Isolation and Characterization of Umbilical Cord Stem Cells Derived from Rabbit Umbilical Cords

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**Background:** We have identified the most appropriate method of isolating rabbit umbilical cord stem cells (rUCSCs).

**Methods:** Three explant culture methods were compared with regards to time for primary culture, cell number, and cell morphology. The explant culture methods used are: 1) whole umbilical cords allow to dry and stick on to the tissue culture plates and later supplemented with rabbit umbilical cell culture media; 2) umbilical cord cut into smaller pieces and added directly to the culture plates with cell culture media; 3) cut smaller umbilical cord pieces allowed to dry and stick to the culture plate and later supplemented with cell culture media.

**Results:** rUCSCs isolated using smaller pieces of umbilical cords and dried on the tissue culture plates explant method led to shorter primary culture time, higher numbers of isolated cells, and higher proliferation rates compared with other isolation methods. Second we determined if these harvested umbilical cord stem cells had the ability to differentiate into cartilage *in-vitro*. In this study, we found that a large quantity of rUCSCs cells can be obtained from the umbilical cords of rabbits. We also found that that rabbit umbilical cord stem cells are able to differentiate into cartilage *in-vitro*.

**Conclusions:** Given the distinct advantages of umbilical cords, such as accessibility, abundance of cells obtained and their ability to differentiate into cartilage, these could potentially be used in a clinical setting to regenerate lost cartilage relieving the underlying problems found in Osteoarthritis.

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**Key words:**