appeared on 7th Apr 2007

Genetic versatility

The value of the genetic heritage of the Parsis is being tapped by Avesthagen, a Bangalore based bio-pharma firm, says S.Ananthanarayanan

Intellectual property rights laws and international politics have given importance to the 'gene pool' in the biological diversity that developing countries possess. At the other end of the spectrum is a population with remarkably uniform genetic make-up - again a resource with its own value.

Diversity

Natural and uncontaminated locales, like rain forests or river valleys, harbour millions of species that live in near symbiotic balance. Even within species, the genetic form is unspecialized and amorphous, and is able to resist predator species, microbes or even difficult climate and drought.

The rich collection of species and strains represent a storehouse of centuries of genetic experiments, which could scarcely be replicated in the laboratories of a pharmaceutical enterprise. This diversity, combined with the folk wisdom of tribal people, is a selection of useful genetic types out of the whole multitude – an exercise that represents generations of trial and error, which again, cannot be repeated.

NGOs and legal pundits have laboured long to safeguard the rights of indigenous people and to stave attempts like a US firm had made to patent turmeric or ***haldi***, the common Indian condiment. The genetic pool that the underdeveloped world possesses is viewed as raw material, a capital asset with which to buy the benefits of development and to catch up.

Genetic research

The other development of our times is the mastery of the genetic code and the ability to go down to the genetic level to find cures for diseases. We have found that the whole fantastic complexity of each one of us is owed to molecules of billions of atoms, the DNA, locked inside each one of our cells. Scraps of these molecules code for millions of different proteins that are the agents that bring about growth, death, genius, disease….

Now we have found ways to map the patterns in the vast tracts of our DNA and every time a specific gene, or a scrap of DNA is identified as responsible for a disease or immunity, we have ways to replace or to replicate those genes. Scientists the world over cooperated to spell out the 'human genome' or the complete structure of our genetic blueprint. But the job got done, at last, only when a private group added its substantial mite – such is the value of genetic research of and to the pharmaceutical industry!

Uniformity

But the job of identifying the genes that lead to disease is no simple task. For all our skills and the vast computation tools we have, the human genome is too complex for the common factor in different instances which code for the same ailment to be easily found out. There would be millions of common patches that are there in other instances too. And there may be several common patches, which have nothing to do with the ailment at all! Dealing with the genome of different patients of the same disease, when each one is so different, is an arduous task!

This is where a group of genetic samples that are similar becomes important. The genes of siblings, which share much of the genome, are useful. If one has the disease and the other is immune, the difference in the genes can be more readily located. And if there were hundreds or thousands of persons with strongly similar genetics, this would be valuable indeed!

Vikings and Parsis

Such uniform gene pools exist in the communities of the descendants of the Vikings, now in Iceland and in the Parsis, that remarkable community in western India. The Parsis fled religious intolerance in Persia in the 9th century and sought refuge in India. As a small community that does not allow marriage outside itself, this population in India has become strongly ***inbred*** during the last 12 centuries. The result is that certain genetic disorders have got strengthened and even fertility has been affected.

But on the positive side, the 69,000 strong Parsi community in India represents a resource of genetic uniformity. With large stretches of the genome showing low variability, there is greater assurance that the markers of disease, in persons affected, could be identified. Research in the Parsi genome could thus hasten new attacks against multitudes of disorders, to the benefit of Parsis and the world at large.

Dr Viloo Moravalla Patell, a Parsi molecular biologist in Bangalore has founded Avesthagen, a pharmaceutical company in 1998, and has set out to build a database of Parsi genetic and medical data. The Parsis keep extensive genealogical records and medical histories could be developed from clinics and hospitals. Avesthagen has tied up with bioMériux of France for diagnostic chips and with Sequenom of the US for validating markers for cancer.

In Iceland too, deCODE Genetics, a biomedical company is collecting genetic data of the descendants of the Vikings.