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How Overexpression of the Eif4e Reduces the Levels of Neuro-Filament Proteins and Causes Autism

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Eukaryotic translation initiation factor 4E, also known as eIF4E, is a protein encoded by the Eif4E gene, which is involved in directing ribosomes to the cap structure of mRNAs. Overexpression of EIF4E has been found to cause increased translation of neuroligins; post-synaptic proteins with a causal link to Autism Spectrum Disorders (ASDs). Detailed studies of the effect of EIF4E overexpression on the development of neurons and neurocircuits are likely to give important insights into the molecular and biochemical processes involved in ASDs and other neurodevelopmental disorders.

In this study, neurofilament structures were examined by incorporating a vector with the fluorescent marker mCherry into the EIF4E gene. A GFP-tagged marker was designed and synthesized to further enable incorporating mCherry. It was then transfected into SH-SY5Y cells for study using fluorescence microscopy. Synthesis of the pIRES2-eIF4E-AcGFP1-mCherryisoform and the rate of transfection into SH-SY5Y cells were successful. Further refinement of the process is needed; however, the findings of this study indicate that, with improvements, the method described is a potential route for the incorporation of mCherry into the Eif4E expression vector, and its subsequent transfection into SH-SY5Y cell lines.

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