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Stem cells and iPS cells: Far and beyond in surgical science

Regarding embryonic stem cells (ESCs), in addition to its potential in cell regeneration, is still much debate as well as the rejection of the use of these types of stem cells related the issue of ethics and morals on how to create it (read: sacrifice the embryo). Nuclear transfer is the only way to create ESCs from adult cells (adult stem cells, ASCs). This technique is done by inserting the adult cell nucleus into the egg cell (ovum) whose nuclei had been removed previously. The egg will then reprogram adult cell nuclei into ESCs. This technique is referred to as therapeutic cloning if done in humans, but no one has ever managed to successfully do it. We have recently been amazed by the discovery of RNA interference (RNAi), which unveils new sheets in biomolecular science and its application in surgical sciences, particularly in the modification of the treatment of incurable. Presumably, we must again be amazed at the latest findings in the biomolecular field transformation of skin cells into cells that resemble and function as stem cells, induced pluripotent stem-cells, known as iPS cells. The discovery of iPS was first introduced by Professor Yamanaka of Kyoto Univ., Japan in 2006. Only by including only four types of genes that can reprogram mature cell (read: adult skin cells) to ESCs. iPS cells are very like the ECS; well as morphology, growth ability, cell surface antigens, gene expression, epigenetic status typical and its telomerase activity. If this technique can be applied to humans, it will be easier to perform compared to the nuclear transfer technique. Furthermore, this technique is inexpensive and does not invite controversy since it does not sacrifice the egg. Long debate about ethical and moral issues about how to create ESCs will fade with the technique of making iPSs. As the reward, this iPS received a Nobel prize in medicine, six years since the invention, which is the fastest Nobel prize in medicine given since it published.

Biography

Ahmad Faried currently works as a staff at Department of Neurosurgery and Stem Cell Working Group, Faculty of Medicine, Universitas Padjadjaran-Dr. Hasan Sadikin Hospital, Bandung, West Java, Indonesia. He has completed his PhD in Gunma University, Medicine, Japan under supervision of Prof. Hiroyuki Kuwano and Dr. Hiroyuki Kato; received his Postdoctoral grant from JSPS at the same university and continuing his Clinical Fellow in Neurosurgery at The University of Tokyo, Japan under supervision of Prof. Nobuhito Saito. He is a Neurosurgeon with Cell Biology as his back ground. He has a great deal of interest in neuroscience research such as brain microvessel endothelia cells, placental stem cells, neural stem cells, iPSCs, cancer stem cells, neurosurgery, bio-medic engineering especially instrumentation, medical information communication and technology (medical ICT) as well as medical services using cloud computing system.

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