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Proteomics analysis of brain avm endothelium post radiosurgery in pursuit of targets for molecular therapies

To develop a new molecular targeted treatment for brain arteriovenous malformation (AVMs), identification of membrane proteins that are expressed on AVM endothelium is crucial. In this study we employed *in vitro* and *in vivo* biotinylation methodology to target cell membrane proteins in murine cerebral endothelial cell cultures (bEnd.3) and the rat model of AVM. Two forms of mass spectrometry were applied (iTRAQ-MS and MS/MS analysis) to identify and quantify membrane protein expression at various time point following irradiation to simulate a radio surgical treatment approach. The proteomics data revealed several differentially expressed membrane proteins between irradiated and non-irradiated cells at specific time points, e.g. PECAM-1, cadherin5, PDI, EPCR, integrins and ion channel proteins. Immunocytochemistry was used to confirm the expression of selective membrane proteins. This novel work provides potential target protein molecules for evaluation in animal models of brain AVM.

Biography

Margaret Simonian has PhD in Advanced Medicine from Macquarie University, Australia. She worked as a Research Scientist and Proteomics Consultant at UCLA and John Wayne Cancer Institute. She is a reviewer for several scientific Journals, such as J. of Proteomics, J. of Arthritis and Research Therapy and J. of European Proteomics Editorial board member for J. of Data Mining in Genomics & Proteomics and J. of Science Publications. Her research interest focuses on utilizing Proteomics and Molecular Biology in biomarker discovery and drug development of diseases such as Brain Tumors and AVMs, Cardiovascular diseases, Parkinson, Alzheimer's etc. She also lectured many undergraduate and graduate University courses.

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