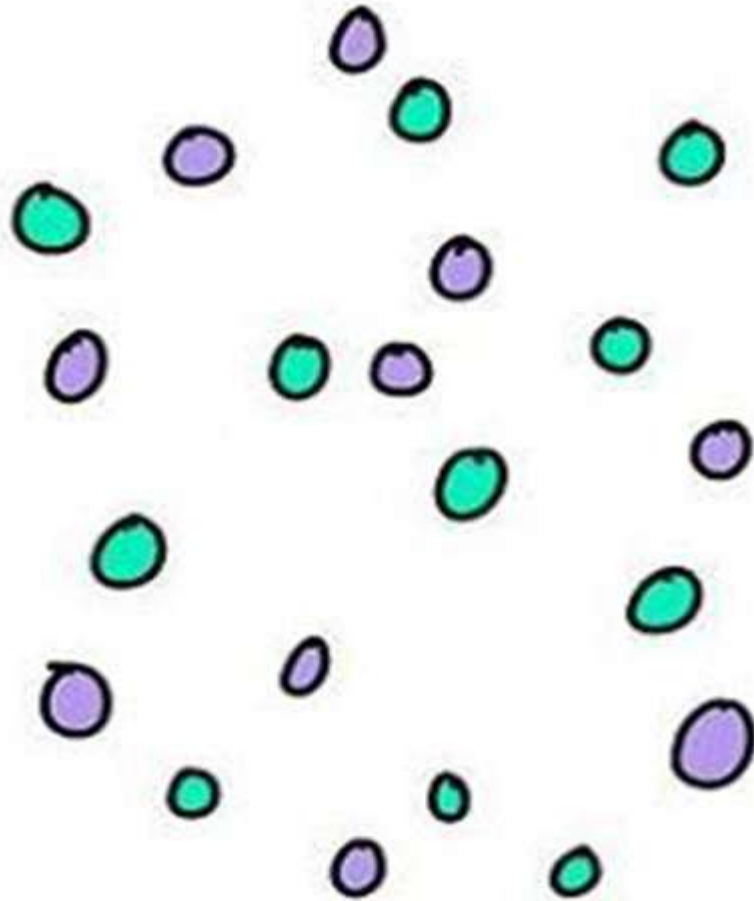
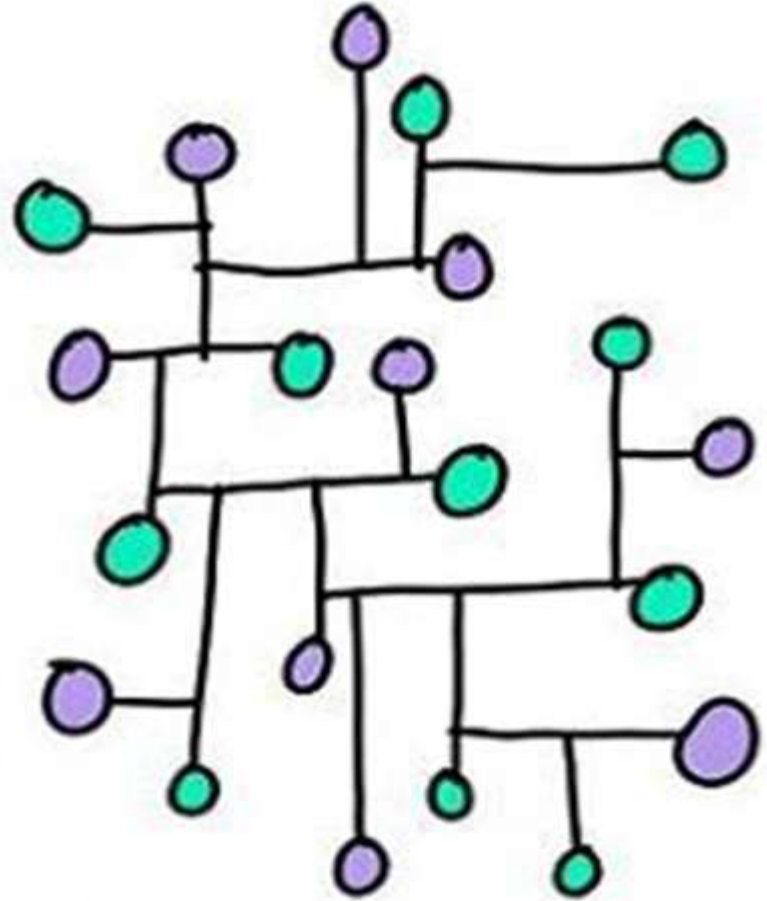


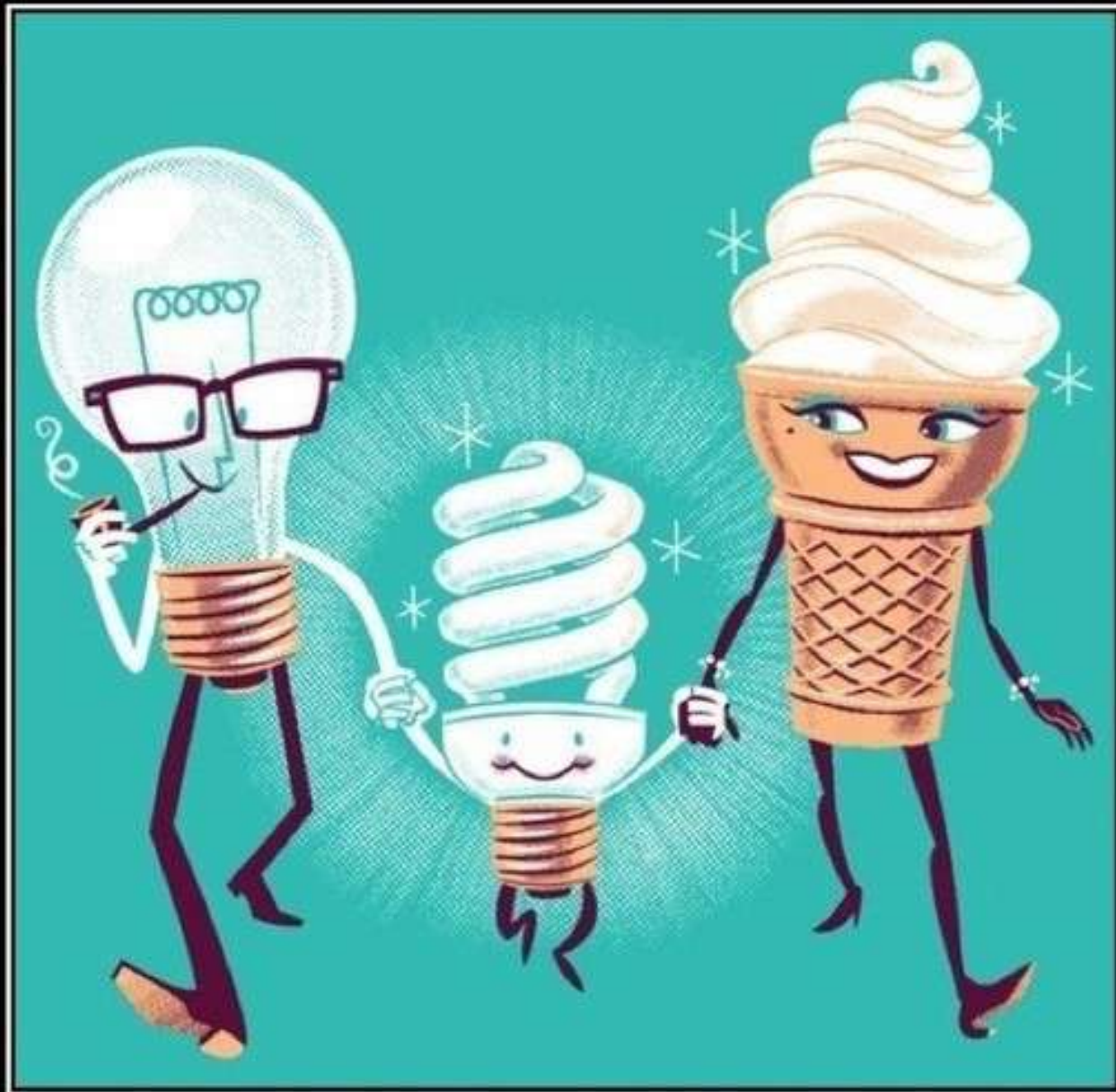
Knowing



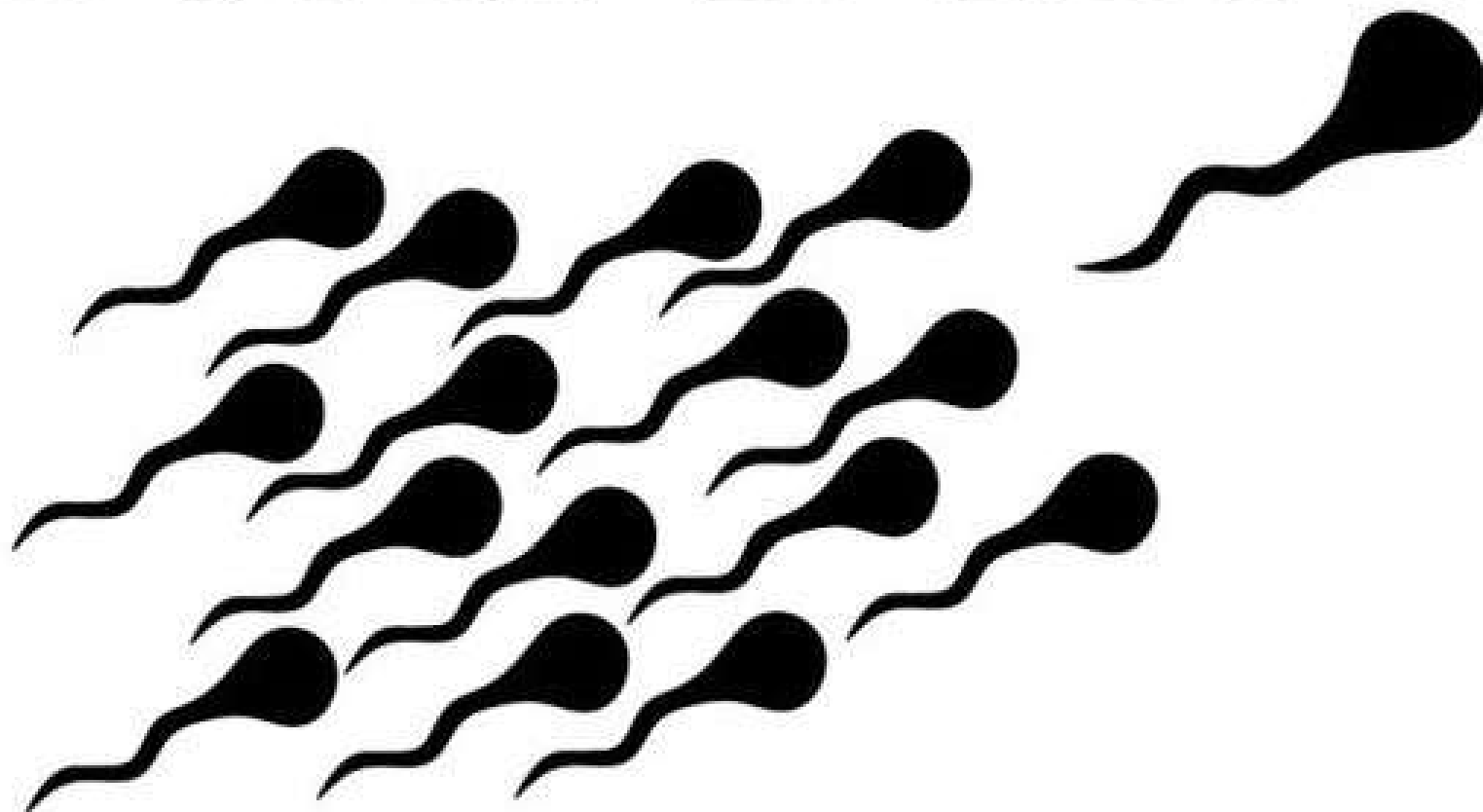
Understanding



@gapingvoid



**10 MILLION  
SWIMMERS**



**AND YOU WON**

**GENETICS**  
**MUTATIONS HAPPEN.**





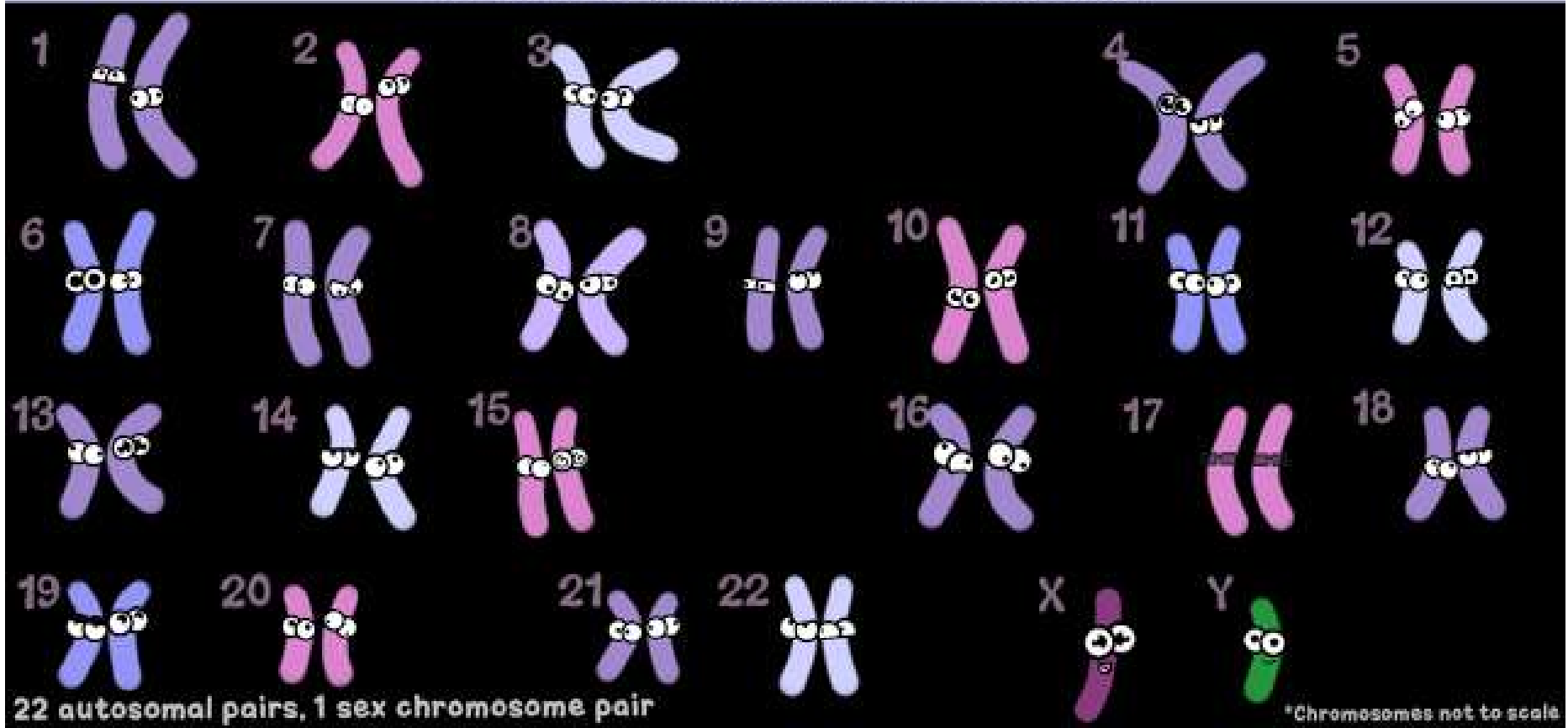
# GENETICS

This is how it works.

#AmoebaGIFs

# Human Karyotype: 46 chromosomes\*

@AmoebaSisters





# HETEROZYGOATS

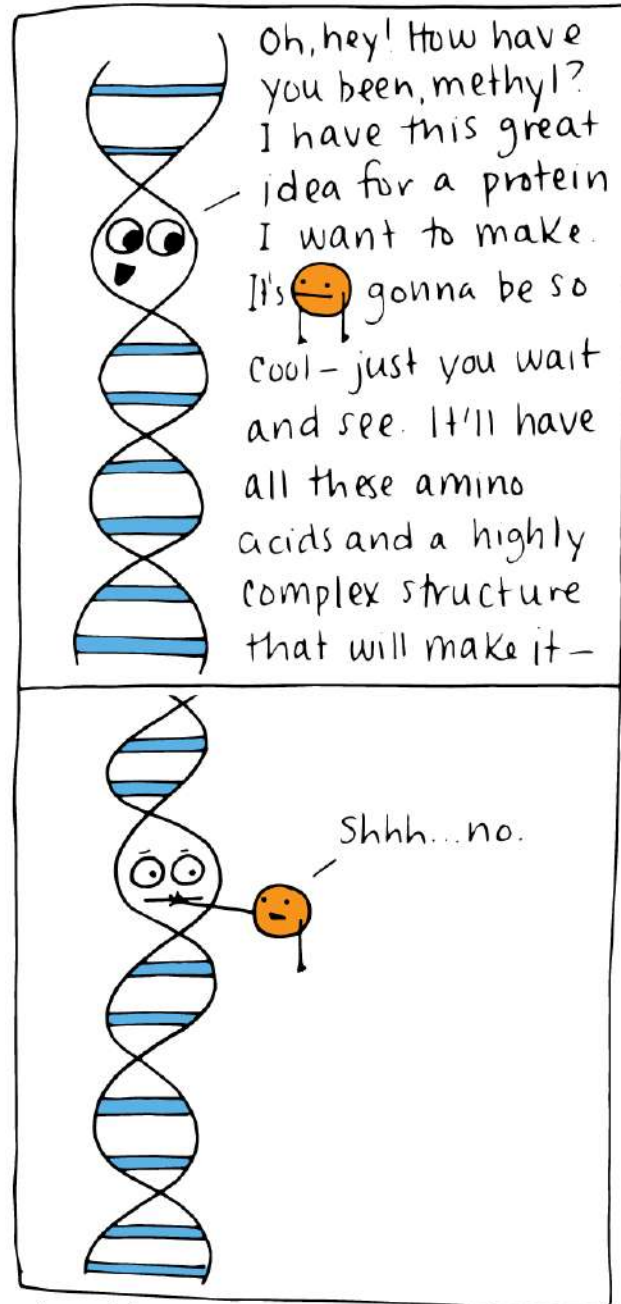
Just allele uneven.





# CODOMINANCE

This is how it works



**Another gene silenced.**

**SEE SOMEONE  
ATTRACTIVE**



**MAKE MENTAL PUNNETT  
SQUARES**

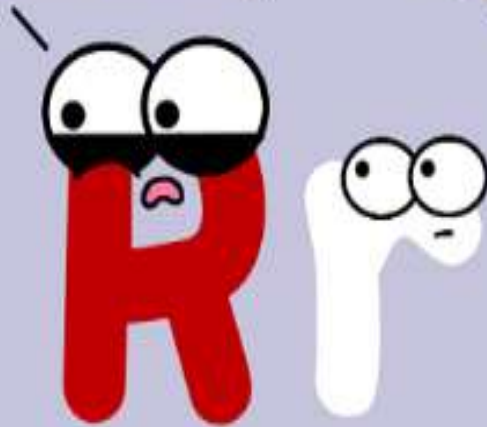
## Codominance

We shall rule this chicken together!



Huzzah!

It's just really hard for me to fully commit to this flower...



## Incomplete Dominance





W

W



B

B

BW



BW

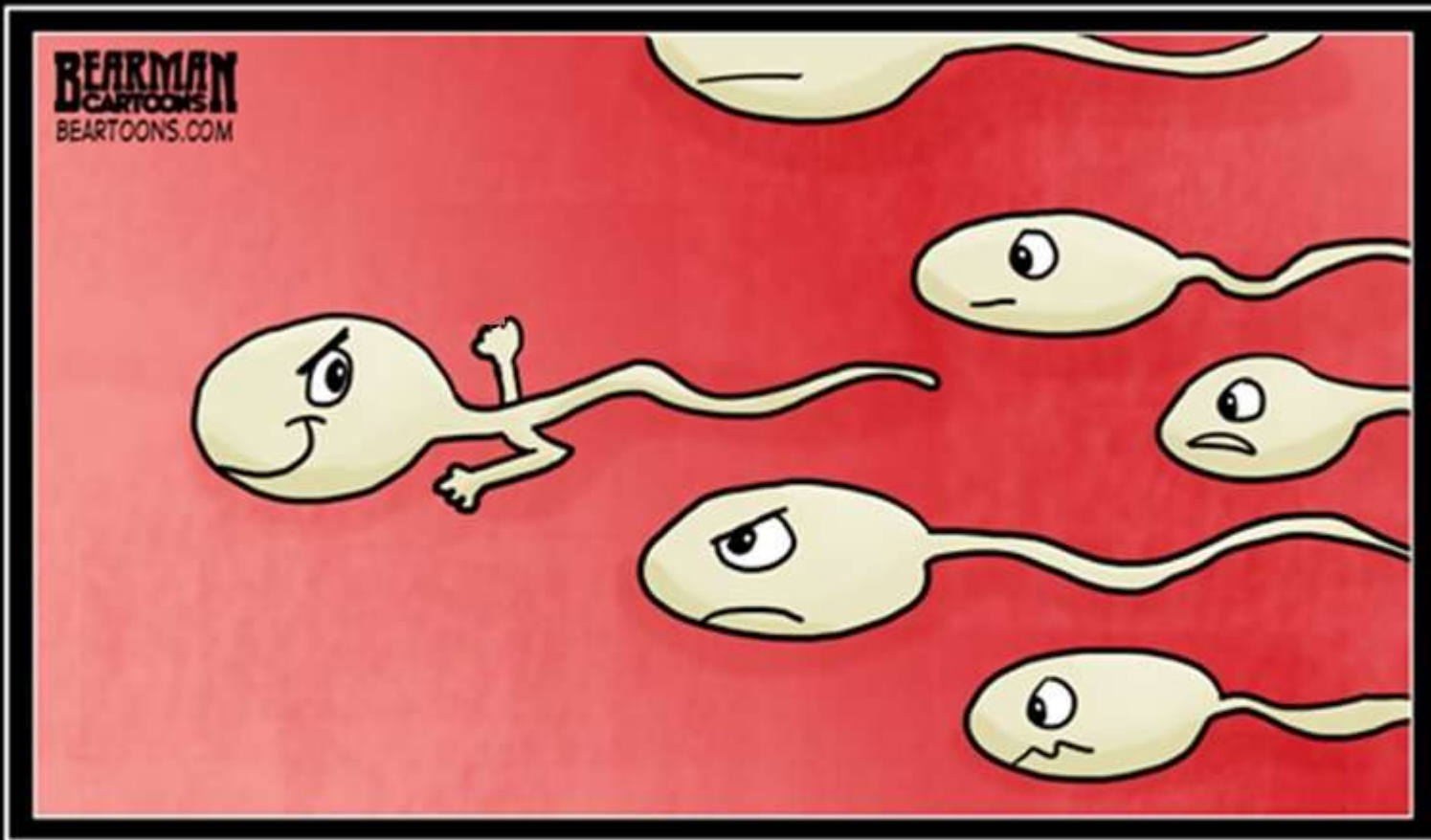


BW



BW





# BELIEVE IN YOURSELF

Don't ever let someone tell you that you're not good enough. Never forget that you were the fastest sperm.



# Gregor Mendel

Giving Peas a Chance  
Since 1856



**BIOLOGY  
LAB**



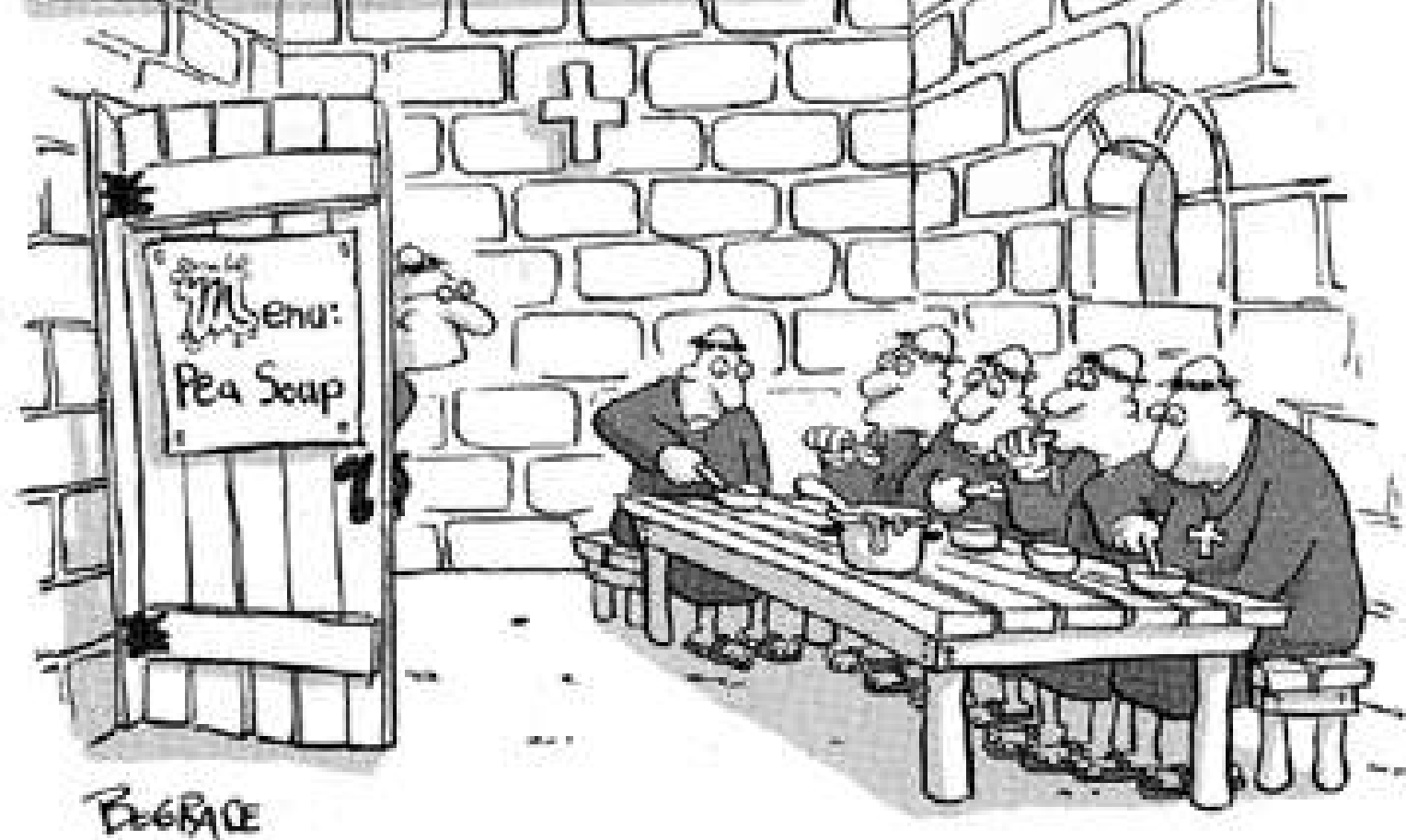
ALL THE "X" CHROMOSOMES ARE  
TRYING TO FIND  
SOMEBODY  
TO PLAY  
TIC-TAC-TOE  
WITH!

THAVES 3-4

E-mail: ThavesOne@aol.com  
©2010 Thaves / Dist. by UFS, Inc.  
www.frankandernest.com



Mendel's Genetics Research  
Suffers a Temporary Setback

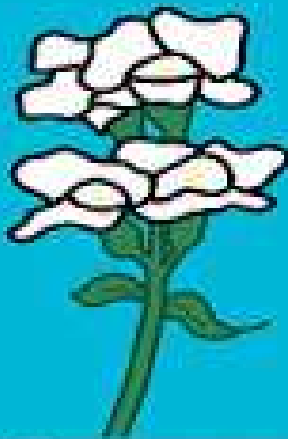




Genetic Series - Video 5



+

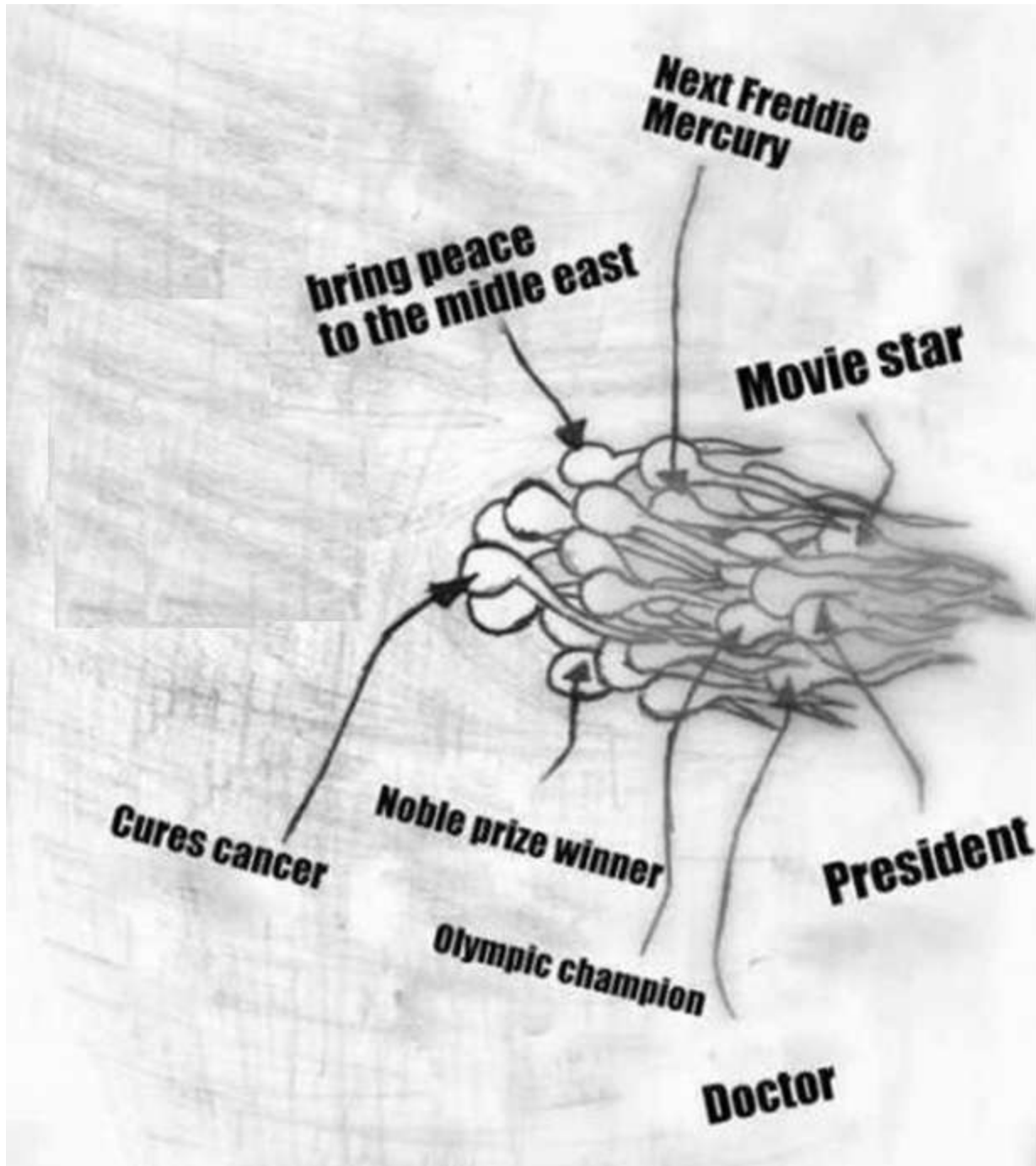


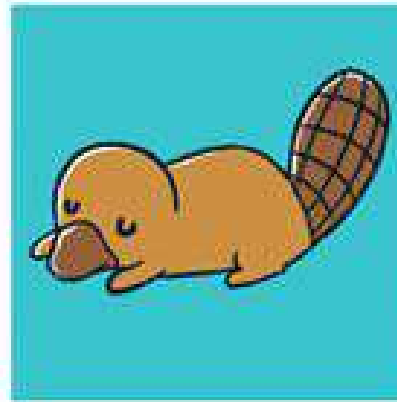
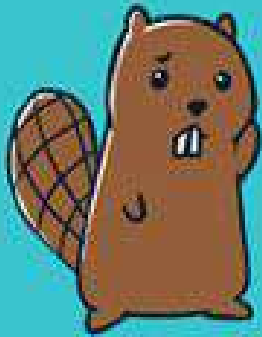
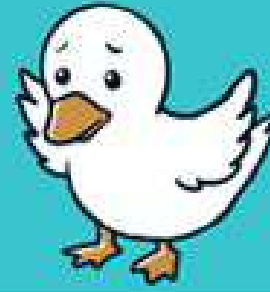
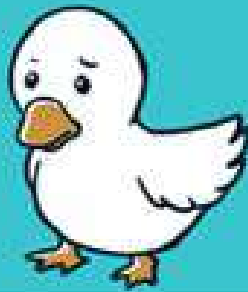
=

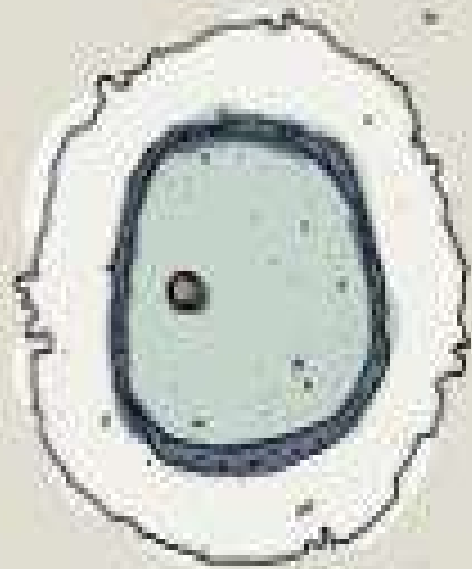


**Incomplete Dominance, Codominance, Polygenic Traits, and Epistasis**

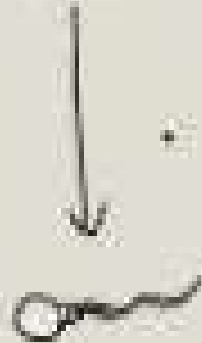
With the Amoeba Sisters





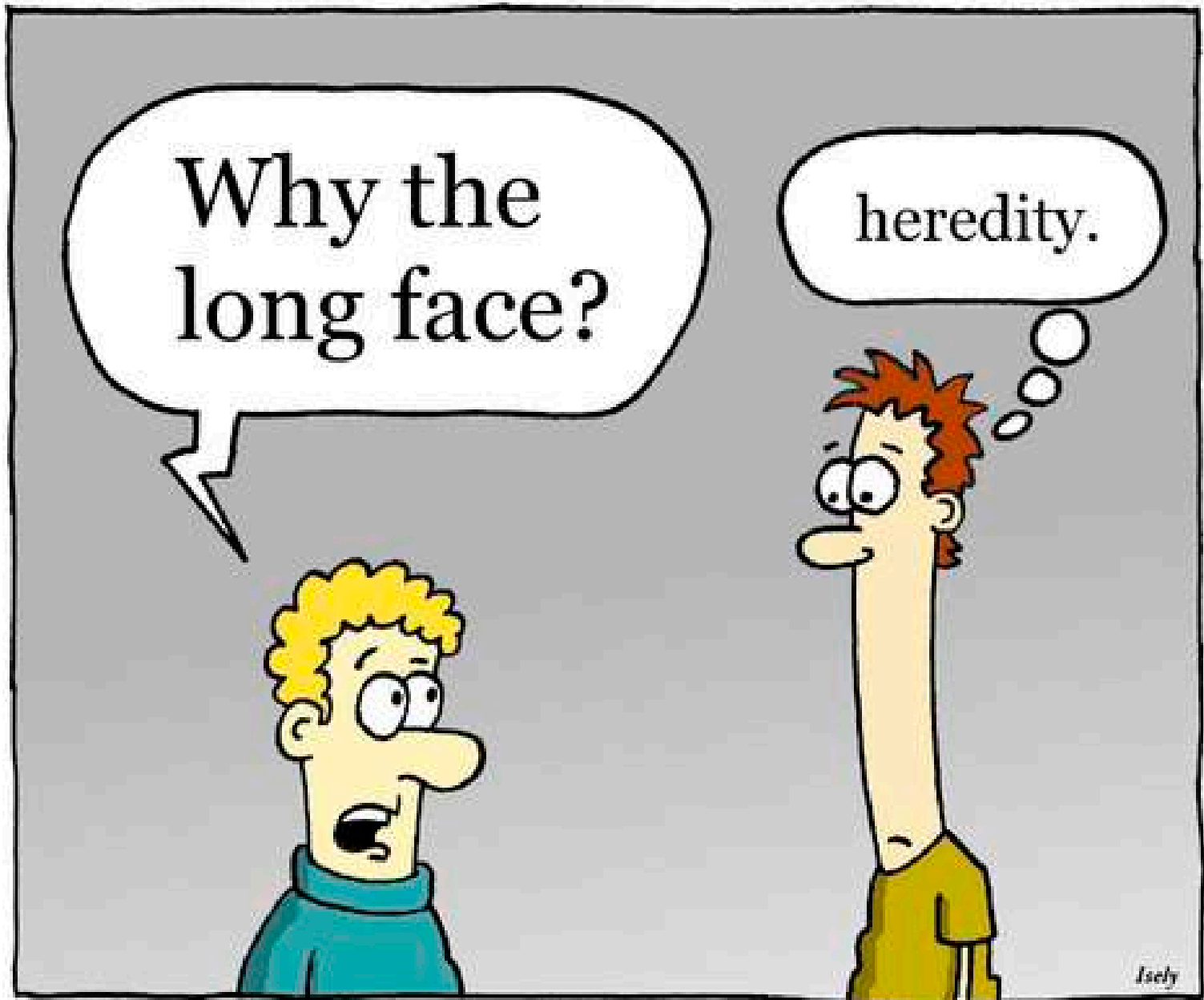


MICHAEL  
THOLPS



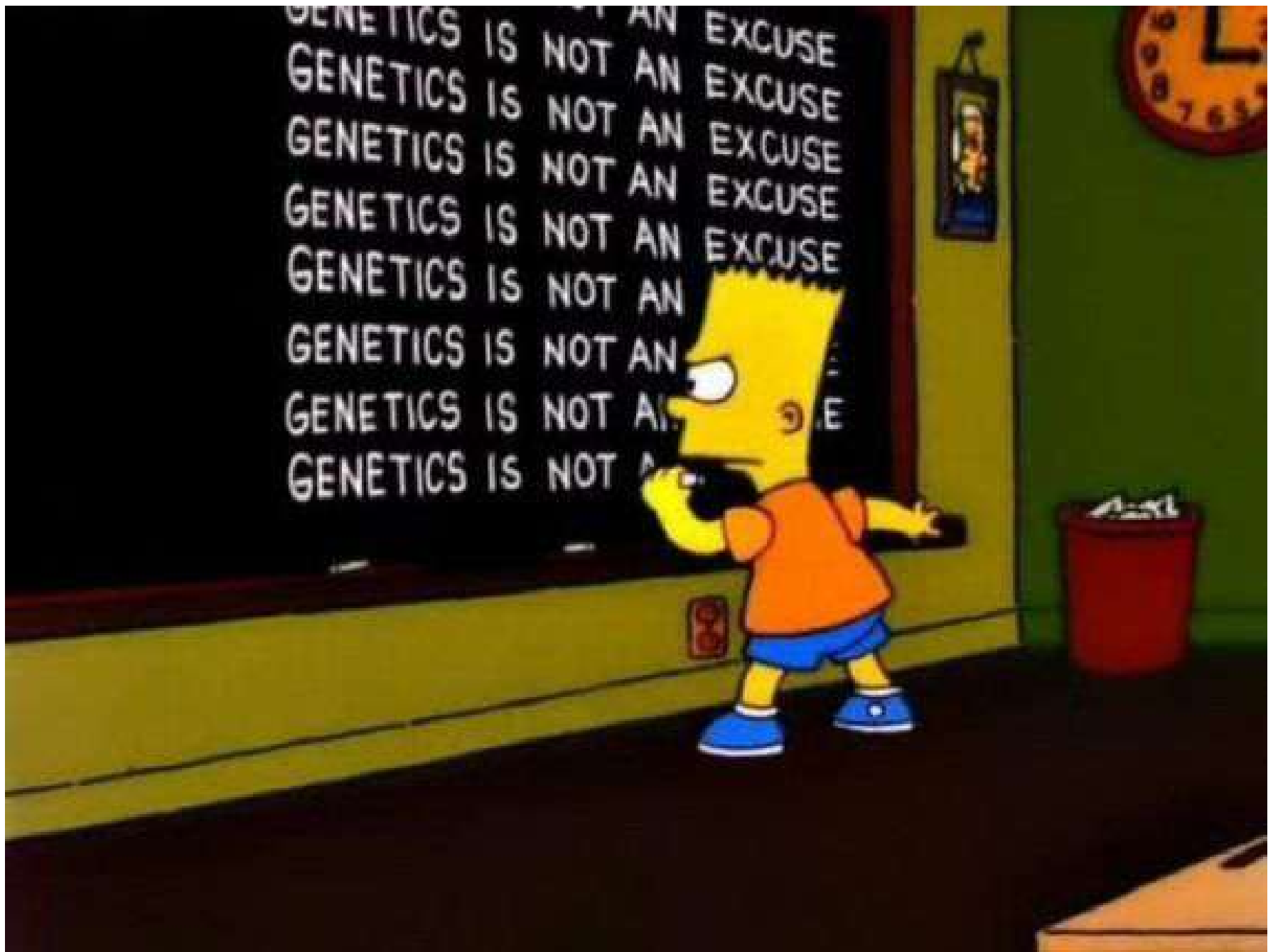


"It's not my fault I got all the good genes.  
Nobody told me you'd be coming."









# RANDOM FERTILIZATION

Average male between ages 15-30 makes  
200,000,000-300,000,000 sperm/day

Females born with 1-2 million immature eggs  
Releases 400-500 mature eggs in lifetime

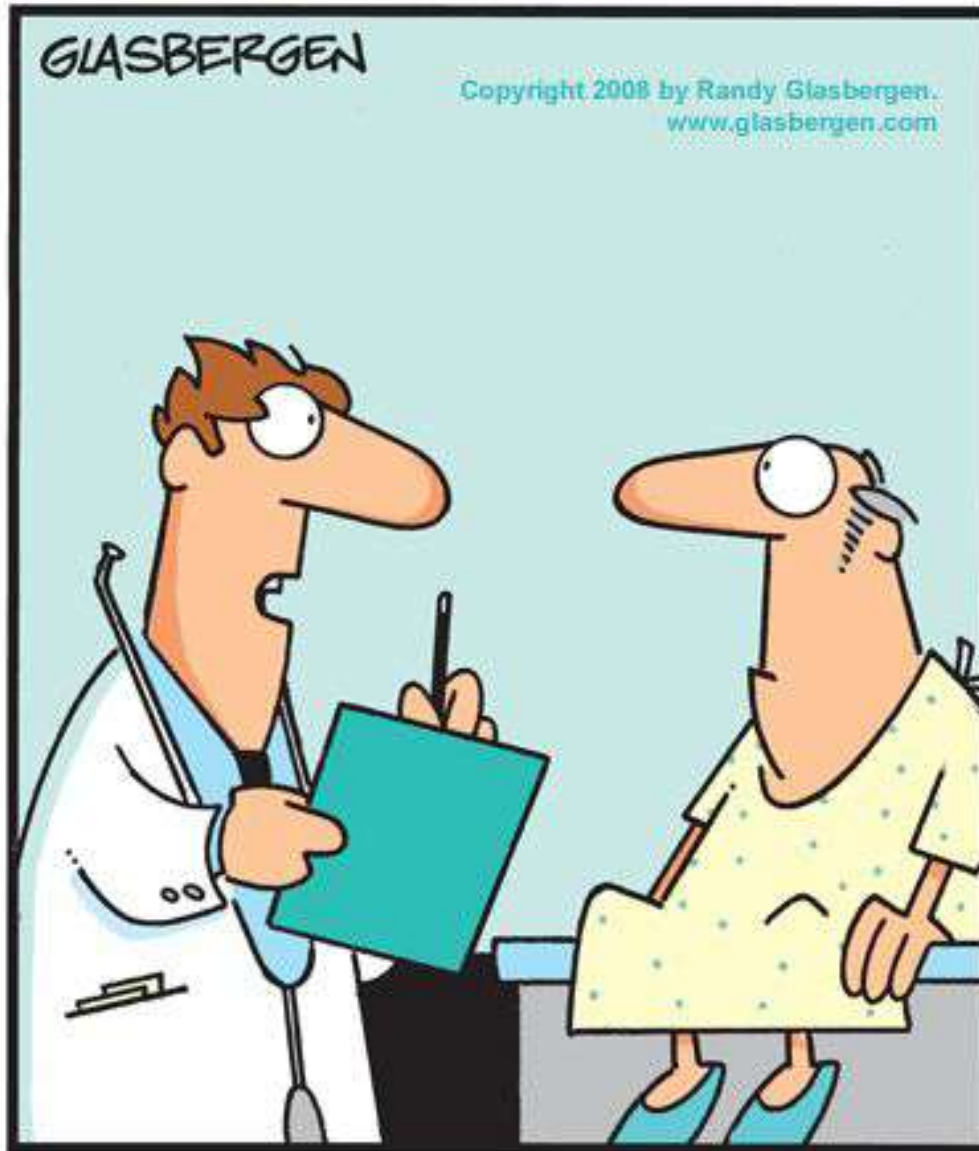
Egg  $2^{23}$  = 8.4 million possible combinations

Sperm  $2^{23}$  = 8.4 million possible combinations

$2^{23} \times 2^{23} \sim 70$  trillion diploid combinations  
(This doesn't include crossing over!)

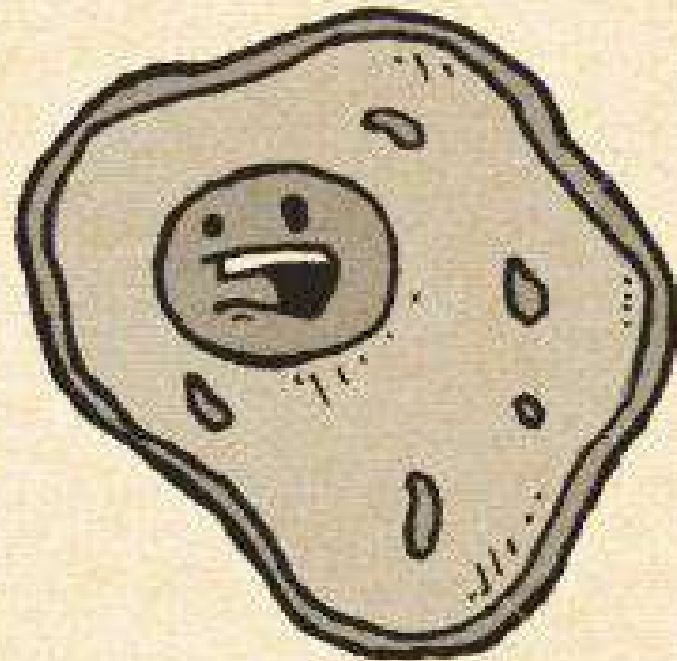
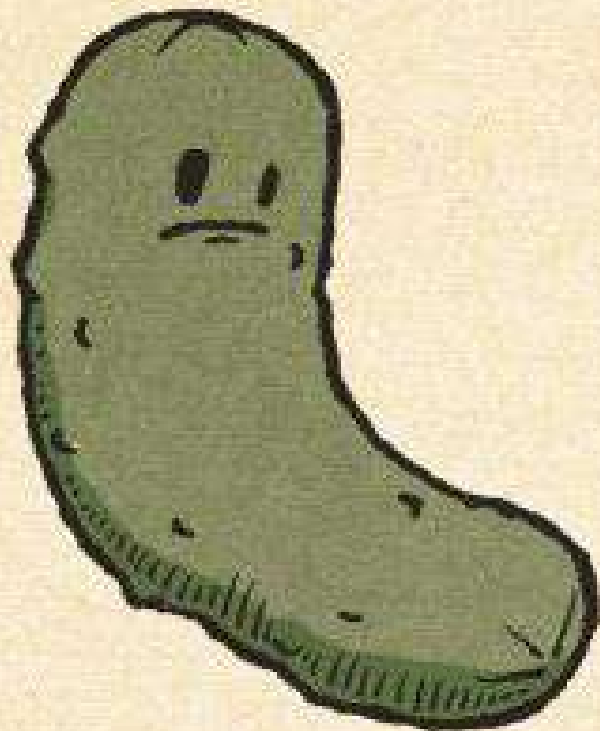
Odds of one particular egg getting together with  
one particular sperm is astronomical.

**EVERYONE IS UNIQUE!**



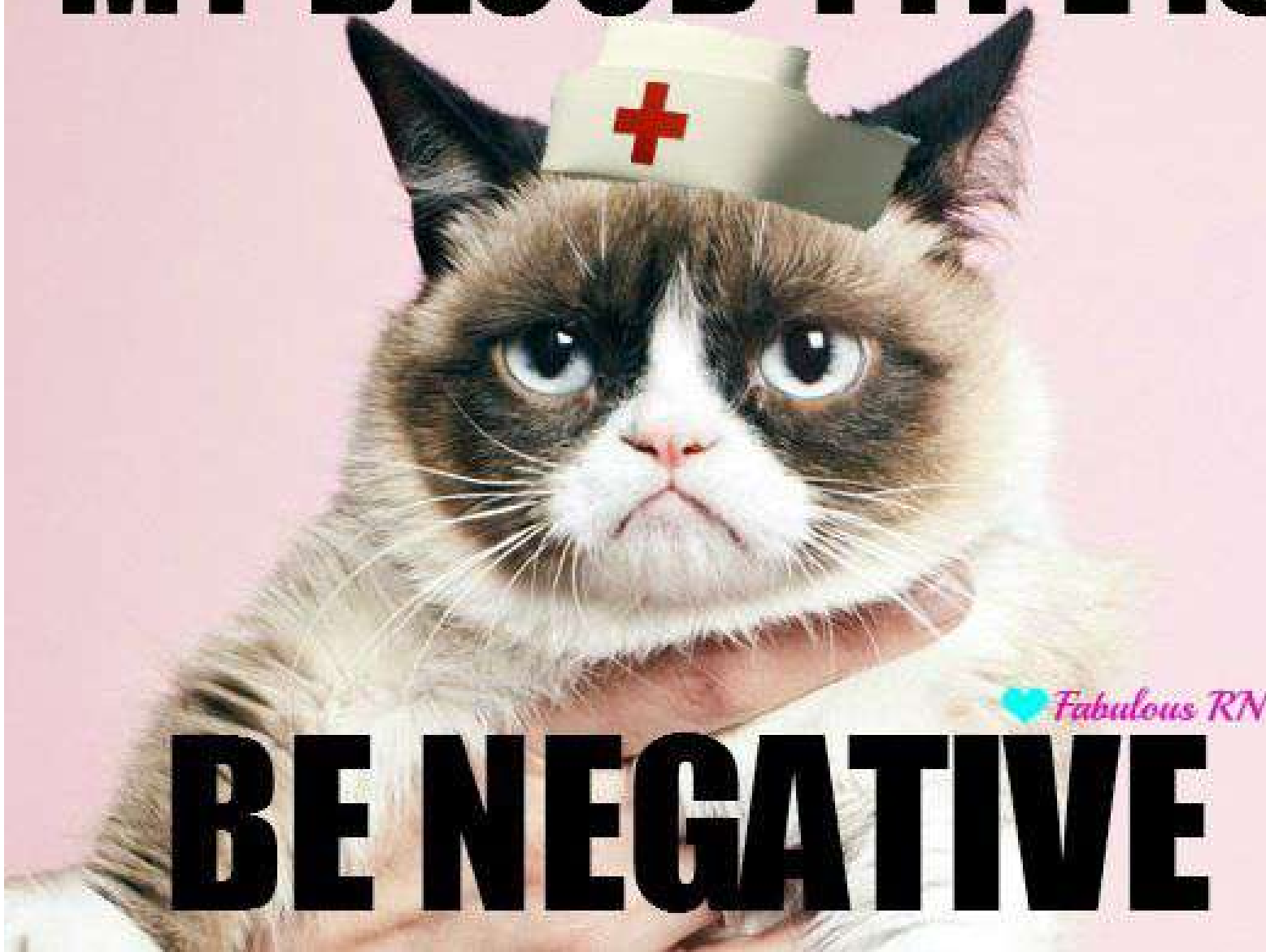
**“Eat less, exercise more and invent a time machine so you can go back and choose parents with better genetics.”**

Ah man, Benny, I think  
you have Pickle Cell Anemia.





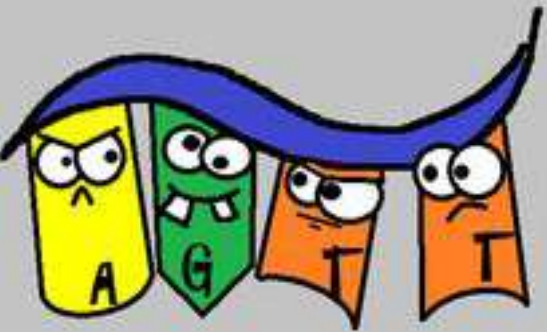
**MY BLOOD TYPE IS**



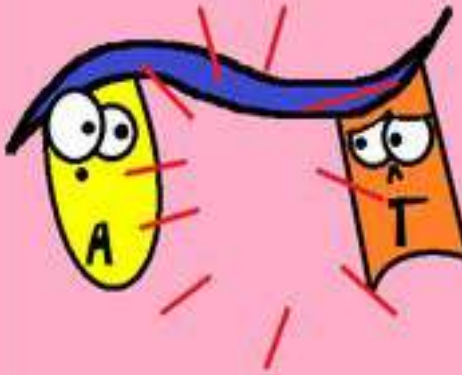
 *Fabulous RN*

**BE NEGATIVE**

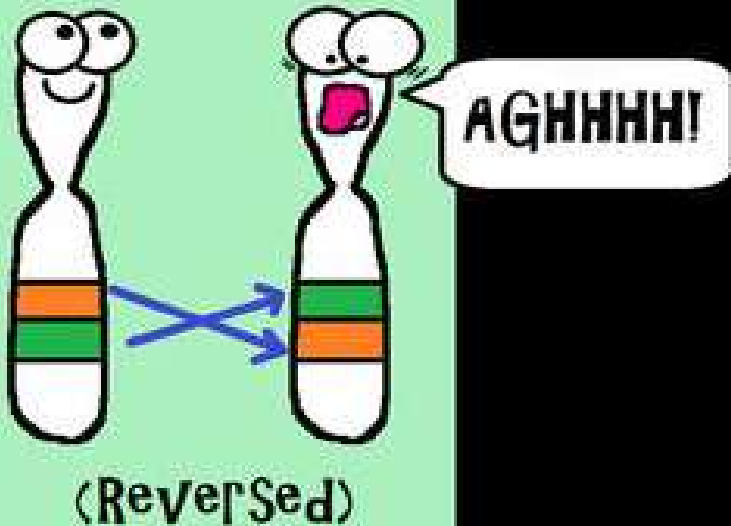
# INSErTION



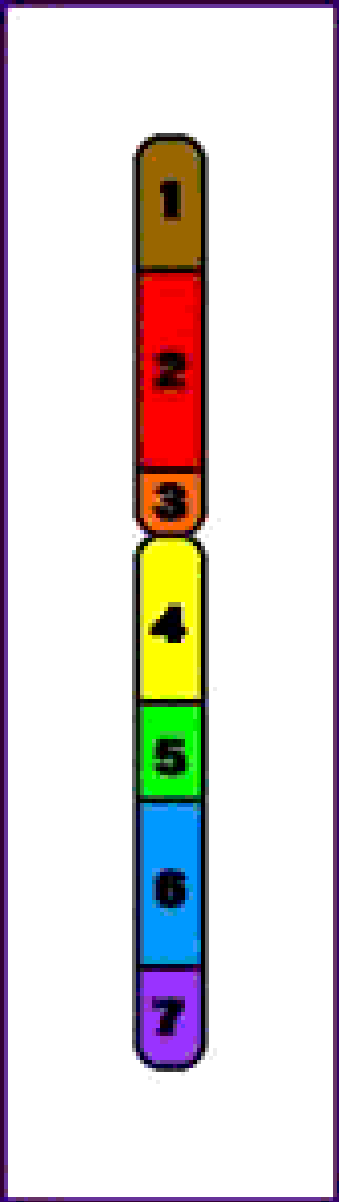
# DeLETION



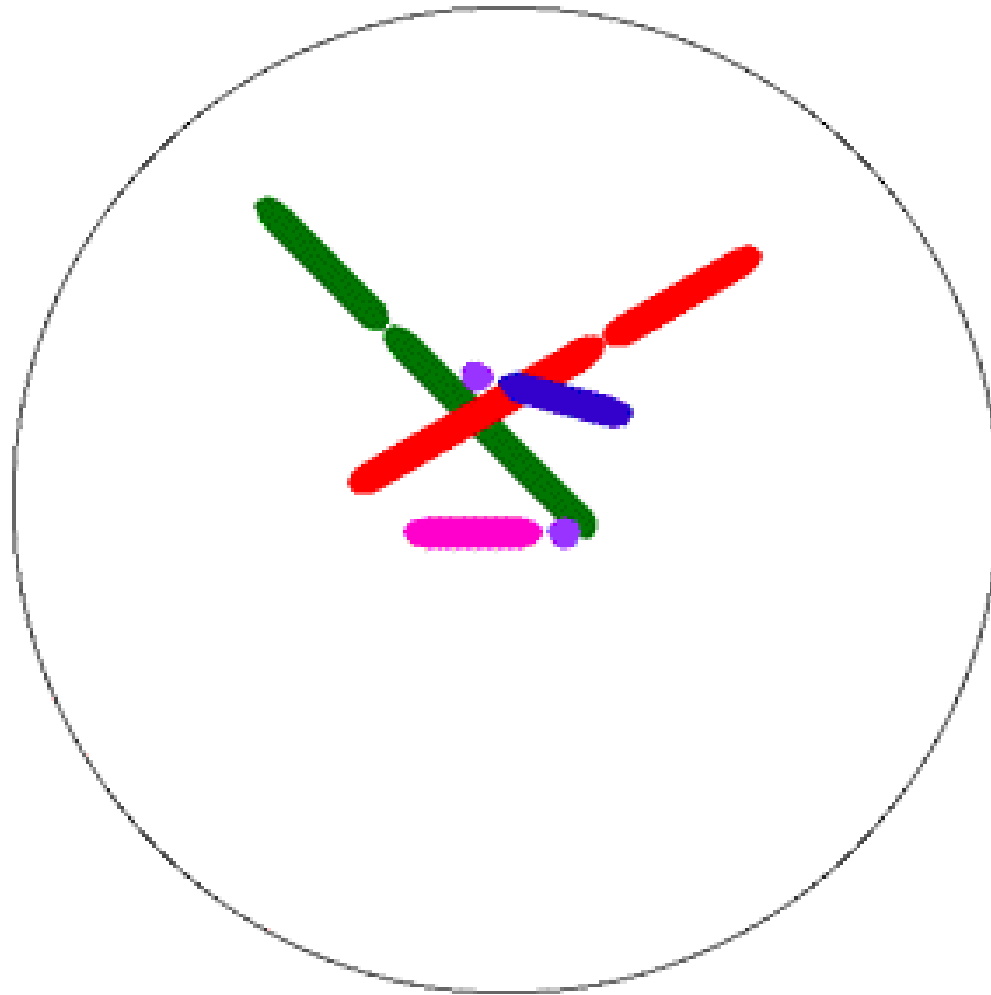
# INVErSION

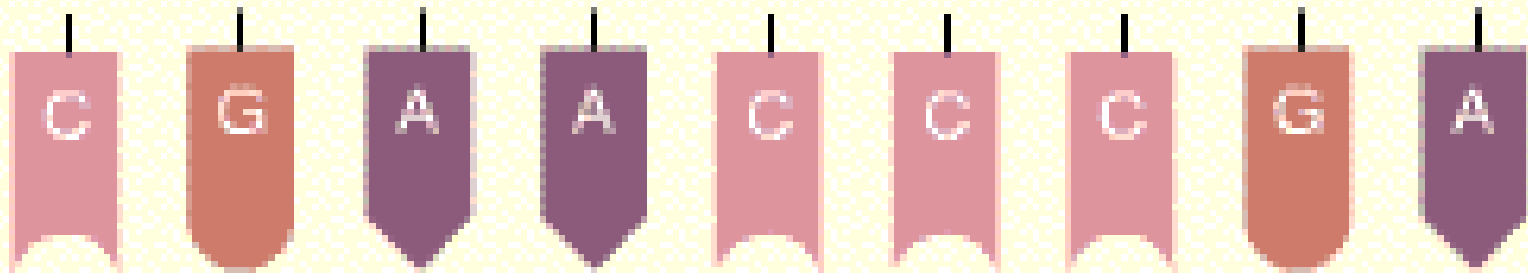




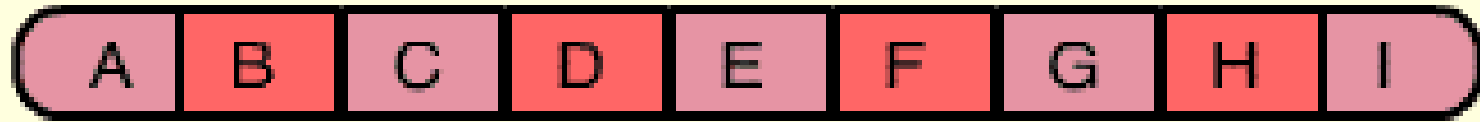


# Nondisjunction





1. Original



1. Original

Rh - ve  
Mother



Rh + ve  
Fetus  
(First exposure)



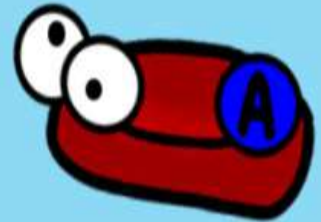
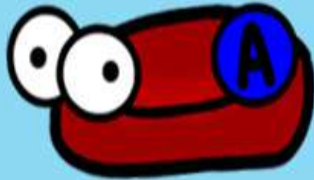
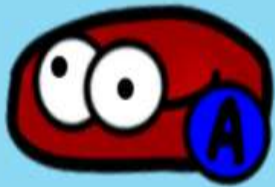
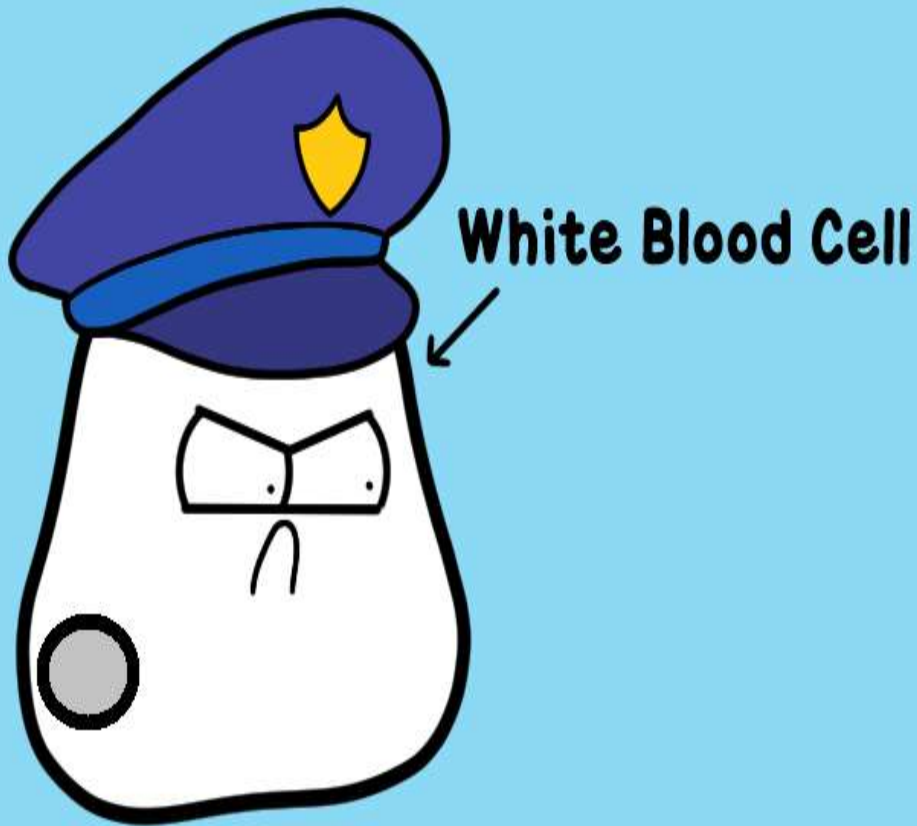
Mother's immune system recognizes the new antigen as non self.

That cell doesn't look familiar!



Looks like a trespasser..  
We better catch it next time!

Mother's white blood cells produces IgM antibodies.  
IgM does not cross the placenta.  
First baby is safe.



Twins Kian and Reme. Born a minute apart - one black, one white, due to the rare combination of their parents genes (both parents have a white mother and a black father). They have just turned 8.



**Dominant**



**Recessive**



**Codominant**



**Incomplete  
Dominance**







**“Brother Mendel! We grow tired of peas!”**

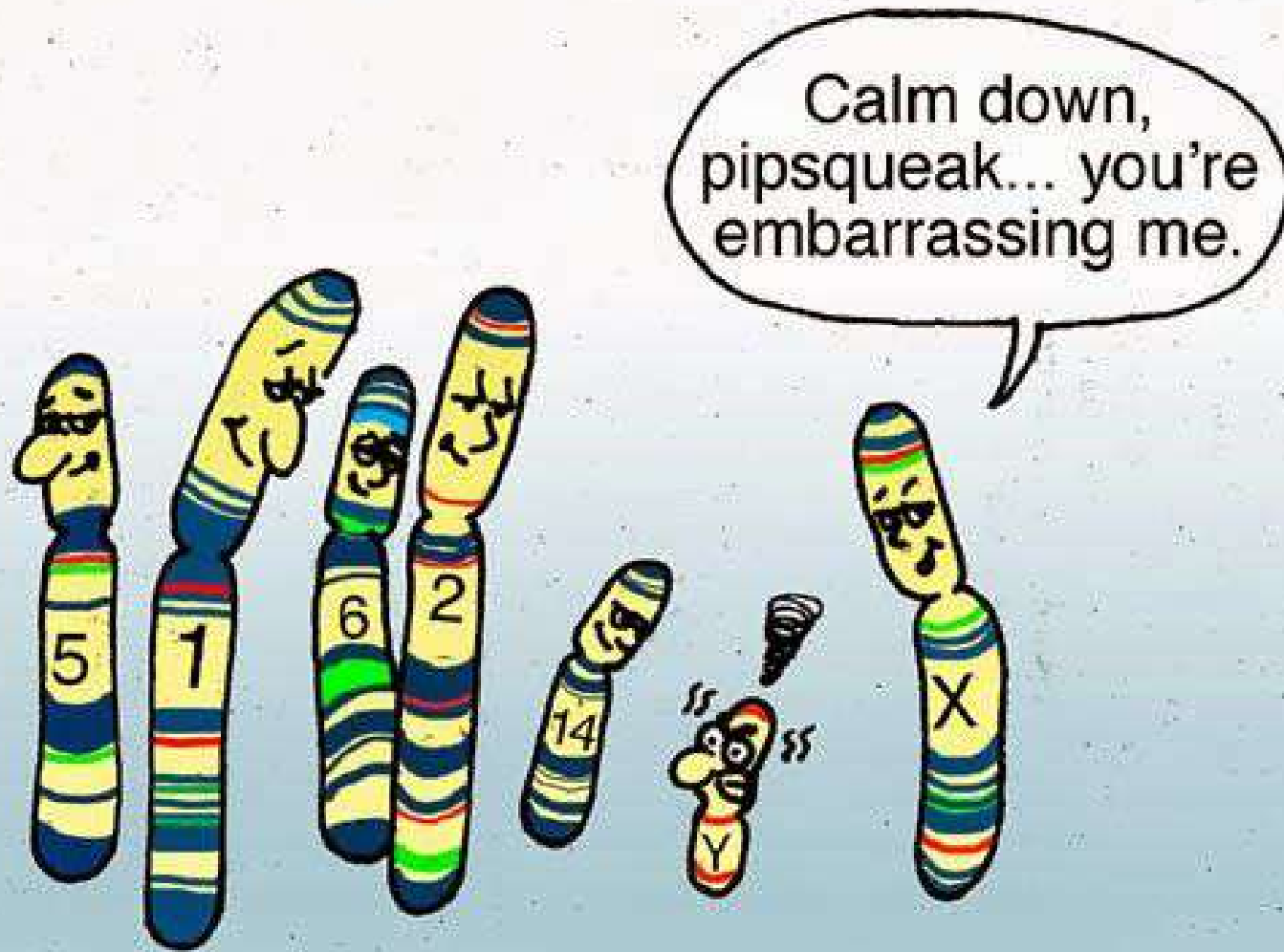
Cartoon by J. Chase.

MENDEL

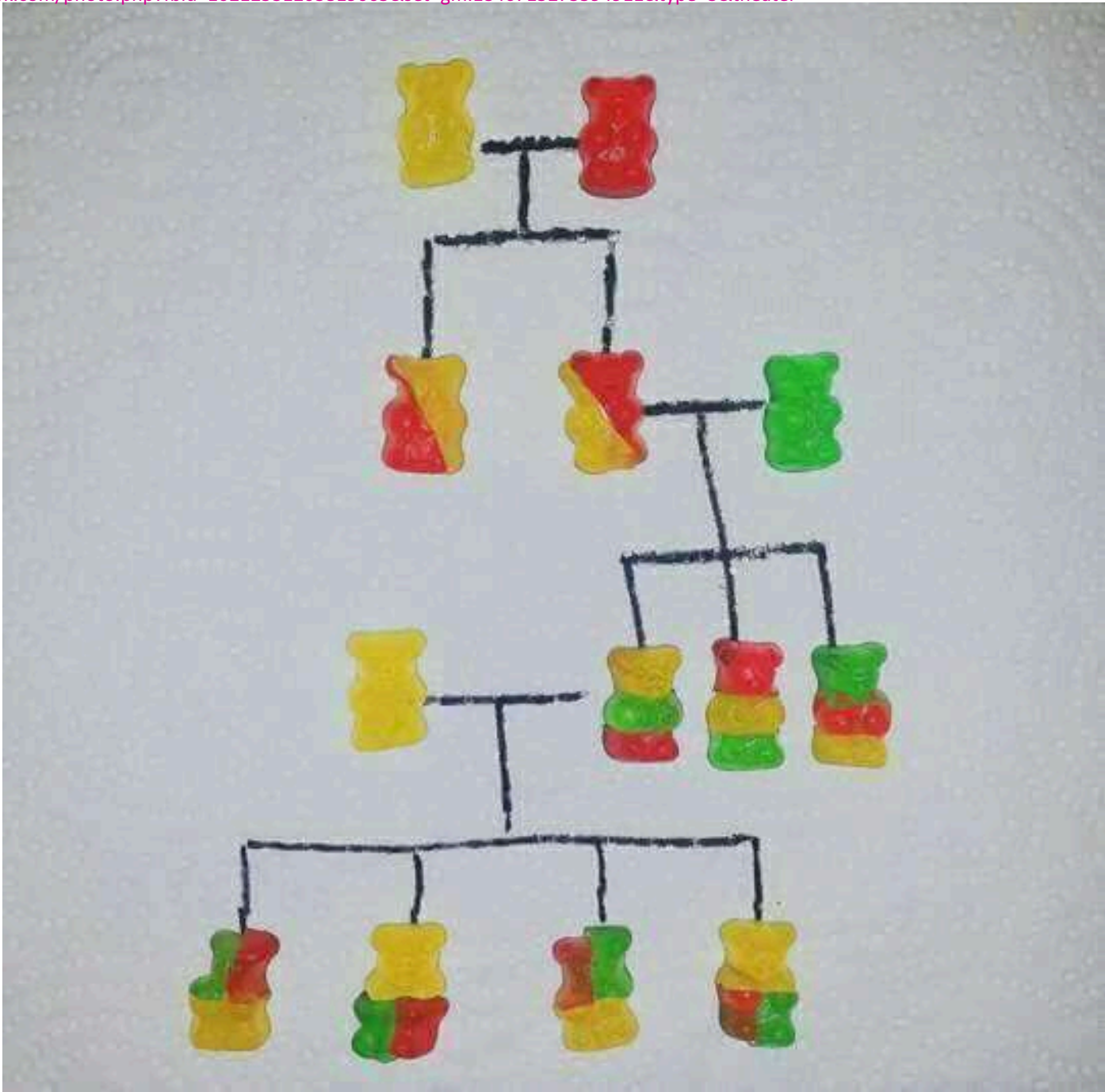
NOW  
KISS!

PEAS





Male aggressiveness might be caused by the Y chromosome, overcompensating for its short size.



# FOIL method for Dihybrid or Two-Trait Cross

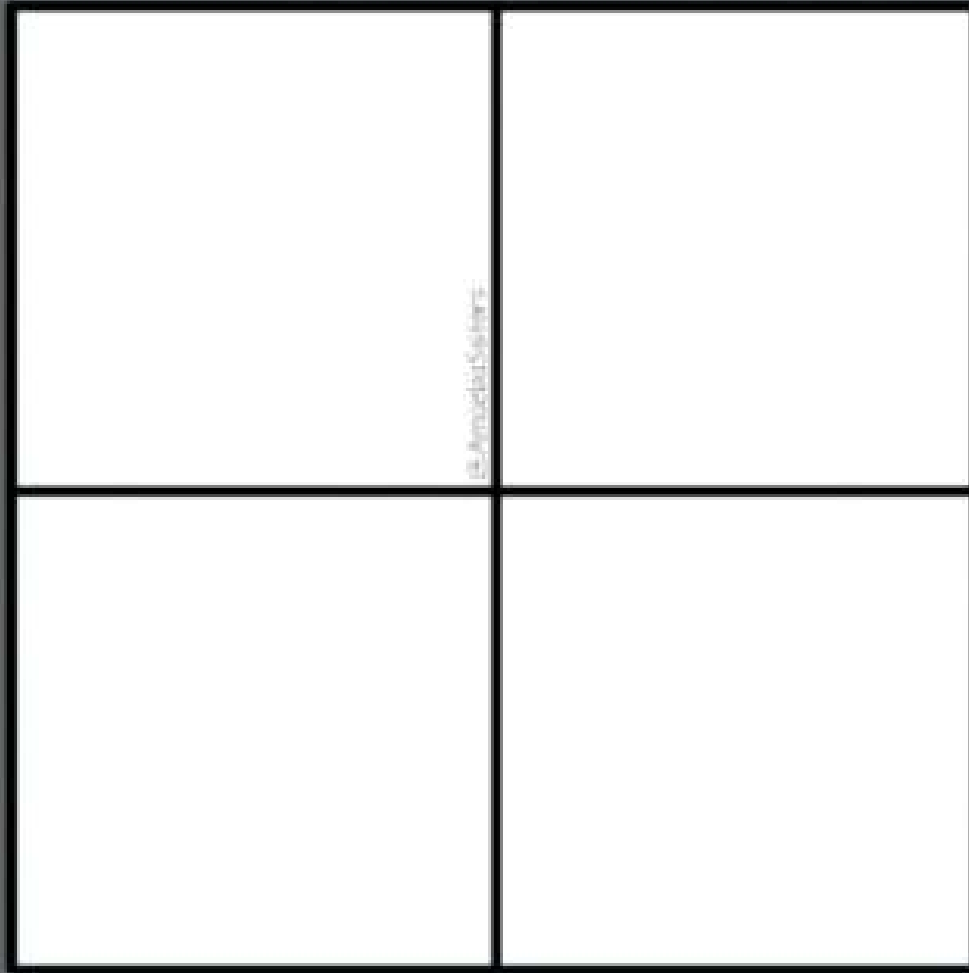
@AmoebaSisters

**F**  
**O**  
**I**  
**L**

**HhSs x hhss**

# SOLVING PUNNETT SQUARES

with Hairy (H) and Hairless (h) Guinea Pigs



©AmoebaSisters