TRANSCELL BIOLOGICS

TRANSCOMM

VOL. 01 Issue 01 THE TRANSCELL NEWSLETTER August, 2018

KEYWORDS

Human Genome

Predictive Diagnosis

Drug Discovery

Personalized Medicine

Social Issues

K Madhumohan

K. Madhumohan

I.V. Krishna

I.V. Krishna

Human Genome Project Decoded – So What?

In our previous communication, we pondered about the giant global collaborative effort of National Institute of Health (NIH) that has achieved something which no individual or company could do, "the human genome sequencing" as a part of Human Genome Project (HGP). The current communication will be an extension that adds the aroma of pros and cons to HGP. HGP essentially aimed at understanding gene functions and their relation to diseases. The initiative was completed in 2003 with an overwhelming success that opened multiple avenues to modern science with an equal concentration on risks and societal issues. Here, we made an attempt to throw light on major matters associated with HGP that is worth perusal.

Variation of DNA among individuals can revolutionize the process of diagnosis, prognosis, treatment and even prevent a number of diseases at early stages that affect human beings. This principle was fundamentally exploited into a purpose to start the giant mission called "The Human Genome Project (HGP)" which apparently sought to sequence the entire human genome. The HGP was meant to get clues to understand the human biology and molecular mechanisms underlying diseases.

The benefits of HGP were majorly directed to Human health for disease free survival. HGP has promoted technology and resources to have profound impact on biomedical research especially in clinical medicine. Inspired from HGP, genome sequences of microbes, plants and animals have revolutionized many

fields of science, including microbiology, virology, infectious disease and plant biology. DNA sequencing based genome maps have aided researchers to annotate few marker genes associated with genetic conditions. For example, Cystic fibrosis, Sickle cell anemia, myotonic dystrophy, fragile X syndrome, neurofibromatosis types 1 and 2, Alzheimer's disease, and familial breast cancer. The goal eventually was to address the fundamental causes of disease.

Nonetheless, HGP has both advantages and perceived disadvantages with psychology of handling the information.

Advantages of HGP

Precision diagnosis: The technique of decoding the genetic message enables more accurate diagnostic techniques for certain conditions which are difficult to diagnose at an early stage. For example, inborn genetic disorders of the foetus can be accurately evaluated. Early stage analysis of cancer patients and other disorders can be accurately validated towards treatment options even before the onset of disease symptoms.

Preventive diagnosis: DNA sequencing technology allows us to understand genes that determine disease susceptibility and therefore enable clinicians to alert people who are likely to suffer from a particular disease and offer a preventive course of action, which may involve medical treatment or lifestyle changes.

Personalised Medicine: Personalized medicines can be developed based on individual biochemistry that is determined by the individual's genome signature. This field ensures a future of tailor made medicines with improved efficiency.

Drug Discovery: HGP provides knowledge on human genome and genetics back ground of patients that allows pharmaceutical/biotech companies to discover therapeutic targets and drugs that will be more effective on patients.

Implications in forensic science: DNA fingerprinting helps to match a suspect to the biological material found at a crime scene. There are some proprietary predictive computer aided models to figure out what a suspect looks like from DNA found at a crime scene e.g. predictions based on their eye, hair and skin color.

Risk assessment: Knowledge of HGP will have an enormous impact on risk assessment of individuals by environmental exposure to toxic agents. Researchers know that genetic differences cause some people to be more susceptible than others to such agents. This knowledge will directly address the long-term mission to understand the effects of low-level exposures to radiation and other energy-related agents, especially in terms of cancer risk.

Figure: Snapshot of a DNA finger printing analysis that enables accurate individual identity. [Courtesy:http://www.streetdirectory.com/travel_guide/118743/science/benefits_of_human_genome_project.html].

Other Benefits of HGP

Other notable benefits of HGP that improved human survival over time were:

- To identify potential suspects who's DNA may match with the evidence left at crime scenes in order to establish paternity and other family relationships.
- DNA sequence information may also predict graft rejection problems to facilitate efficient organ transplants.
- To detect and identify bacteria and other microorganisms that may pollute air, water, soil, and food.
- Determine pedigree for seed or livestock breeds understanding disease vulnerabilities and revealing drug targets.
- For environmental monitoring to detect pollutants.
- To evaluate protection at quarantines from biological and chemical warfare.

References:

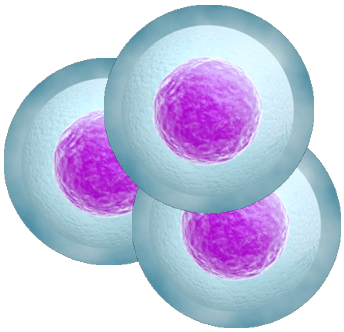
- Leroy Hood and Lee Rowen. The Human Genome Project: big science transforms biology and medicine. Genome Medicine, 2013. 5:79.
- https://getrevising.co.uk/grids/the_human_genome_project_2
- http://www.streetdirectory.com/travel_guide/118743/scienc
- e/benefits_of_human_genome_project.html
- https://www.ndsu.edu/pubweb/~mcclean/plsc431/students99/melaas.htm
- What is the Human Genome Project? Obtained 10/2/99. http://www.ornl.gov/TechResources/Human_Genome/home.html.

Client testimonials:

When I was briefed on ScellCare-G from Transcell Biolife that Umbilical cord blood stem cell genome information (data) will be provided to us as their storage product's premium feature, we were thrilled to know about this possibility. I am a science believer and understand the advantages of this information of my new born's umbilical cord specific stem cell genomic data, uses in predictive, personalized medicine and so proudly opted this package with Biolife. **Sai Kumari Komatigunta, Ongole, Andhra Pradesh**

My daughter is 7 yr old, had loose tooth last before week and she was asking me for tooth fairy present like my elder one. That day, we went to our dentist at Madhapur, Hyderabad for general dental check up. I picked Transcell Biolife's brochure/flyer that was there and read about the stem cells that can be harvested from my kid's about to fall tooth; Biolife's ToothScell-G performing gene profiling on these stem cells before storing them for us in their facility at Hyderabad. I am a data specialist working with Novartis and I know the importance of big data, value of data in clinical applications. So, I found out the details from our dentist and have got my kid enrolled with Biolife to not only store her tooth's stem cells but also get the gene profile done that can as well be stored for any further interpretation and analysis. Too good to have such options provided to my family by Biolife and pleased with their contemporary, useful features surrounding stem cell storage. I have not heard anything like this from other companies. **Abhinav Reddy Challa, Hyderabad, Telangana**

TRANSCELL™
BIOLOGICS



"Store your mesenchymal stem cells today with Transcell Biolife, the only biobank facilitating stem cell genomics for personalized medicine in India".

Customer care No.CC: +91 8985000888 Email:info@tran-scell.com

Social Networking
TranScell Biologics is now live on Facebook and Twitter.

Pleaselike us on
Facebook – TranScell Biologics
and follow us onTwitter @ TranScellhyd

Please visit our Blog page
http://transcellhyd.wordpress.com

www.transcellbio.science
www.trancell.in