



# CONNECTING SALT AND PUBERTY: THE NEUROKININ B STORY

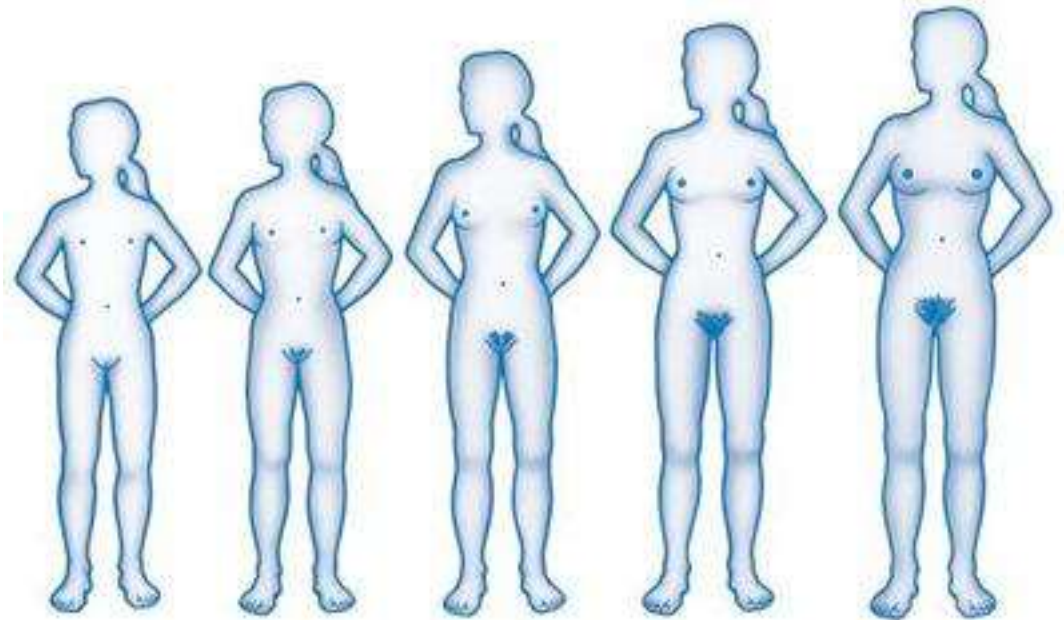
TERESA FULLER

MENTORS- DR. DONAL SKINNER AND DORI PITYNSKI-MILLER



# PUBERTAL MATURATION

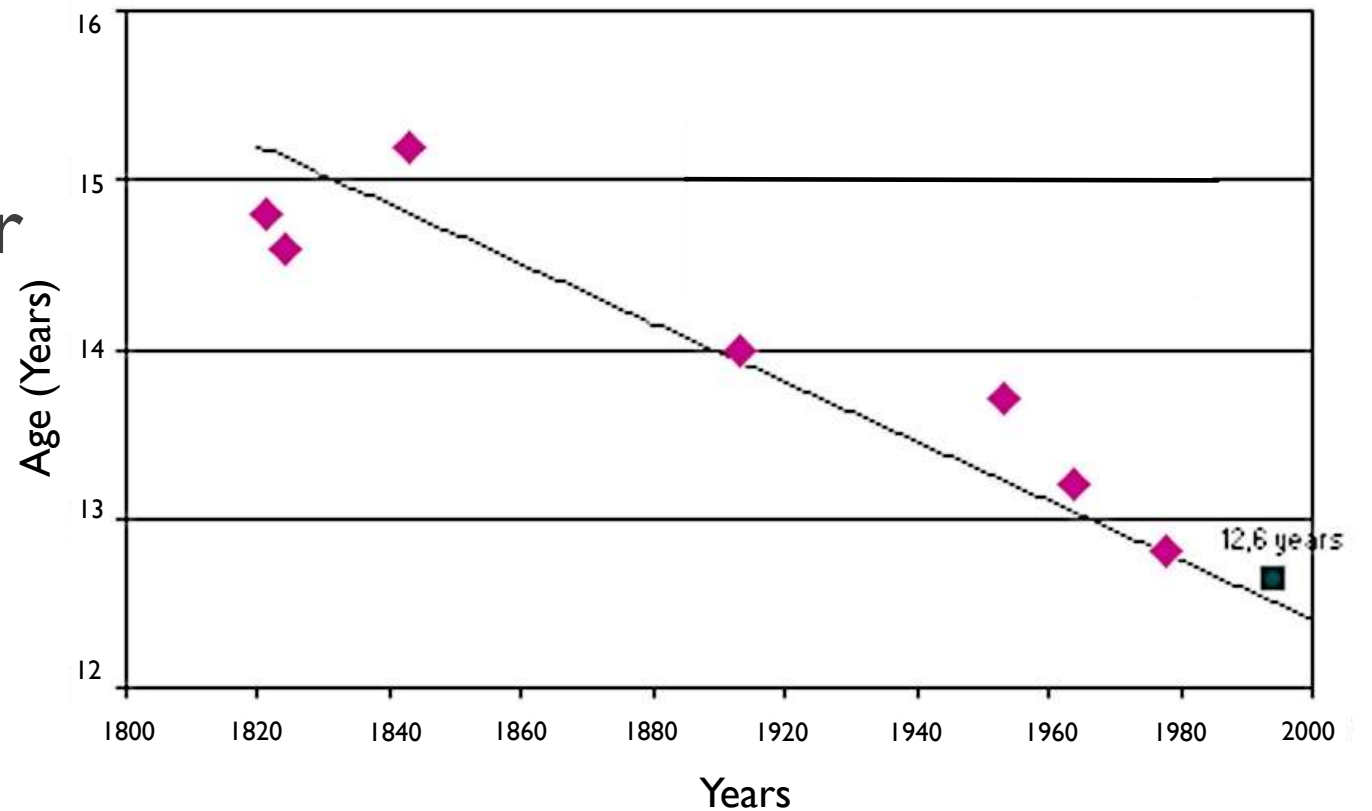
- Marked by activation of the reproductive system.
- Activation leads to increased estrogen, which causes development of primary and secondary sexual characteristics.



# EARLIER PUBERTY

- Puberty is occurring earlier among girls.

Mean Age at First Menstruation in France 1820-2000

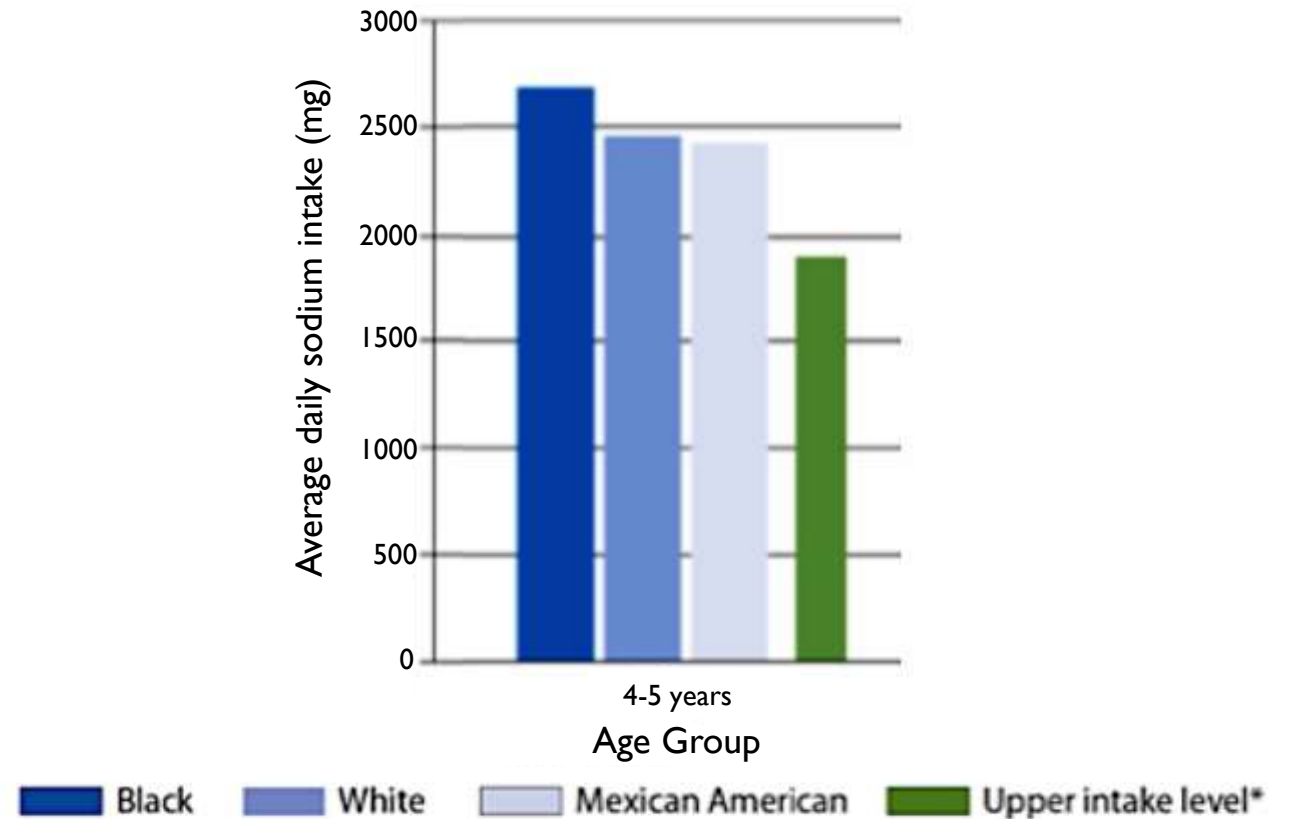


# DIETARY SODIUM CONSUMPTION

- Dietary sodium intake is on the rise.



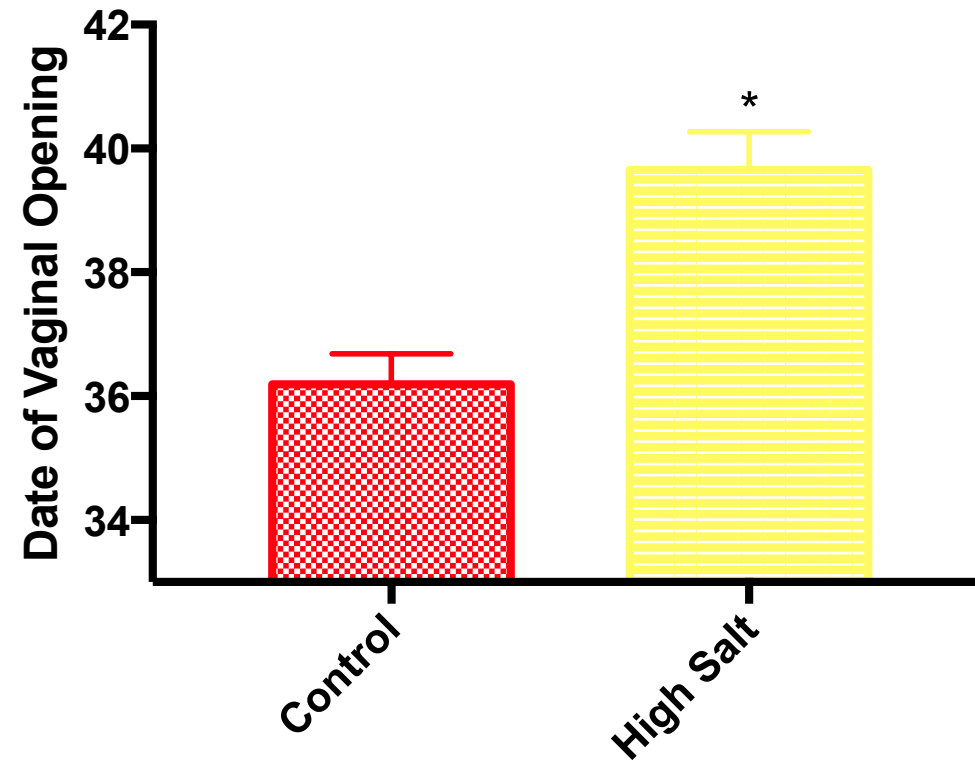
Daily sodium intake by age and race/ethnicity



# SALTS AFFECTS PUBERTAL TIMING

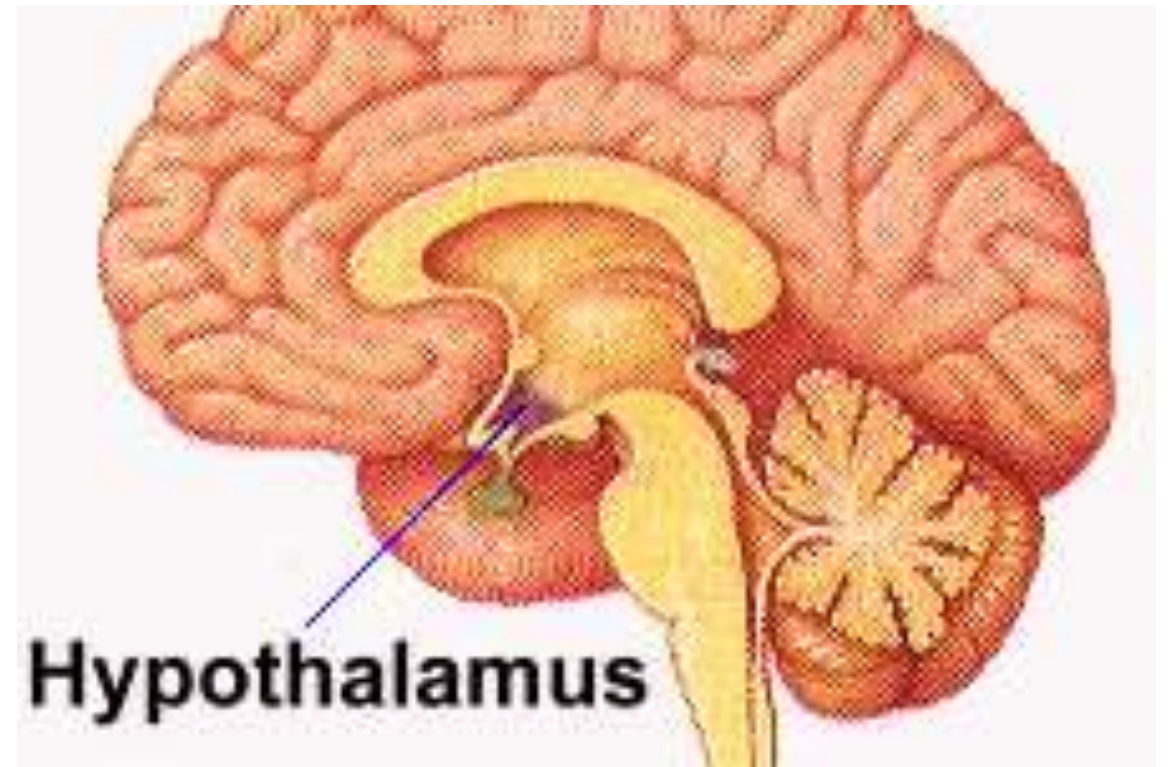
High salt diet delays puberty.

Average Date of Vaginal Opening



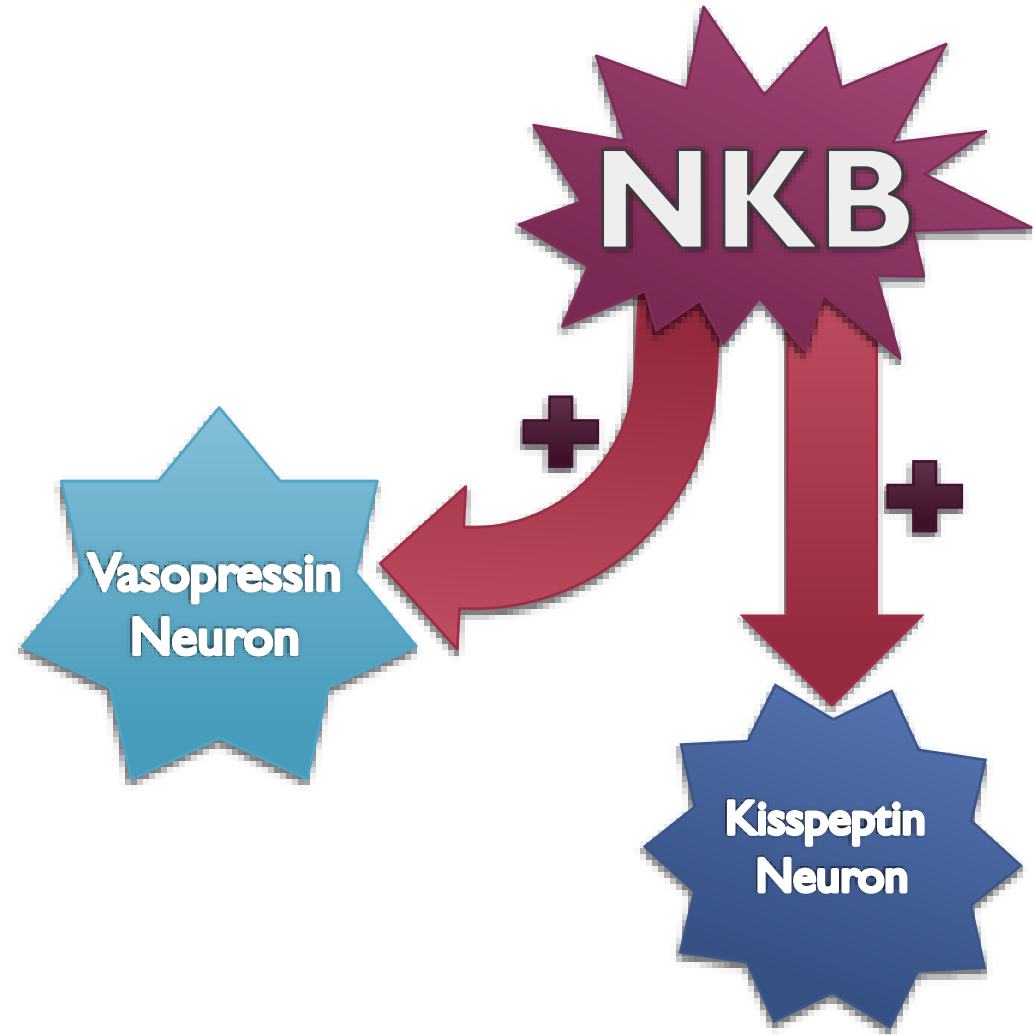
# THE HYPOTHALAMUS

- Hypothalamus is the master regulator of the reproductive system
- Kisspeptin neurons inside the arcuate nucleus of the hypothalamus important for activation of the reproductive system.



# NEUROKININ B

- NKB plays a role in both puberty and salt regulation.



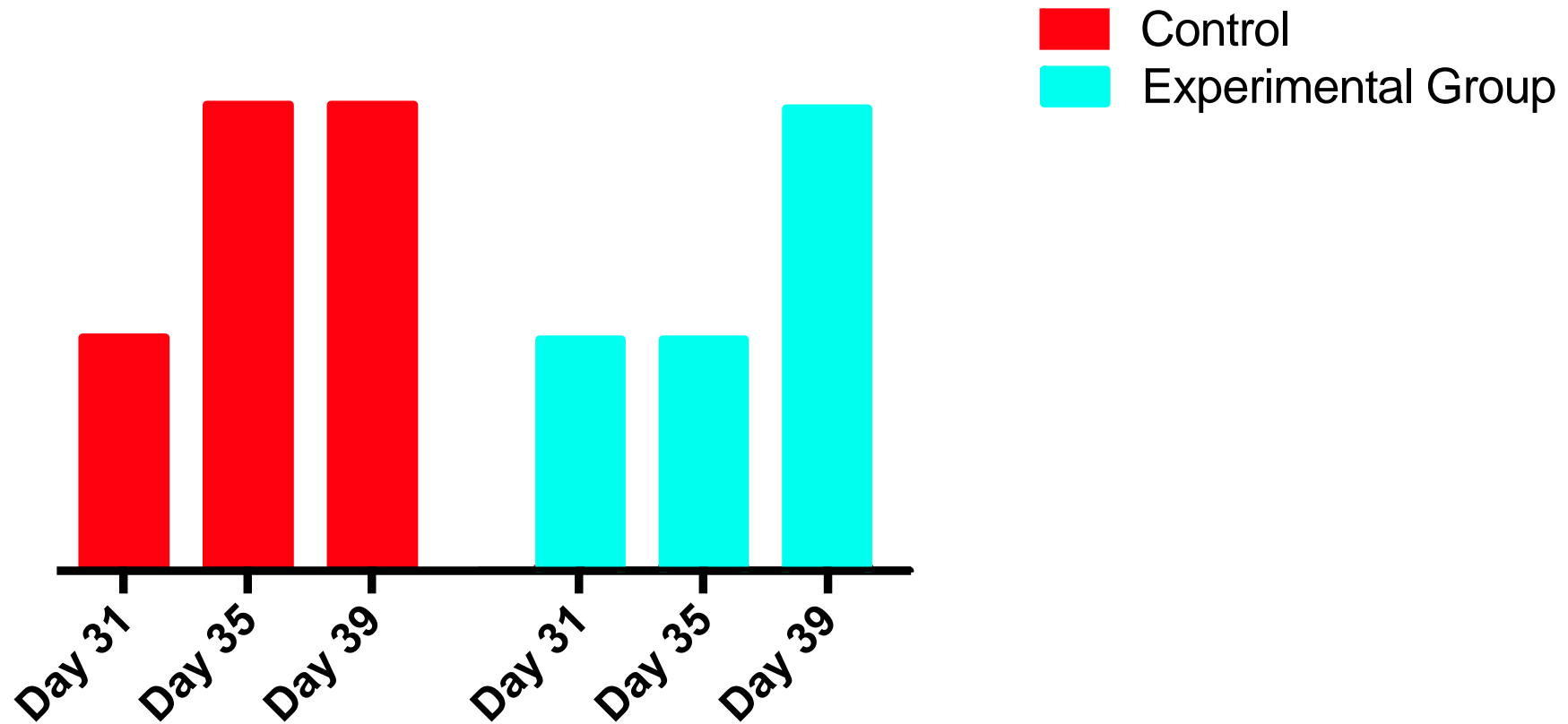
## CENTRAL QUESTION

Is the delay in puberty we see in animals fed a high salt diet due to altered expression of NKB in the arcuate nucleus?



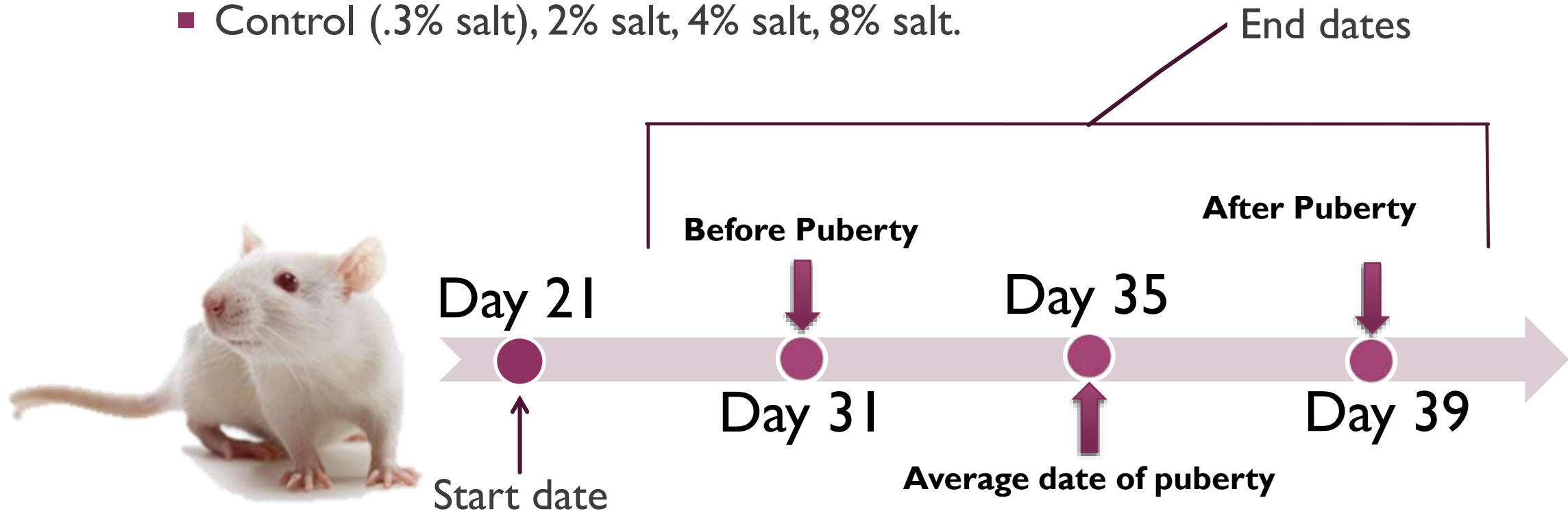
# HYPOTHESIS

## Hypothesized NKB Expression

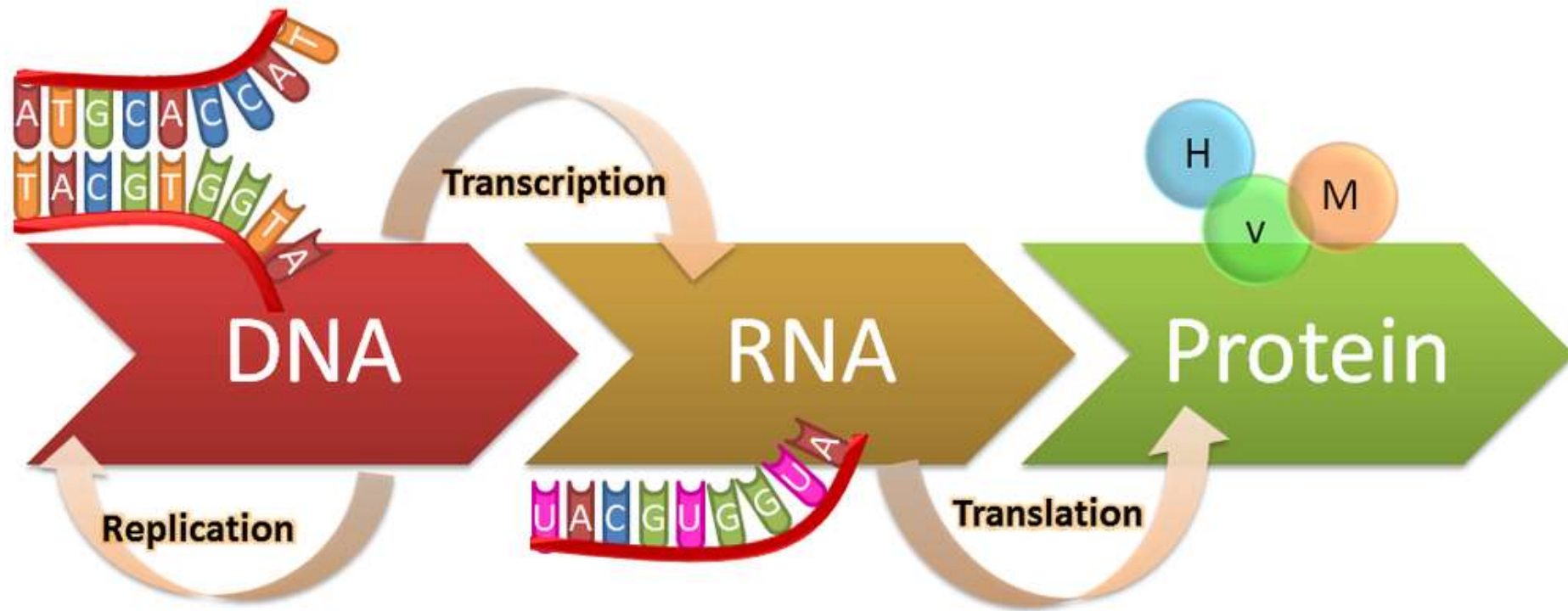


# EXPERIMENTAL SETUP

- 12 distinct experimental groups
  - Control (.3% salt), 2% salt, 4% salt, 8% salt.

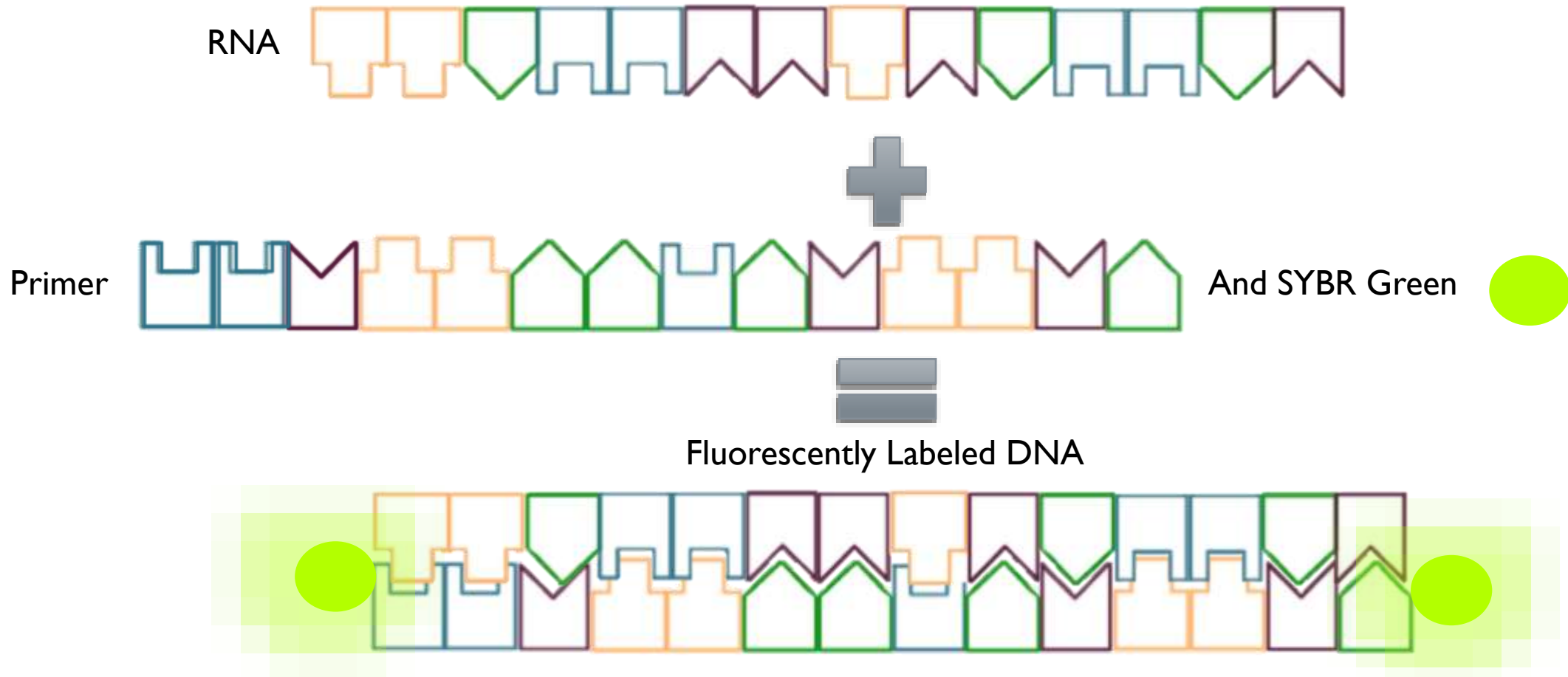


# CENTRAL DOGMA OF MOLECULAR BIOLOGY



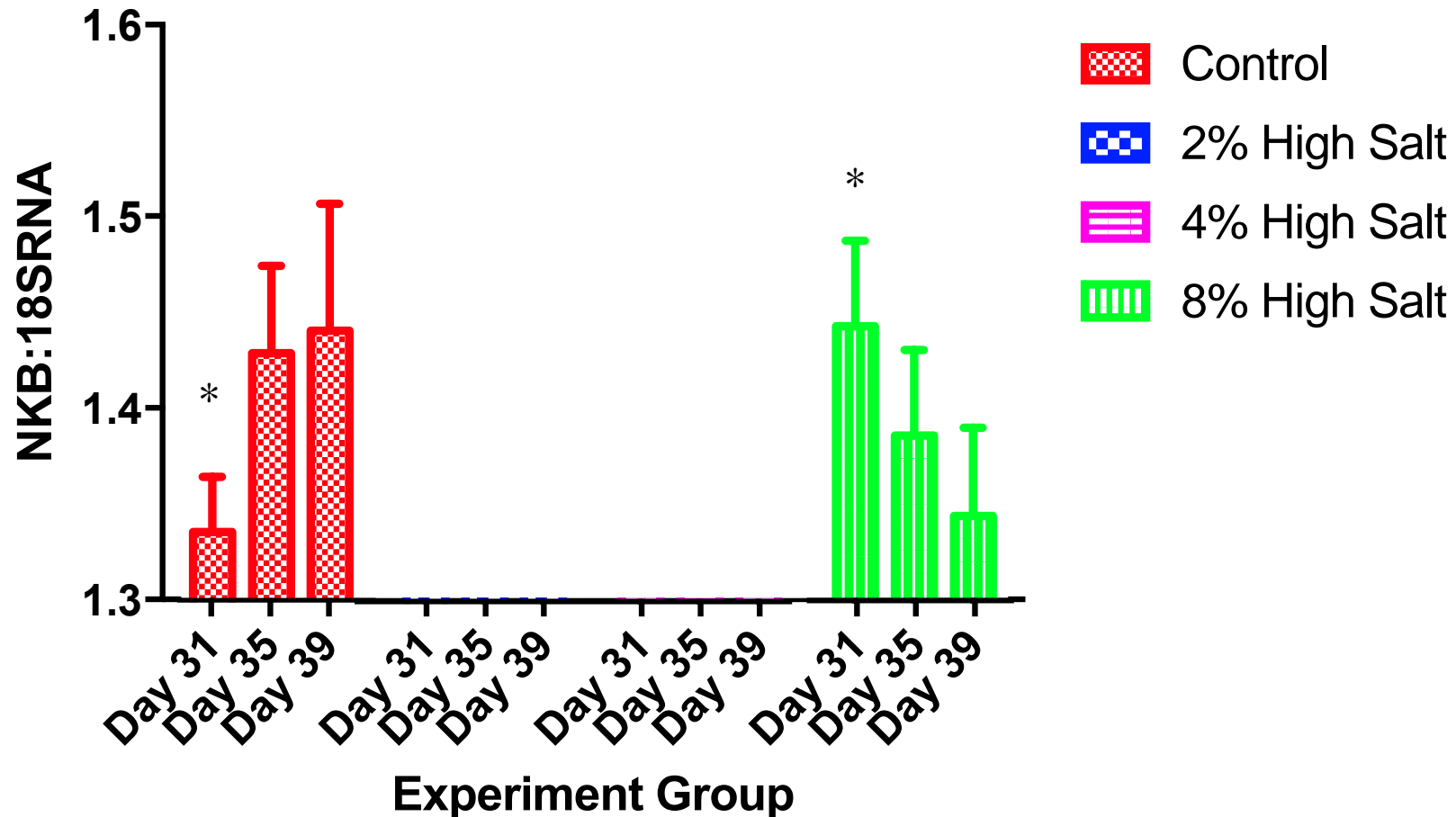
# QUANTITATIVE POLYMERASE CHAIN REACTION

Used to quantify synthesis of certain mRNA strands and ultimately, specific proteins.



# QPCR RESULTS- CHANGES IN NKB EXPRESSION THROUGHOUT PUBERTY IN ALL DIETS

## All Groups All Days



## CONCLUSION

- High salt diets delay puberty in rat models.
- NKB expression in ARC is significantly altered before puberty in a high salt diet compared to control.

Think about the  
American diet.

## POSSIBLE FUTURE RESEARCH

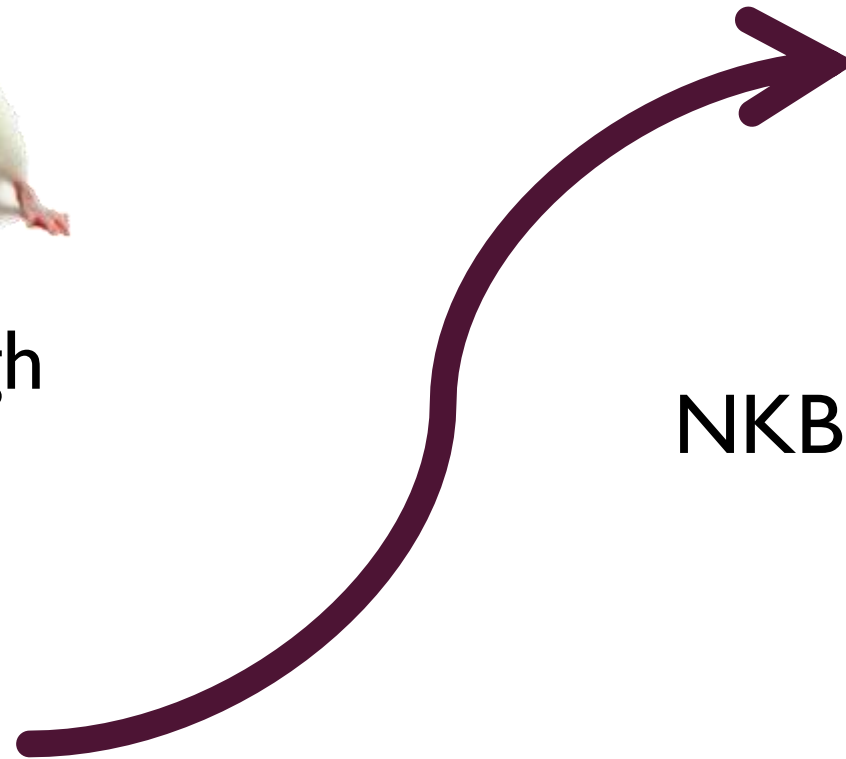
Rat



Chronic infusion of high concentration NKB



Delay in puberty



Stop infusion



NKB concentration lowers



Observe puberty

# THANK YOU

- INBRE
- Dr. Donal Skinner
- Dori Pitynski-Miller
- Dr. Marjorie MacGregor
- Carole Hertz
- Rachel Schambow
- Arianna Schabauer