J. Natn.Sci.Foundation Sri Lanka 2005 33(1): 3-4

FEATURE ARTICLE

DO YOU BELIEVE IN MIRACLES ?

ARJUNA DE ZOYSA
Department of Mathematics and Philosophy, The Open University of Sri Lanka, Nugegoda.

Do you believe in miracles? is the title of an article which appeared in the New Scientist magazine, in October last year (Vol. 184, Issue 2468). It described an 'accidental' discovery in medical science, which in their opinion parallels that of Alexander Fleming's discovery of penicillin. This discovery, subsequent developments and some questions about today's science is discussed here.

All of us began life as a bundle of stem cells. This was in our embryonic existence. Soon these stem cells grew into specialized groups of tissues which resulted in organs and limbs, forming out complex human bodies. A few of them remained as stem cells. For instance bone marrow is a rich source of adult stem cells. Stem cell research has become a hot topic in medical science research for two reasons; they can, if grown in a laboratory, form a healthy replacement for diseased tissue cells in a patient. The easiest source of stem cells however is from an embryo, such as found in an aborted foetus, thus embryos are of scientific value. This is controversial to the new political Right and became a major issue in the recently concluded U.S. presidential elections. Some of George Bush's campaigners called for a ban on all stem cell research using human embryos. There are, however, two other ways of obtaining stem cells: from adult sources rich in stem cells such as bone marrow or by what is known as therapeutic cloning. The latter is to take some diseased cells from a patient, and reverse it to its primordial state similar to a fertilized egg and then persuade it to grow back into an embryonic stage, and subsequently divide into different tissues. The resulting grown cells would be healthy and not rejected by the patient when reintroduced. Adult stem cell research however is nascent and has not progressed beyond the Petri dish in a laboratory.

Abuljadayel, an Indian - Muslim woman scientist's approach was unique, similar to the therapeutic method, but she has progressed to the stage of treating real life patients. Her initial discovery was accidental while working in a hospital in Jeddah and doing 'part time' research. She made a solution of leukemia cells and attached an antibody termed CR3/43 to bind on to these cells. The solution also had immune molecules called a complement which destroy any cells with attached CR3/43 antibodies. In one instance however, she forgot to include the complement. The leukemia cells, instead of dying, had visibly changed and looked very much like bone marrow stem cells. She repeated the experiment without the complement several times, and found that repeatedly the diseased cells were regressing into their stem cells; a retro-differentiation, which was pure biological heresy. Somehow it appeared that the specialized adult leukemia cell regressed back into its original stem cell form when a CR3/43 antibody was attached to it. Importantly, the new immune cells which grew from these stem cells in the human body were healthy. As the leukemia cells were taken from a patient and treated, the stem cells could be reinserted without rejection. Further, no embryonic source, hence no controversy. Sanjay, a young man with A-plastic anemia was marvelously cured by such a process, in a Mumbai Hospital. It is now routinely practiced by Abuljadayel and her team, on other life threatening diseases as well.

Her first experiments at Jeddah were in 1990. She tried to publish, but was rejected repeatedly. Meanwhile in 1997, Dolly the cloned sheep arrived in Edinburgh, she was produced by regressed adult cell nucleus. Still she could not publish. Meanwhile, she continued her research in India. She look a patent out in 1994 on the process and her husband raised funds by forming a company called Tri-stem. Using these funds she worked in India, and furthered her research. She now claims that she could develop any tissue type-neurons, mussels, heart etc. from embryonic type stem cells by this procedure of obtaining adult cells, diseased or healthy, regressing them back to their original stem cells and re-growing them back by using growth factors. Amazing good news, for those with diseased cells. All that has not been

tested so far is whether this approach results in permanent cures, because the cured patients are too recent. Only time will tell, but so far so good.

Finally in 2003, her work was accepted for publication in a peer reviewed journal, thirteen years since her accidental discovery. Why did it take so long, and why are other researchers not repeating her work? Why didn't her outstanding work result in a research programme in a Lakotosian sense, perhaps to surpass her or even to refute her? These are awkward questions which raise socio-political issues about today's science.

The fact that she is a woman from a country well outside the 'Centres of excellence' of today's science may have something to do with this. Dolly the Sheep, was accepted, published and repeated in many other American/European Laboratories almost immediately, at least since publication.

Abuljadayel and her husband had to use unusual sources of funds such as tapping the British stock-market. This raises questions as to how science funding reinforces orthodoxy, and constraints any radical shifts in its research programme.

Finally Abuljadayel's work by –passes the ethics controversy in stem-cell research as it does not require the use of cells, from an aborted foetus. This is a big issue in Judeo-Christian societies but should it be for other cultures? We in Sri Lanka have been playing the role of a *scientific foot soldier*, taking commands from those Centres of Science in Europe and America's. Abuljadayel's pioneering work should teach us to take control and chart out our own scientific pathways. The Indians have already begun to do so.