

Haematology



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_____ ID: _____ ID: _____ Haematology Cell haematology has adopted the language of 'proliferation' to refer to those possible ways, that suggest cells multiplication in organisms, and that in a rapid manner. In particular, the language of proliferation is central to the study of leukaemia or cancers. The connection between cell proliferation and cancer is a harmless, natural process and it is essential to life. Mutimer (2000) states that proliferation is managed by a series of biological control mechanisms that regulate the growth of cells in such a manner that they reproduce what is coded into their genetic material. Once these mechanisms fail and the cells reproduce without control, cancers are the resultant to a deadly organism as a whole. (Mutimer, 2000, p. 59) Proliferation can be understood by two characteristics 1) Cell growth and 2) Cell division. Both occur as a result by increment in number of cells.

Proliferation, as appropriated within the study of cancer, refers to an autonomous process of growth and spread, internally driven but externally controlled. Danger arises when the controls fail and the natural proliferation of cells produces excessive reproduction.

Cell 'differentiation' according to Cancerpage. com is defined as " a process during which

Young, immature (unspecialised) cells take on individual characteristics and reach their mature (specialised) form and function". (Cancer2006) Dr.

Anderson describes that " correct differentiation of embryonic cells is essential in order to structure the cells associated with the complex environment of embryo. Failing to replicate the full range of normal developmental signals is likely to have disastrous consequences. Providing some but not all of the factors required for embryonic stem cell

differentiation could readily generate cells that appear to be normal (based on the limited knowledge scientists have of what constitutes a "normal cell type") but are in fact quite abnormal". (Condic, 2002)

Maureen (2002) in her article further talks about differentiation in terms of differentiated cells that transplant incompletely while running the serious risk of introducing cells with abnormal properties into patients. According to Maureen (2002) "This is of particular concern in light of the enormous tumour-forming potential of embryonic stem cells. If only one out of a million transplanted cells somehow fail to receive the correct signals for differentiation, patients could be given a small number of fully undifferentiated embryonic stem cells as part of a therapeutic treatment. Even in very small numbers, embryonic stem cells produce teratomas, rapid growing and frequently lethal tumours. No currently available level of quality control would be sufficient to guarantee that we could prevent this very real and horrific possibility". (Condic, 2002)

The term 'Self renewal' refers to those embryonic cells that make several identical copies of themselves. "Both differentiation and self-renewal are guided by an elaborately regulated genetic program, which transforms embryonic stem cells into the many different cell types that make up the body. Adult stem cells share the hallmark trait of self renewal, but are relatively rare: in bone marrow, the source of haematopoietic, or blood-forming, only an estimated one in 10, 000-15, 000 cells is an adult haematopoietic stem cell (HSC)". (PLOS, 2004)

Schroeder et al while discussing about the control factors states that these processes are influenced by control factors such as 'progenitor cells' in vast quantity as "these cells possess the tendency to retain a high capacity for

self-renewal and differentiation processes". (Schroeder et al, 2003)

References & Bibliography

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