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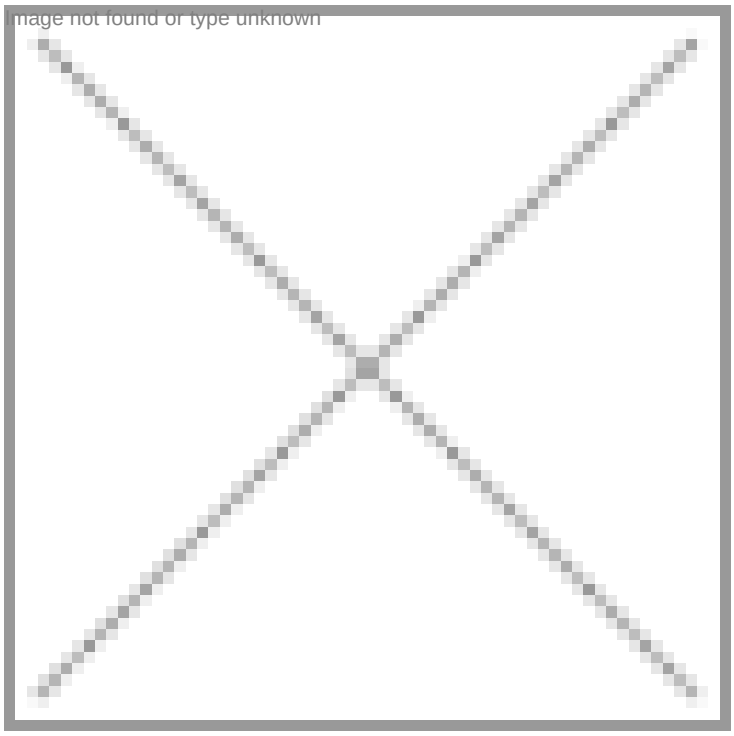
HGM 2008 Genomics, the future of medicine

14 October 2008 | News



HGM 2008 Genomics, the future of medicine

Each year the Human Genome Organization (HUGO) holds its annual Human Genome Meeting (HGM) designed to update and increase knowledge in the ever-evolving field of human genome research. HGM 2008 was held in Hyderabad, India from Sep 27-30 2008. A report on the key proceedings from the 13th HGM.

It is prognosticated that in the coming years some Nobel laureates will emerge from the field of medical genomics. The writing is on the wall. The field of genomics has seen some rapid progress in the last 10-15 years, especially so after the sequencing of the human genome. This new frontier research has taken off and globally scientist are generating and putting together humongous amount of data to draw and solidify conclusions that will give genomics research the required momentum.

At the Human Genome Meeting 2008 (HGM-2008) in Hyderabad, the excitement and anticipation was very much in the air with scientists sharing their studies and conclusion with their counterparts across the globe, comparing notes and debating the technicalities. HUGO has to its credit the task of bringing medical genomics research findings in the public domain thereby, hastening the research and discovery of new approaches, globally. From here, it can only get better believe the leaders from the scientific community. How?

A paradigm shift
Collaboration is the crux of scientific advancement or any other achievement for that matter. Taking a cue from HUGO's role in human genome sequencing, India's apex research body CSIR has announced a global initiative â€“ Open Source Drug Discovery (OSDD). This provides a unique opportunity for scientist, doctors, technocrats, software professionals, students and others with diverse expertise to work for the cause of affordable drugs. The OSDD program aims to find cures for diseases that affect the world's poorest of the poor. In the first phase, drug discovery for tuberculosis will be undertaken. The government of India has committed $35 million towards this project and has already released about $12 million. To join the OSDD community you can register at: http://www.osdd.net.

Genetic map of India
The Indian Genome Variation Consortium, which coordinated a study involving over 150 scientists and researchers from six CSIR labs and Indian Statistical Institute, Kolkata provided the first comprehensive genetic map of India. This is likely to help identify populations that are genetically protected/at risk from major disease threats.

Sample some of the predictions made by Dr Charles Cantor. By 2028:

- Widespread environmental manipulation: drugs, lifestyle, nutrition will be a major feature of preventive medicine.
- One way or another, we will be able to address directly nucleic acids as therapeutic targets.
- Like it or not, genetically engineered humans will be a reality.
- Whole human genome sequencing will cost less than $100.
- Individuals will be routinely sequenced either prenatally or neonatally.
- Metagenomic information in the mouth, colon, and perhaps other sites will see routine clinical use.
- Epigenetic and gene expression data will be used in routine diagnostics and prognostics: molecular pathology will largely supplant conventional pathology.
- Single cancer cells or immune cells will be selected and studied to understand disease and manage treatment.

What is HUGO?

Human Genome Organization (HUGO) came into existence in 1988 and was fondly known as Victor's HUGO after its founder Dr Victor A McKusick, who was passionate about the cause of genomics. He passed away just this July. HUGO has been responsible for making the human genome sequence data available in the public domain. This has created a flat world for new biology for all developing countries, which had not been able to participate in the expensive sequencing efforts.

HUGO has demonstrated the power of collaborative research making possible the difficult task of sequencing of the human genome a reality. Today, the Human Genome lies accessible to mankind in an example of democratic sharing of data generated with public support and distributed free to promote further research in this area.

HUGO is incorporated in Geneva, Switzerland. The membership of HUGO is open to all persons concerned with the human genome or other scientific subjects related to it. Currently, it has 220 members.

The financing for HUGO comes from several nongovernmental foundations, including the Howard Hughes Medical Institute, the Lucille P Markey Charitable Trust, and the Wesley Foundation. Multinational governmental funding for HUGO is now being sought.

Dr Cantor is the founder, CSO and a member on the Board of Directors at San Diego, California-headquartered Sequenom Inc. Apart from over 440 peer-reviewed articles and more than 60 patents, he also has to his credit the first textbook on Genomics: The Science & Technology of the Human Genome Project. While delivering the HUGO 20th anniversary lecture, Dr Cantor dwelled on the theme: "20 years ago and 20 years from now". He traced the growth of biology and its tools from 1988 to 2008 and took a future shot at 2028. However, neither he nor any of his contemporaries will be surprised if any of his predictions come to fruition much earlier, such is the nature of science: you can expect the unexpected.

At this point, what appears to take centre stage is the study of variations in the human genome. Slicing the data generated from such studies appears to be the key that will unlock doorways to preventive medical care. Dr Lalji Singh, Director of Centre for Cellular & Molecular Biology (CCMB), Hyderabad effectively showcased the diverse genepool of the Indian population tracing how it came to be so and what a wealth of information it is given that it is not part of the HapMap project.

HGM 2008

The Human Genome Organization (HUGO), an international body of scientists involved in fostering international collaboration in genomics for human health zeroed on India to commemorate its 20th anniversary by holding its 13th Human Genome Meeting---HGM 2008 in Hyderabad, India (September 27-30, 2008).

Over 1200 delegates including leading scientists from 44 countries converged at Hyderabad for this four-day conference with a packed agenda and line-up of sessions that gave the delegates a preview of the advances being made in medical genomics field and at the same time raised many more questions that pose a challenge for the scientific community.

HUGO's decision to hold HGM 2008 in India is being hailed as the world's recognition of India as the science & technology hub and its acknowledgement of the country's scientific potential.

India's apex research body the Council of Scientific & Industrial Research (CSIR) and the Institute of Genomics and Integrative Biology (IGIB), Delhi were the organizing partner for HGM 2008.

However, studies like this are just part of the challenge. The real challenge always lies in putting it to practical use in healthcare and making it affordable. Dr Jay Keasling, CEO of Joint Bioenergy Institute, US is in pursuit of low-cost, effective, anti-malarial drugs. His research focuses on engineering microorganisms for environmentally friendly synthesis of small molecules. Keasling's laboratory at the Berkeley Centre for Synthetic Biology, where he leads the team in the capacity of Director, has engineered bacteria and yeast to produce polymers, a precursor to the anti-malarial drug artemisinin, and advanced biofuels and soil microorganisms to accumulate uranium and to degrade nerve agents.

It is expected that this artemisinin-based drug will be available to patients by 2010. Dr Keasling informed that the knowhow for the drug has been transferred to pharma major Sanofi Aventis free of cost on the pre-condition that the drug will be priced affordably. Malaria impacts 300 million people worldwide.

Undoubtedly, it is initiatives like this that will change the life for better.

Nandita Singh, Hyderabad