

- Damage from external agents (mutagens)
- Defenses Against Mutation
 - Mutation repair proteins
- Effects of Mutations
 - Primary Impact: No change (in protein or cell function)
 - Less Frequent: Negative Impact
 - Rare: Positive Impact

Day 6

1/24/2020

DEVELOPMENT

EXAM ON MONDAY AT 7PM!!!!

FRUIT FLIES

- “Fruit Fly” *Drosophila Melanogaster*
 - Easy to care for
 - Short generation time (7+ days)
 - Large numbers of offspring
 - Identifiable mutations
- Fruit fly mutations
 - Different eye color, eye shape, wings, color larva, etc.
- Thomas Hunt Morgan (1866-1945)
 - Demonstrated that genes are located on chromosomes.
 - Sex-linked traits
 - Crossing over between chromosomes.
 - Famous for his paper where he talks about genetics and evolution.
 - Linked Mendel’s principles of inheritance and Darwin’s theory of natural selection as a means for transforming species.
- Fruit Fly Genome
 - A genome is all of the hereditary information found in an organism.
 - # of Chromosomes: Fruit Flies $2N = 8$, Humans $2N = 46$
 - # of Genes: Fruit Flies $\sim 13,600$, Humans $\sim 23,000$
- Fruit Fly Life Cycle
 - See Picture
 - Meiosis: only happens to produce sperm and eggs, just for sexual reproduction.
 - ($2N \rightarrow 1N$)
 - Meiosis has an E and Sex has an E
 - Fertilization: ($1N + 1N = 2N$)
 - Mitosis: a cell make a genetic copy ($2N \rightarrow 2N$)
 - Excessive Mitosis: Cancer

GENES AND DEVELOPMENT

- See Diana’s Pictures
- Master Control Genes
 - HOX Genes: organize head, thorax, abdomen