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EXPRESSION OF OCT-4 IN C-KIT POSITIVE FULL TERM AMNIOTIC FLUID CELLS BY REAL-TIME PCR IN EXTENDED CULTURE

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ABSTRACT

The discovery of amniotic fluid stem (AFS) cells has initiated a new and very promising field in stem cell research. The unique characteristic of AFS cells can be seen from their differentiation potential where these cells are broadly multipotent to pluripotent, giving them a great potential in drug discovery. AFS cells that have been derived from full term pregnancy serves a better alternative compared to the midterm gestation as it is more accessible, less adverse effects and safer to the patients involved. Previous studies have reported that full-term AF c-kit positive cells are able to express the pluripotency marker, Oct-4. This study aims to investigate the stability of the full-term AF c-kit positive cells by examining the expression of Oct-4 in extended culture by qRT-PCR. The cells were first attached in a gelatin coated flask, with ES medium supplemented with LIF. Then, the RNA was extracted and synthesized into cDNA. The result demonstrated that the expression of Oct-4 in AF c-kit positive cells in passage 70 is weak. However, further troubleshooting needs to be carried out to validate the result. Based on the result, overall, the stability of the cells could be compromised in extended culture although further study needs to be carried out to validate the result. Therefore, low passage number is more recommended for studies using full-term AF c-kit positive cells.

CHAPTER ONE

INTRODUCTION

1.1 Background

There have been great attention and interest regarding the subject of stem cells (SCs) in the scientific community. The knowledge and understanding on the aspects of SCs also have been increased comprehensively, with the hope that SCs can give benefits in the medical field, especially to cure numerous of diseases. This is expected due to the great potential use of the SCs, based on their unique characteristics, self renewal and differentiation potential. SCs has the capability to differentiate into cells of multiple lineages, making it as a valuable alternative source for drug discovery cell-based therapies (Grskovic, Javaherian, Strulovici, & Daley, 2011). There are two types of SCs that can be distinguished based on the origin of tissue sources. The first one is embryonic stem cells (ESCs) that have been derived from pre-implantation embryos. The other type of SC is the adult stem cells that can be found in many and variety types of tissues (Wert & Mummery, 2003). SCs can also be differentiated