NEWS IN BRIEF

CAN WE PATENT A HUMAN GENE?

A contentious issue is being debated in the US Supreme Court which may have wide ranging ramifications in medicine. The judges themselves agree it is one of the most fascinating questions they have pondered. The question is deceptively simple. Can a human gene be patented?

The story begins in 1990 when Dr Marie-Claire King discovered a breast cancer gene on chromosome 17 later called the BRCA gene. A group of scientists then formed a company called Myriad Genetics and discovered risky mutations on this gene most famously the BRCA1 and BRCA2. The presence of mutations on these tumor suppressor genes increases the risk of breast cancer by 5 times and ovarian cancer by 10 -30 times. Myriad Genetics promptly filed for a patent and then developed a diagnostic test BRCA Analysis. The fallout of the patent is that anyone needing to do the test must necessarily pay thousands of dollars while the actual cost to the company is about $200.

In 2009, a lawsuit was initiated by the American Civil Liberties Union and the Public Patent Foundation on behalf of 20 plaintiffs, challenging Myriad's right to patent the BRCA1 and BRCA2 genes. Over the next few months it will be interesting to see how the Supreme Court will decide what is being touted as "the broadest possible question" (*The Hindu 20 April 2013, The New York Times 14 April 2013*).

PORTABLE DEVICE TO DETECT INFECTIONS

Scientists from Massachusetts General Hospital have developed a hand held device which can detect bacteria including tuberculosis in just a few hours. After DNA is extracted from the sample, any of the target sequence that is present is amplified using a standard procedure, then captured by polymer beads containing complementary nucleic acid sequences and labeled with magnetic nanoparticles with sequences that bind to other portions of the target DNA. A miniature NMR coil incorporated into the device — which is about the size of a standard laboratory slide — detects any TB bacterial DNA present in the sample. Tests of the device on samples from patients known to have TB and from healthy controls identified all positive samples with no false positives in less than three hours.

Another paper published in The *Nature Nanotechnology*, describes a similar system using ribosomal RNA (rRNA) — already in use as a bacterial biomarker — as a target for nanoparticle labeling. The investigators developed both a universal nucleic acid probe that detects an rRNA region common to many bacterial species and a set of probes that target sequences specific to 13 clinically important pathogens, including *Streptococcus pneumoniae*, *Escherichia coli* and methicillin-resistant *Staphylococcus aureus* (MRSA). The device was sensitive enough to detect as few as one or two bacteria in a 10 mL blood sample and to accurately estimate bacterial load. Testing the system on blood samples from patients with known infections accurately identified the particular bacterial species in less than two hours and also detected two species that had not been identified with standard culture techniques (*The Hindu 6 May 2013, http://www.sciencedaily.com 5 May 2013*).

DOES INDIA REALLY HAVE MORE MALNUTRITION THAN SUB-SAHARAN AFRICA

'Truth in numbers is an essential element in serious intellectual discourse.' It has long foxed experts why percentages of malnourished and stunted children in India outstrip those in Sub-Saharan Africa. Arvind Panagariya, Professor of Economics at the Columbia University, USA has tried to relook the question in a special article in the May issue of the Economic and Political Weekly. The contention of the paper, instead, is that the current globally uniform height- and weight-based measures of child malnutrition, which place India behind nearly every Sub-Saharan African country, are premised on invalid assumptions and therefore need correction. He compares health indices of Kerala with that of Senegal and Mauritiana. Senegal, which has 4.25 times the infant mortality rate of Kerala, almost six times Kerala's underfive mortality, and 4.3 times Kerala's maternal mortality ratio, has lower rates of stunting and underweight children. It is puzzling if you consider that female literacy rate in Kerala is 92% in sharp contrast to 29% in Senegal and 51% in Mauritiana. The same pattern repeats when India is compared to each of the 33 Sub-Saharan African countries with lower per capita incomes. Several findings and arguments show that the absence of a balanced diet alone cannot fully explain the estimates of stunted and underweight children in India. The "gradual catch-up" hypothesis that generations of good food will slowly improve overall nutrition and genetic differences both, is probably at work. But the fact that Japanese adults have remained 12 to 13 cm shorter than their Dutch counterparts despite more than 50 years of good diet implies that genetic differences are important and the use of same standards globally to identify malnutrition, is flawed. Without genetic differences, there is no empirically plausible explanation for the significantly higher levels of malnutrition and stunting in India versus Africa. He argues that it is imperative to develop country- or even region-specific norms for height and weight to have a true perspective of the complicated issue of malnutrition (*Economic and Political Weekly, 4 May 2013*).

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