John Hearn Podcast

I'm John Hearn. I'm Deputy Vice-Chancellor at the University of Sydney and Professor of Physiology in the Medical School.

I'm Donald Singer, Professor of Clinical Pharmacology and Therapeutics at the Graduate Medical School, University of Warwick.

John Hearn is at the University of Warwick, as a speaker at an international symposium, the aim of which was to discuss the ways in which the new genetic and other technologies can achieve a safer, more effective approach to providing personalised medicines. This Personalised Medicines Symposium was part of the International AC 21 Research Festival, which had over 1100 delegates.

DS John as you are from the University of Sydney which was a founding member of AC 21 in 2002, would you start by explaining what this organisation represents?

JH It's a consortium and it stands for Academic Consortium 21, but actually has 25 universities around the world, committed to working together and to enhancing cultural understanding.

DS With key partners from Nagoya, Beijing and elsewhere, there's certainly strong potential to promote educational exchange and research.

JH In a time when globalisation is effecting education, being here in Warwick to consider those issues from a whole range of cultures, is a real pleasure.

DS Your talk here today concerned stem cells. Perhaps you can start by saying what it was that lead to your interest in this area of research.

JH Really it goes back to when I was an undergraduate doing simple experiments on frogs and lizards and cell growth. The old thing of the lizard's tail falling off and how that could re-grow. I spent around 20yrs studying fertility of large wild mammals and humans and specialised in embryo implantation, from where the interest came in stem cells, which at the time had not been isolated from primates, although they had from rodents in 1981. So I started our programme in about 1984 and it was confluent with the other projects we were running.

DS People talk about stem cells as if there is only one type. Can you expand on what we mean by stem cells?

JH They are really baseline cells that can develop into any tissue or organ in the body. At its simplest, they are cells that can adapt into a cell line that becomes any of the primary cell choices early in embryology. They are found in the embryo, as one might expect because its from those cells that the embryo will grow and differentiate into all the regions from brain to muscle to heart, liver etc…

DS Less well-known is the fact that adults also have stem cells available. Could you expand on the potential of adult stem cells?

JH Again I think it's been very interesting how the awareness has grown that adults must have stem cells. It must have been assumed throughout, because of course we replace our bodies every 7 years or so with renewal and regeneration. Each of our organs must therefore have cells that have the capacity to grow and develop, to repair wounds or to repair areas that are not so effective. Looking for adult stem cells is more difficult, because they are so distributed around the cells and tissues of the body. So defining them is more difficult than defining the embryonic stem cells, which we know come from a particular place in the 6 day old early embryo, the inner cell mass.

DS Could you describe some of the reasons why people are excited by the potential of stem cells?

JH Well, they're a bit of a snake oil of our time because they promise an amazing renovation of current medicine. They have the promise of replacing damaged organs, of being new treatments for really distressing diseases, like Alzheimer's, or diabetes, juvenile diabetes, mending, repair. But there's a long way between the promise and the reality at the moment and I think we need to be very realistic about where we are and what needs to be done.

DS What do you see as being some of the key risks in using stem cells for treatment?

JH Well, the gaps are really between the mental leap of what's possible if you have a cell that can divide and become the whole range of cell types, so that you could tailor those for individuals and have therapies that could prolong life, cure diseases and could deal with many of the intractable issues and diseases people suffer from today. The gap from that to where we are, which is in the early days of having isolated stem cells and now studying what the factors are that make them choose the different pathways they go on. But as yet we do not understand the regulation of that growth, or whether that growth could be controlled, so that has risks in terms of cell transplantation with unregulated growth that could become cancer, or might not do in other ways what the cells are expected to do.

DS Finally, it's always difficult looking into the future, but where do you see this field going, say in 20 years time?

JH I think in 20 years time, let's look optimistically and say that Personalised Medicine will have come along from a number of different angles. It'll be much easier to target and understand the targets for therapies in the individual, or in groups and in that situation, if we have much better data and profile on individuals, then maybe stem cells will be one of a battery of approaches, including pharmaceuticals, which allow one to deliver therapies, earlier preventing disease, rather than fire-fighting diseases later.