Scientists discover new source for harvesting stem cells

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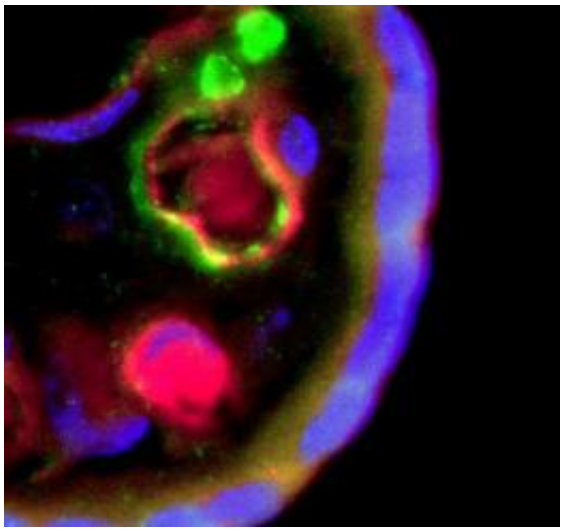

This is a microphotograph of chorionic villus of human term placenta immunostained for CD34 (Marker of endothelial and hematopietic stem cells, red), CD31 (marker of endothelial cell, green) and nuclei (DAPI, blue). Non-endothelial CD34-positive cell is clearly observed in tissue of placenta. Credit: Society for Experimental Biology and Medicine

A groundbreaking study conducted by Children's Hospital & Research Center Oakland is the first to reveal a new avenue for harvesting stem cells from a woman's placenta, or more specifically the discarded placentas of healthy newborns. The study also finds there are far more stem cells in placentas than in umbilical cord blood, and they can be safely extracted for transplantation. Furthermore, it is highly likely that placental stem cells, like umbilical cord blood and bone marrow stem cells, can be used to cure chronic blood-related disorders such as sickle cell disease, thalassemia, and leukemia.

The study, led by Children's Hospital & Research Center Oakland scientists Frans Kuypers, PhD, and Vladimir Serikov, PhD, will be the feature story in the July 2009 issue of *Experimental Biology and Medicine*. The doctors and their team made the discoveries by harvesting term placentas from healthy women undergoing elective Cesarean sections. "Yes, the stem cells are there; yes, they are viable; and yes, we can get them out," declared Dr. Kuypers.

Stem cells are essentially blank cells that can be transformed into any type of cell such as a muscle cell, a brain cell, or a red blood cell. Using stem cells from umbilical cord blood, Children's Hospital Oakland physicians have cured more than 100 kids with chronic blood-related diseases through their sibling donor cord blood transplantation program, which began in 1997. However, according to the American Cancer Society, each year at least 16,000 people with serious blood- related disorders are not able to receive the bone marrow or cord blood transplant they need because they can't find a match.

Dr. Kuypers explained that even when a patient receives a cord blood transplant, there may not be enough stem cells in the umbilical cord to successfully treat their disorder. Placentas, however, contain several times more stem cells than umbilical cord blood. "The greater supply of stem cells in placentas will likely increase the chance that an HLA (human leukocyte antigen) matched unit of stem cells engrafts, making stem cell transplants available to more people. The more stem cells, the bigger the chance of success," said Dr. Kuypers.

Drs. Kuypers and Serikov have also developed a patent-pending method that will allow placental stem cells to be safely harvested and made accessible for transplantation. The process involves freezing placentas in a way that allows them to later be defrosted and suffused with a compound that enables the extraction of viable stem cells. The method will make it possible for companies to gather, ship and store placentas in a central location. "We're looking for a partnership with

industry to get placenta-derived stem cells in large quantities to the clinic," said Dr. Kuypers. He adds that much more research and grant funding are needed to explore the maximum potential of this latest discovery. He remains encouraged. "Someday, we will be able to save a lot more kids and adults from these horrific blood disorders."

Source: Children's Hospital & Research Center at Oakland (news : web)