

ASC's ARE PLURIPOTENT

Stem cells derived from amniotic fluid: new potentials in regenerative medicine.

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Abstract

Human amniotic fluid cells have been used as a diagnostic tool for the prenatal diagnosis of fetal genetic anomalies for more than 50 years. Evidence provided in the last 5 years, however, suggests that they can also harbour a therapeutic potential for human diseases, as different populations of fetal-derived stem cells have been isolated from amniotic fluid. Mesenchymal stem cells were the first to be described, which possess the higher proliferation and differentiation plasticity of adult mesenchymal stem cells and are able to differentiate towards mesodermal lineages. Amniotic fluid stem cells have more recently been isolated. They represent a novel class of pluripotent stem cells with intermediate characteristics between embryonic and adult stem cells, as they are able to differentiate into lineages representative of all three germ layers but do not form tumours when injected in vivo. These characteristics, together with the absence of ethical issues concerning their employment, suggest that stem cells present in the amniotic fluid might be promising candidates for tissue engineering and stem cell therapy of several human disorders.