DRUŠTVO ZA CELIČNO IN TKIVNO INŽENIRSTVO SLOVENIJE
CELL AND TISSUE ENGINEERING SOCIETY OF SLOVENIA

'Stem Cells and Cancer'

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No less than two Nobel Prizes have now been awarded to the field of Stem Cells. The future for stem cells seems bright, although much is still to be done to make the dream a reality. Life expectancy since the 18th Century has increased rapidly, largely due to antibiotics and preventative medicine. However, the quality of life of our ageing populations in particular and indeed of children who might not normally have lived is not always as good as we would like. The concept of “Regenerative Medicine” has been made for science which allows damaged tissues and organs to be repaired. Often stem cell therapies are discussed in terms of “cure”, but, more often, what we are realistically aiming for in true regenerative medicine is to improve not only the disease or condition, but also the quality of life of the patient. This is extremely important. We also now have choices in stem cells with embryonic, Induced Pluripotent Stem Cells (IPS), Bone Marrow and Umbilical Cord Blood (UCB). UCB has been researched for over 100 years, with first reports in The Lancet in 1939 and first attempts at bone marrow transplantation with cord blood in the 1970’s. Successful cord blood transplant took place in 1988. Now over 70 diseases are treatable with cord blood and over 15 clinical trials are underway for new conditions. Bone marrow has been successfully transplanted since the 1950’s by another Nobel Prize winner, E.Donnall Thomas. Although the majority of these treatments have been “allogeneic” to treat someone else, this has been joined by a new potential, essential for regenerative medicine, to use cord blood to treat the same person: “autologous”. Our group was first in the world to identify a rare group of cells which have some similar characteristics to embryonic stem cells and to develop them into non-blood tissues such as liver, brain-related, pancreatic and others. Further, cord blood also contains interesting immune system cells, such as natural killer cells, pre-dendritic and mesenchymal stem cells, all of which are now being developed for clinical treatments. Our own work has lead to several clinical trials but our latest include the use of a child’s own cord blood for the treatment of severe neonatal hypoxia, which often leads to the symptoms known as “Cerebral Palsy”. We are additionally developing a treatment for children who have congenital bone malformations such as Cleft Palate facial bone problems, using the child’s own mesenchymal stem cells to make bone implants. Naturally stem cell banking has become an important issue surrounding this topic and raises a lot of debate. However, we must look to the future to protect the populations of our countries and be ready for treatments that are categorically coming.