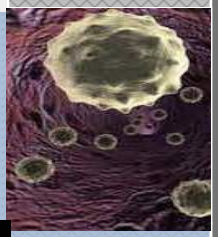

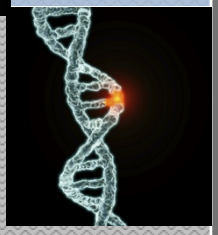

EMHGBN Newsletter

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Eastern Mediterranean Health Genomics and Biotechnology Network (EMHGBN) was created in 2004 with collaboration of representatives of selected centre of excellence in (health related) molecular biology, biotechnology & genomics in the Eastern Mediterranean region by recommendations and efforts of WHO/EMRO.

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Health Genomics and Biotechnology Networking Workshop

Tehran, Islamic Republic of Iran, Sep. 9 -10, 2007

The secretariat of EMHGBN had successfully organized a training workshop for establishing and operating national Genomics and Biotechnology Networks in the regional countries named **Health Genomics and Biotechnology Networking Workshop** for EMRO countries during **9-10 September** for two days in Pasteur Institute, Tehran, Islamic Republic of Iran.

The workshop held with the following objectives:

1) Make the venue to exchange leading ideas to establishment of the EMRO countries national networks in health genomics and biotechnology.
2) Distribution of developed international collaboration culture
3) Recognition of the Genomics and Biotechnology potentials and capabilities in member countries, such as human resources, laboratories, instruments, etc

Avicenna hall in Pasteur institute of Iran-Tehran

It is notable to mention that the representatives from several EMRO countries including Egypt, Syrian Arab Republic, Oman, Lebanon, Saudi Arabia and Jordan that have been introduced by their health ministers, the Research Deputy of Islamic Republic of Iran and President of Pasteur Institute of Iran attended this workshop.

Invited delegates had presentations on the current status of genomics and biotechnology activities, coordination and management in their countries. The workshop issues focused on keynote presentations that included the experiences with recently established national networks in Iran in order to persuade participants to create national networks as well as elaboration on the benefits of cooperation and sharing information between health-related research canters of excellence among Eastern Mediterranean Region.

Complete report of this workshop will be published in next issue of EMHGBN newsletter.

Recombinant protein production unit in Pasteur Institute-Karaj

Conference hall- Pasteur Institute-Karaj

Transgenic plants for remediation of xenobiotic pollutants

By: Dr. Susan Eapen

A review article entitled "Advances in development of transgenic plants for xenobiotic pollutants" published in Biotechnology Advances 25 (2007), 442-451 deals with development of transgenic plants with enhanced ability for remediation of xenobiotics such as trichloroethylene, pentachlorophenol, trinitrotoluene, glycerol trinitrate, atrazine, ethylene dibromide, metolachlor and hexahydro 1,3,5-trinitro 1,3,5-triazine. The article was contributed by Dr. Susan Eapen, Sudhir Singh and Dr. S.F.D'Souza of Nuclear Agriculture & Biotechnology Division, BARC, Mumbai, India.

Rapid industrialization coupled with increased urbanization has enhanced the levels of xenobiotic pollutants in the environment with a consequent impact on human health. Cleaning up of the environment by plants has the advantage of in situ remediation coupled with its environmentally friendly and economically cheaper qualities. In general, plants lack complete catabolic pathway for degradation/ mineralization of xenobiotics compared to microorganisms.

Development of transgenic plants where critical steps for degradation of xenobiotics are incorporated will help in enhancing their potential for xenobiotic degradation.

Different steps in phytoremediation of xenobiotics involve uptake, translocation, transformation, compartmentalization and sometimes mineralization. Once xenobiotics enter plant cells, they metabolize them by three sequential steps. In phase I, the xenobiotic molecules undergo oxidative or hydrolytic transformation resulting in more polar and chemically more reactive molecules. Phase I metabolism is mainly mediated by cytochrome P450 enzymes. In phase II, activated xenobiotic metabolite gets bound with –SH group of glutathione resulting in hydrophilic forms. Enzymes such as glutathione-S-transferases act in phase II and the resultant molecules are more polar and less toxic. During phase III, the conjugated xenobiotics are transported into vacuoles and further processing of conjugates may take place in vacuolar matrix. Mammalian cytochrome P450 monooxygenase genes have been incorporated into transgenic plants and they could break down a wide range of pollutants including TCE, EDB, carbon tetrachloride, chloroform etc. Maize glutathione S-transferase when expressed in tobacco, the transgenic plants could remediate many chloroacetinilide herbicides.

With the objective of developing plants with enhanced potential for xenobiotic degradation, in our laboratory, we have developed transgenic tobacco plants with mammalian cytochrome P450 gene and also with fungal glutathione-S-transferase genes. The plants are currently being studied for degradation of different xenobiotics. If the plants show enhanced potential for degradation of xenobiotics, we will be extending our work to other plants as well.

Borj Cedria science and technology park (Tunisia)

General Background

Tunisia, since many years ago taken various steps to upgrade its industry and invest in the knowledge economy. Among the strategies of the so-called 'national system of innovation', Tunisia is preparing twelve new science and technology parks by the year 2010. Six are actually being performed. Borj-Cedria Science and Technology Park is the first one in terms of its implementation programme.

Discover the Park

Borj-Cedria Science and Technology Park project (BC-STP) is composed of 3 major components:

• Research & Innovation Park

• University Park

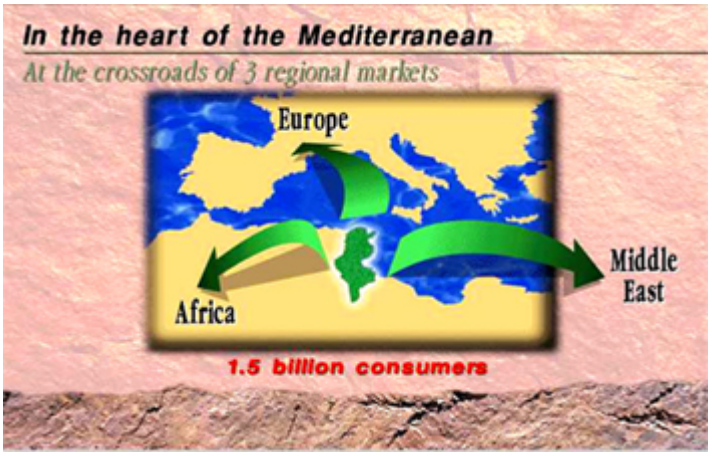
• Production Park

The Research & Innovation Park is established on a land that has been used by the National Institute of Scientific Research and Technology (INRST). At the beginning of 2006 INRST was changed and developed into 4 research centres i.e. Biotechnology, Energy, Water, and Material Sciences. The University Park will have 3 higher education institutes and other common usage facilities. The Production Park is composed of an Industrial district that will host high-tech firms and hold Workshops to entertain start-ups that are developing industrial Paradigms or making preliminary production on a limited size.

Objectives

- acquire technologies in 5 key strategic areas:

- Plant Biotechnology
- Renewable Energy
- Water Resources & Environment
- Material Science
- Applied Industrial IT

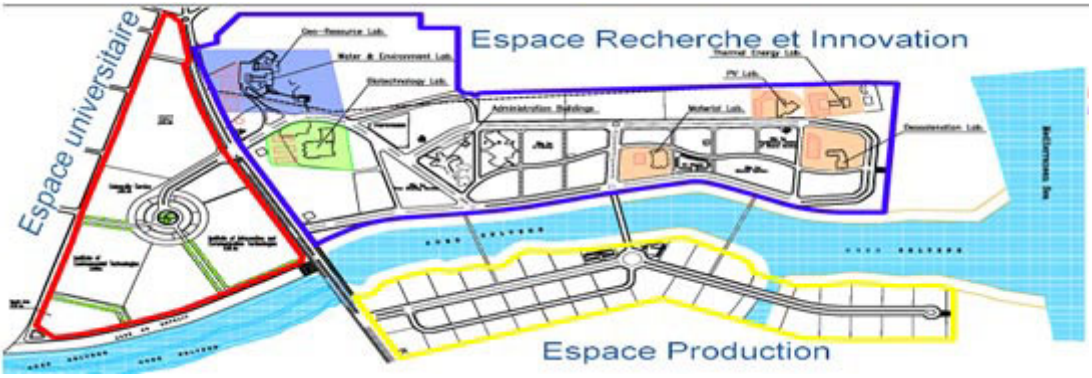


• Create competent related industries

• Develop expert and innovative human resources

• give Solution to the Country requirements

Park Map



It has various research centers. The biotechnology research center comprises of these laboratories and units:

1) Molecular Physiology of Grapevine Laboratory
2) Adaptation of Plants to Abiotic Stresses Laboratory
3) Vegetables / micro-organisms Interactions Laboratory
4) Characterization of Quality of Olive Oil Laboratory
5) Aromatic and Medicinal Plants Unit

[Ref: 9October2007http://www.ecopark.rnrt.tn/index.htm]

Nanotechnological applications in medicine

Nanotechnology-based tools and techniques are quickly emerging in the fields of medical imaging and targeted drug delivery. By applying constructs such as dendrimers, liposomes, nanoshells, nanotubes, emulsions and quantum dots, these advances lead to the idea of personalized drug and the potential for very early, even presymptomatic, diagnoses joined with highly-efficient targeted therapy.

Introduction

Here we describe nanomedicine as the utilization of technologies on the range of about 1 to 500 nm with the aim of diagnosing and treating disease. We present some of the recent applications of different new nanotechnological techniques and tools in diagnostic imaging and therapeutics.

Diagnostic imaging in nanomedicine

For diagnosis, this translates to detection and characterization of very early (even pre-symptomatic) disease offering evaluation, preferably non-invasively, similar to that of immunohistochemistry. Of course performing in this way is difficult, requiring concurrent discovery and quantification of several markers. Starting with single biomarkers as prerequisite for disease, preliminary successes in nanotechnology-enabled molecular imaging have been made in all imaging modalities including optical, nuclear, ultrasound, computed tomography (CT), and magnetic resonance imaging (MRI).One of the most primitive applications of nanotechnology in MRI was the application of paramagnetic iron oxide particles; when absorbed by healthy hepatocytes, these particles could aid to differentiate between normal and cancerous liver cells. in recent times, nanometer-sized constructs such as dendrimers, liposomes, nanoshells, nanotubes, nanoemulsions, quantum dots, and even viruses have been developed as imaging agents proposed as noninvasive probes or to target biomarkers of disease. Many have passed from in vitro to in vivo applications, targeting biomarkers such as the overexpressed folate receptor of cancer cells, human growth factor receptors (HER2) on tumors, or integrins crucial to angiogenesis around tumors and atherosclerotic vessels.

Nanotherapeutics

Controlled drug delivery

At present, there are limited numbers of nanomedical products on the marketplace, with the majority being medications that are formulated (or re-formulated) into nanosized constructs to manipulate the pharmacodynamics, biodistribution and overall efficiency. Abraxane, a nanoparticle version of paclitaxel attach to albumin, achieves water solubility without harsh excipients, has been revealed to be more efficient than preceding formulations of paclitaxel, and is the first such chemotherapeutic nanoparticle approved by the FDA.

Site-targeted nanotherapeutics

Beyond intelligent pharmacokinetic manipulations, a more sophisticated purpose of nanotherapeutics is to develop agents that move inside the body undetected to distribute particular therapy—whether chemical, radioactive, genetic or other — to uniquely recognized sites having negligible untoward consequence somewhere else. An in vitro model of atherosclerosis demonstrates the possible targeted nanotherapeutic paradigm from diagnosis, through therapy, to serial non-invasive follow-up. In hyperlipidemic rabbits, Winter et al used integrin-targeted paramagnetic nanoparticles that had formerly been revealed to identify angiogenesis in very early atherosclerotic disease with MRI. This new agent offers quantification of the level of disease and, at the same time, can deliver therapeutic doses of an anti-angiogenic drug, fumagillin, which could delay plaque progression.

Thus, targeted nanoparticles can considerably improve the safety profile of the medicine by lowering overall dosage and concentrating levels in disease sites.

Limitations and considerations in nanomedicine

Clearly, not all efforts to use new nanotechnology approaches in medicine have met with the equal success as those cited here. The new tools are not essentially intuitive and bring with them new challenges and problems. Nanometer-sized constructs do not act in the identical predictive ways that single, small-molecule interactions happen. Nanoconstructs, particularly multifunctional ones, are multifaceted three-dimensional substances with critical reliance on position, size, shape and charge of interrelated components. At present, what we know about nanomedicine is dwarfed by what we do not know; the majority of the challenges have not been described. Safety and drug effects are not confined exclusively to the patient population receiving the ultimate nanomedicine product. The complete manufacture and disposal process also require to be regarded. The duty is to redefine the safety, function, and environmental effects of the novel tools and techniques.

Conclusions

Nanotechnology, generally, is experiencing a fast growth period with main advances arriving rapidly. Consequently, these progresses are used in the biomedical field in many diverse ways. Present preclinical research promises novel methods to diagnose disease, to convey particular therapy, and to observe the effects acutely and non-invasively. This quick start and drastic change in methods will generate new challenges in the regulatory procedure, but will also offer a productive ground from which many exciting, and yet unimagined, applications of nanotechnology in medicine will arise.

[Ref: Shelton, D. Caruthers, Samuel, A. Wickline and Gregory M, Lanza. Nanotechnological applications in medicine. *Current Opinion in Biotechnology, Volume 18, Issue 1, February 2007, Pages 26-30.]*

Interview with Dr. Faten Bin Saif from Saudi Arabia

Please introduce yourself and explain your scientific discipline

My name: Faten Abdullah Bin Saif Consultant Medical Microbiologist, MD, KSFpath, DTM&H (London) currently working as the head of molecular section at the Central Lab. Riyadh, MOH, KSA

What is your current field of research?

We are mainly focusing on the diagnostic part of infectious diseases since there are separate department for research part

Do you use any biotechnology or genomics tools in your research?

Yes, PCR machine, ELISA kits and so on

Are biotech scientists trained in your own country or abroad?

Both of them.

What about quality of knowledge they gain? Which one is better?

I would not compare one from inside and one from outside. But I think people who are trained from outside have more experience because they have a better chance to obtain more experience.

What about public perception of biotechnology in your country?

The people who are involved in health sector are aware of biotechnology importance and they know that this is the future but I don't think ordinary people have good idea about biotechnology.

Is there any journal that is published in your country and deals with biotech issues?

Unfortunately no.

Are you familiar with EMRO countries and EMHGBN?

Yes, I had the honour to participate in the workshop which was held recently by our colleagues in Iran.

Do you have any suggestions for improving collaborations among EMRO countries?

I think the idea of developing a network among EMRO countries is really great However, there should be a continuous monitoring & follow up to sustain this network through frequent meetings & training programs.

At the end of interview is there anything special you want to mention?

I would like to thank you people in Iran to initiate this network & I hope to get all the benefit from our collaboration in this matter & in different aspects
Thank you & best regards

The 1st International Congress on Health Genomics and Biotechnology

Nov. 24-26, 2007
Tehran, Islamic Republic of Iran
Parallel with The 5th National Biotechnology Conference & 4th Iranian Congress of Genetic Disorders & Disabilities.

The **First International Congress on Health Genomics and Biotechnology** will take place in Tehran, Iran at a prestigious Summit Meeting Conference Hall from 24-26 November 2007. This Congress will cover more than 40 different subjects including:

1. Genomics and Biotechnology in non communicable diseases
2. Genetics of Human Pathogens
3. Biopharmaceutics and Genetic Technology
4. Bioethics, Biosafety in Genomics and Biotechnology Research and Application and Policy and Regulation, Networking and Management

There will also be many side meetings and workshops.

We welcome all organizations and genomics as well as biotechnology-focused scientists to take an active role in the forthcoming international congress which is expected to attract more than 1000 scientists from all over the world in order to exchange health-related information in Genomics and Biotechnology.

The forthcoming conference will be held with the objectives as follows;

1. Introduction of the related new research findings in the region

2. To draw the attention of research and training centres and executive organizations, industries and the private section to the expansion of Health Genomics and Biotechnology.

3. Distribution of developed international collaboration culture in technology transfer and Research and Development activities among the Islamic countries institutes/companies/organizations and also induce collaboration in production, training, Research and Development
4. Recognition of the Genomics and Biotechnology potentials and capabilities in member countries, such as human resources, laboratories, instruments, etc
5. Recognition of challenges and obstacles in advancement of Genomics and Biotechnology in the regional countries and the world
6. Strengthening the relationship between researchers of EMRO member countries through discussion and debate among the health-related scientists

The interested researchers could register and/or submit their papers in the related areas on the website of congress. All submitted papers will be reviewed by the internationally known referees after whom corresponding authors of the accepted papers will be notified.

Deadlines:

Abstract Submission: Oct. 30, 2007
Acceptance Announcement: Nov. 7, 2007

For further information, including registration and abstract submission, please kindly visit the website of the congress at www.hgb.ir or contact the secretariat of the congress on below address;

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Looking forward to meeting you in Congress in November 2007.