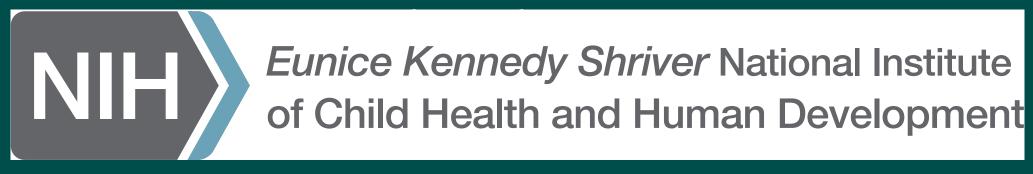
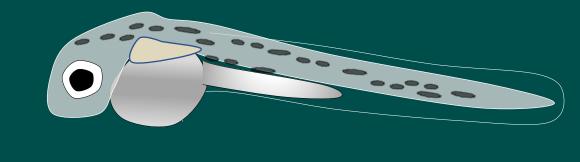
# Analysis of epigenetic gene regulation using a novel zebrafish epigenetic reporter line

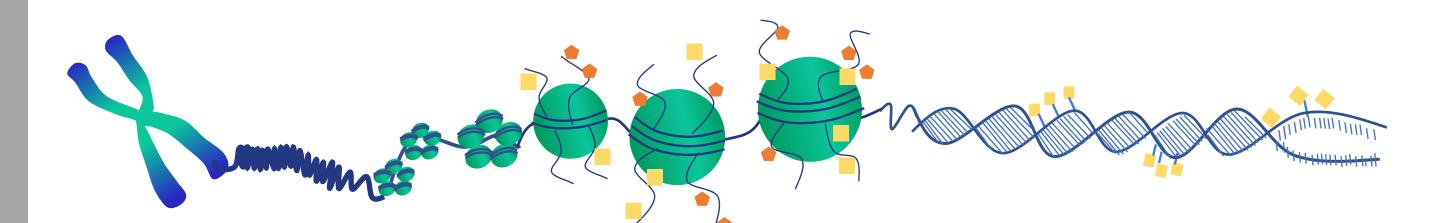
Miranda M. Marvel<sup>1</sup>, Aniket V. Gore<sup>1</sup>, Kiyohito Taimatsu<sup>1</sup>, Andrew Davis<sup>1</sup>, Daniel Castranova<sup>1</sup>, and Brant M. Weinstein<sup>1</sup>

Department of Developmental Biology, NICHD, NIH, Bethesda, MD



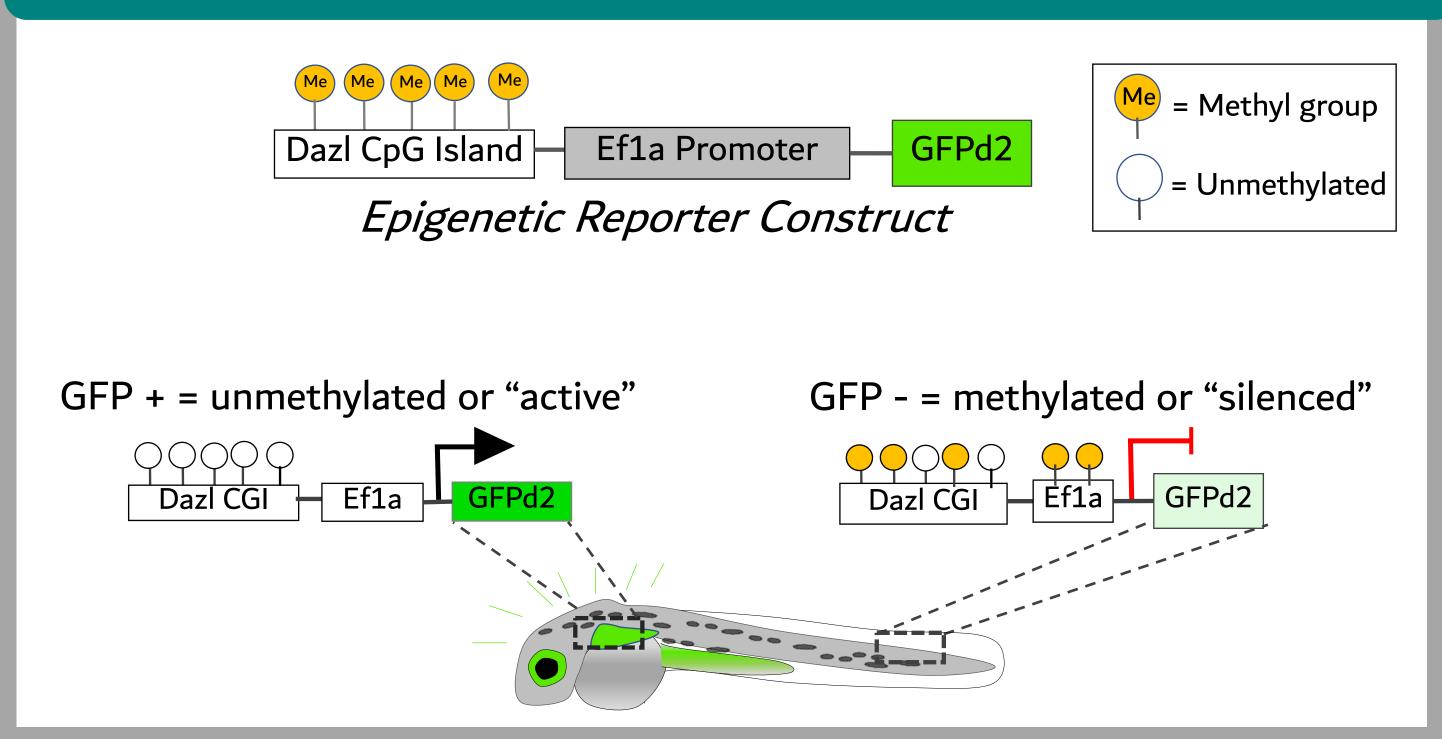


# Background

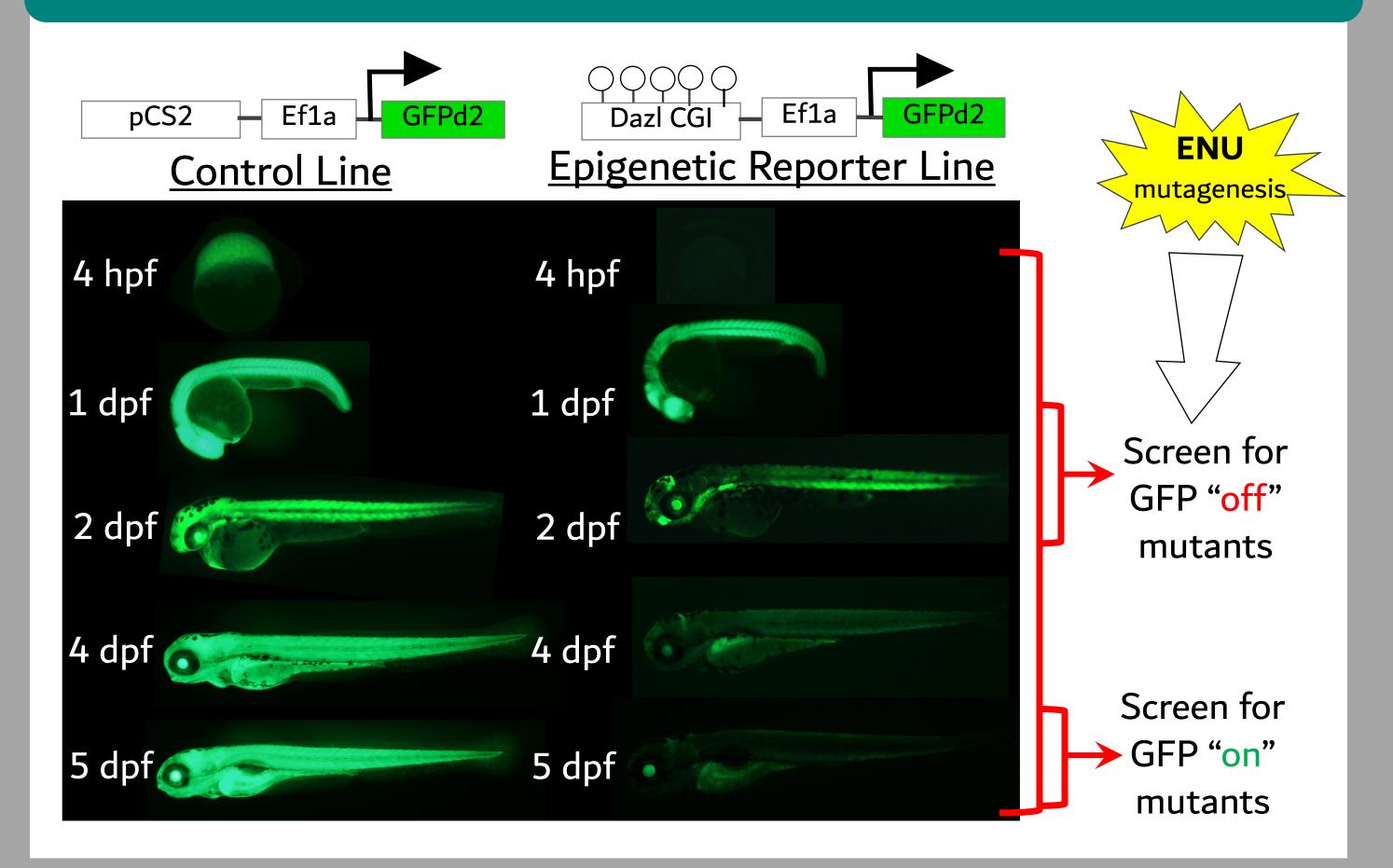


- Many vertebrate epigenetic modifiers, although critical regulators of embryonic development, are still unknown
- We recently generated an epigenetic reporter tg zebrafish line, which we are using to identify epigenetic mutants
- One mutant exhibits abnormal head morphology and epigenetic silencing, which we are now characterizing

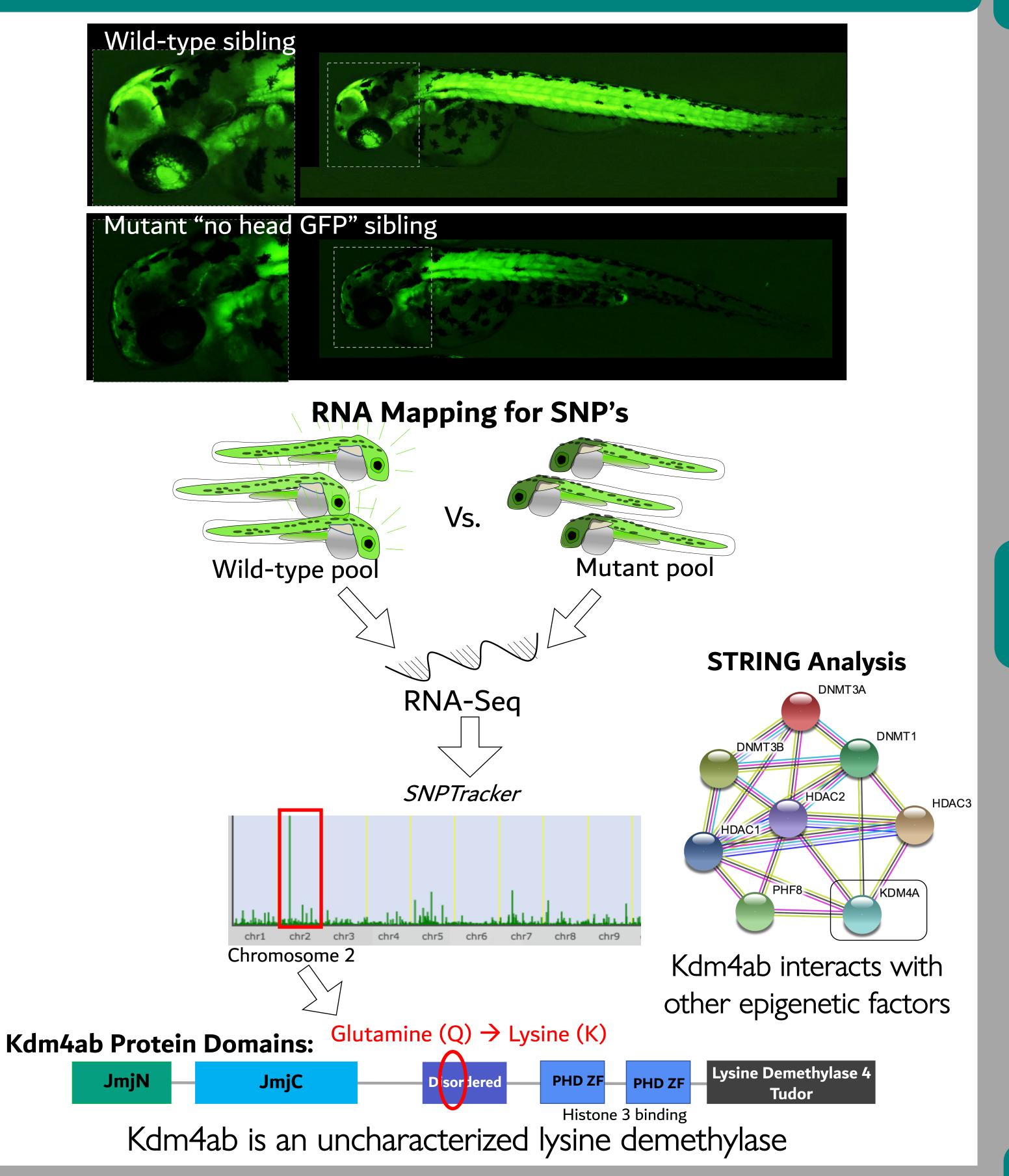
# Generation of an epigenetic reporter line



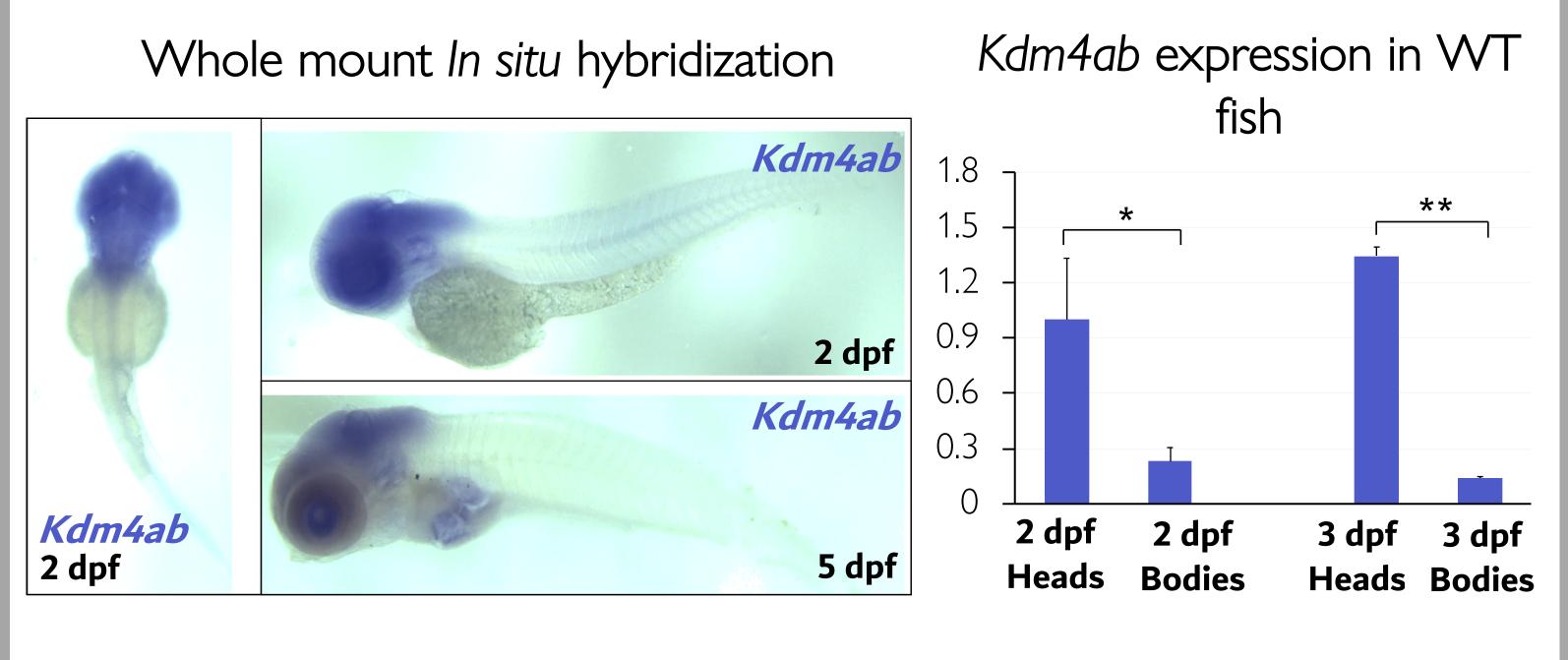
# Screening for epigenetic mutants



# Mapping a "No head GFP" Mutant

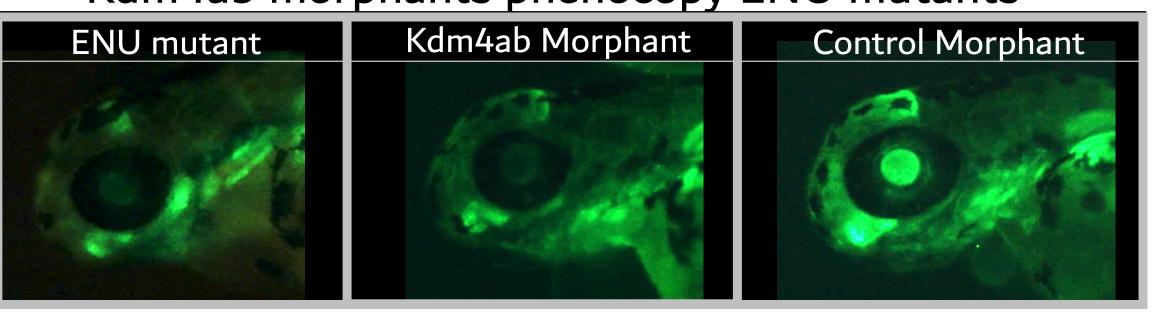


# Kdm4ab exhibits a neural-specific expression

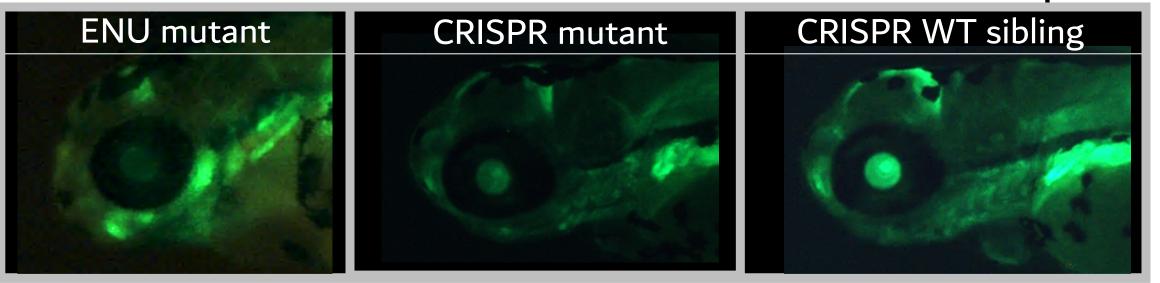


# Kdm4ab mutants and morphants exhibit similar phenotypes

Kdm4ab morphants phenocopy ENU mutants

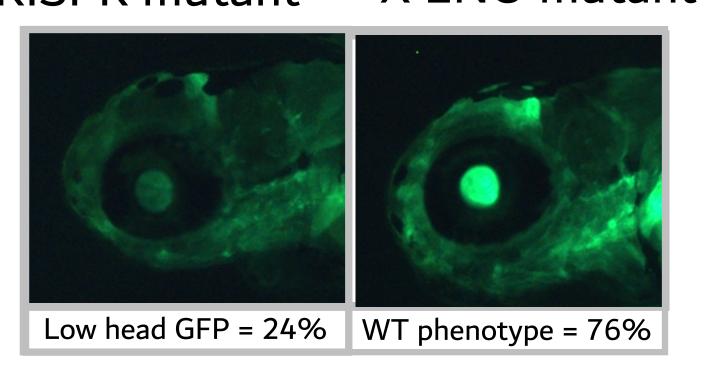


Kdm4ab CRISPR mutants exhibit similar low head GFP phenotype



# Complementation test validates kdm4ab as the responsible gene

CRISPR mutant +/- X ENU mutant +/-



Same gene = fails to complement
Different gene = complements

Phenotype % in progeny from complementation tests

100
80
40
20
Low head WT
GFP
Failed comp test

### Future Directions

# Wild-type Vs. Kdm4ab Mutant Cell dissociation RNA Isolation ChIP-Seq to id differential histone mark landscape expressed genes

### Conclusions

- Kdm4ab is most likely a critical epigenetic regulator of neurodevelopment
- Kdm4ab mutants and morphants exhibit similar phenotypes
- Kdm4ab-mediated pathways and mechanisms will be elucidated in the future