



MCDB 1111/2222

course goals  
course information

Fall 2017 - fundamentals  
→ SYLLABUS ←

Spring 2018 - genetics  
→ SYLLABUS ←

original text @ biowiki  
virtual biology labs

original web version

– course text –  
AY 2017-18



Inspired by [Biofundamentals](#) (MCDB 1111/1150) and the NSF-supported [Chemistry, life, the universe & everything](#) general chemistry course project, coreBio provides an introduction to evolutionary, molecular systems biology & genetics ([testimonial](#)).

ThecoreBio courses can be taken instead of the MCDB 1150/2150 for MCDB, iPHY, Neuroscience, Biochemistry, and (we believe) EBio majors.

Course materials supplied free to students.

# Course information

## **No need to purchase a text book:**

- Book available on line– print it if you must but

## **Required reading and discussion BEFORE CLASS**

- using Nota Bene (you have received an email invitation)
- you will be groups, ask and answer questions / comments

## **beSocratic activities** completed BEFORE CLASS

- you should have recieved an email invitation
- you will need silverlight installed in your browser
- we will discuss activities & the questions they raise in class

## NB/beSocratic activities are **10% of your course grade**

- points awarded on compliance (trying) not whether you get the questions right



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# Welcome to MCDB 1111

# Course information

## **No co-seminar:**

- different from the other MCDB intro course
- but the lab is the same for MCDB majors

## **Questions:**

- articulate why you are befuddled or confused or in disagreement

## **Exam review:** in class before each exam

- copies of a previous year's exam are supplied

## **Exams**

- held during class time (~20 questions)



# Understanding biology is important:

whether you want to go into research, medicine, business, teaching, politics, or avoid disease, date others, have kids, or go shopping (eat or do not eat gluten, etc).

January 11, 2017 / Hard Style

## **I Didn't Vaccinate My Kids and the One Who Lived Turned out Fine**



# We assume...

- **Learning is not easy**
  - requires engagement & effort
  - formulating clear questions
  - formulating complete answers
- **Understanding biology**
  - involves understanding / ability to work with what are often strange and unfamiliar ideas
  - not memorizing words (although you have to learn the language)
- Articulating your assumptions + **practicing** using them and getting useful feedback (**coaching**) are key

# Course (biology) is built on three core ideas

- Evolutionary mechanisms
  - Biological continuity (life from life)
- Physicochemical behaviors
  - bounded non-equilibrium systems
  - coupled reactions
  - Molecular machines
- Interacting systems
  - genes/proteins, cells, tissues, etc.
  - individuals in social and ecological contexts

# How we run the class...

We have learning assistants (**Tamar + Keegan**)

**and**

a graduate student TA: **Jessica Westfall**

**they will attempt to get you to articulate your questions  
and answers**



# cool things you can do with molecular biology

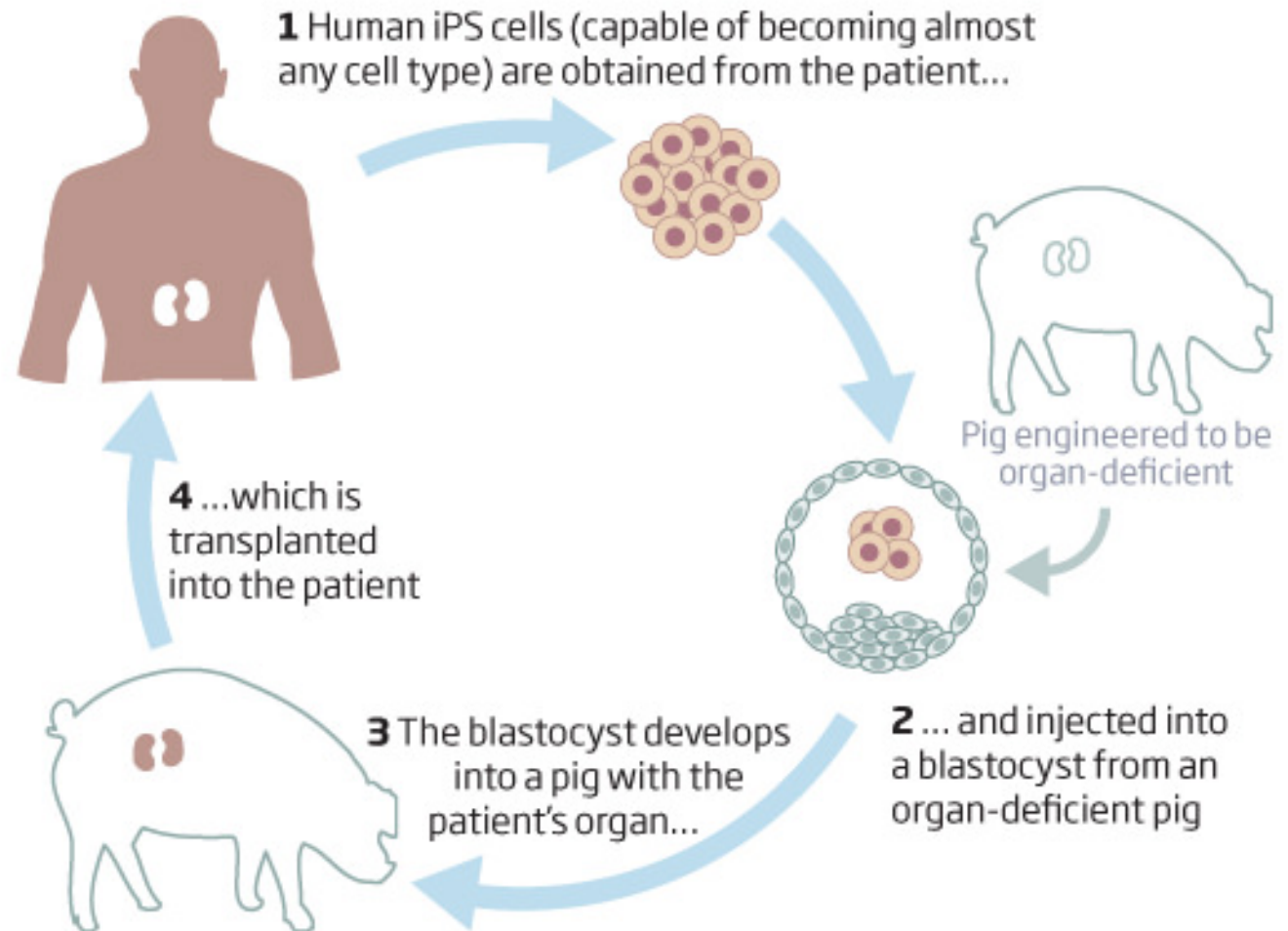
- academics (teaching and research)
- private industry (research / management)
- public policy (regulation and support)
- communications (writing etc)
- intellectual property / legal issues (tech. transfer)
- investment (funding and profiting from research)

# cool things you can do with molecular biology

## This little piggy grew a human kidney

©NewScientist

Human organs for transplant could be grown in pigs that have been genetically modified to not produce their own organs





# Genetically Engineering Pigs to Grow Organs for People

Scientists announce the birth of 37 pigs gene-edited to be better for human transplant.

Feynman  
on  
magnets  
and  
understanding



2:55 / 7:32



# next

Wed. Preface +  
30 Aug. Chapter 1.1: Understanding science (and learning)

7-19 MK

**Complete** [beSocratic #1](#)