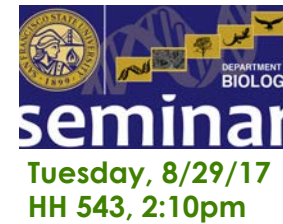


Class 3 8/28/17

## Personal Genomics/Study of Heredity

- Announcements
- Class administration
  - Please turn in your Student Info Sheets
    - Indicate on form (or e-mail me) if you wish to change to other section
- Did you bring your clicker remote today? GREAT!!
- Office hours HH668C:
  - MONDAYS 2 – 4pm

1



## Biol 572/872 Ecology, Evolution, & Conservation Biology Colloquium

<http://biology.sfsu.edu/content/EEC>



**Darcy Ernst**  
**USF/Las Positas College**  
*Environmental control of reproduction*

<https://www.usfca.edu/faculty/darcy-ernst>

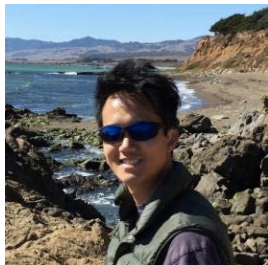
2



## Romberg Tiburon Center Seminar Series

<http://rtc.sfsu.edu/seminar/index.htm>

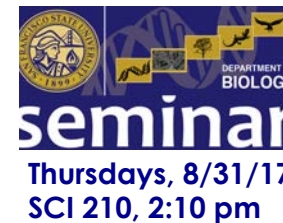
Wednesday, 8/30/17  
Bay Conference Center, 3:30PM



**Andrew Chang**  
**Smithsonian Environmental Research Center**  
*TBA (something about marine invasions?)*

<https://serc.si.edu/users/andrew-chang>

3



## Biol 871 Colloquium in Microbiology, Cell & Molecular Biology

<http://biology.sfsu.edu/content/MCMB>



**Michael McManus**  
**UC San Francisco**  
*Deconstructing the genome using CRISPR technologies*

<http://mcmanuslab.ucsf.edu>

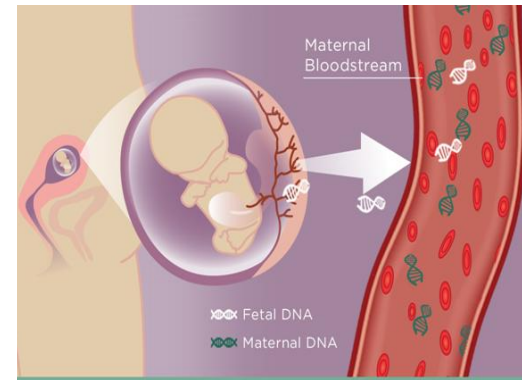
4

## The Beery twins' story highlights the promise of personalized medicine



www.the-scientist.com

## Non-Invasive Prenatal Testing (NIPT)



- Fetus and mother share a blood supply.
- Fetal cells release DNA that enters the maternal bloodstream.
- Maternal blood now contains a mixture of maternal cell-free DNA and fetal cell-free DNA.

www.monashultrasound.com.au

6

## The Beery twins' story highlights the promise of personalized medicine



### TASK #2b

In groups of 3 – 4:

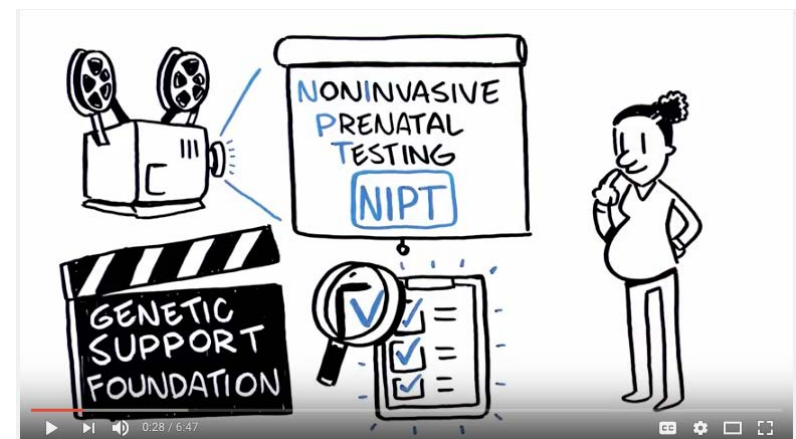
Consider the odyssey of the Beery twins.

- How old were they when they had been first (incorrectly) diagnosed?
- How old were they when they were given a second diagnosis (correct...sort of)
- What technique was used to diagnose their problem correctly? How old were they?

www.the-scientist.com

7

## NIPT: Making Informed Decisions



<https://www.youtube.com/watch?v=oeR4jGNCnd4>

8

## “DNA tests locate genetic branches of African Americans’ family trees”



www.post-gazette.com

9

## Genome sequencing technology



Applied Biosystems  
3730 DNA Analyzers

2002

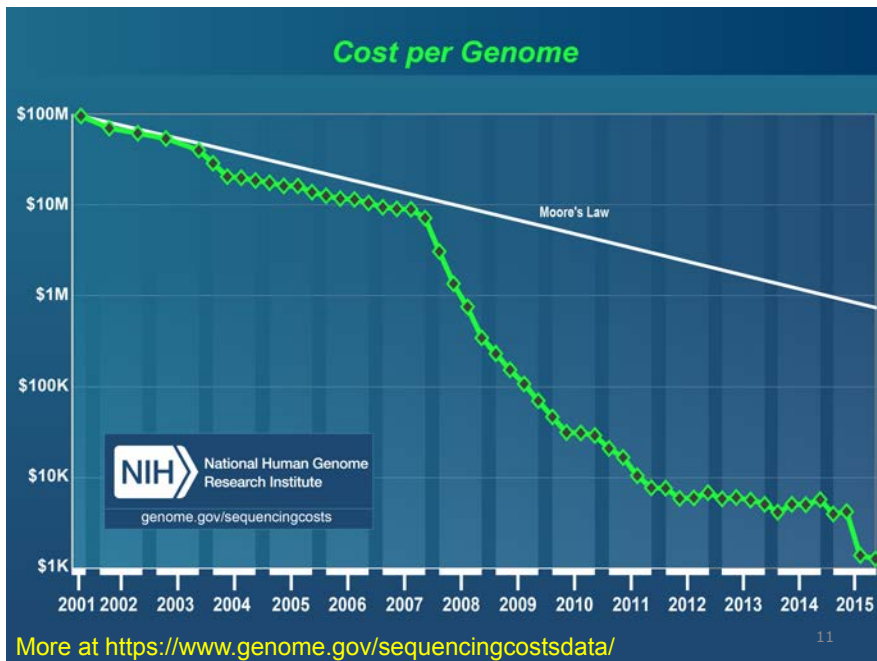


Oxford Nanopore  
MinION

2014

www.flickr.com  
www.nanoporetech.com

10



11

## Direct-to-consumer analysis for sale on the internet

**23andMe**

welcome ancestry health **how it works** store search help

sign in register kit 0

**Personal Genome Service®**  
Get to know your DNA. All it takes is a little bit of spit.

Here's what you do:

1. Order a kit from our [online store](#).
2. Register your kit, spit into the tube, and send it to the lab.
3. Our CLIA-certified lab analyzes your DNA in 6-8 weeks.
4. Log in and start exploring your genome.

**PGS®**

Welcome to You

Frequently Asked Questions

- How does 23andMe genotype my DNA?
- Why can't 23andMe diagnose me?

visit the store try a demo

12



## The “lighter side” of DNA analysis

23andMe Research  
 23andMe Research Findings  
 Physician Community  
 Scientific Community

**23andMe Research Findings**

**Cilantro as a matter of taste** SEPTEMBER 2012

For many people fresh cilantro is a beloved ingredient in their favorite dishes. Others find the herb practically inedible, likening the taste to soap, mold, and dirt. The story behind this love-hate reaction is partly genetic. [Hide Details](#)

**DETAILS**

The proportion of people who dislike fresh cilantro (also known as coriander) varies by ethnicity and genetic factors are suspected to play a role. In the largest genome-wide association study of cilantro preference to date, 23andMe scientists compared genetic data from more than 25,000 individuals with European ancestry who declared whether they liked the taste of fresh cilantro or whether they thought cilantro had a soapy taste. We found that people with the AA genotype at [rs7107418](#) had higher odds of perceiving a soapy taste in cilantro and higher odds of disliking the herb compared to those with the AG genotype, and people with the GG genotype had lower odds of perceiving a soapy taste or disliking cilantro. This SNP is close to a number of genes coding for olfactory receptors, one of which (OR6A2) is involved in detecting certain chemical compounds called aldehydes that are key components of cilantro aroma.

Does fresh cilantro taste like soap to you?

Yes	9%
No	89%
Not sure	20%

23andMe customer data

*Our research is driven by our community. A big thank you to our customers who make our research possible.*

Help us fuel more research

**Add to Cart »**

13

## Health-related risks sold directly to consumers: an evolving landscape

**23andMe** The leading health and ancestry DNA service [sign in](#) [register kit](#) [cart](#)

welcome ancestry **health** how it works store  [help](#)

**Take a more active role in managing your health**

Knowing how your genes may impact your health can help you plan for the future and personalize your healthcare with your doctor.

**Add to Cart »**

23andMe estimates your genetic chances of getting **Age-Related Eye Disease** (Age-related macular degeneration)

AS LOW AS **< 1%** AS HIGH AS **56%**

23andMe will tell you: **Your genetic risk** What you can do

\* Results based on our calculations for males with European ancestry.

**Plan for the future**  
Find out if your child will be at risk for 50 inherited conditions and learn about steps you can take. [about carrier status](#)

**Be on the lookout now**  
Knowing your health risks will help you and your doctor figure out health areas to keep an eye on. [about disease risks](#)

**Plan with your doctor**  
Personalize your healthcare by knowing in advance how you will respond to certain medications like Warfarin. [about drug response](#)

14

## Challenges in personal genetics

1. Clinical utility: How likely is it you or your doctor can take action based on genetic information?
2. How much might this information impact you and your family?
3. How can we ensure access for everyone?
4. Will people understand that our environment (health care, family, society, etc.) also shapes who we are?

15

## Practice Clicker Question

Do you like the taste of cilantro?

- A. YES  
 B. NO  
 C. NOT SURE



16