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The role of myocyte enhancer factor2 C (Mef2c) in the development of medium spiny neurons in the mouse striatum

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Aims:
We have shown the transcription factor Mef2c to be significantly upregulated in the striatum over a period encompassing peak generation of medium spiny neurons (MSNs). Here we present data that suggest a significant functional role of Mef2c in the maturation and survival of MSNs in the mouse striatum. MSNs are the neurons predominantly degenerating in Huntington's disease.

Methods:
Using the Gsx2-cre-loxp recombination system, the Mef2c gene was specifically deleted in the striatum to generate Gsx2-Cre Mef2c-/- mice. Proliferation assay using BrdU and Edu, motor behavioural testing, Golgi-cox based tracing of dendrites, RT qPCR, cell culture, TUNEL assay and stereological quantification of striatal cell counts for NeuN, and MSNs markers were all used in a developmental series.

Results:
Mef2c expression in WT striatum is raised over the period critical for the birth and maturation of MSNs, and peaks at postnatal day 0. Histological analysis revealed a significant reduction in striatal volume and reduction of total numbers of cells staining for NeuN, FoxP1 and Darpp-32, in Gsx2-Cre Mef2c-/- mice compared with wt mice. Furthermore, CKO mice exhibit significant impairment of motor function and some anatomical changes in dendrite development. A cell death assay revealed a significant increase in apoptotic cells at postnatal day 0 in Gsx2-Cre Mef2c-/- mice.

Conclusions:
Our results suggest that Mef2c has a significant role in the survival and normal maturation of striatal MSNs. Further experiments are ongoing to explore the mechanisms underlying these findings

Biography:
Heba Ali is a Phd student in the Cardiff University at Museum Avenue, Cardif, United Kingdom. She has done many researches in the area of neurology and Neuroscience. She has published more than 10 in the journals. Her research interests are Neuroscience, Neurology and Chemistry.

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