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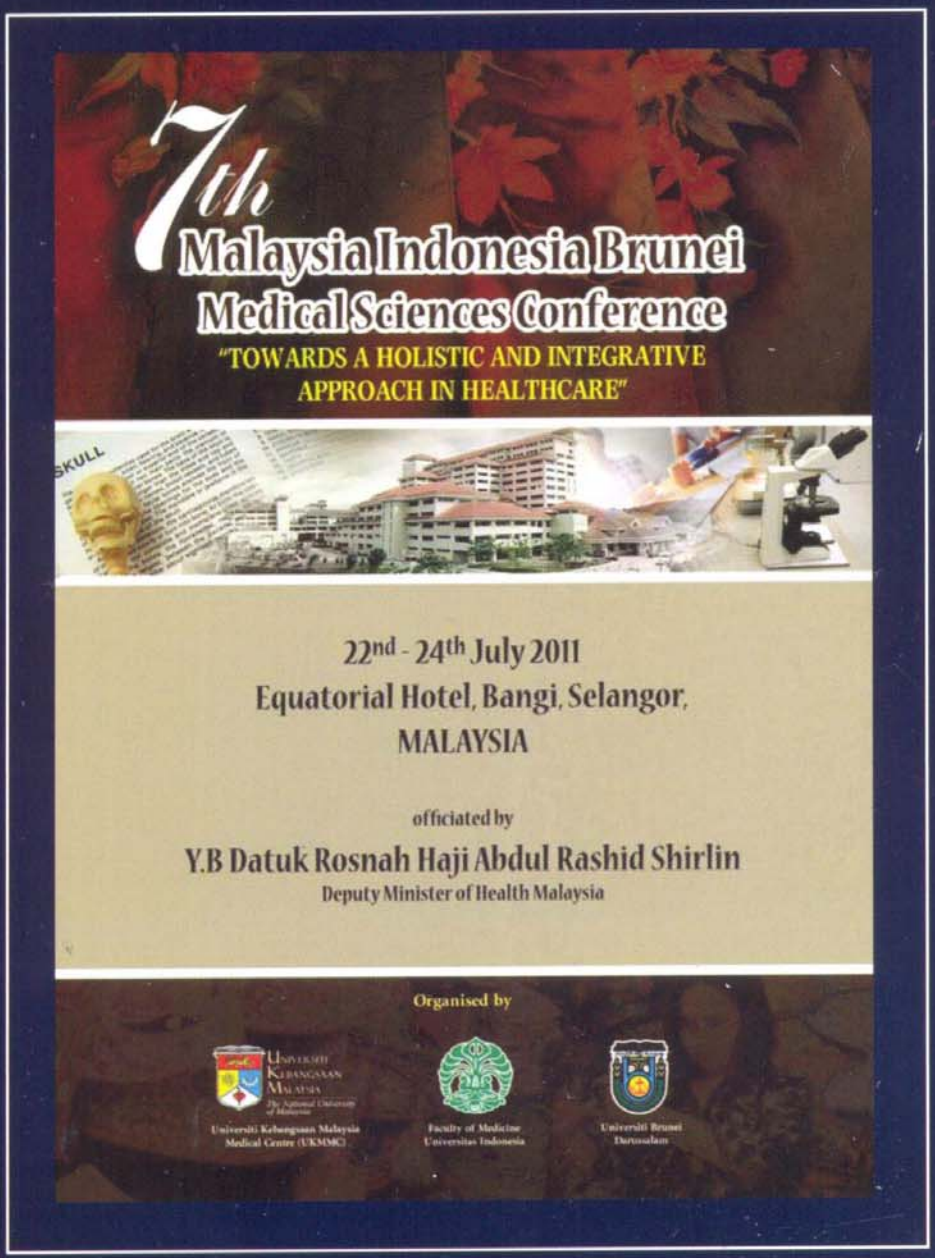

ESTABLISHMENT OF *MACACA FASCICULARIS* BONE MARROW STEM CELLS CULTURE FOR FUTURE USE AS A PROOF OF CONCEPT IN BIG ANIMAL MODEL

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Background:
Tissue engineering technique using bone marrow stem cells (BMSCs) requires the establishment of culture condition that permits the rapid expansion of these cells ex vivo while retaining their potential to differentiate into specific tissues. Fetal bovine serum (FBS) is commonly used as a source of growth factors for cell number expansion. Culturing the *Macaca fascicularis* bone marrow stem cells resulted in low proliferation and long period of incubation using FBS. Therefore, there was failure in obtaining enough number of cells. Here we report the establishment of culturing the *Macaca fascicularis* bone marrow stem cells using the FBS and combination with autologous serum.

Materials and Methods:
Bone marrow stem cells were separated using Ficol-paque, a density gradient centrifugation and cells cultured in MEM alpha medium, 10% FBS with the addition of 5% autologous serum. The osteogenic inductions agents were 0.2mM acid ascorbic 2-phosphate, ten milimolar β-glycerolphosphate and 10^{-8} molar dexamethasone.

Results:
The establishment of culturing technique for the Macaca fascicularis bone marrow stem cells using FBS combines with autologous serum showed higher growth kinetic and shorter population doubling time compared to the culture without the autologous serum. The cells culture using the combination of serum has 1.4% higher growth rate compared to 0.4% of the cells using FBS alone. The population doubling time takes only four days compared to 33 days culture.

Conclusion:
Thus, the combination of FBS and autologous serum permits faster cell growth and this will be able to provide enough number of cells for tissue engineering.

Keywords:
Macaca fascicularis, bone marrow stem cells, serum, autologous, tissue engineering.