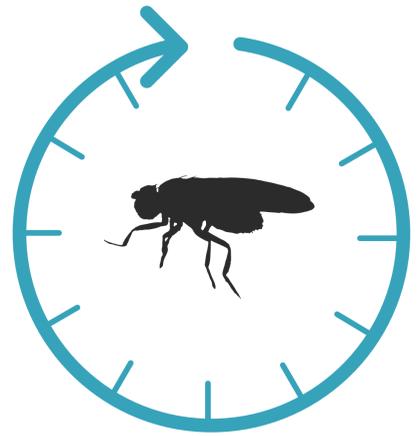


# REGULATING THE UAS/GAL4 SYSTEM IN ADULT *DROSOPHILA* WITH TET-OFF GAL80 TRANSGENES



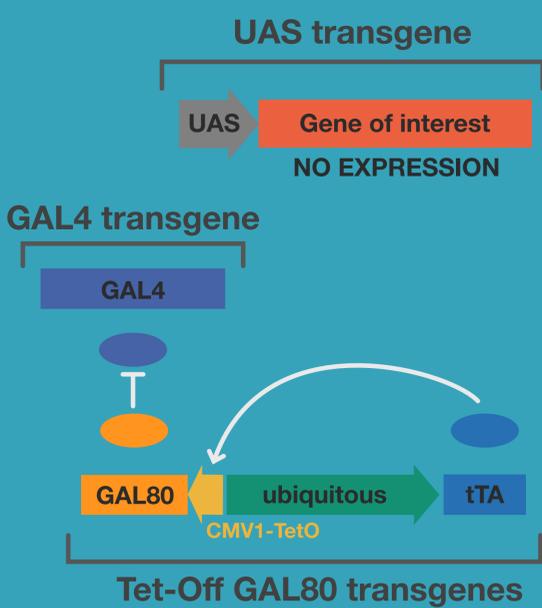
## INTRODUCTION

Sequencing and genomics technologies are overwhelming us with genes and mutations associated with normal or pathological biological processes. The experimental manipulation of gene expression in intact organisms provide definitive and conclusive answers to determine biological significance and causal relationships. The **UAS/GAL4 system** is widely used to manipulate gene expression but **does not have the ability to control the timing of the manipulation**.

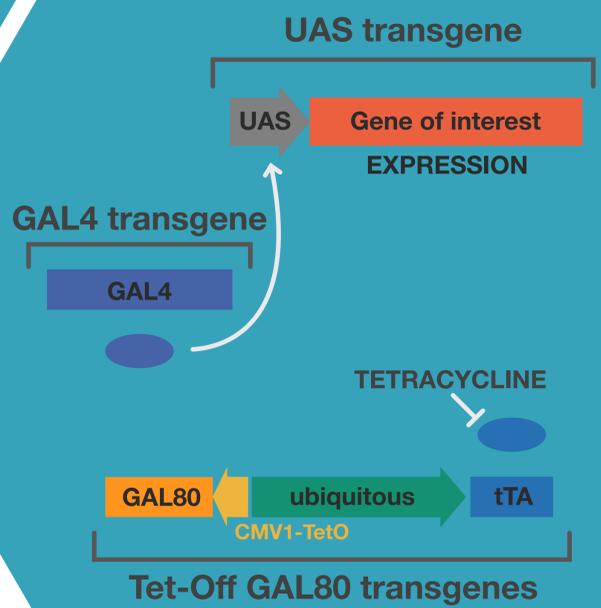


This study constructed and characterized Tet-off GAL80 transgenes designed to allow temporal control of GAL4 activity in aging adults. By placing GAL80 under the control of a Tet-off promoter, GAL4 activity is regulated by the presence or absence of tetracycline in the diet.

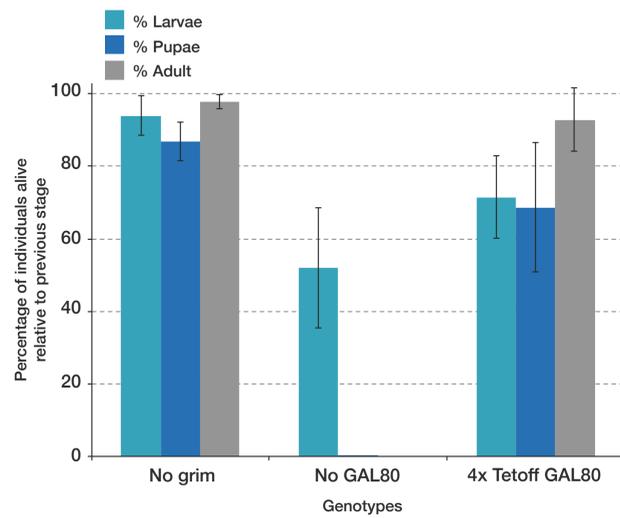
### NO TETRACYCLINE



### + TETRACYCLINE



## RESULTS



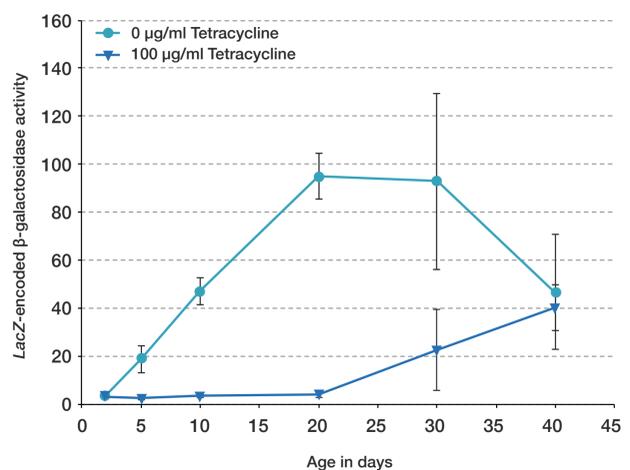
### REPRESSION

**Almost complete inhibition of the expression** of UAS transgenes during the pre-adult stages of the life cycle is obtained by using four copies and two types of Tet-off GAL80 transgenes.

### INDUCTION

**Induction of GAL4 activity is observed in adults fed tetracycline** but the inhibition of GAL4 activity and the maintenance of induced expression are altered in old animals.

The lack of inhibition is likely due to the **decline of the repressive ability of GAL80 with age**.



## CONCLUSION

This study reveals that the **repressive ability of GAL80 is affected by the age and sex of the animal** which is a major limitation to regulate gene expression with GAL80 in aged *Drosophila*.