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## Neuroprotective role of vitamin D in primary cortical neuronal cultures

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A role of vitamin D in brain development and function has been gaining support over the last decade. There are several lines of evidence that suggest vitamin D may have a neuroprotective role. The administration of vitamin D or its metabolites has been shown to reduce neurological injury and/or neurotoxicity in a variety of animal systems. Physiological concentration of calcidiol and calcitriol is between 30-50 nM in blood whereas the physiological concentration in brain is found to be 10 pM. This vitamin can cross the BBB and bind to the nuclear D3 receptors in the brain. Preliminary studies in our laboratory indicated that when isolated primary neuronal cells derived from rat's brain were pre-treated with vitamin D and then followed by induced oxidative stress with hydrogen peroxide, it resulted in greater neuroprotection by upregulating the gene expression of glutathione. The research in our laboratory looked at various metabolic markers of oxidative stress and apoptosis, and found that pretreatment of neurons for upto six days with vitamin D3 can significantly reduce lipid peroxidation as well as protecting genomic DNA oxidation by hydrogen peroxide. A number of criteria for looking at cell viability and proliferation in the presence of vitamin D3 treatments were employed and it again showed better protection of the neurons from induced oxidative stress, suggesting its potential role as a neuro therapeutics agent. Our results highlight the importance of taking vitamin D3 supplements from an early age which could prevent the development of various neurodegenerative diseases.

### Biography

Samina Hyder Haq is a Senior Biochemist by profession, having completed a Doctorate in Biochemistry from the Medical School, University of Manchester, United Kingdom. She is very experienced in Biochemistry and Molecular Biology fields. She has worked with the Connective Tissue Research Group (UK) where most of the pioneering work was done in the collagen field. Her research at the Medical School Manchester (UK) developed and excelled in tissue culture techniques to study collagen synthesis in cultured avian and mammalian cells. She is currently working as an Assistant Professor at Biochemistry Department King Saud University. Her main research interest is using primary neuronal cultures as a model for various neurogenerative disorder and looking at the therapeutic efficacy of various drugs.

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