

UNIVERSITI TEKNOLOGI MARA

**EXPRESSION OF PLURIPOTENCY MARKERS ON
RAT C-KIT POSITIVE AMNIOTIC FLUID CELLS FROM
FULL-TERM PREGNANCY**

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ABSTRACT

The discovery of amniotic fluid stem (AFS) cells initiated a new and very promising field in stem cell research. AFS cells from full-term pregnancy serves a better alternative to AFS cells of mid-term gestation as it promises more safety to the patients, less adverse effect and more accessible. Previous study reported that the c-kit positive AF cells demonstrate the expression of pluripotency markers, Oct-4. Although the cells have been successfully expanded in a long period of time, it is still unknown whether the cells maintain its pluripotency in high passage number of cells, *in vitro*. Here we aim to characterize the expression of these markers on full term c-kit positive amniotic fluid (AF) cells at high passage number at molecular level, using Reverse Transcription PCR (RT-PCR). Upon culturing, the c-kit positive cells exhibit heterogenous population of cells, with fibroblastic to epithelial-like morphology. The RNA of the cells were then extracted and subjected to RT-PCR. RT-PCR result demonstrates the absence of Oct-4 and Sox-2 expression in the c-kit positive cells. These data suggest that the passage number influence the potency of the c-kit positive cells. The study also suggests that the c-kit positive cells are able to survive in passage 70 (P 70) and beyond.

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CHAPTER 1

INTRODUCTION

Stem cell research is an attractive field that brings hope to cure numerous of diseases. Recently, researchers are focusing on alternative source of stem cells that has no ethical or controversial issues, such as amniotic fluid (AF). AF is a fluid contained in the amniotic sac and act as a medium that creates space for the fetus to move and grow (Underwood *et al.*, 2005). Amniotic fluid cells obtained through amniocentesis are widely used in routine prenatal diagnosis (Pappa & Anagnou, 2009).

Amniotic fluid (AF) consists of heterogenous cell population displaying various types of cells including stem cells (Da Sacco *et al.*, 2010). Recently, researchers had discovered that these amniotic fluids also contains therapeutic cell which is the amniotic fluid stem (AFS) cells (Prusa *et al.*, 2004). Today, amniotic fluid stem (AFS) cells are widely accepted as a new powerful tool for basic research as well as for the establishment of new stem-cell-based therapy concepts. The ability of stem cells to self-renew and give rise to subsequent generations with variable degrees of differentiation capacities offers significant potential for generation of tissues that can potentially replace diseased and damaged areas in the body, with minimal risk of rejection and side effects (Prusa & Hengstschlager, 2002).