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DIFFERENTIATION OF MONOCYTIC LINEAGE CELLS FROM A DISEASE-SPECIFIC IPSC

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SUMMARY

Acute myeloid leukemia (AML-M5) commonly afflicts children below 2 years old. We have successfully generated the AML-M5 –specific IPSC line and this disease specific IPSC line could serve as platform to study AML-M5 at stem cell level. Here, we would like to explore the feasibility to differentiate the AML-M5-specific IPSC into monocyte lineage cells (e.g. premonoblast, monoblast, promonocyte, monocyte and macrophage) using the haematopoietic colony forming unit assay follow by direct monocyte/ macrophage differentiation assay. Differentiated monocyte lineage cells were characterised using morphological analysis and 6-colour immunophoenotyping flow cytometry. Monocyte lineage cells derived from BGOV-1 embryonic stem cells, non-cancerous haematopoietic stem cell (HSC) and Thp-1 cells (parental cell of AML-M5 iPSC) were included for comparative analysis. We have successfully generated monocytic lineage cells from AML-M5-specific IPSC as well as the controls (e.g. non-cancerous haematopoietic stem cells). Regardless of their origins, the monocytic lineage cells showed similar morphological characteristics. Varying surface marker expressions were noted in monocytic lineage cells differentiated from AML-M5-IPSC as compare to the controls. Outcome of the study suggests that the AML-M5-IPSC has attained pluripotency and is able to differentiate into monocytic lineage cells of different maturation stages. This allows investigation of clonal evolution in AML-M5 starting from the stem cell level.