A potential source for human insulin replacement therapy: 3 days induction protocol of insulin-producing cells derived human bone marrow mononuclear cells

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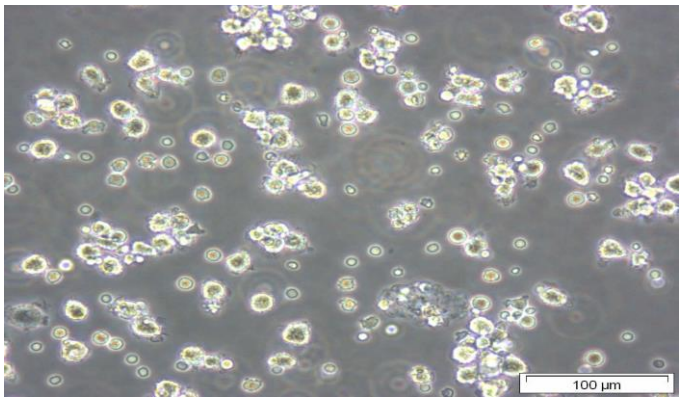
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Diabetes is an endocrine disease and it is emerging at alarming rates around the globe and the curative treatment is still undergoing for diabetic patients to date. The major hurdle to make a suitable resource for human replacement therapy is difficulty to make an optimum protocol that can be transplanted into human. The present study described the 3 days modified protocol for generation of insulin producing cells (IPCs) from h-BM MNCs aspirate as a candidate cells for human insulin replacement therapy.

The human mononuclear cells were isolated from BM aspirations. The cells were induced into IPCs using serum-free DMEM/F12 medium containing specific growth factors for 3 days. The morphology of IPCs was confirmed by microscopy analysis using dithizone staining method, following expression of Pdx1 gene by PCR analysis. The secretion of Insulin was further analyzed by ELISA. The result of study revealed that IPC-derived human mononuclear cells from BM were confirmed and showed Crimson-like appearance. Following, the expression of Pdx-1 gene at Day 1, 2 and 3 of induction. Furthermore, the Pdx-1 gene was able to secrete Insulin into culture medium. These results demonstrated the differentiation of human MNCs-derived BM cells into IPC using a 3 days modified protocol. The IPC-derived human BM MNCs will be transplanted in Sprague Dawley induced streptozotocin(STZ) Rat for further investigation of its functional ability.



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4 Sun, Y, Chen, Li, Hou XG. et al 2007. Differentiation of bone marrow-derived mesenchymal stem cells from diabetic patients into insulin-producing cells invitro. *Chinese Medical Journal* 120(9):771-776.

Biography:

Dr Sayid Ridho received his medical degree from the Syiah Kuala University and Internal Medicine specialist from the University of Indonesia, Jakarta, Indonesia. He is a Senior Lecturer at Faculty of Medicine, UIN SYAHID, Jakarta, Indonesia. Now he is also on duty as service director at Hajj hospital, Jakarta..

He is actively involved in basic research, with particular niche focus on mesenchymal stem cell and other stem cell therapy in diabetic. To intensify efforts of this focusing therapy, he had undergone numerous training programs in Canada, Jakarta and Malaysia. He has several publications, including as invited speakers for diabetic and non-diabetic topics. He had undergone more than two hundred scientific symposiums and has several patents' right. In 2009, his basic research was published at Monaco, Monte Carlo. In September, 2014, several of his basic researches also were published at international conference/congress in Indonesia and Hong Kong. Other paper was received and published too in 2016 at internal medicine world congress in Bali, Indonesia, 2018 and 2019 at ICHLAS and IHEX Jakarta, Indonesia. Dr Sayid Ridho is a fellow of

Indonesian Medical Association, Indonesian Society of Internal Medicine and Indonesian Association of Stem Cell. He has a fellowship of internal medicine in 2015 by PAPDI.

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