

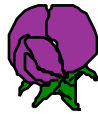
# Mendelian Genetics – Monohybrid cross

Genetics 371B Lecture 2

28 Sept. 1999

## Interpreting Mendel's experiment

Parents:



Gametes:



F1 progeny:



Gametes:



F2 progeny:


## **Conclusions:**

1. Determinants are **particulate**
2. They occur in **pairs**; one member may be **dominant**
3. Determinants **segregate randomly** into gametes

Prediction: The F2 “Purple” class consists of two subclasses:

Testing the prediction:

What Mendel did:

What we would do today (hindsight!):

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## **Generality of Mendel's first law:**

(Not just for pea plants!)

- ◆ Fruit fly (*Drosophila melanogaster*)

Normal (brown) body x black body

- ◆ Mice

Agouti x Black

- ◆ Humans

Albinism

# Pedigree analysis

- ◆ What are pedigrees?
- ◆ Why bother with them?
- ◆ Constructing pedigrees

"The **inability** to smell methanethiol is a **recessive** trait in humans. Ashley, Perry, and Gus are three smelling children of Erin (a non-smeller) and Darren (a smeller). Perry's only child is a non-smeller boy. Construct a pedigree for this family, indicating the genotypes where possible."

*To be continued...*

# Complications

- ◇ Expressivity
  
- ◇ Penetrance

Do all human traits show simple Mendelian inheritance?

# Commonly used pedigree symbols

○ Female

□ Male

○—□ Mating

I ○ 1 — □ 2  
 II ○ 1 — □ 2  
 Parents and children (in order of birth)

○ \ / □  
 Dizygotic (nonidentical) twins

○ / \ ○  
 Monozygotic (identical) twins

◇ Sex unspecified

● ] Affected  
 ■ ] individuals

◐ ] Heterozygotes  
 (autosomal  
 ■ ] recessive)

⊙ Carrier, sex-linked recessive

◓ ] Deceased  
 ∅ ]

● Stillborn or abortion

▣ ↗ Proband

○=□ Consanguineous marriage