

Adult & Non-Embryonic Stem Cell Research Advances and Updates for 2006

Buerger's Disease: Scientists in Korea using adult stem cell treatments showed significant improvement in the limbs of patients with Buerger's disease, where blood vessels are blocked and inflamed, eventually leading to tissue destruction and gangrene in the limb. Out of 27 patients there was a 79% positive response rate and improvement in the limbs, including the healing of previously non-healing ulcers. *According to Stem Cells Express, January 26, 2006.*

Bladder Disease: Doctors at Wake Forest constructed new bladders for seven patients with bladder disease, using the patients' own progenitor cells grown on an artificial framework in the laboratory. When implanted back into the patients, the tissue-engineered bladders appeared to function normally and improved the patients' conditions. "This suggests that tissue engineering may one day be a solution to the shortage of donor organs in this country for those needing transplants," said Dr. Anthony Atala, the lead researcher. *According to The Lancet, April 4, 2006; reported by the AP, April 4, 2006.*

Lupus: Adult stem cell transplant offers promise for severe lupus – Dr. Richard Burt of Northwestern Memorial Hospital is pioneering new research that uses a patient's own adult stem cells to treat extremely severe cases of lupus and other autoimmune diseases such as multiple sclerosis and rheumatoid arthritis. In a recent study of 50 patients with lupus, the treatment with the patients' adult stem cells resulted in stabilizing of the disease or even improvement of previous organ damage, and greatly increased survival of patients. "We bring the patient in, and we give them chemo to destroy their immune system," Dr. Burt said. "And then right after the chemotherapy, we infuse the stem cells to make a brand-new immune system." *Reported on ABC News, April 11, 2006; Journal of the American Medical Assn, February 1, 2006.*

Heart: Adult stem cells may inhibit remodeling and make the heart pump better and more efficiently – Researchers in Pittsburgh have shown that adding a patient's adult stem cells along with bypass surgery can give significant improvement for those with chronic heart failure. Ten patients treated with their own bone marrow adult stem cells improved well beyond patients who had only standard bypass surgery. In addition, scientist in Arkansas and Boston administered the protein G-CSF to advance heart failure patients, to activate the patient's bone marrow adult stem cells, and found significant improvement nine

months after the treatment. *According to the Journal of Thoracic and Cardiovascular Surgery, December 2005; American Journal of Cardiology, March 2006.*

Stroke: Mobilizing adult stem cells help stroke patients – Researchers in Taiwan have shown that mobilizing a stroke patient’s bone marrow adult stem cells can improve recovery. Seven stroke patients were given injections of a protein – G-CSF – that encourages bone marrow stem cells to leave the marrow and enter the bloodstream. From there, they hone in on damaged brain tissue and stimulate repair. The seven patients showed significantly greater improvement after stroke than patients receiving standard care. *According to the Canadian Medical Association Journal, March 3, 2006.*

Liver: British doctors reported treatment of five patients with liver failure with the patients’ own adult stem cells. Four of the five patients showed improvements, and two patients regained near normal liver function. The authors noted: “Liver transplantation is the only current therapeutic modality for the liver failure but it is available to only a small portion of patients due to the shortage of organ donors. Adult stem cell therapy could solve the problem of degeneration disorders, including liver disease, in which organ transplantation is inappropriate or there is a shortage of organ donors.” *According to Stem Cells Express, March 30, 2006.*

Nerve Regeneration: Previously Unknown Molecule Called Oncomodulin Spurs Regeneration in Optic Nerve. Researchers have discovered a naturally occurring growth factor that stimulates regeneration of injured axons in the CNS. ‘Under normal conditions, most axons do not re-grow after injury. Benowitz, the study’s senior investigator, believes Oncomodulin could someday prove useful in reversing optic nerve damage caused by glaucoma, tumors, and traumatic injury. In addition, the lab has shown that Oncomodulin works on at least one other type of nerve cell, and now plans to test whether it also works on the types of brain cells that would be relevant to treating conditions like stroke and spinal cord injury. *Ascribe Newswire, May 14, 2006.*

Genetic Metabolic Disease: Cord Blood Transplantation Study Documents Help for Children with Genetic Metabolic Disease. The published results of a long-term study of treatment with cord blood adult stem cells shows excellent survival of infants and young children that would normally die of neurological and other organ damage due to genetic metabolic diseases such as adrenoleukodystrophy (Lorenzo’s Oil disease), Krabbe disease, and Hurler syndrome, and other

lysosomal and peroxisomal storage disease. *Martin et al., Biology of Blood and Marrow Transplantation, 2006*

Respiratory Conditions: Adult Stem Cells Differentiated into Lung Cells; Could be Used to Treat Emphysema and Pulmonary Fibrosis. Researchers at the University of Minnesota...differentiated [a cord blood adult stem cell] into lung cells responsible for making surfactant. This is the first time human stem cells—from and source—have differentiated into type II alveolar cells. ‘Turning cord blood stem cell into an alveolar cell represents a significant milestone in stem cell research,’ said David McKenna, M.D., assistant professor of Lab Medicine and Pathology and assistant medical director of the Clinical Cell Therapy Lab at the University of Minnesota. ‘This Milestone could be used to help develop a human lung model for research purposes and/pr eventually therapeutic application to treat a number of respiratory conditions – such as emphysema and pulmonary fibrosis, as well as pulmonary injury due to therapy-related causes. *Pharmalive.com Businesswire, May 2006.*