

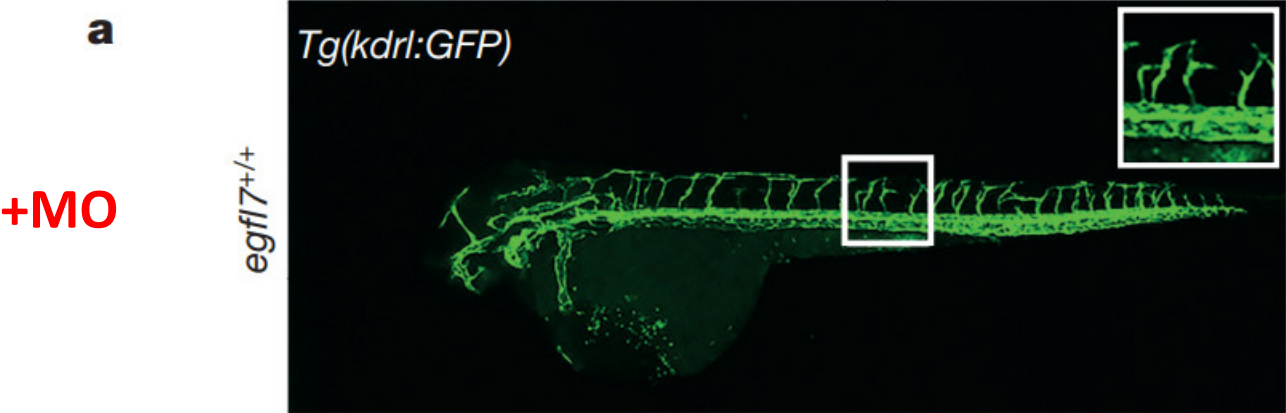
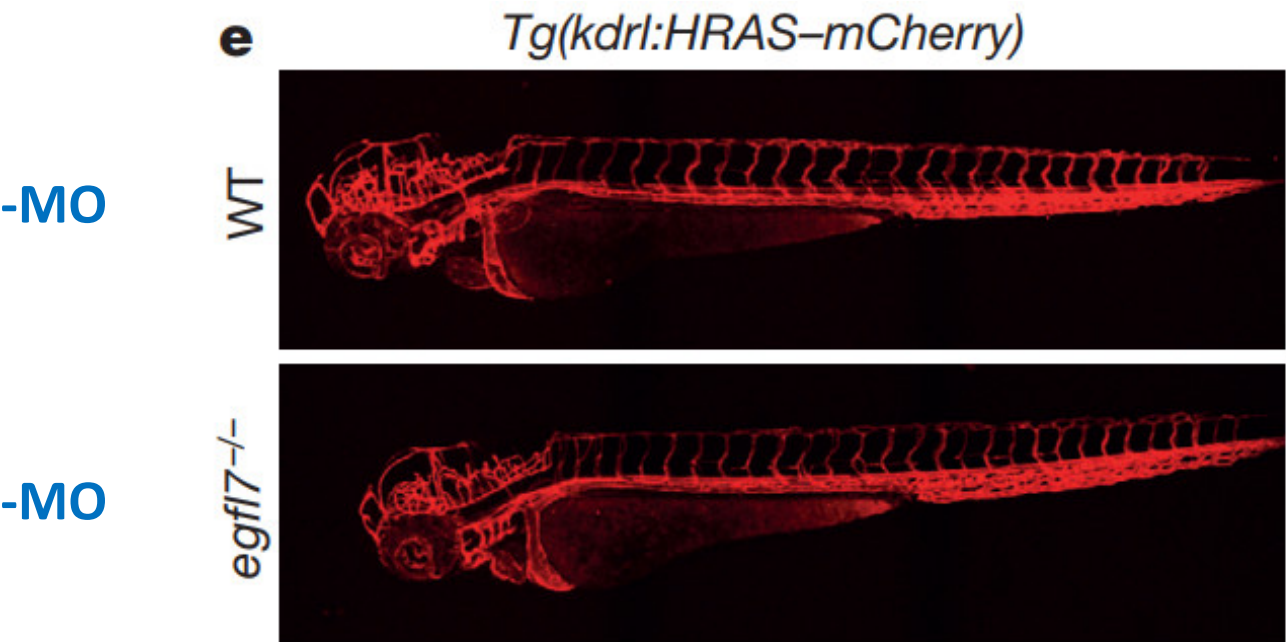
# GGSB Prelim Q1 – Hang Chen

## Question 1:

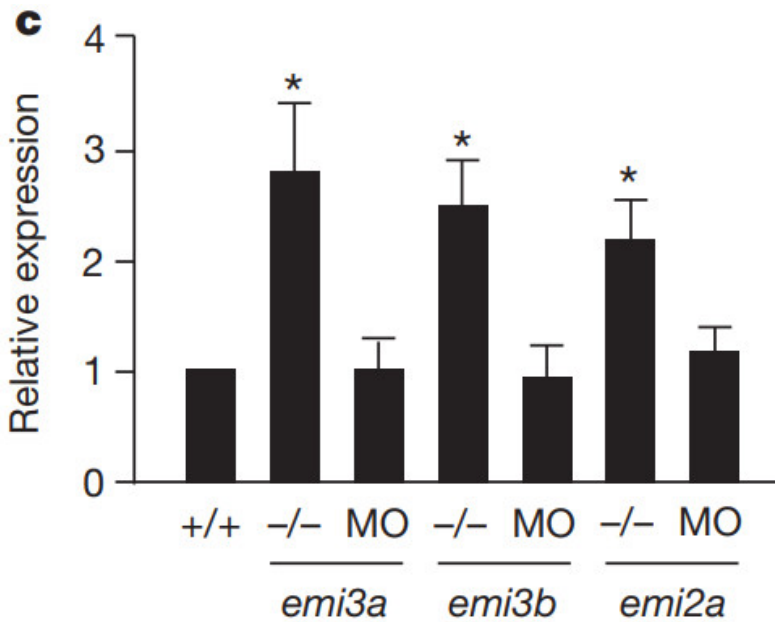
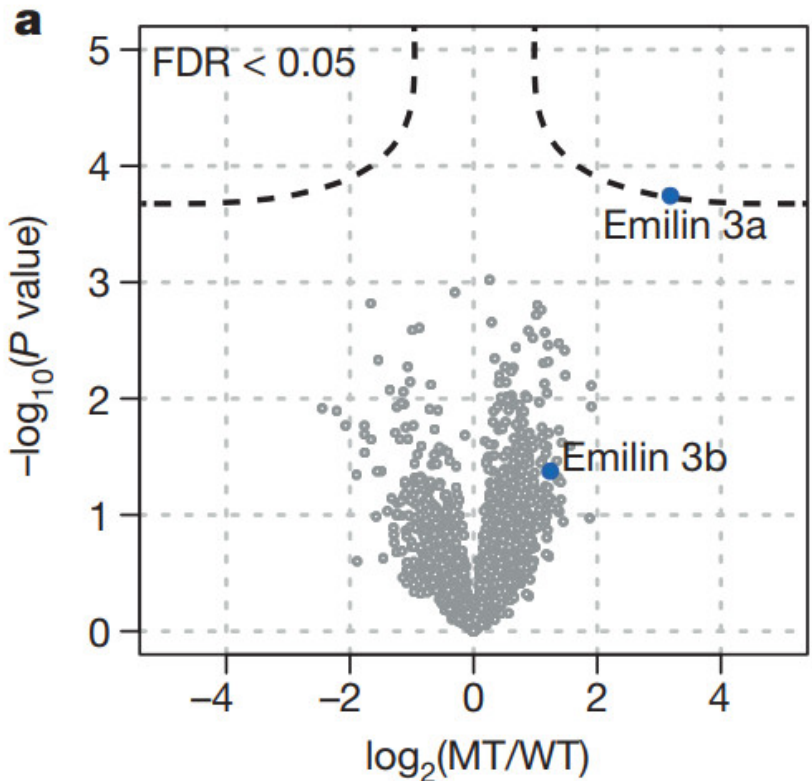
Transcriptional adaptation:

- Concept: mutations in one gene -> Expression modulation in **other** genes -> phenotypic rescue
- Why it is important: to maintain fitness in the presence of harmful mutations / robustness under perturbations
- How it caught attention: different phenotypes between knockouts and knockdowns
  
- Note: Knockouts are by early stop codon, not entire gene deletion
- Note: Morpholinos are synthetic antisense nucleotide analogs

Example of *Egfl7* and vasculogenesis

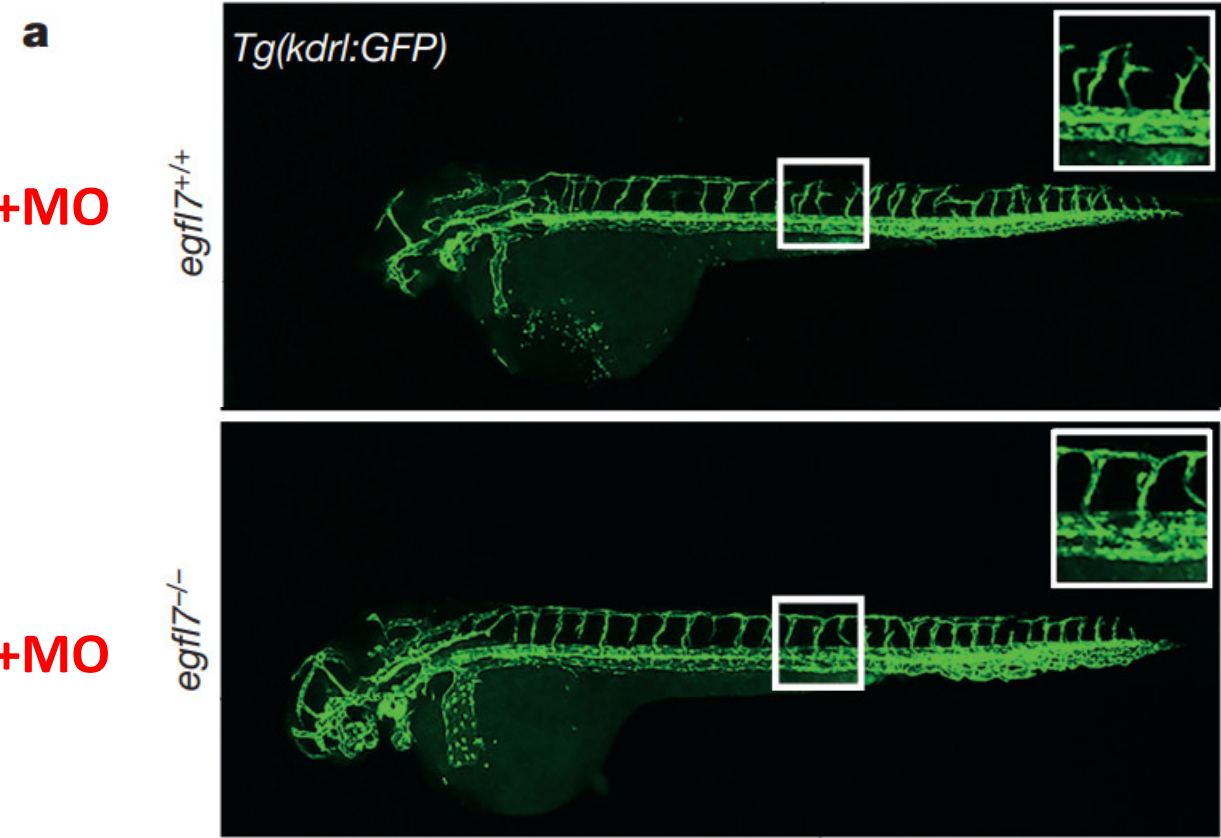


Rossi et al., 2015

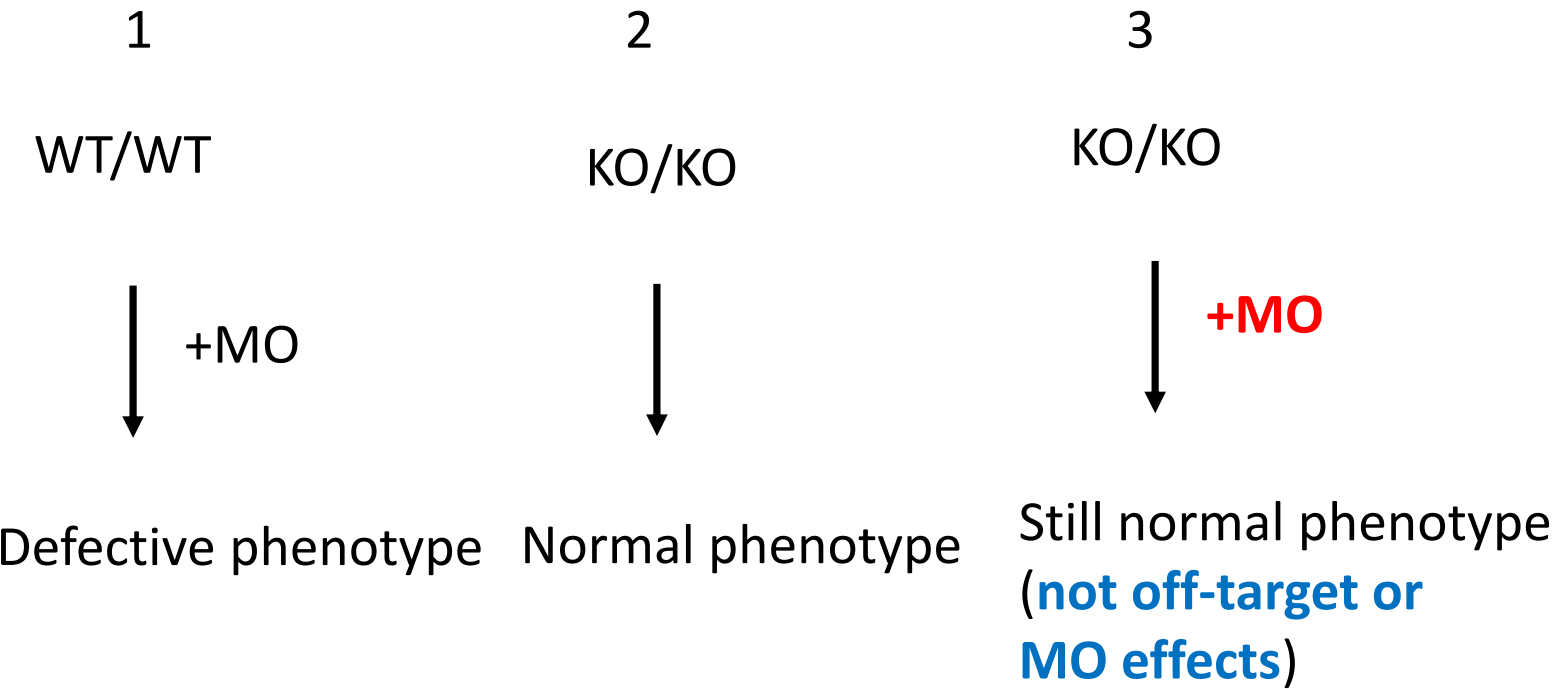


(also extracellular matrix proteins)

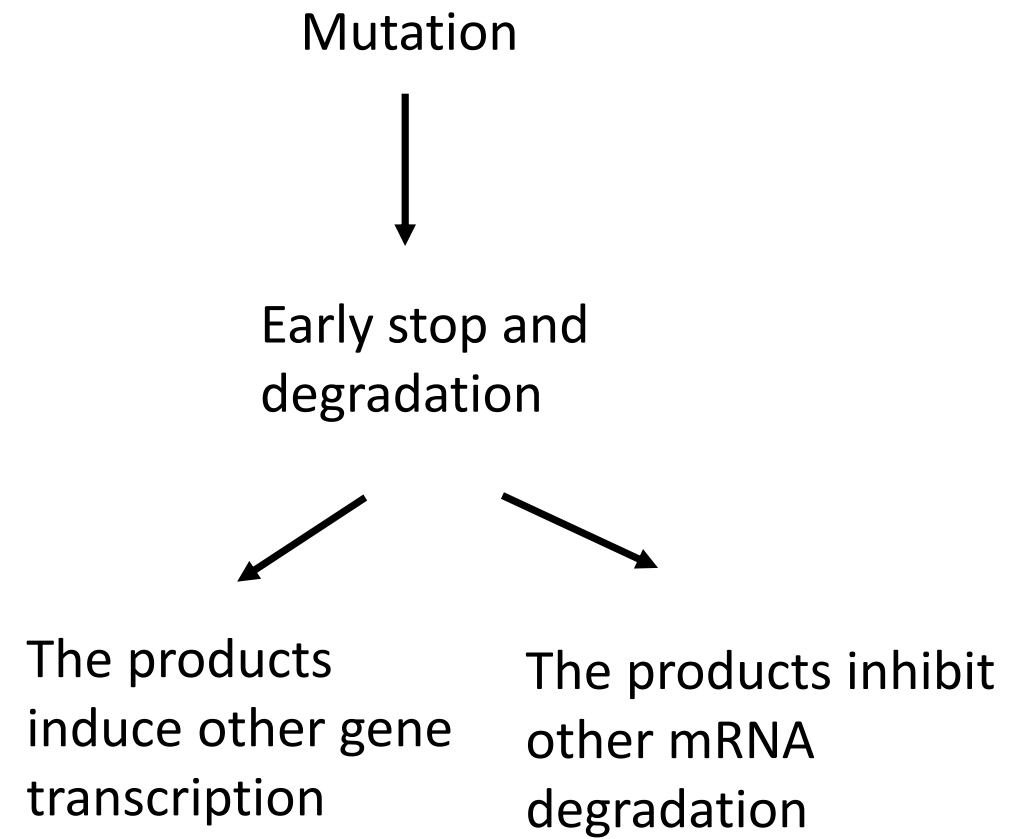
Question 2:



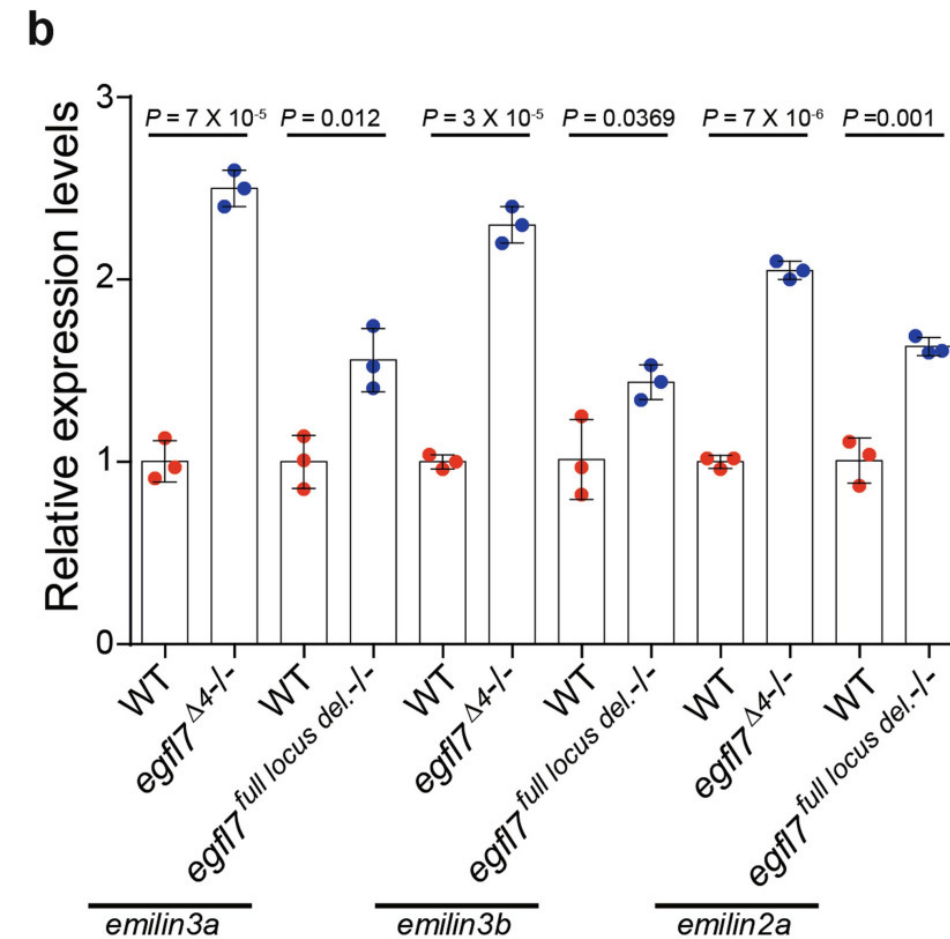
Rossi et al., 2015



(If the vasculogenesis deficiency was caused by MO, then group 1 and 3 should have the same phenotype)



One possibility: increased transcription



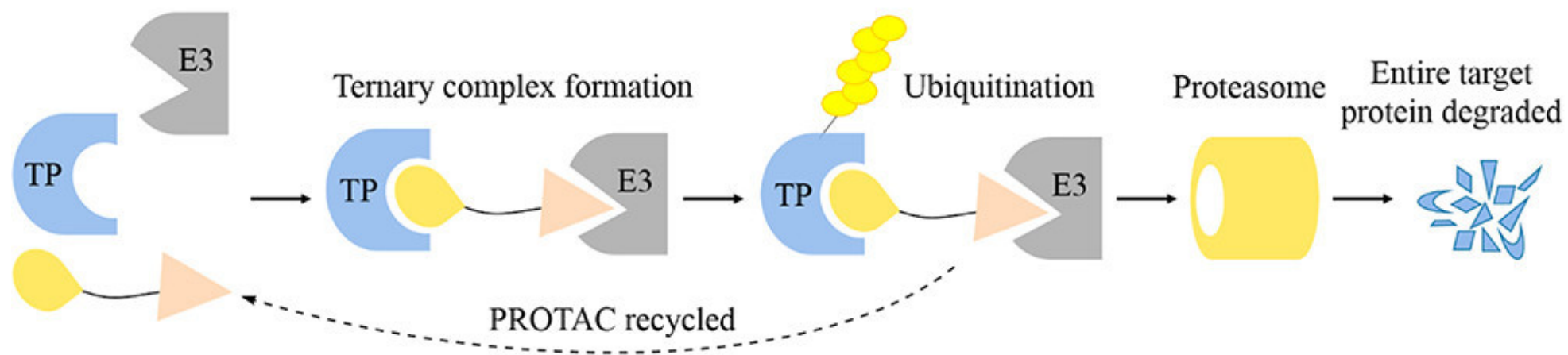
### Question 3 and 4:

Another possibility: decreased degradation

Experiment design:

- In silico search for RBPs ->
- PROTAC for the RBPs in KO ->
- expect MO-like phenotype and no RNA increase for adapting genes

(Ctrl: PROTAC for irrelevant RBPs in KO, WT-like phenotype)



*Gao et al., 2020*

Special thanks to Xiaochang Zhang group.