

Transcription factor MEF2C influences neural stem/progenitor cell differentiation and maturation in vivo.

Journal: Proc Natl Acad Sci U S A

Publication Year: 2008

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PubMed link: 18599437

Funding Grants: MEF2C-Directed Neurogenesis From Human Embryonic Stem Cells

Public Summary:

Scientific Abstract:

Emerging evidence suggests that myocyte enhancer factor 2 (MEF2) transcription factors act as effectors of neurogenesis in the brain, with MEF2C the predominant isoform in developing cerebrocortex. Here, we show that conditional knockout of Mef2c in nestin-expressing neural stem/progenitor cells (NSCs) impaired neuronal differentiation in vivo, resulting in aberrant compaction and smaller somal size. NSC proliferation and survival were not affected. Conditional null mice surviving to adulthood manifested more immature electrophysiological network properties and severe behavioral deficits reminiscent of Rett syndrome, an autism-related disorder. Our data support a crucial role for MEF2C in programming early neuronal differentiation and proper distribution within the layers of the neocortex.

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