6th MTERMS 2016

Malaysian Tissue Engineering and Regenerative Medicine Scientific Meeting

in conjunction with

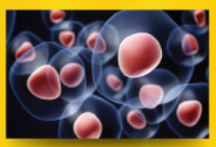
2nd Malaysian Stem Cell Meeting

"Ensuring sustainability through innovative regenerative technologies"

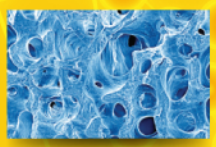
17th - 18th November 2016

The Light Hotel
Seberang Jaya, Penang

Topics



- Reprogramming and pluripotency
- Stem Cell and Cancer



- Biomaterials and Tissue Regeneration
- Transplantation and immunomodulation

- 3D Bioprinting and tissue engineering

- Cell and Gene Therapy
- Imaging and Pre-Clinical Model

Organised by

Institut Perubatan & Pergigian Termaju (IPPT), USM and
Tissue Engineering & Regenerative Medicine Society of Malaysia (TESMA)

Co-organised by

Malaysian Society for Stem Cell Research and Therapy (MSCRT)

P-BTR 3

In vitro and *in vivo* gene expression studies of cartilage-like tissue engineered construct using a combination of transiently transfected human osteoarthritic chondrocytes and tissue engineering technique

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Purpose: To evaluate the formation of cartilage-like tissue engineered constructs (TECs) using human osteoarthritic chondrocytes overexpressed with SOX9 gene seeded on poly(lactic-co-glycolic acid) (PLGA) with and without fibrin scaffolds through cartilaginous genes expression analysis.

Methods: Upon approval by the IREC18; NMRR-12-1383-14531 and IIUM/IACUC Approval/2015/[5][22], six cartilage samples were obtained from consented patients after joint replacement surgery. The cells were isolated, cultured and transfected with pcDNA3-SOX9 using Lipofectamine 2000™. Prefabricated disc-shaped porous PLGA with and without fibrin were used as scaffolds. The 'cells-scaffolds' TECs were formed and cultured for 3-week and implanted subcutaneously at the dorsum of athymic mice for 4-week. Collagens I, II, IX, X, XI, SOX9 and aggrecan expression were evaluated using a qualitative two-step reverse-transcriptase PCR. GAPDH and β-actin genes were used as internal controls.

Results: Presence of cartilaginous markers can be detected in all TECs with various expression intensity. Collagen II, the cartilage-specific marker was down-regulated in vitro but re-expressed in vivo. Collagen I, X, SOX9 and aggrecan were steadily expressed in all TECs. Although collagen IX and XI are closely associated with collagen II, their expressions were almost untraceable except for few cases. Presence of GAPDH and β-actin genes indicated the reliability of the analysis.

Conclusion: Cartilage-like TECs have been successfully formed based on genes expression analysis.