Ex Utero and in Utero Stem Cell Therapy: Clinical Applications and Trials

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Stem cell therapy is limited by cell source and pharmaceutical regulatory. Embryonic and fetal stem cells require embryos and fetuses impose major ethical issues, while adult stem cells are rare difficult to isolate and acquire sufficient cells for clinical use. Stem cell expansion and manipulations require additional clinical grade laboratory facilities and good manufactory practice certification. To allow easy access, sufficient cell source, minimal manipulations and nominal certification, we had successfully mobilized maternal bone marrow cells to peripheral blood, separated all the white cells by apheresis and then isolated stem cells by clinical graded Prodigy for in-utero stem cell therapy in fetuses confirmed with α-thalassemia major, bart's hydrops fetalis. We also used FDA approved close separation system to isolate mononuclear cells from umbilical cord blood and conducted ex-utero stem cell therapy for hypoxic ischemic encephalopathy and neuroblastoma. In this talk, I will introduce the rationale and methodology and share our experience, clinical and some scientific data of perinatal stem cell therapy trials.

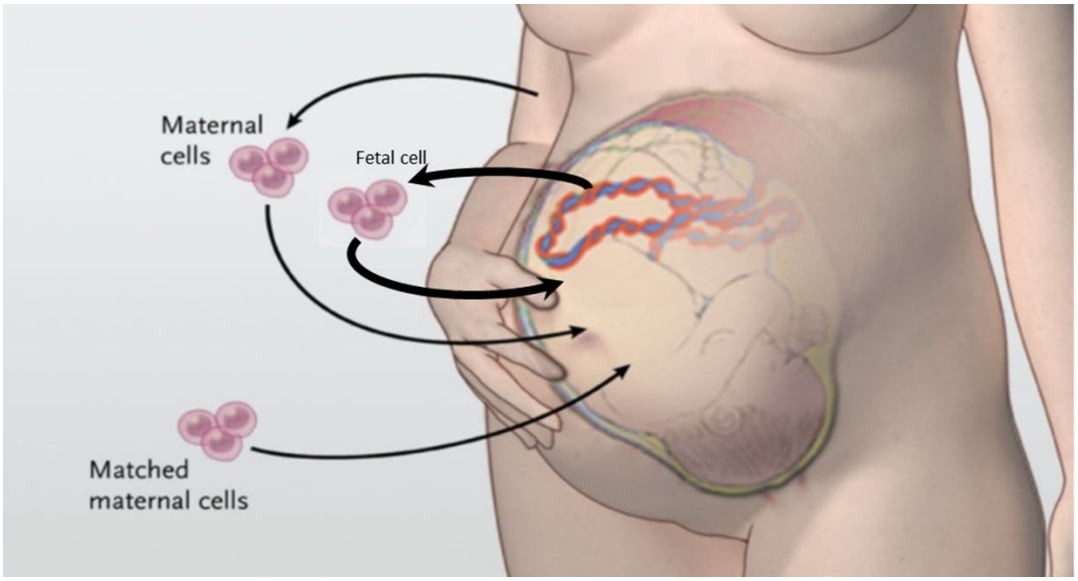

Figure. Cell sources for perinatal stem cell therapy.