



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"*

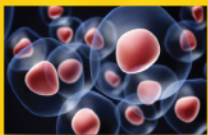


17th - 18th
November 2016

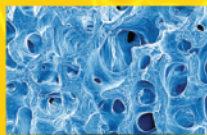


The Light Hotel
Seberang Jaya, Penang

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)

O-GRP 3

Effects of SRY (Sex Determining Region Y)-Box 9 (SOX9) and Telomerase Reverse Transcriptase (TERT) genes transfection in chondrocytes seeded on three-dimensional scaffolds: gross observation and cell proliferation assay

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Purpose: To evaluate the formation of *in vitro* 3D tissue constructs engineered from the SOX9 and TERT genes post-transfected chondrocytes seeded on poly(lactic-co-glycolic acid) (PLGA) based scaffolds.

Methods: With the approval of Institutional Animal Care and Use Committee (IACUC, IIUM), the post-transfected rabbits' chondrocytes were seeded on the prefabricated PLGA with and without fibrin scaffolds. The resulting constructs were cultured for three-week. This experiment setting examined the following groups: (1) non-transfected chondrocytes (control), (2) SOX9-transfected chondrocytes, (3) TERT-transfected chondrocytes and (4) SOX9/TERT-transfected chondrocytes; each seeded on PLGA and PLGA/fibrin scaffolds. All eight groups were evaluated for gross morphology and cells proliferation activity.

Results: Grossly, all constructs shrunk in size. The PLGA/fibrin constructs showed a glass-like appearance throughout the culture. The chondrocytes seeded in PLGA/fibrin number showed an increment pattern from day-1 to -21 compared to chondrocytes seeded in PLGA only. The SOX9/TERT-transfected chondrocytes seeded on PLGA/fibrin showed a steadily increased growth pattern comparable to that of control group. Both SOX9 and TERT genes may have synergistic effect in maintaining cell proliferation activity in 3D scaffolds. Overall cellular growth pattern seemed better in PLGA/fibrin than PLGA alone. Besides, PLGA/fibrin constructs exhibited a more stable macroscopic structure throughout the *in vitro* culture making it a suitable candidate for implantation purpose. Further *in vitro* study involving construct's weight, histology analysis, genes expression, biochemical assessments and *in vivo* implantation are currently underway.

Conclusion: SOX9 and TERT genes transfected chondrocytes incorporated with 3D scaffolds may facilitate the formation of good quality cartilage *in vitro*.