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Bruce K Young

New York University School of Medicine, USA

Human amniotic fluid stem cells for regenerative medicine

Stem cells are undifferentiated cells with the capacity for differentiation. Amniotic fluid cells have emerged only recently as a possible source of stem cells for clinical purposes. There are no ethical or sampling constraints for the use of amniocentesis as a standard clinical procedure for obtaining an abundant supply of amniotic fluid cells. Amniotic fluid cells of human origin proliferate rapidly and are multipotent with the potential for expansion *in vitro* to multiple cell lines. Tissue engineering technologies that use amniotic fluid cells are being explored. Amniotic fluid cells may be of clinical benefit for fetal therapies, degenerative disease, and regenerative medicine applications. They may be a useful resource for evaluating pharmacological effects on human cells. We present our studies using flow cytometry and cell culture as well as genomic data to characterize human amniotic fluid-derived stem cells. In addition, we offer a review of the evolution of human amniotic fluid cells as a possible modality for therapeutic use.

Biography

Bruce K Young is internationally known as a leader and innovator in Obstetrics and Gynecology. He introduced prenatal genetic diagnosis and performed the first amniocenteses at the NYU Medical Center, founding the Prenatal Diagnosis program in 1972 and the Division of Maternal-Fetal Medicine in 1975. Other innovations followed, including fetal heart rate monitoring, fetal scalp blood pH, umbilical artery blood measurements in labor, intravenous infusion of magnesium sulfate for pre-eclampsia instead of an intramuscular injection, the world's first Obstetrical Intensive Care Unit, and a technique for fetoscopic closure of preterm ruptured membranes. He has edited 2 books on Maternal-Fetal Medicine and written 2 books for the general reader. He directed the Division of Maternal-Fetal Medicine until 2005 and presently directs the NYU Pregnancy Loss Prevention Center. He is a member of the Kimmel Stem Cell Center at NYU Medical Center. His current research focuses on human amniotic fluid-derived stem cells.

bruce.young@nyumc.org

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