

# CHRD 2024: Abstract Submission Form

**Presenter Name**

Yina Her

**Presenter Status**

Masters Student

**Role in the project**

Perform Experiments  
Analyze Data  
Write Abstract

**Research Category**

Basic Science

**Title**

Characterizing the Neuronal Role of CK2 using *Drosophila melanogaster*

**Background**

De novo variants in either CSNK2A1 or CSNK2B cause neurodevelopmental disorders with overlapping variable symptoms. These two genes encode Casein Kinase 2 (CK2) complex subunits. CK2 is enriched in the central nervous system and is constitutively active. There are currently in vivo models in flies to study CK2 in the adult brain. Moreover, the variants, found in CSNK2A1 or CSNK2B have yet to be functionally assessed in vivo.

**Objective**

First, we will assess the role of CK2 in neurons and glia in development and the adult organism. Secondly, we will generate CK2 disease-associated variants and assess their function in flies.

**Methods**

CK2 (CkII $\alpha$  and CkII $\beta$ ) are knocked down in *Drosophila* neurons by RNAi using the nSyb-GAL4 driver for knockdown during development and elav-GAL4GS for adult-specific knockdown. *Drosophila* behavioural assessment was performed by negative geotaxis. Seizure-induction was performed by bang-sensitivity assay. Variant transgenic flies were generated via site-direct mutagenesis, followed by Sanger verification, and embryo injection commercially.

**Results**

We found that neuronal knockdown of either CkII $\alpha$  or CkII $\beta$  in neurons with nSyb-GAL4 resulted in lethality where some escapers had wing defects. No obvious phenotype was observed with elav-GAL4. We successfully generated 16 variants in CSNK2A1 or CSNK2B to generate transgenic flies. Tissue-specific overexpression using nub-GAL4 showed defects in wings in the variants, whereas ey-GAL4 caused no obvious defects in the eyes.

**Conclusion**

We established that neuronal CK2 is critical for the development of *Drosophila melanogaster*. Future studies will examine the adult-specific role of CK2 in neurons. Our variant functional testing reveals a wide variety of variant impacts.

**Do you have a table/figure to upload?**

No

## Authors

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