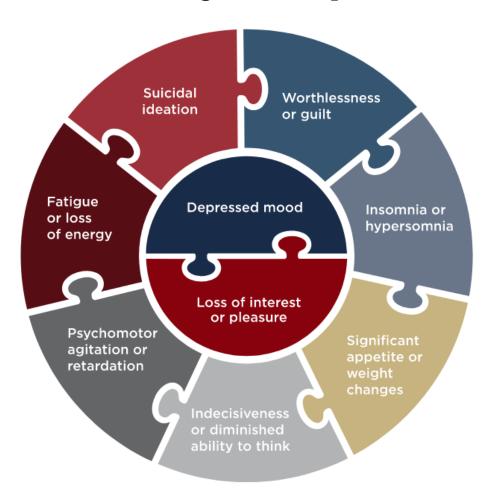
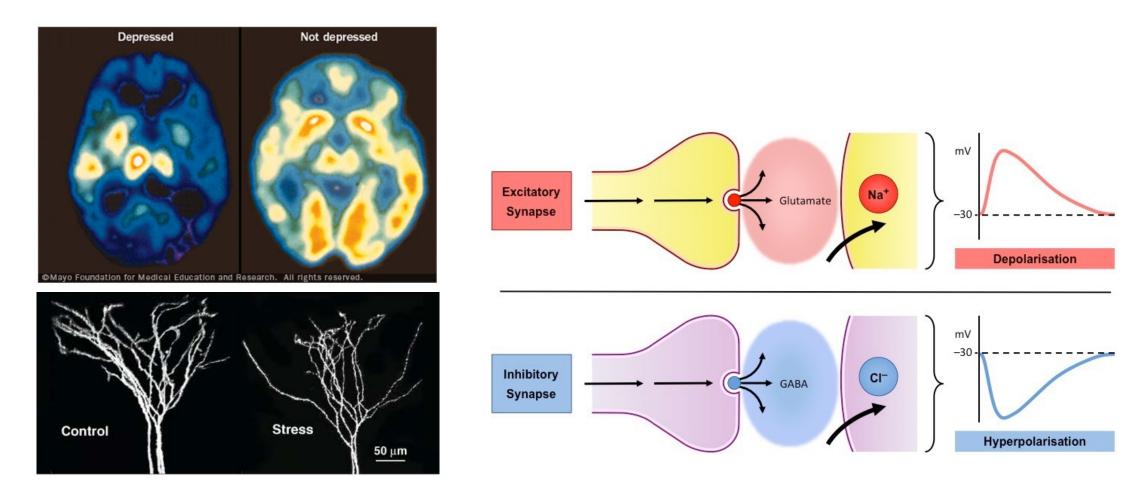
# Major Depression Jer Weann Ang

#### What is major depression?



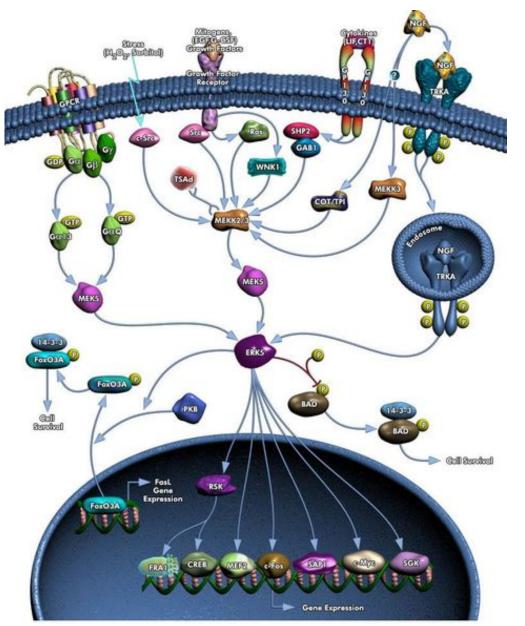
Depressed mood or a loss of interest and pleasure in daily activities for at least a period of two weeks.

#### What causes major depression?



People with more vulnerable genetic makeup are predisposed to developing major depression.

### What gene is involved in depression?





**Molecular function: transcription factor** 

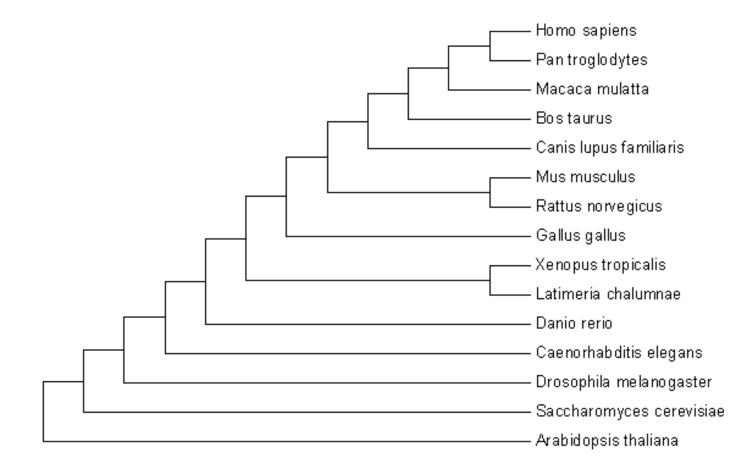
**Cellular component: nucleus** 

Biological process: MAPK cascade , neuron migration, neuron differentiation

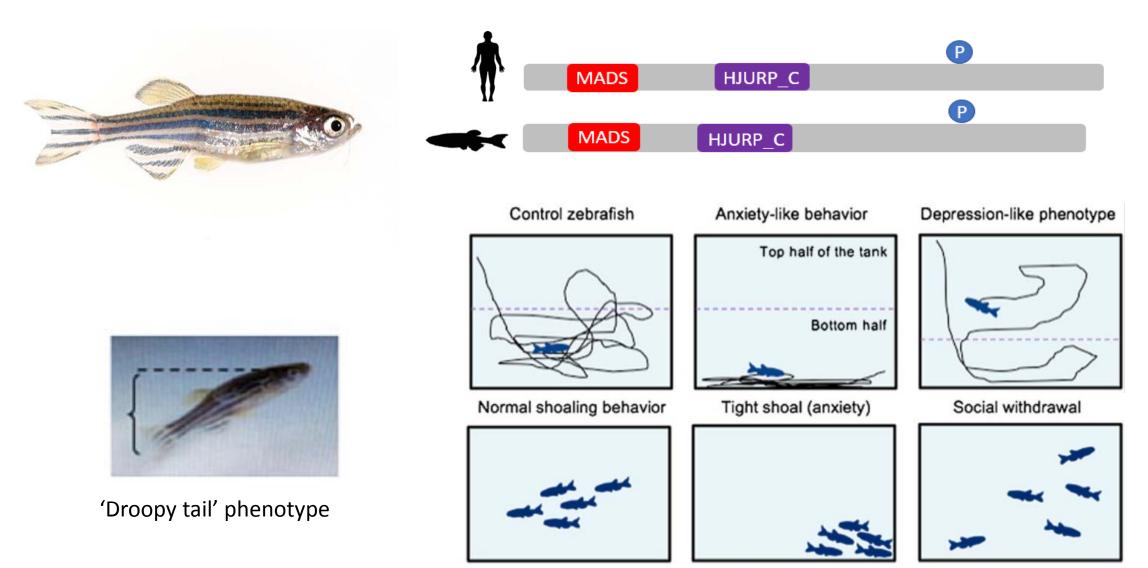
# How well conserved is MEF2C ?

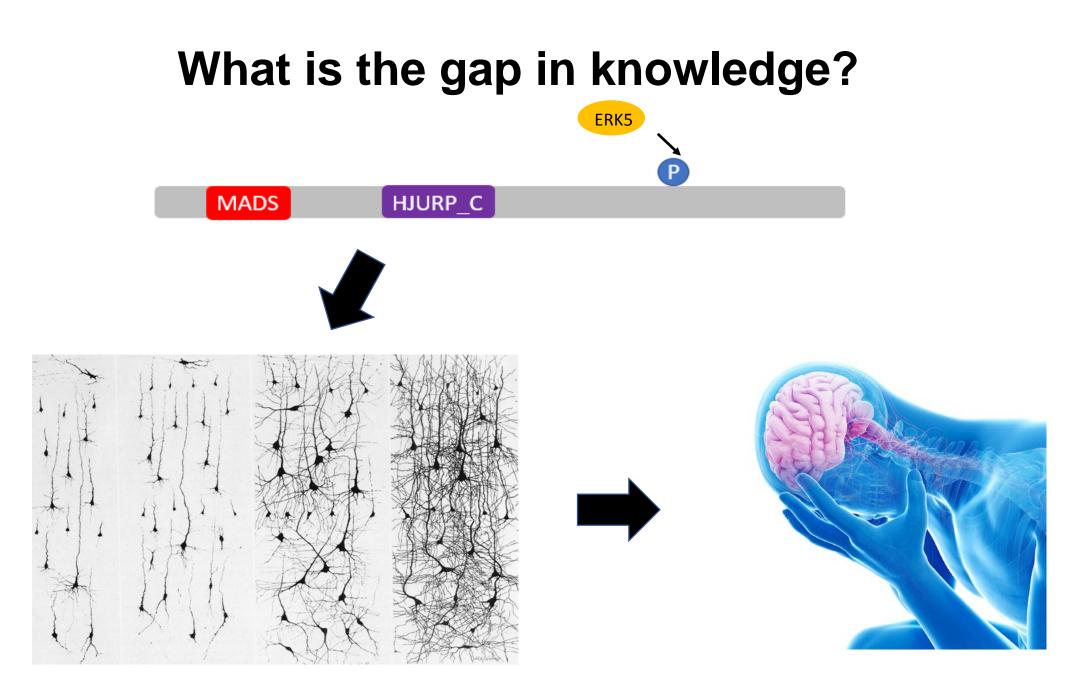


#### **Phylogenetic tree of MEF2C**



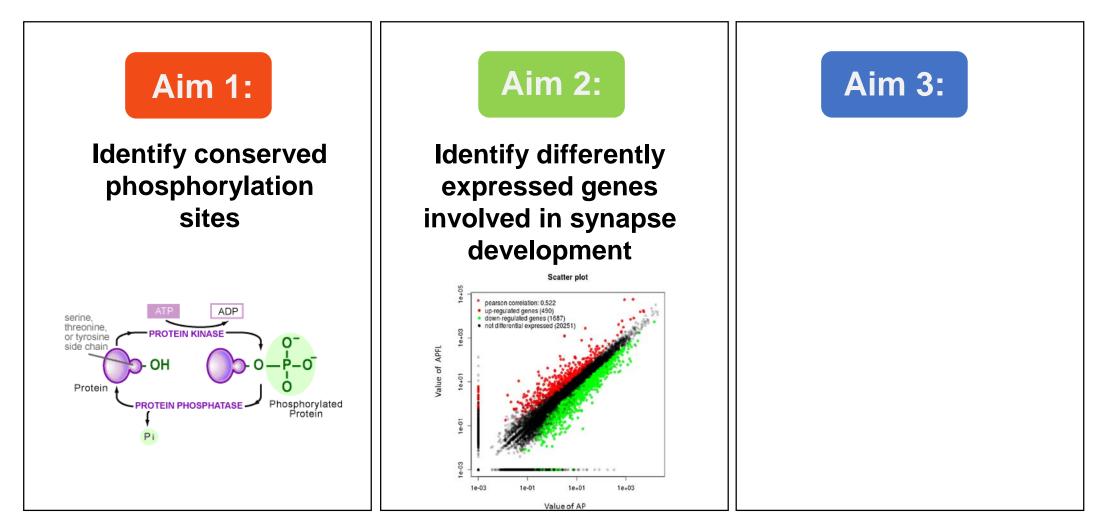
#### What model organisms to use?





## What is the primary goal?

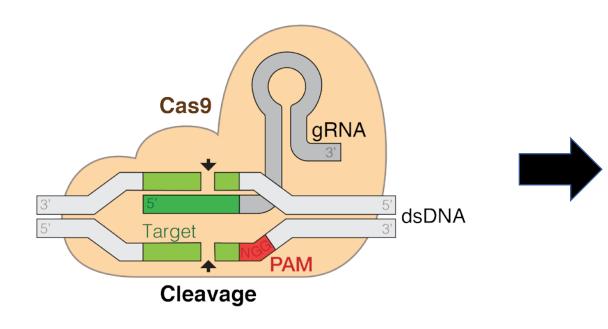
Understand the role of MEF2C phosphorylation sites in the regulation of excitatory synapse elimination



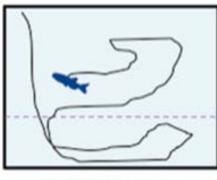
# Aim 1: Which phosphorylation sites are conserved across MEF2C homologs?

1. Homo_sapiens	G	L	G	A	C	T S	B T	н	L	SC	S	S	Ν	L	S L	P	S	Т	Q	s I	- N	I.	K	S	Е	Ρ	۷	SF	P	R
2. Pan_troglodytes	C	L	G	A	С	T S	з т	н	L	S C	S	В	Ν	L	S L	P	S	Т	Q	s I		1	ĸ	S	Е	Ρ	۷	SF	PF	R
3. Macaca_mulatta	C	L	G	A	С	τs	S T	н	L	S C	S	ß	Ν	L	S L	P	S	Т	Q I	s I	_ N	T	K	S	Е	Ρ	۷	S F	P	R
4. Bos_taurus	C	L	G	-	-			-	-		-	-	-	-		-	-	-	-			-	-	-	-	-	-			-
5. Canis_lupus_familiaris	C	L	G	A	С	T S	3 T	н	L	SC	S	ß	Ν	L	S L	P	S	Т	Q	s I	- N	1	K	S	Е	Ρ	۷	SF	P	R
6. Mus_musculus	C	L	G	A	С	T S	ЗТ	н	L	SC	S	В	Ν	L	S L	P	S	Т	Q	s I	. 5	1	ĸ	S	Е	Ρ	۷	SF	F	R
7. Rattus_norvegicus	C	L	G	A	С	Т	B T	н	L	SC	S	Б	Ν	L	S L	P	S	Т	Q	s I	_ N	T	K	S	Е	Ρ	۷	SF	P	R
8. Danio_rerio	H	L	G	Ν	C	s s	S A	Q	L	C	S	В	A	L	S L	P	S	Ν	QI	V L	H	I.	K	S	Е	Ρ	۷	SF	P	R
9. Xenopus_tropicalis	C	L	G	-	-			-	-		-	-	-	-		-	-	-				-	-	-	-	-	-			-
10. Drosophila_melanogaster	G	G	G	G	G	s I	I G	N	۷	EC	A	T	Ν	L	s v	L	S	н	A	a c	۱	н	L	G	Μ	Ρ	N	SF	RF	S
11. Gallus_gallus	C	L	G	-	-			-	-		-	-	-	-		-	-	-	-			-	-	-	-	-	-		-	-
12. Saccharomyces_cerevisia	C	T	A	۷	NI	N	B N	S	S	NI	S	ß	Т	Ν	NT	N	N	Ν	N	1 1	1 N	N	Ν	Ν	S	S	NI	N N	1 8	N
13. Latimeria_chalumnae	C	L	G	Т	С	T S	3 S	н	L	SC	S	r	Ν	L	S L	P	S	Т	Q	s l	- N	T	ĸ	S	Е	Ρ	۷	SF	PF	R
14. Arabidopsis_thaliana	-	-	-	-	-	- ,		-	-		-	-	-	-		-	-	-	-			-	-	-	-	-	-			-
15. Caenorhabditis_elegans	-	-	-	-	-			-	-		-	-	-	-		-	-	-	-			-	-	-	-	-	-			-

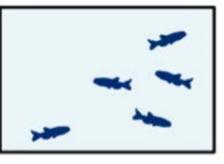
# Aim 1: Which phosphorylation sites are conserved across MEF2C homologs?

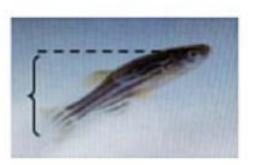


Depression-like phenotype



Social withdrawal





Aim 2: What genes are differentially expressed in zebrafish with depressive phenotypes?

### References

- <u>http://newhopeclinicalresearch.com/specialties/major-depression/</u>
- Nguyen, M., Stewart, A. M., & Kalueff, A. V. (2014). Aquatic blues: modeling depression and antidepressant action in zebrafish. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*, 55, 26-39.
- <u>https://www.powerofpositivity.com/depression-changes-brain-ways-reverse/</u>
- <u>https://www.google.com/search?q=differentially+expressed+genes&s</u> <u>ource=lnms&tbm=isch&sa=X&ved=OahUKEwibyvqdxKTaAhWr7oMKH</u> <u>Q89BlsQ\_AUICigB&biw=1422&bih=629#imgrc=ZjzpMPTPWScj5M</u>: