OMICS Group Conferences
Accelerating Scientific Discovery

2nd International Conference and Exhibition on
Neurology & Therapeutics
June 17-19, 2013 Hilton Chicago/Northbrook, Chicago, USA

The effect of including the C2 insert of Nonmuscle Myosin II-C on Neuritogenesis

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The functional role of the C2 insert of nonmuscle myosin II-C (NM II-C) is poorly understood. Here, we report for the first time that the expression of the C2 insert-containing isoform, NM II-C1C2, is inducible in Neuro-2a cells during differentiation both at mRNA and protein levels. Immunoblot and RTPCR analysis reveal that expression of NM II-C1C2 peaks between days 3 and 6 of differentiation. Localization of NM II-C1C2 in Neuro-2a cells suggests that theC2insert-containing isoform is localized in the cytosol and along the neurites, specifically at the adherence point to substratum. Inhibition of endogenousNMII-C1C2 using siRNA decreases the neurite length by 43% compared with control cells treated with nonspecific siRNA. Time lapse image analysis reveals that neurites of C2-siRNA-treated cells have a net negative change in neurite length per minute, leading to a reduction of overall neurite length. During neuritogenesis, NM II-C1C2 can interact and colocalize with β1-integrin in neurites. Altogether, these studies indicate thatNMII-C1C2 may be involved in stabilizing neurites by maintaining their structure at adhesion sites.

Biography

Siddhartha S. Jana has completed his Ph.D. at the age of 28 years from University of Delhi, India and postdoctoral studies from National Institutes of Health, Bethesda, USA. He is the faculty of Indian Association for the Cultivation of Science, a premier research institute in India. He has published more than 10 papers in reputed journals.

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