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Nurturing Health Professionals in
Education and Research

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Abstract Book



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Keynote

NURTURING HEALTH PROFESSIONALS IN EDUCATION AND RESEARCH

Prof. Emerita Tan Sri Dr. Sharifah Hapsah Syed Hasan Shahabudin,
Professor Emerita of Medical Education and Former Vice Chancellor of Universiti
Kebangsaan Malaysia.

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YIA04

OPTIMISATION OF A PC 12 CELL-BASED *IN VITRO* STROKE MODEL FOR SCREENING POTENTIAL NEUROPROTECTIVE AGENTS

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Abstract

Aims/Objective: PC12 cells can be differentiated into a neuronal phenotype with nerve growth factor (NGF), and were widely used as an *in vitro* stroke model for screening neuroprotective agents. However, certain PC12 cell variants were reported to be non-responsive to NGF for differentiation, while optimisation studies of media and growth surface substrates are rare. This study aimed to test three commonly used PC12 variants for growth parameters and differentiation ability to set up an optimal *in vitro* stroke model.

Methods: PC12 cells (Riken cell bank), PC12 Adh and PC12 Neuroscreen-1(NS-1) cells were tested. The optimisation included cell culture medium, substrate, response to NGF-induced differentiation and duration of oxygen-glucose deprivation (OGD) by measuring cell viability and apoptosis. Validation of the *in vitro* system was done by testing with a known neuroprotectant, 8-OH-DPAT.

Results: The optimal culture media for PC12 cells (Riken) and NS-1 cells was DMEM. Collagen IV was the best substrate for PC12 cells (Riken) and NS-1 cells. PC12 Adh showed no preference for media or substrates. NS-1 cells gave the highest NGF-induced differentiation (72.7%), followed by PC12 (Riken,36%) and PC12 Adh (6.9%). NS-1 achieved optimal differentiation after three days of 150 ng/ml NGF treatment. Treatment with 8-OH-DPAT on NGF-differentiated NS-1 cells after three hours of OGD showed a significant reduction in apoptosis ($P<0.05$).

Conclusion: An *in vitro* stroke model using NS-1 cells grown in DMEM with collagen IV was optimised as substrate. Differentiated NS-1 cells subjected to 3-hour OGD had enabled the screening of neuroprotectants for treatment of stroke.