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African Expert Group Meeting
To assess the Implications of New Technologies
for the Lagos Plan of Action

Biotechnology and Genetic Engineering in Human Health

by

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1984

The rapid developments in biotechnology and genetic engineering have created a revolution in all biological science and in scientific research.

There are different definitions of biotechnology; the preferable is that proposed by OECD in 1980, "the application of scientific and engineering principles to the processing of materials by biological agents to provide goods and services."

The applications of biotechnology and genetic engineering in the field of "Human health" are in progress and almost daily new things come out in the benefit of humans.

Among the biotechnology and genetic engineering that are applied in human health are;

- recombinant DNA: i.e. the transfer of genetic materials from one organism and incorporate it to be recombined in other organism; by this way specific character of one organism could be transferred to other organism;
- monoclonal antibodies: i.e. fusion of cell able to produce a specific antibody, with another cell produce no antibodies; and the hybrid cell (hybridoma) produced by this fusion is able to produce the antibodies in tissue culture.
- molecular hybridization: i.e. the hybridixation between DNA and its specific RNA specially mRNA. When DNA in form of cDNA (complementary DNA) is labelled, it is easily to identify its mRNA (massanger RNA).

The Egyptian Academy of Scientific Research and Technology: Has published, recently in 1984, a report on "Towards a Technology Policy for Egypt" as a framework for implication of new technology and selected four main fields: (1) Genetic engineering and biotechnology, (2) new and renewable energy, (3) microelectronics and (4) high polymers (plasticisers - plastics), to start with.

To achieve these new technologies, a nominated center of excellence in these specific fields has been established.

One of the excellence centers in Cairo has been established three years ago; Theodor Bilharz Research Institute for Tropical Medicine and

Parasitology in collaboration with West Germany. One of the main aims of this Institute is to research and develop new biotechnology and genetic engineering techniques in diagnosis, treatment and control of Schistosomiasis (Bilharziasis). This disease affects more than 25% of population in rural areas in tropical and subtropical countries.

The activities of the Theodor Bilharz Research Institute (TBRI) in application of new technology are planned in the following items:

1. Selection and training of high caliber persons on new biotechnique and genetic engineering in international centres;
2. Establishment of well-equipped laboratories;
3. Formulation of team-work for solving specific problems headed by an expert in this field;
4. Consultation by experts from other institutes in Egypt and abroad.

As a result of this plan, TBRI has a team-work dealing with the following problems:

1. Tissue culture and monoclonal antibody in order to prepare specific vaccins;
2. Recombinant DNA
   In order to diagnose the infection early and accurately, and
3. Genetic control of the intermediate vectors in order to break the life cycle of the parasite.

All of these techniques are new in the field of biotechnology and genetic engineering done on the level of small but excellence labs, and the final goal of this research is the implication of these techniques for the benefit of human health, i.e. by early dignosis of the disease, by control of the parasite and by vaccination of persons.