended answers to a series of questions, deals with a variety of aspects of the care and management of patients undergoing multiple drug therapy. It is aimed essentially at those in senior positions concerned with teaching health workers, programme planning and implementation of leprosy control programmes.'

In the original English language version, over 5000 copies were sold and the 4th edition (1988) recently sold out, and is being reprinted now. CERPHA (Comissao Evangelica de Reabilitacao de Pacientes de Hanseniase, Rua Guapeni 54/101, Caixa Postal 24046, Rio de Janeiro, Brazil) translated and distributed 2000 copies in Brazil. Copies in Spanish are available from Centro de Investigacion de Enfermedades Tropicales, Apdo 25-A, Acapulco, Guerrero, Mexico. Copies in Bengali can be obtained from Dr D. S. Chaudhury, Greater Calcutta Leprosy Treatment and Health Education Scheme, 23 Market Street, Calcutta 700 087, India. The price for an English edition, from OXFAM, Banbury Road, Oxford, England, is £3.50 (US $7) plus postage.