# NATIONAL COLLOQUIUM ON STEM CELL RESEARCH 2016

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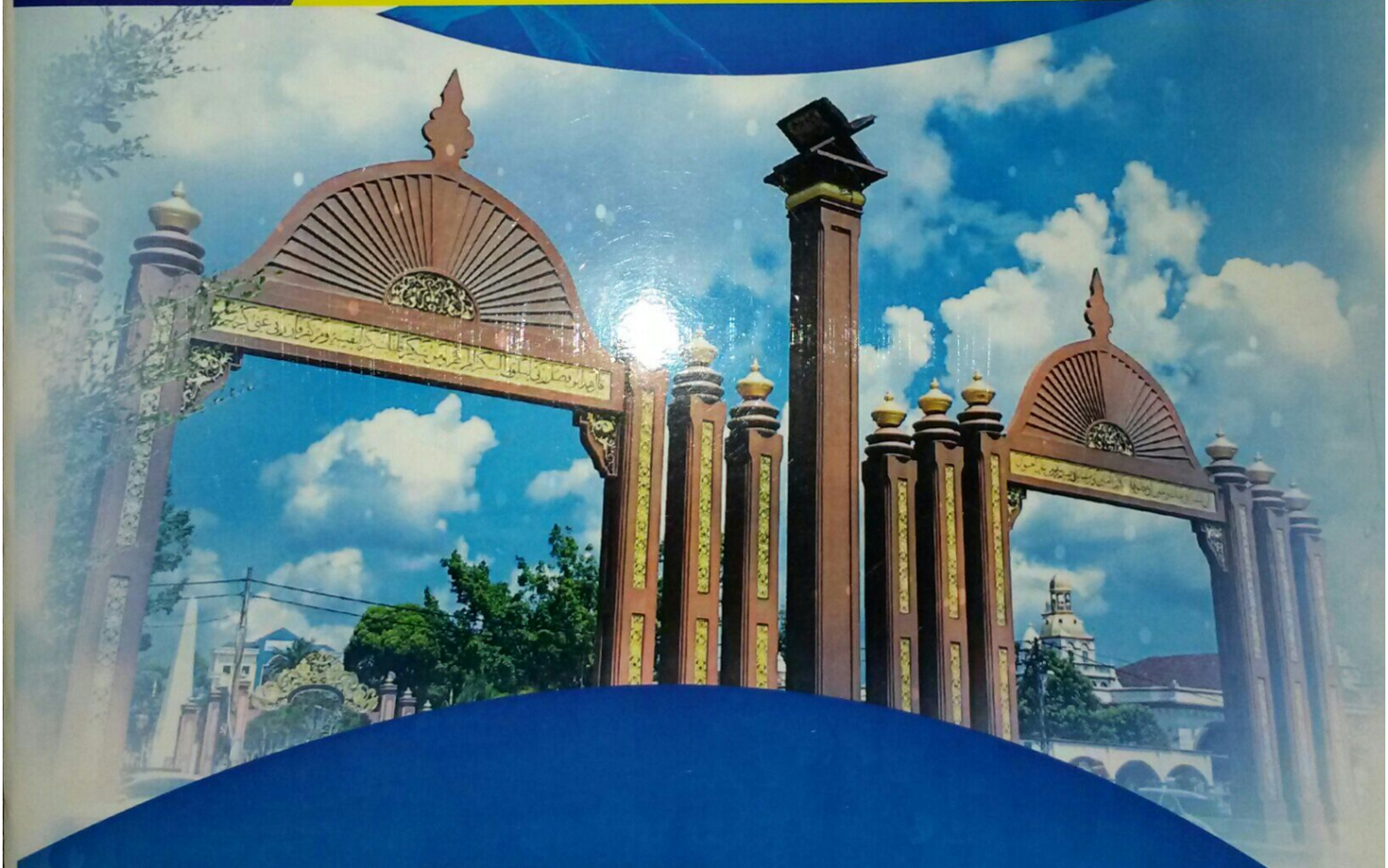
**THEME :** *THE FRONTIERS IN STEM CELL RESEARCH*



# ABSTRACT BOOK

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## Fabrication and evaluation of mechanical strength of poly(lactic-co-glycolic acid) scaffold incorporated with atelocollagen type II

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**Introduction:** Desired mechanical strength is vital for biomaterial implantation in clinical application. Poly (lactic-co-glycolic acid) (PLGA) is widely used in tissue engineering as biomaterial scaffold, due to its excellent properties of processability and degradation control. However, the reported poor mechanical strength is a huge setback. Incorporation of natural atelocollagen may improve the mechanical properties of implant biomaterial. Atelocollagen type II is a specific type of collagen lacking in telopeptide region, which contribute to low antigenic properties. The gel-like properties when incubated at body temperature may potentiate better mechanical properties of PLGA.

**Objective:** The study explores the fabrication and mechanical properties of PLGA incorporated with atelocollagen type II.

**Methods:** Porous PLGA scaffold was fabricated via solvent-casting/salt-leaching method using salt as porogen. 1-Ethyl-3-(3-dimethylaminopropyl) carbodiimide (EDC) and N-Hydroxysuccinimide (NHS) were used to crosslink both PLGA and atelocollagen. Fabrication of atelocollagen and PLGA was evaluated with Differential Scanning Calorimetry (DSC) and Attenuated Fourier Transform Infrared Spectroscopy (AT-FTIR) analysis. Instron E300 was used to measure the compression modulus of PLGA incorporated with atelocollagen (PLGA/A) and PLGA alone.

**Results:** The result of DSC analysis showed an increase of glass transition of PLGA/A by 12°C. The incorporation of atelocollagen and PLGA was confirmed by the presence of amide bond at AT-FTIR r at 1650cm$^{-1}$. The compressive strength of PLGA/A (0.897±0.06MPa) was recorded three times higher compared to PLGA alone (0.252±0.02MPa).

**Conclusion:** The finding suggests that PLGA/atelocollagen type II scaffold may serve as a potential hybrid biomaterial for tissue engineering.

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