



TOGETHER
for a sustainable future

OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.



TOGETHER
for a sustainable future

DISCLAIMER

This document has been produced without formal United Nations editing. The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization (UNIDO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries, or its economic system or degree of development. Designations such as “developed”, “industrialized” and “developing” are intended for statistical convenience and do not necessarily express a judgment about the stage reached by a particular country or area in the development process. Mention of firm names or commercial products does not constitute an endorsement by UNIDO.

FAIR USE POLICY

Any part of this publication may be quoted and referenced for educational and research purposes without additional permission from UNIDO. However, those who make use of quoting and referencing this publication are requested to follow the Fair Use Policy of giving due credit to UNIDO.

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

14739

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

Mohamed Ali Saber, Ph.D., C.Sc.
Professor and Head of Biochemistry Dept.
Theodor Bilharz Research Institute
for Tropical Medicine and Parasitology
Cairo, Egypt

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 hybridization between DNA and its specific RNA specially mRNA. When DNA in form of cDNA (complementary DNA) is labelled, it is easy to identify its mRNA (messenger 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 diagnosis of the disease, by control of the parasite and by vaccination of persons.