Introduction
Axonal transport defect is thought to play an early role in the progression of neurodegenerative diseases such as Alzheimer’s and Huntington’s disease. In both of these diseases axonal blockages and neuronal cell death in seen, suggesting that disruption of axonal transport may activate apoptotic pathways. Previously, we tested the hypothesis that axonal transport defects activate apoptotic pathways by an increase in cellular stress. We predict that expression of PI3K should rescue neuronal cell death. Using the TUNEL assay, we found that overexpression of constitutively active PI3K rescues Huntington induced neuronal cell death phenotypes, but has no effect on Huntington aggregates within larval brains. Previously, we also found that PI3K does not affect axonal transport defects induce by expression of HTT with expanded polyQ repeats. Taken together our observations suggest that the PI3K pathway plays an important role during neurodegeneration and that excess of PI3K could reduce cell death without affecting axonal transport defects.

Hypothesis
- We hypothesis that axonal transport defects activate apoptotic pathways by an increase in cellular stress.
- We predict that expression of PI3K will rescue neuronal cell death and axonal transport defects.

PI3K Pathway

Expression of constitutively active PI3K does not show significant cell death in larval brains

Excess of constitutively active PI3K reduces HTT-138QmRFP-mediated cell death in larval brains

Expression of HTT-15QmRFP does not cause neuronal cell death. (B) Expression of HTT-138QmRFP causes neuronal cell death. (C) Excess of PI3K with HTT138QmRFP reduces HTT-138QmRFP induced cell death. Quantification analysis shows that excess of PI3K could decrease cell death induce by HTT with expanded polyQ repeats. (P=0.6x10^-7)

Conclusion
- Inactive PI3K shows the increased cell death.
- Expressing constitutively active PI3K with HTT-138QmRFP decreased in cell death.
- PI3K pathway may play an important role during neurodegeneration.

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