Evaluation of a BDNF-like Molecule as a Potential Therapeutic Agent for KAND

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EVALUATION OF A BDNF-LIKE MOLECULE AS A POTENTIAL THERAPEUTIC AGENT FOR KAND

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Kif1a is a motor protein that transports essential substances from the nerve cell body into the axon for normal neuronal function.
Transport inside the brain: The basic mechanisms of neuronal trafficking
The BDNF Hypothesis

• Kif1a carries large vesicles filled with Brain Derived Neurotrophic Factor (BDNF) from the cell body into the axons.

• BDNF is essential for nervous system development, maturation and function.

• Lack of sufficient amounts of BDNF contributes to KAND.

Carabalona et al., 2016, Nat.Neuro.
Lo et al., 2011, Neurosci. Lett.
Analyzing the Brain

In utero electroporation

Mutant mouse
Analyzing the Brain

In utero electroporation
BDNF Restores Certain Abnormal Features in the Developing Brain
BDNF-Like Small Molecule Also Restores Certain Abnormal Features in the Developing Brain
Analyzing the Brain

Mutant Mouse
Mutant Mouse Brain Has Enlarged Fluid-Filled Spaces and Thinner Cortex
Staining Shows a Decrease in Neuronal Number
Treatment With BDNF-Like Molecule Reduces The Ventricular Enlargement
Staining Shows Normal Neuronal Number

Neurons per unit area

Wt  Mut. After Treatment

wt  mutant after treatment
Conclusion

Further studies are needed to assess the role of a BDNF-like molecule as a treatment for KAND.
Thank you !!!

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Vallee lab members

Dr. Wendy Chung
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