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NEW RESEARCH PROGRAMME IN PREDICTIVE MEDICINE(1)

Predictive medicine seeks to predict susceptibility to diseases with a view to their prevention and early diagnosis, as well as to improved prognosis and eventual treatment. The Commission has proposed a new Community research programme in this field based on the use of new biotechnologies, and especially on human genome analysis. The programme is expected to run from 1989 to 1991 at a total cost of 30 million ECU. It is proposed that the Community contribution be 15 million ECU, with matched funding from national sources.

Fifty years ago the principal cause of morbidity and mortality was infectious disease but with the discovery of antibiotics, and improvements in hygiene and pest control, it is now a minor one in industrialized countries. Apart from the consequences of accident or war, much disease today has a genetic component which may be of greater or lesser importance. Over the past few years a great deal has been learned about those diseases which are due to the inheritance of a single defective gene, though in most cases we are still very far from a remedy, e.g. cystic fibrosis, sickle cell disease, duchenne muscular dystrophy.

However, when it comes to the common diseases such as coronary artery disease, diabetes, cancer, auto-immune diseases, the major psychoses and other important diseases of Western society, the position is far less clear. These conditions have a strong environmental component and although genetic factors are undoubtedly involved, they do not follow any clear-cut pattern of inheritance. Put another way, the disease results from the exposure of genetically susceptible individuals or populations to environmental causes; prevention will depend on reducing the levels of exposure either in populations or, more probably, in susceptible individuals.

As it is most unlikely that we will be able to remove completely the environmental risk factors, it is important that we learn as much as possible about the genetically determined predisposing factors an hence identify high-risk individuals. Predictive Medicine seeks to protect individuals from the kinds of illnesses to which they are genetically most vulnerable.

The human genome is the complete set of genetic material (deoxyribonucleic acid, or DNA) found in the human cell, and which embodies the instructions describing each human being. It is now possible to analyse, or map, the genome is such a way that one can "read" these instructions and, in so doing, locate the genes which, when altered, give rise to particular diseases. Along the way it will be possible to make fundamental new discoveries in medical biology.

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KOMMISSIONEN FOR DE EUROPÆISKE FÆLLESSKABER - KOMMISSION DER EUROPÄISCHEN GEMEINSCHAFTEN
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The approach to predictive medicine embodied in this programme will be that of human genome analysis, and will contain the following elements:

- improvement of the resolution of the human genetic map, i.e. creation of a map of the human genome, consisting of DNA markers, which would enable researchers to locate genes easily and quickly;

- the setting up of ordered DNA libraries, i.e. of collections of ordered sets of DNA fragments which fully represent the DNA present in the entire genome, selected chromosomes or chromosomal fragments;

- the improvement of advanced genetic technologies and, through a training programme, the spreading of these advanced technologies throughout the Member States.

The programme will establish networks of European laboratories already working in this field, coordinating research into molecular genetics to achieve a better understanding of genetic disease and hence to improve the prospects for diagnosis and therapy.

The programme shall be implemented through cost-shared or marginal cost contracts, support to centralized facilities and networks, training contracts, training grants, courses, consultations with national experts, organization of study-group meetings, participation in seminars and symposia, and publications. The Commission participation may range from about 50% in the case of cost-shared contracts and may reach 100% in other cases.

Participants may be research institutions, universities, industrial enterprises or combinations of them, located in Member States or in certain third countries. Projects must be carried out by participants from more than one country, and include at least one participant from one Member State.