



Regional Health Genomics and Biotechnology Newsletter

Vol. 1, Issue 3, Sep. 30, 2006

The RC53, WHO/EMRO- EMHGBN –Side meeting Isfahan, Islamic Republic of Iran Sep. 11, 2006

A side meeting was held during the RC53, WHO/EMRO Meeting, Isfahan, Islamic Republic of Iran, on Monday, 11th of September 2006, in the presence of his Excellency Dr. Bagheri Lankarani, Minister of Health and Medical Education on the critical situation of the EMHGBN network.



EMHGBN –Side meeting

The main purpose of the side meeting was the introduction of the regional network and the efforts for the enhancement of collaboration in production, training, research & development in the countries that are covered by WHO/EMRO.



Health Minister of Djibouti, visiting the Pasteur and EMHGBN booth in exhibition and Dr. S. Sardari, Director of EMHGBN explaining the situation of EMHGBN network in the region.

Delegates from Bahrain, Egypt, Islamic Republic of Iran, Oman, Pakistan, and Saudi Arabia, Health Minister of Syrian

Arab Republic, GCC office and WR attended the meeting.

Recently the EMHGBN network had been considered as an important initial step towards the improvement of collaboration in Biotechnology and Genomics in EMRO countries.

It is necessary to mention that the Eastern Mediterranean Health Genomics and Biotechnology Network (EMHGBN) and Pasteur Institute of Iran had a booth in the RC53, WHO/EMRO exhibition. The catalogues and posters of EMHGBN, other networks and Pasteur Institute were presented during the exhibition.



Pasteur and EMHGBN booth

Developing countries with recipe for thriving health biotech industries

<http://www.medicalnewstoday.com>

Cuba, South Africa, India, China, Brazil are among nations

showing the way in thriving biotech industries. Cuba, South Korea and India make and export their own biotech vaccines, Egypt manufactures recombinant insulin and South Africa is developing a novel vaccine for HIV/AIDS. Health biotechnology is no longer the sole preserve of high-level research institutions of North America and Europe, according to a ground-breaking three-year study by 15 researchers of health biotechnology innovation systems in seven countries: Brazil, China, Cuba, Egypt, India, south Africa and South Korea. Vaccines, diagnostic tools, and other products of biotechnology which can be produced relatively easily and cheaply by developing countries, have the potential to save millions of people who die each year from various diseases. This study helps to reveal and understand the recipe used by developing countries to create thriving health biotech industries. Development of biotech industries in developing countries is essential, because markets for drugs in industrialized countries are much more lucrative, and poorer parts of the world have lagged badly behind. Of 1393 new drugs marketed between 1975 and 1999, only 16 were for tropical and other diseases predominantly affecting developing countries and three of the 16, were for tuberculosis, which affects countries worldwide; more than 175 new drugs were developed for

cardiovascular disease in the same period.

Successful Innovation Requires Collaboration

<http://www.medicalnewstoday.com>

The case studies confirmed that successful innovation requires widespread collaboration. Brazil and Egypt have also been hindered by a lack of linkages especially between universities and industry. Those countries success to date has been the result of strong individuals playing pioneering roles in their health biotechnology development. Despite the value of strong individual leadership, a systematic approach is likely to be more sustainable in the long run.

Down Syndrome Research Prize in the Eastern Mediterranean Region

<http://www.WHO.int/governance>

The Down Syndrome Research Prize in the Eastern Mediterranean Region of WHO was established in 1999 to encourage research on the subject, which is a major health problem in the region. It was created on the initiative of and with funds provided by Dr. Abdul Rahman Abdulla Al-Awadi, president of the Islamic organization for Medical

Sciences, having taken into consideration the high incidence of Down Syndrome in the Region. The prize consists of bronze medal and a sum of US \$ 2000, which is awarded to one or more persons considered to have made an outstanding contribution in the filed of research related to Down Syndrome.

The prize is awarded every two years, and presented during a session of the WHO Regional Committee for the Eastern Mediterranean.

Procedure of the proposal and selection of candidates

<http://www.WHO.int/governance>

Any national health administration of a member state in the WHO Eastern Mediterranean Region, or any former recipient of the prize, may nominate a candidate for the prize. Proposals are made to Regional Director for the Eastern Mediterranean, who submits them to the foundation committee, together with his/her technical comments. The foundation committee decides on the recommendation to be made to the WHO Regional Committee for the Eastern Mediterranean, which designates the recipient of the prize.

**First Mediterranean
Congress on Biotechnology
Location: Hamment,
Tunisia
Date: 25-29 March 2006
Organized by: Association
Tunisienne de Biotechnologie
(A.T. Biotech)**

<http://www.scdev.net>

Description: As well as oral and poster presentations, the conference featured plenary lectures and 16 symposium lectures. Congress sessions was given by well-known speakers covering all aspects of biotechnology and its interaction with industry, the environment, health and agriculture.

**Method Optimization
Revers Phase High
Performance Liquid
Chromatography (RF-
HPLC) for characterization
of Digested Products of
Recombinant Pro-Insulin.**

Omidi M , Sardari S, Zakeri M, Vaziri B, Aliahmadi A, Jeblli M, Mahboudi F. Biotechnology Research Center, Pasteur institute of Iran.

The fourth national conference of Biotechnology, 2005, I.R. Iran, proceeding the conference, page 198

Expressing multiple joined pro-insulin genes in E.coli has produced recombinant insulin. Refolded pro-insulin has been converted with trypsin and carboxypeptidase-B. Finally, the bioactive insulin is separated by RP-HPLC (Mukhopadhyay, 1997, Marks, 1989). In this study , the effect of several parameters on RP-HPLC of recombinant pro-insulin was investigated. These parameters were TFA concentration (0.05-0.02 %), temperature (room temperature up to 50°C), gradient (0-100% acetonitrile in different times) and flow rate (0.6-1ml/min). In this study the optimum gradient for separation and characterization of digested products of pro-insulin especially insulin was suggested.

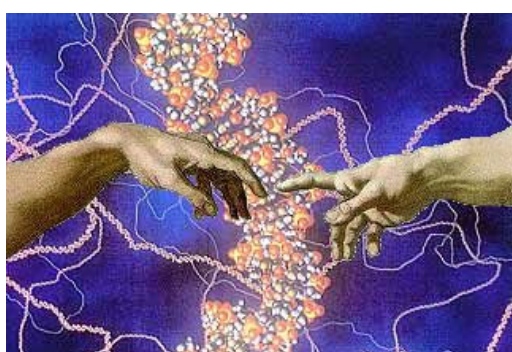
**Current status of genomics
and biotechnology in the
Eastern Mediterranean
EM/ RC51/Tech .Disc.3**

<http://www.emro.who.int/RC51/media/EMRC51TechDisc03.doc>

Investment in biotechnology and genomics in countries of the region is low and expertise and infrastructure are generally lacking. Egypt, Islamic Republic of Iran, Kuwait, Morocco, Pakistan, Saudi Arabia, Tunisia and United Arab Emirates are examples of countries of the

region that have invested in developing indigenous expertise in different areas of biotechnology and genomics. However the focus of these investments has been in sectors other than health.

The agricultural sector leads in the acquisition and application of these technologies for research and development (R&D) in most countries of the region.



In many countries, native crops and fruits have been enhanced to produce higher yields and disease resistance. Some countries are already exporting their products to other countries. R & D in veterinary biotechnology is also well developed in some countries, centers for camel breeding in Saudi Arabia and the United Arab Emirates are among the world's finest.

Water desalination, industrial waste refining and oil preservation are well established technologies in some member countries of the (Persian) Gulf Cooperation Council.

Most countries in the region are utilizing application of

biotechnology, such as DNA probes, PCR and immunological markers for infectious disease diagnosis, albeit on a limited scale.

Access to these technologies is limited and costs are high.

A number of countries of the region have reasonably well established centers for clinical genetics, and in some cases access to these services is more widespread. Several countries in the region, including Egypt, Islamic Republic of Iran, Morocco, Pakistan, Saudi Arabia and Tunisia have now initiated programs through partnerships and investments that are aimed at developing and utilizing biotechnology for public health.

Research in developing DNA – based technologies for disease diagnosis, therapy (drug and other product development) and prevention (vaccines) is ongoing. Facilities including infrastructure, equipment and training are growing and policies favorable to growth of biotechnology for improving health are gradually being put in place.

Index medicus for the Eastern Mediterranean Region (IMEMR)

<http://www.who.int/library/country>

In order to give access to health literature published in or

related to Eastern Mediterranean Region Library Network (EMLIBNET) produces an international index to Eastern Mediterranean health literature and information sources using headings according to the Medical Subject Headings Mesh List of the U.S. National library of medicine. This index is called index Medicus for the WHO Eastern Mediterranean Region (IMEMR)

Why index Eastern Mediterranean health literature?

<http://www.who.int/library/country/regional/imemr>

The need for improved access to what has been published on health issues in the Eastern Mediterranean Region, including countries such as : Afghanistan, Bahrain , Cyprus, Djibouti, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, the occupied Palestinian Territories, Pakistan, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, U.A.E, and Yemen Arab Republic has long been felt by researchers, development agencies, health administrators and planners both inside and outside the Eastern Mediterranean Region. Health and biomedical information sources are not always included in the world's leading bibliographic databases.



The **IMEMR** (Index Medicus for the Eastern Mediterranean Region) databases is the only system in the world which indexes and dissemination originating in the Eastern Mediterranean Region and it is as current as any modern international indexing service.

Enhanced periplasmic expression of human Granulocyte Macrophage colony Stimulating Factor in *Escherichia coli* by the modification of the signal peptide cleavage site.

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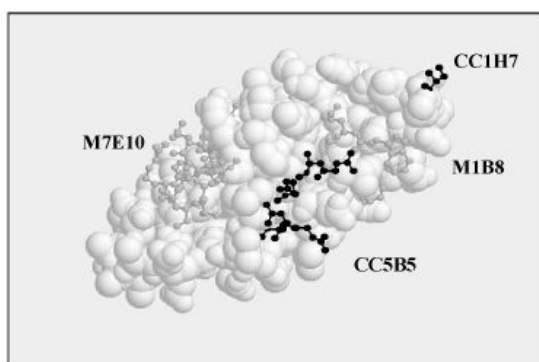
Department of Molecular Genetics.

National Institute for Genetic Engineering and Biotechnology.

Tehran, Iran

[www.nrcgeb.ac.ir/staff/Zomorodipour_files/4th biotechnology/shojaie.pdf](http://www.nrcgeb.ac.ir/staff/Zomorodipour_files/4th%20biotechnology/shojaie.pdf)

Human granulocyte Macrophage colony stimulating factor (hGM-CSF) in one of the hematopoietic growth factors and regulator of hematopoiesis that has been used as therapeutic agent in treatment of various ailments, such as myelodysplastic syndrome, Neutrogena and chemotherapy induced myelosuppression. With the aim of the large – scale production of recombinant hGM-CSF in the periplasmic space of *E. coli* a fusion fragment coding for pelB: hGM-CSF, constructed by splice overlap extension PCR (SOE-PCR) technique, was inserted in a T7-based expression plasmid.



Space-filling representation (RASMOL Script™) of the three-dimensional structure of native hGM-CSF.

The expression analysis was performed on the IPTG (or lactose)-induced BL21 (DE3) strain of *E. coli*, containing the recombinant plasmid. Using SDS-PAGE and densitometric assay of protein bands corresponding to the recombinant hGM-CSF, We analyzed periplasmic processing of signal peptide and the translocation of the mature hGM-

CSF took place more efficiently when lactose was used as inducer, comparing to the results obtained from the IPTG induction. The optimum concentration of lactose was found to be 0.01% after 20 hours, lead to an over-expression of pelB: hGM-CSF followed by nearly complete processing and transport of the mature protein into the periplasmic space. The mature hGM-CSF expressed in the present construct was estimated around 60% of the bacterial periplasmic proteins. Comparing to a previously – made hGM-CSF expression plasmid (K1), Which carries six extranucleotides, coding for methionine and alanine, in the signal peptide C-terminal, the periplasmic expression efficiency of the periplasmic space? These data support the idea that amino acid context in the cleavage site region play a key-important role in the expression efficiency of secretory proteins. Moreover it was documented that a combination of the improved signal peptide cleavage site and the use of an optimized lactose concentration can lead to a highest production level of mature hGM-CSF.

Africa: Higher Hopes for C4 Rice

Food and Agriculture Organization of the United Nations (Rome)

August 25, 2006

<http://allafrica.com/>

Mr. Nguyen was commenting on recent reports on a major international scientific effort to enhance the rice plant's efficiency, or what is known to experts as converting rice from a C3 plant to a C4 plant, where the "C" refers to the carbon captured by photosynthesis for growth.

The more solar energy a rice plant can efficiently capture, the more it will yield, explained Mr. Nguyen. "We need to meet the challenge of feeding a growing world population which is projected to reach 8.3 billion in 2030, with an accompanying rice demand of 771 million tonnes," he said.

An enormous challenge

In order to meet this expected demand for rice by 2030, global rice production - 618 million tonnes in 2005 - will need to increase by about 153 million tonnes. "This is an enormous challenge as land and water resources available for rice production keep diminishing as a result of urbanization and industrialization," Mr. Nguyen said.

Sustainable rice production requires a substantial increase in rice yields per hectare.

"The C4 rice would have the potential to out-yield the best

performing existing rice varieties and hybrids by 15 to 20 percent. However, it will take several more years before the C4 rice varieties may become available. And, then we will have to make sure that they are safe for human and animal consumption as well as for the environment," Mr. Nguyen stressed.

Biosafety concern

The advances in rice biotechnology, however, have also generated new concerns related to biosafety, conservation of rice genetic diversity, intellectual property rights and access. In this respect, the International Rice Commission believes that national capacity building is urgently required to ensure that new innovations benefit local people and do not incur long-term costs to the environment.

Annual meeting of the Global Forum for Health Research

Cairo, Egypt, 29 October - 2 November 2006
Combating disease and promoting health

<http://www.globalforumhealth.org>

The health challenges faced by people around the world are manifested in the global threats

from emerging and re-emerging infectious diseases and in the rapidly increasing levels of noncommunicable diseases and injuries seen in developing countries. Among the many obstacles to be overcome in achieving better health, especially for the poor and marginalized, key factors are the need to improve health systems and services and to ensure equitable and affordable access to these and to good quality, safe and effective medicines. Beyond the treatment of ill health, much more attention is needed to creating the conditions that enable individuals, communities and countries to promote better health - e.g. through information about good practices and avoidance of risk behaviors, and through improvements in the physical and social environments in which people live and work.

Health research has a vital role to play in all these areas, as an originator of new knowledge and technologies; as an essential ingredient in the successful identification of problems and solutions; and as a key element in ensuring effective and equitable implementation of interventions.

The Forum meetings of the Global Forum for Health Research have become established as a premier annual event that brings together policy makers, development partners and the resources, directors and users of research, to debate critical gaps and energize movements for action to address the health needs of the poor and marginalized. We are pleased to announce that, at the invitation of the Egyptian Minister of Health and Population, Forum 10 will take place in Cairo from 29 October to 2 November 2006.

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