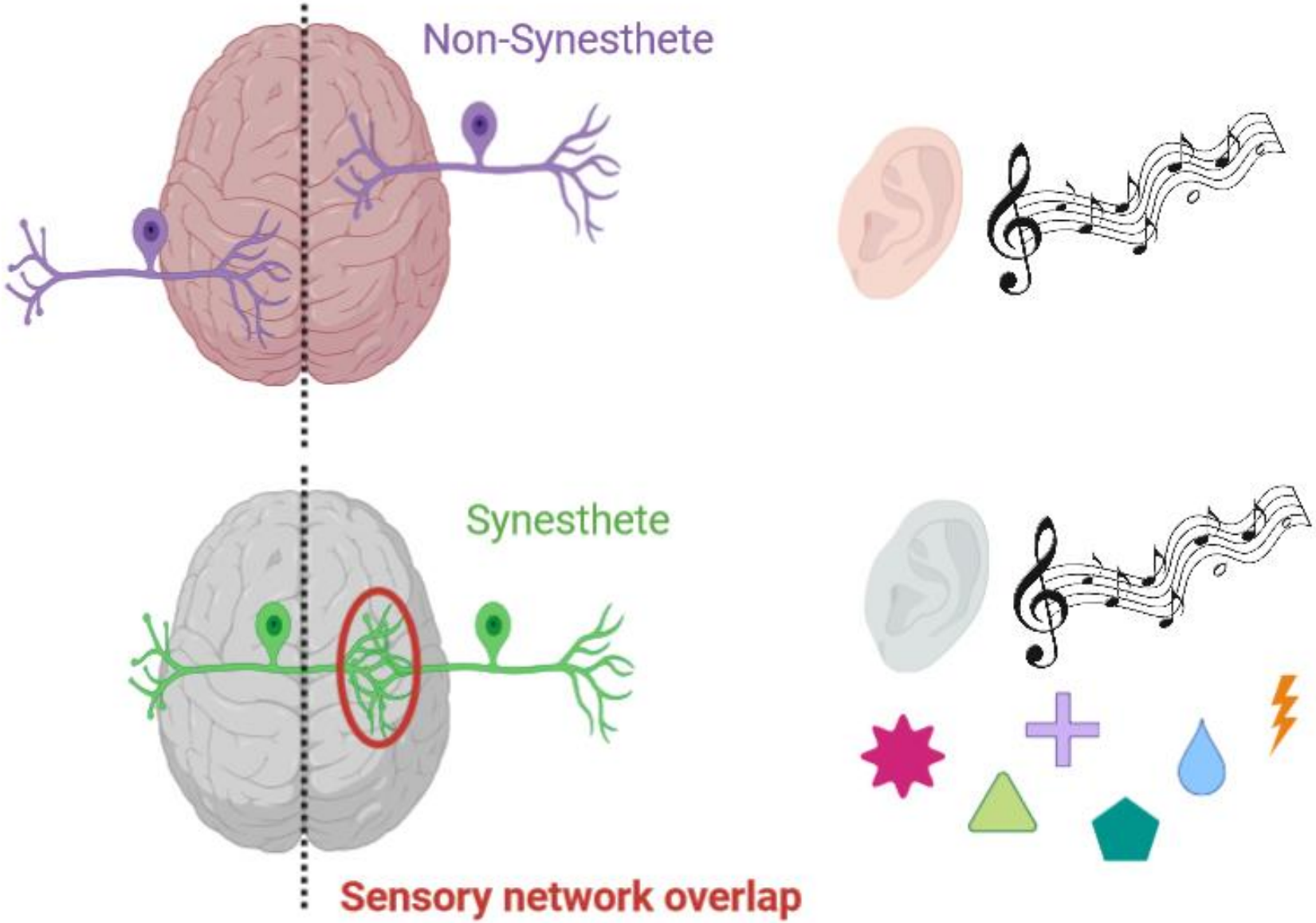

Synesthesia
Olivia Steidl

What is synesthesia?



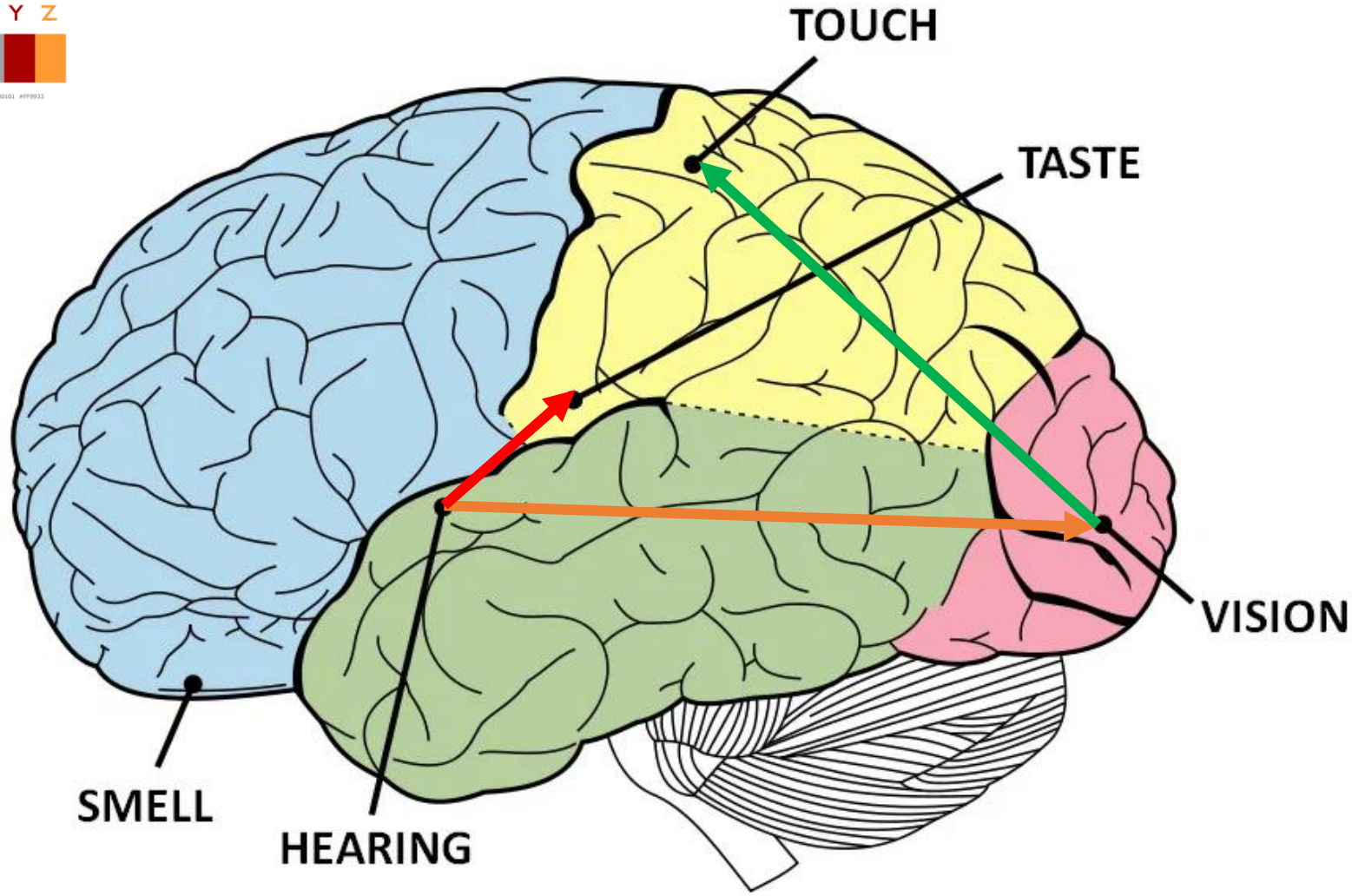
What do synesthetes experience?

Grapheme-color

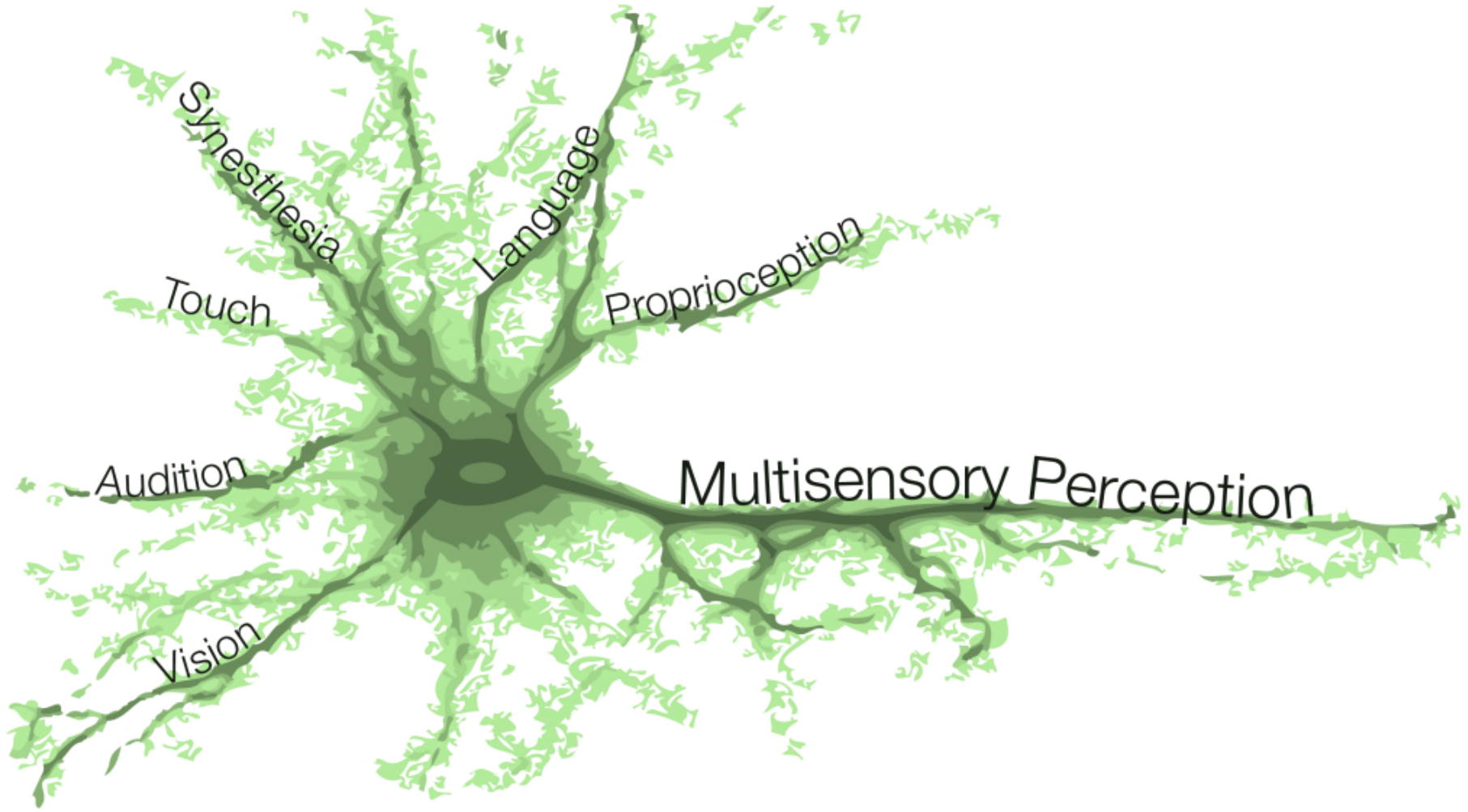
Chromesthesia

Mirror-touch

Lexical-gustatory

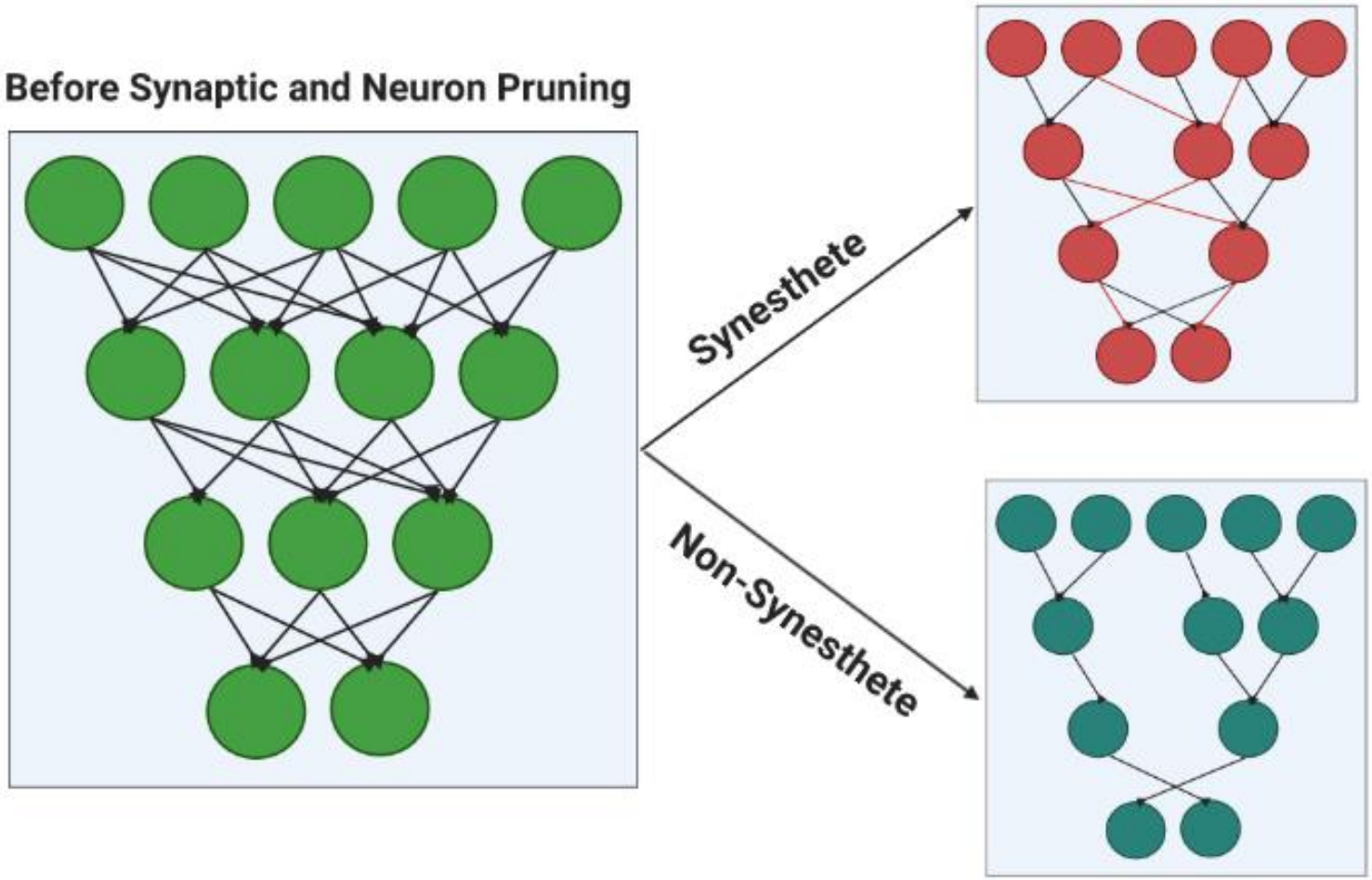


What makes synesthesia interesting?



Role of enhanced perception in learning and memory

What causes synesthesia?

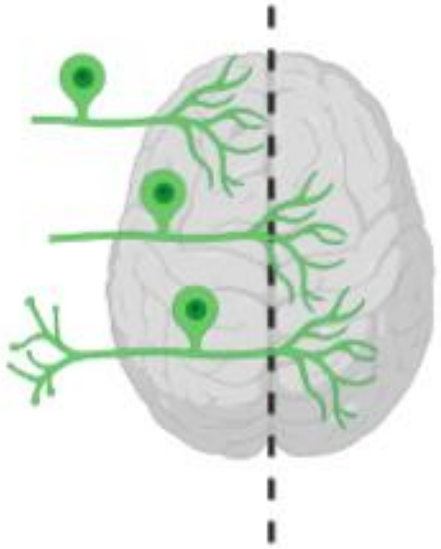


Errant synaptic pruning

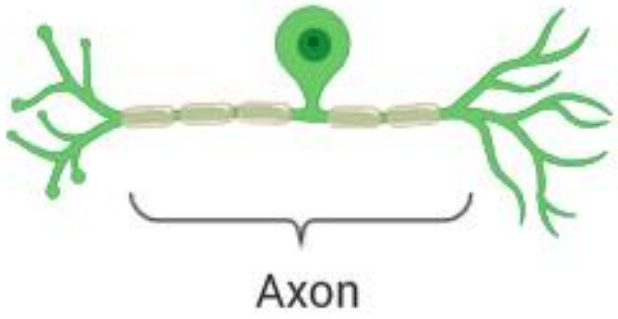
What gene is mutated in synesthesia?

ROBO3

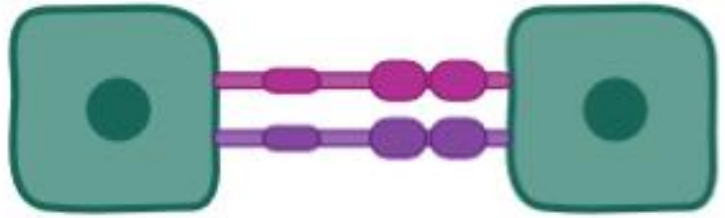
Biological Process



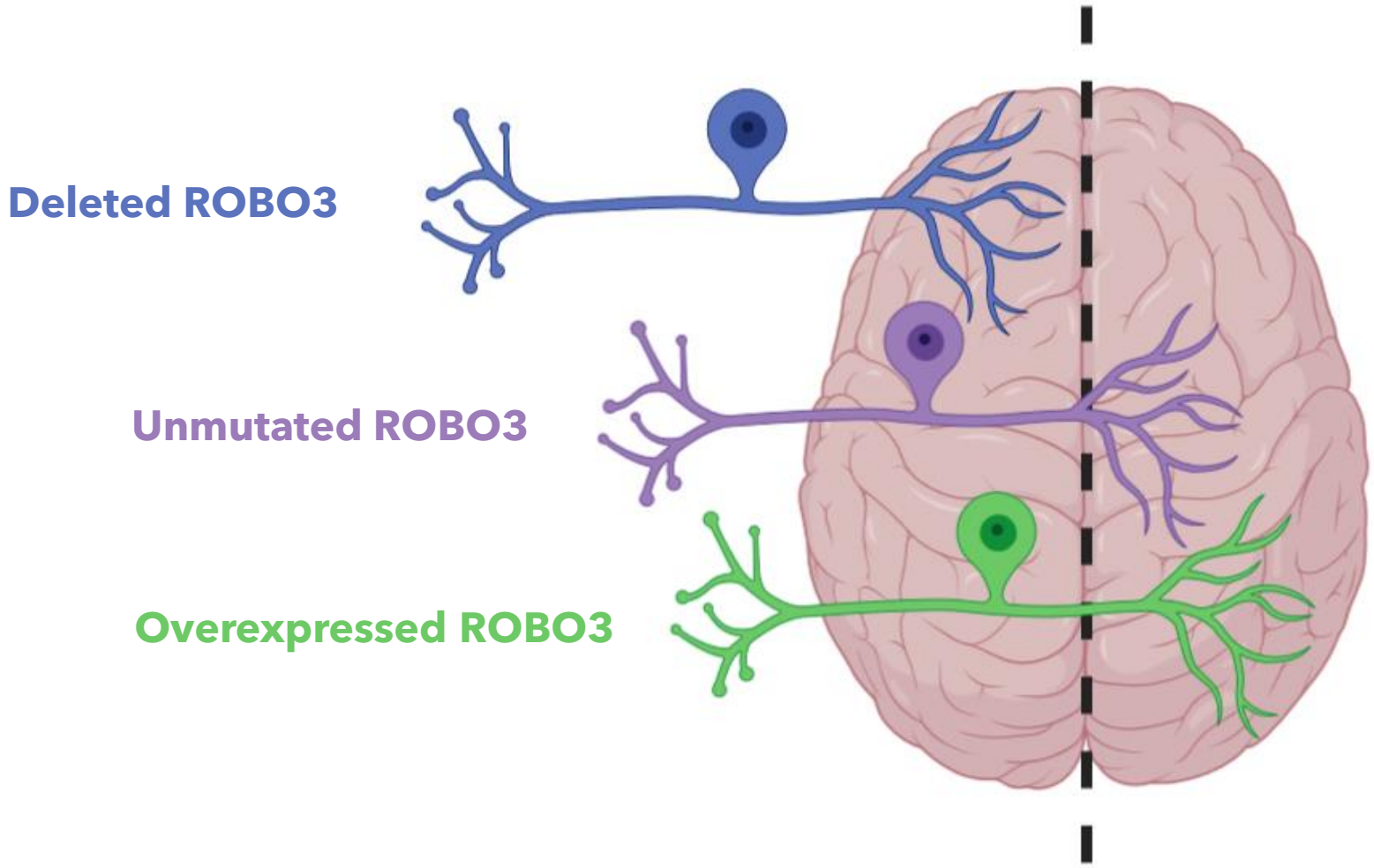
Cellular Component



Molecular Function

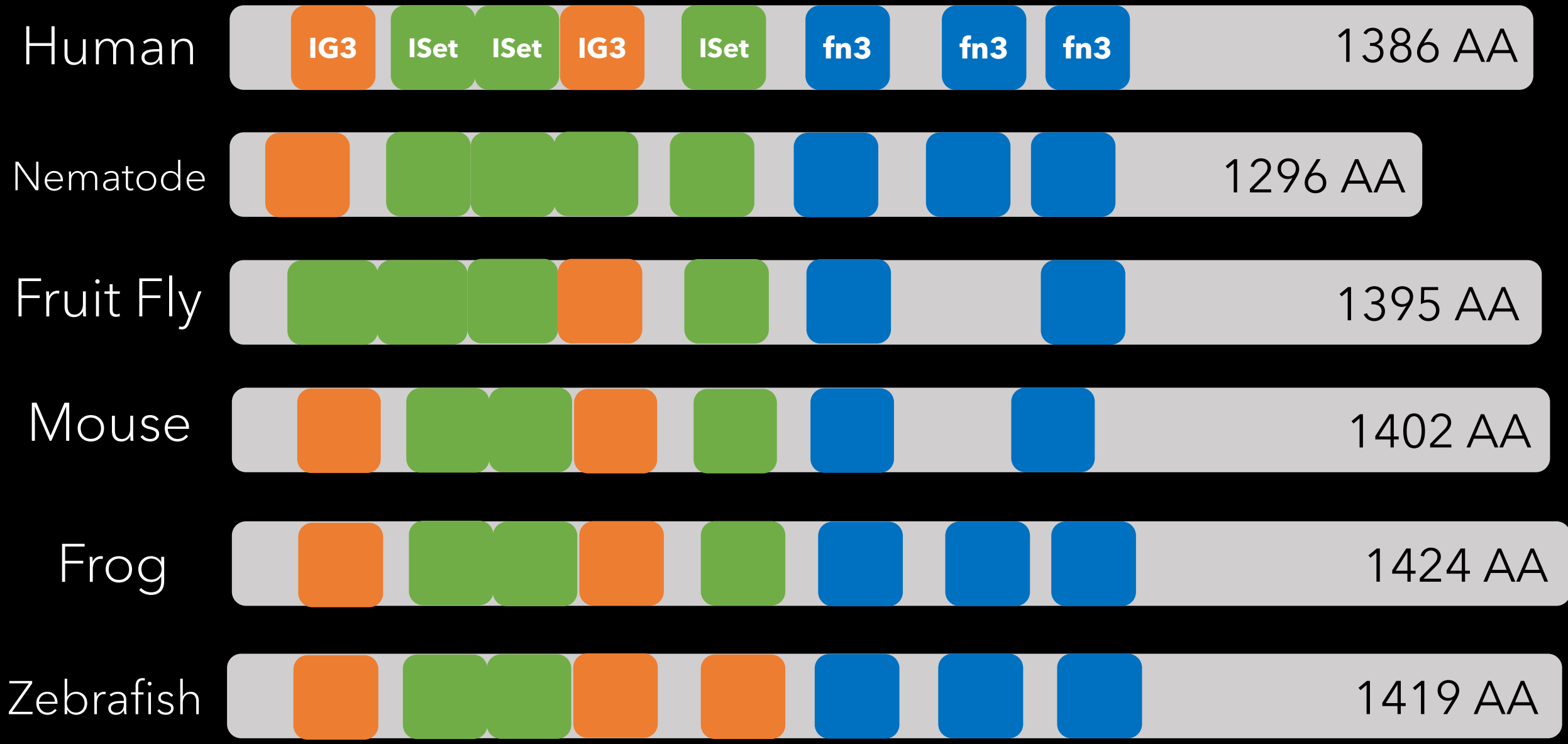


What pathway is ROBO3 involved in?

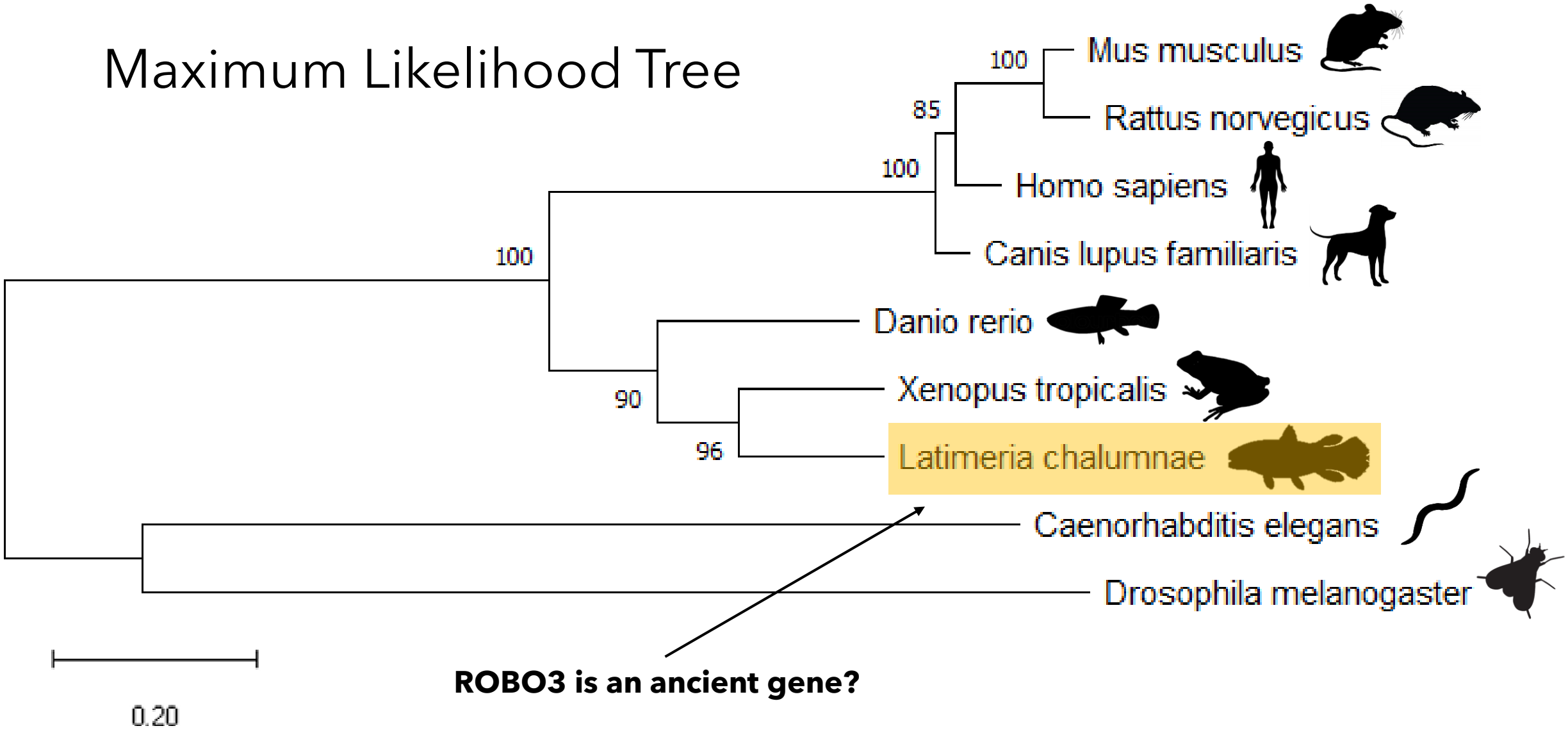


Axon guidance across the midline

How conserved are ROBO3 homologs?

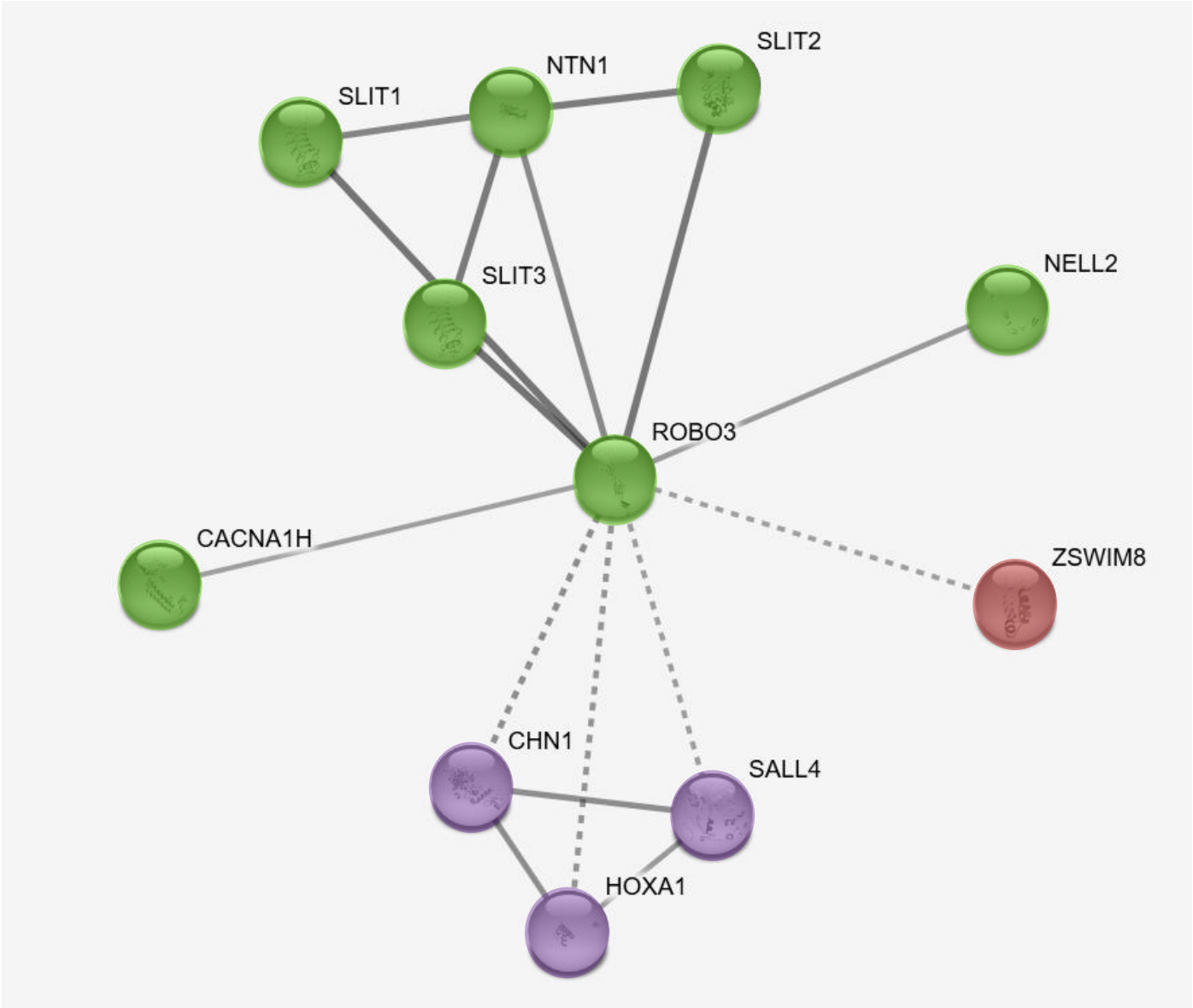


How are ROBO3 homologs related?



What other genes interact with ROBO3?

Axon guidance



Zinc ion binding

Early nervous system development

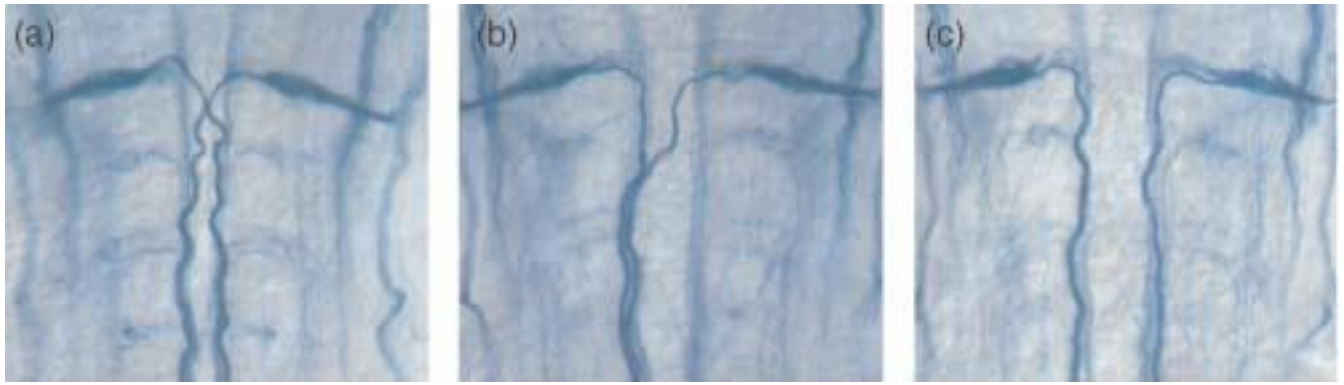
What is the gap in knowledge?

What role does ROBO3 play in **axon guidance** as it relates to enhanced learning through **color perception**?

Hypothesis: ROBO3 mutants will be able to learn information received through color perception more quickly than unmutated model organisms

What model organism can simulate ROBO3 phenotypes?

Zebrafish (Danio rerio) brain



Axons attempting to cross the midline in the zebrafish brain

Transparent nervous systems, color perception, and prior use in learning studies

Burgess, 2009

Aim #1: Identify specific protein domain regions within ROBO3 that contribute to color perception

Pfam

CLUSTAL

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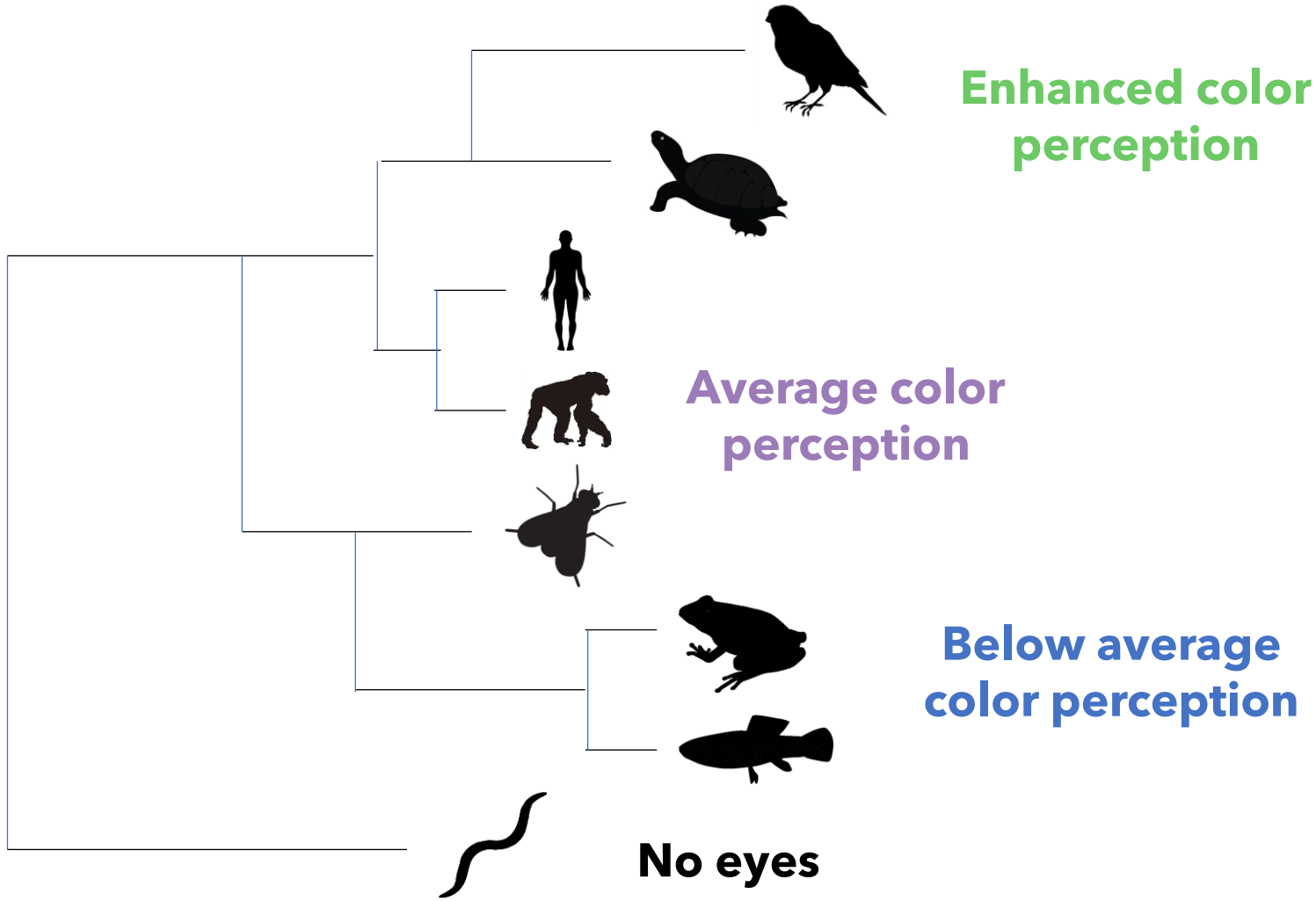
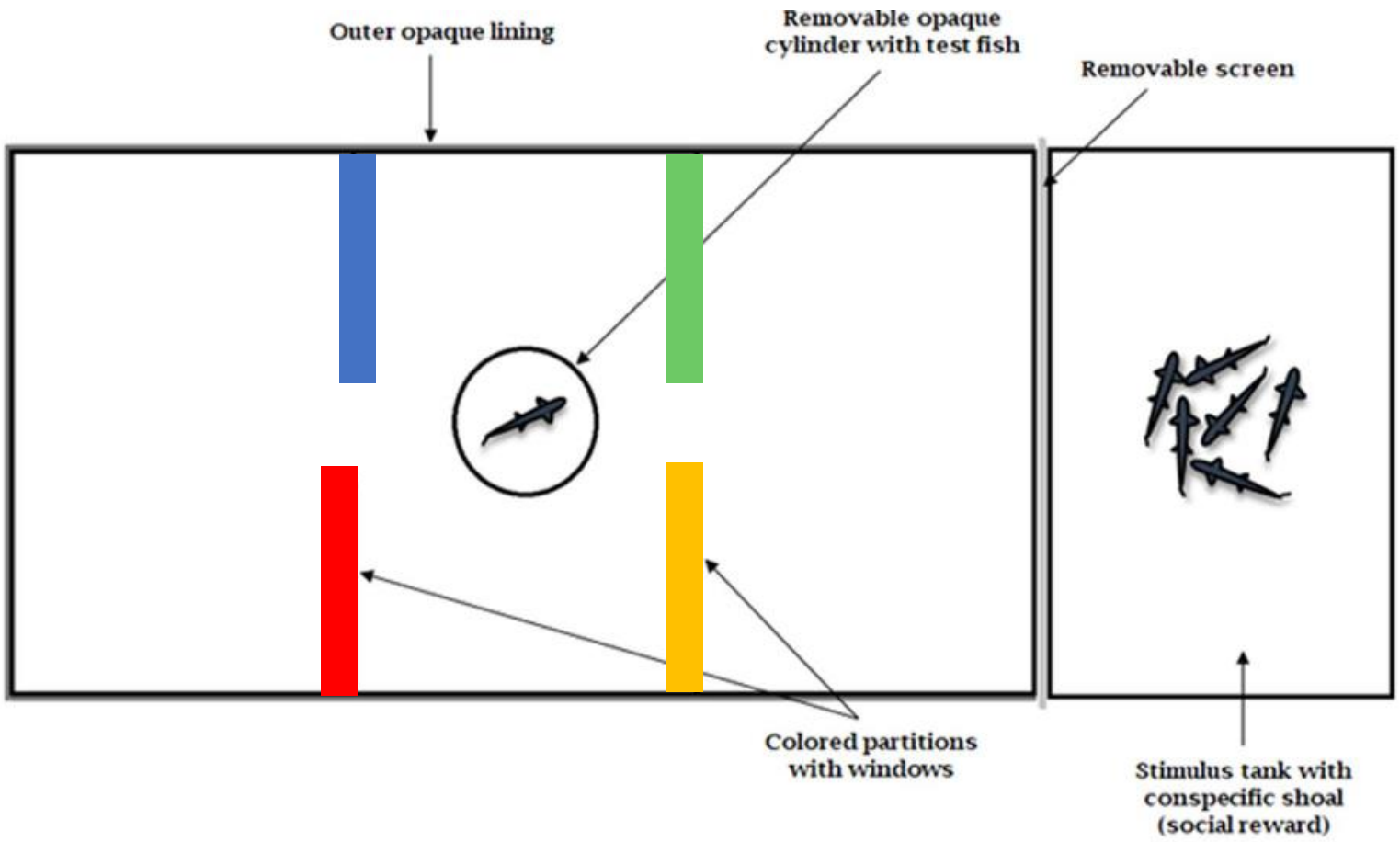


Identify meaningful SNPs based on groupings

Aim #1: Identify specific protein domain regions within ROBO3 that contribute to color perception



Test navigation speed of SNP-targeted ROBO3 mutants against wildtype fish in a color maze adapted from Roy, et. al 2019

What is the long-term goal?

How does color perception impact learning and memory development for diverse species?