

- Theme Music: Rolling Stones
Start Me Up
- Cartoon: Lynn Johnston
For Better or for Worse



If you don't live in Holmes Hall and want access to the physics help room (5th floor of East Holmes), please come down to the front with your student ID and fill out the access sheet!

If you don't sign up for help room access you're going to have a rough time.



Introductions!

- Prof. Vashti Sawtelle - lectures, exams, LON-CAPA, Q's about why we teach this way
- Prof. Walt Benenson - hands-on session stuff
- Alanna Pawlak (Graduate TA): grading, hands-on sessions, help room, Q's about why we teach this way
- 7 undergraduate learning assistants: hands-on sessions, help room, some lecture stuff.
(**Melissa Bucheli** and **Lekha Bapu** are your in-lecture LAs)

Let's learn a
bit about
you!



Where did you grow up?

- A. In the lower part of Michigan
- B. In the Upper Peninsula
- C. In the Midwest outside of Michigan
- D. Somewhere in the U.S. outside Michigan
- E. Outside of the United States!



What year of college are you in as of this week?

- A. First year
- B. Second year
- C. Third year
- D. Fourth year
- E. Fifth year or more

Note: I'm curious about time in college – not credit hours!



What is your major?



- A. Biological science (animal science, biology, biochemistry/molecular bio, genomics, microbiology, etc)
- B. Environmental science (include fisheries & wildlife)
- C. Physical sciences (incl. earth science, astrophysics, chemical physics, chemistry, geological science, physics)
- D. Mathematical and Computational science (incl. statistics)
- E. Undecided/Not on this list

What do you plan to do after getting your degree?



- A. Get a job!
- B. Medical/Veterinary/Dental/Optomety school
- C. Graduate school in life science-related field
- D. Graduate school in non life science-related field
- E. Other/I don't know yet/Stop asking me hard questions!

How many college science classes have you completed?

- A. 0-2
- B. 3-5
- C. 6-8
- D. 9-10
- E. 10+



Mathematical equations:

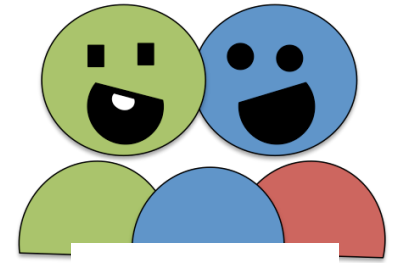
What do you feel **you** can you use them for **now**?

1. For carrying out calculations.
2. For solving for unknowns.
3. For understanding concepts
4. For understanding relationships
5. For making models of real world systems

- A. One or more from {1,2}
- B. One or more from {3,4,5}
- C. A and B
- D. Something else
- E. Not much



What can Physics contribute to Biology and Medicine?



Discuss
It!

- Whiteboards
- Groups of 3 – discuss topics
 - Teaching Assistant and Learning Assistant will be in Lecture hall to participate in these discussions
- Pick one to talk about

Forces in Living Systems

Example: The role of forces in Cancer

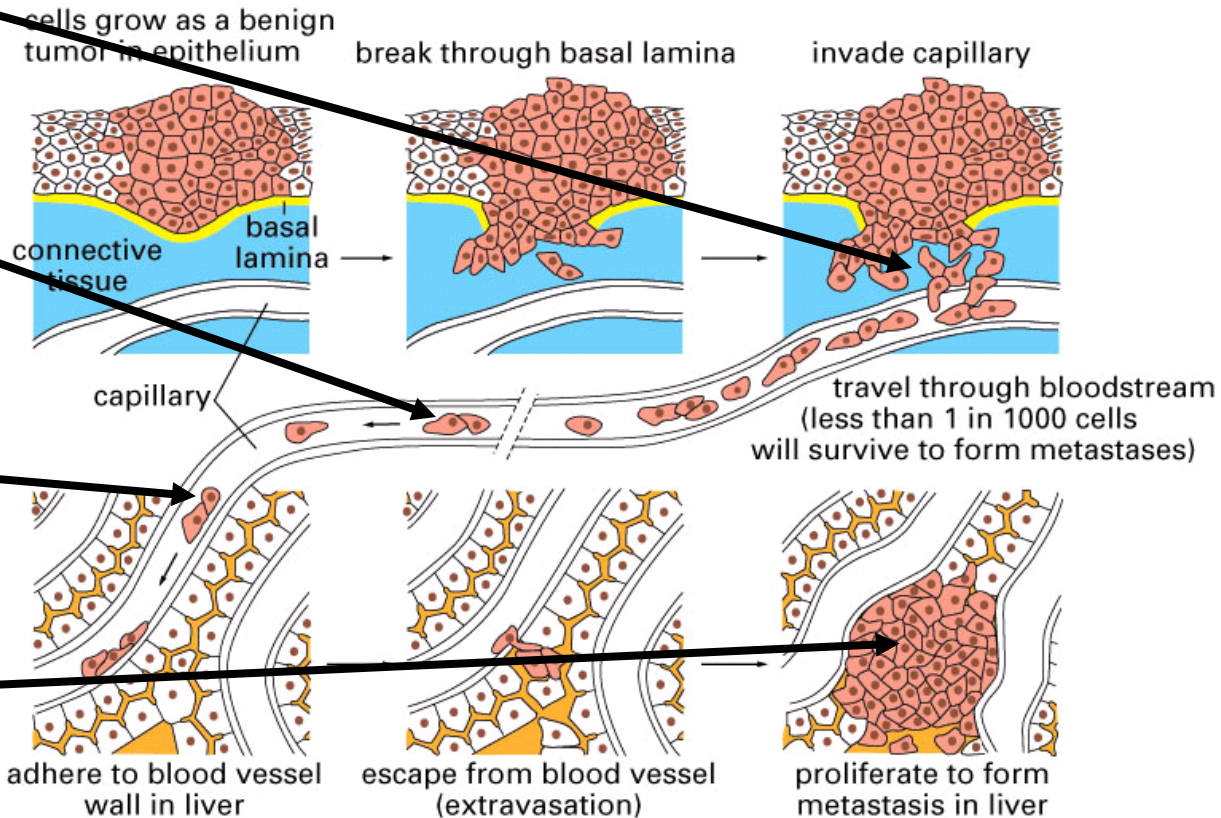
Work from W. Losert, University of Maryland

Cells generate forces to migrate

Cells are deformed by fluid forces

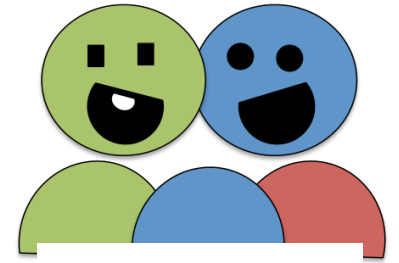
Cells adhere to new tissue

Cells grow in tissue with different stiffness



Overarching themes

- **Thinking physically**
 - Mechanism
 - Coherence
 - Multiple representations
- **Models**
 - Identifying key elements
 - Knowing what to simplify
- **Math**
 - Quantifying your experience
 - Thinking with equations
- **Thinking about your thinking**
 - Debugging
 - Checking
 - Strategizing
- **Connecting to what you learn in biology and chemistry classes!**



Discuss It!

What do you hope to get from this course?

My goals for this course are...

1. To develop a conceptual understanding of physics and the interconnectedness of physical phenomena, and how the laws of physics affect living organisms
2. To develop autonomous learning skills, particularly in relation to create a toolkit of representations for expressing and manipulating the laws of physics.
3. To learn to think clearly and simply about the physical world. We will work on increasing problem-solving and modeling skills.

How we do it - Working in groups

- Science is not just a collection of facts or even of methods: it's a conversation.
- One of the things you have to do in learning to solve hard problems is to ask yourselves questions that lets you bring up what you know. It's often best to learn to do that by asking others.
- Good communication skills and the ability to work in teams are highly valued in modern workplace environments (including health care).

How we do it - Group activities

- In-lecture clicker questions.
- Group problem solving in hands-on.
- Find a group to work with on HW!
 - Our homework can be very hard if you try to do it yourself.
It is designed for working together.
 - Help room highly recommended.

How we do it - Lectures

- Class MWF at 11:30am
- Before class: **READ** the chapter and **ANSWER** reading questions on LON-CAPA (deadlines on course calendar)
- When you come in: grab a whiteboard, eraser/ marker bag for every 3 people
- We will use iClickers every day! Make sure to bring yours and **register it on LON-CAPA!**

First Hands-On Session!

(Today and next week in E-26A Holmes)

- Meet your LA and other students!
- I will be by to take pictures to help me learn names!
- Concept inventories/pre-tests!
- Monday hands-on sessions: go to your **session today!** All others: **go next week.**

Announcements/Deadlines

- **TOMORROW: Thursday, 11:59 p.m.:** Do Chapter 1 reading and answer questions in “Reading Questions” folder on LON-CAPA page (<http://msu.lon-capa.org>).
- **Friday, 11:59 p.m.:** Syllabus quiz / clicker registration due - find it in “Homework” folder on LON-CAPA page.
- Make sure to register your clickers in LON-CAPA! <http://msu.lon-capa.org>