

# CHEM199L

# iSCIENCE

*Spring, 2013*

<i>Call number</i>	<i>Section</i>	<i>Time</i>	<i>Room</i>
58779	L (For first-time students)	WF12-12:50pm	217 Noyes Lab
32558	L2 (For mentors)	WF12-12:50pm	217 Noyes Lab





Edward A. Doisy

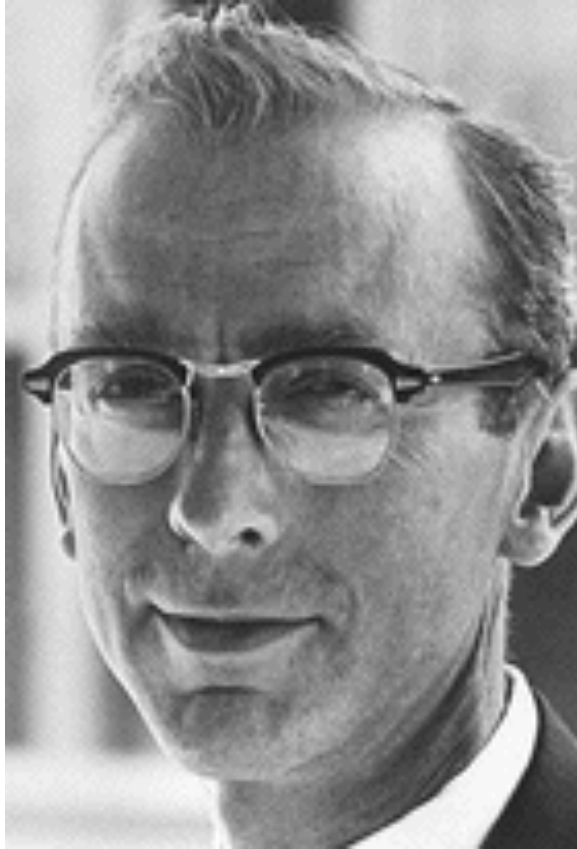
The Nobel Prize in Medicine, 1943

"for his discovery of the chemical nature  
of vitamin K"

A. B. University of Illinois (1914)

M. S. University of Illinois (1916)

Ph. D. Harvard University (1920)



Robert W. Holley

The Nobel Prize in Medicine, 1968

“for their interpretation of the genetic code and its function in protein synthesis”

B. A. University of Illinois (1942)

Ph. D. Cornell University (1947)



Edwin G. Krebs

The Nobel Prize in Medicine, 1992

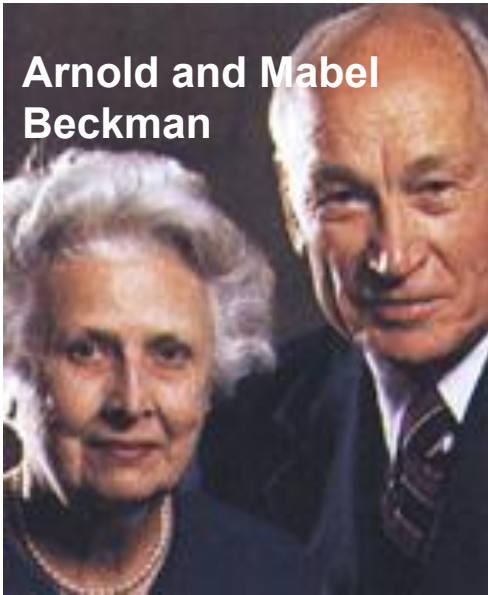
"for their discoveries concerning reversible protein phosphorylation as a biological regulatory mechanism"

B. S. University of Illinois (1940)

M. D. Washington University School of  
Medicine (1943)



Arnold and Mabel Beckman



## Beckman Institute, University of Illinois





Arnold O. Beckman

Founder, Beckman Foundation

Beckman Instrument

Invented pH meter

National Inventors Hall of Fame (1987)

B. S. University of Illinois (1922)

M. S. University of Illinois (1923)

Ph. D. California Institute of  
Technology (1928)





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*"When you're faced with the necessity to do something, that's a stimulus to invention. If (my classmate) hadn't come in with his lemon juice problem, chances are I never in the world would have thought about making a pH meter." (Arnold O. Beckman)*



Edwin G. Krebs

The Nobel Prize in Medicine, 1992

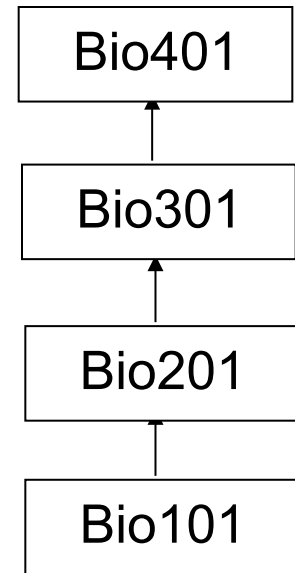
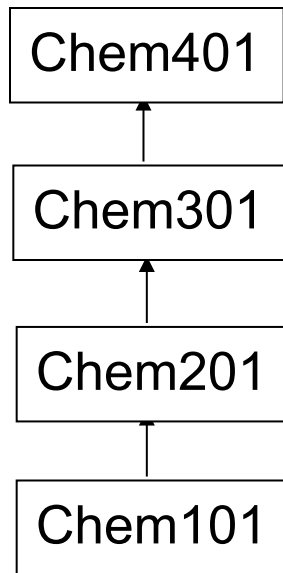
"for their discoveries concerning reversible protein phosphorylation as a biological regulatory mechanism"

B. S. University of Illinois (1940)

M. D. Washington University School of  
Medicine (1943)

*“During my fourth year at the University of Illinois I carried out undergraduate research in organic chemistry and found it to be a fascinating experience. This was probably the first time that I had ever taken a “course” that seemed like fun.” (Edwin G. Krebs)*

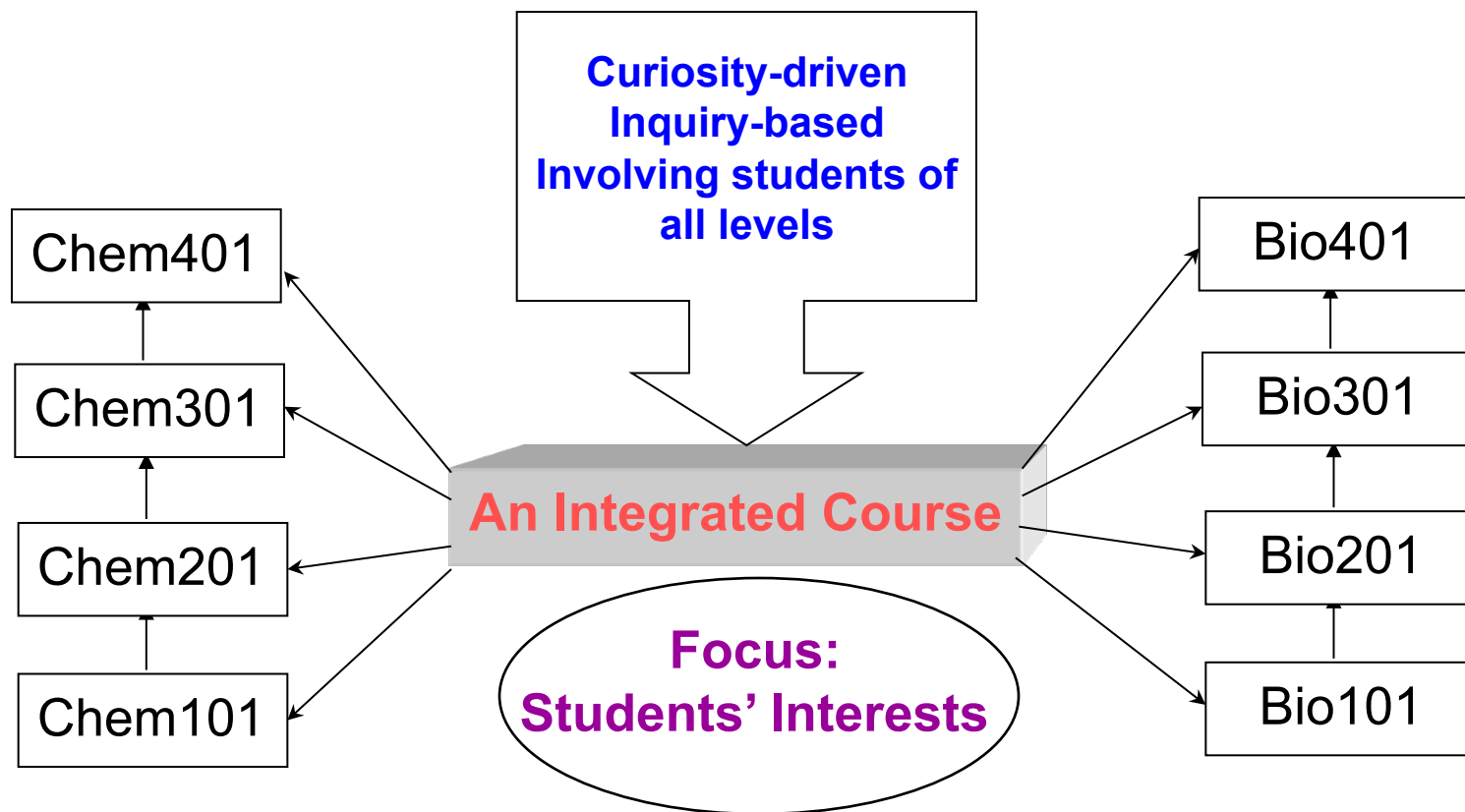
# Road to Success



## Are you looking for a chemistry/biology course that

- is fun to learn
- focuses on your interests
- makes taking other courses more meaningful
- gives you tools to start learning and investigating the subject of your interests right away
- allows you to contribute to the scientific discovery on the subject of your interests
  - lead you to a lab that best matches your interests
  - makes you more marketable after graduation
- prepares you to be ready and more competitive when you graduate

# Chem199L



## What's this course about?

- Freedom to explore topics that **YOU** are interested in.
- Content is driven by **your** interest.
- Fun activities that expose you to **real-world** chemistry and biology.
- Exposure to **real-life** research and career opportunities in academia and industry.
- Carry out **frontier** research activities in the lab.

## Student-Selected Topics

- Do free radicals in food cause cancer?
- What is the role of selenium in the body?
- What effect does exercise have on cancer?
- How are crops genetically modified?
- What are the health consequences of athletic supplements?
- How do fuel cells work?
- How does aspirin cure headaches?
- .....

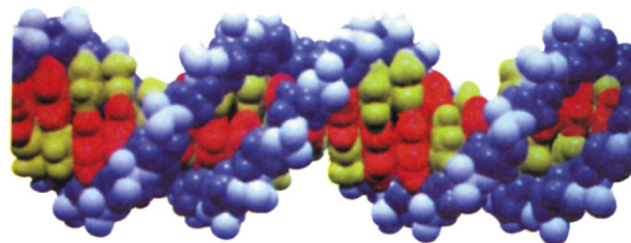
# Activities

- \* Pick a topic related to your interests to explore throughout the semester
- \* Group up with other classmates and experienced mentors who share your interests to have meaningful discussions about achieving your common goals
- \* Make a four year plan for taking other courses to learn about that subject.
- \* Draft your ideal resume for being able to pursue this interest
- \* Supplement course instruction with class activities, including literature clubs, visits to research labs, etc.
- \* Attend guest lectures by UIUC faculty and alumni, as well as by the Chemistry Career Counseling Center
- \* Write an essay about the chemistry and biology behind the everyday activity that interests you
- \* Engage in a debate exploring an aspect of a current controversial scientific issue that relates to your interests



# Special Lecture Topics

- Biochemistry
- Chemistry and biology of food
- Household chemicals
- Chemical toxicology
- Fitness & health
- Pharmaceuticals & drug design



# One topic covers many science disciplines e.g., why is calcium important for health?

- **Chemistry:**
  - **Inorganic chemistry:** calcium coordination chemistry
  - **Analytic chemistry:** calcium sensor design and development
  - **Organic chemistry:** calcium sensor synthesis
  - **Physical chemistry:** electronic structure and spectroscopy
- **Biochemistry:** Calcium proteins and enzymology
- **Microbiology:** calcium ion uptake or trafficking
- **Bioinformatics**
- **Biophysics**
- **and many more....**

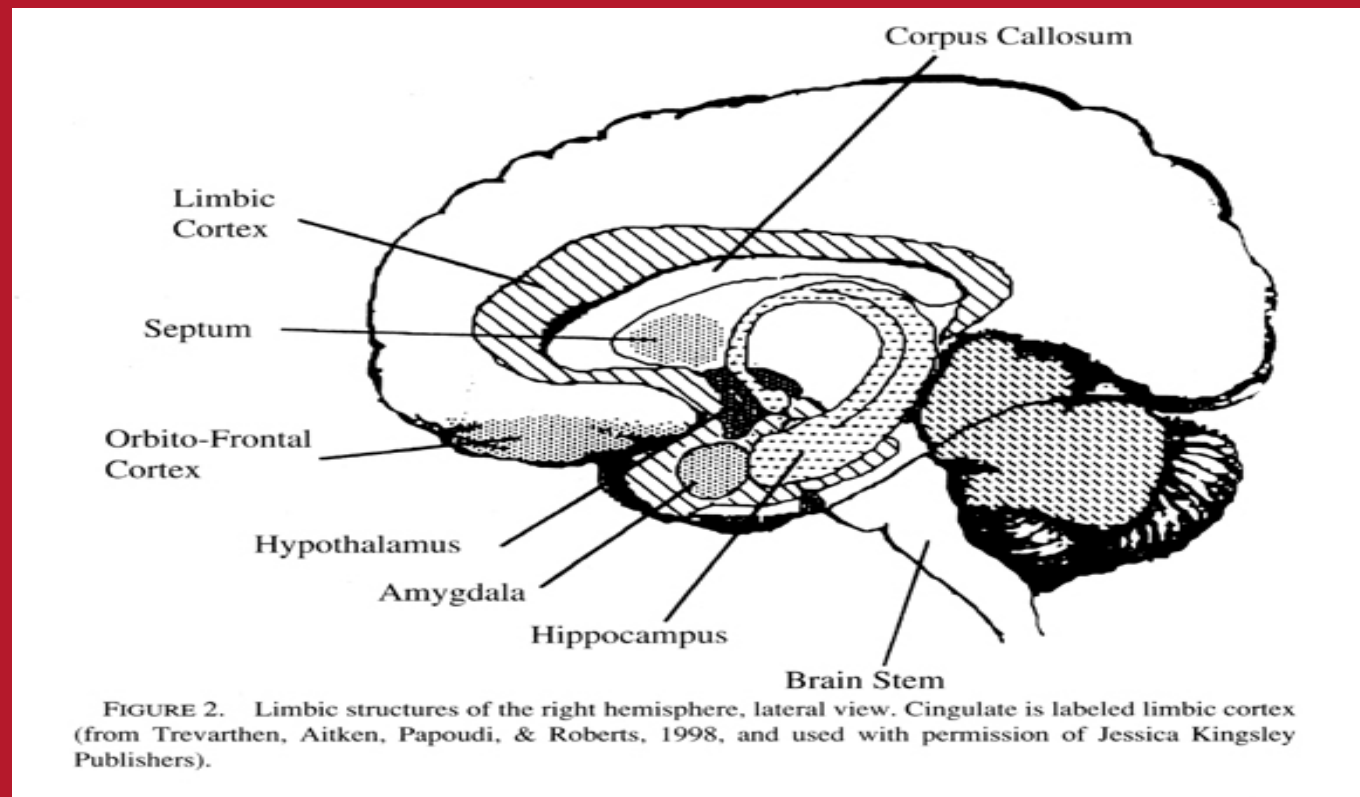
# This is Jeopardy!

Clean	Skin . . .	. . . and Teeth	Poisons	Burn!
<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>
<u>200</u>	<u>200</u>	<u>200</u>	<u>200</u>	<u>200</u>
<u>300</u>	<u>300</u>	<u>300</u>	<u>300</u>	<u>300</u>
<u>400</u>	<u>400</u>	<u>400</u>	<u>400</u>	<u>400</u>
<u>500</u>	<u>500</u>	<u>500</u>	<u>500</u>	<u>500</u>

# Literature Club

## *Fear Response in Humans*

Experiments in rats using shock therapy and tracer dyes have concluded that the amygdala is the center for fear response.

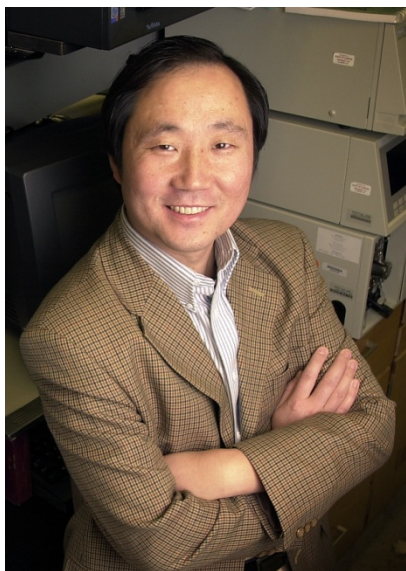


# Chem199L

## □ *The course is*

- an **information center**, making taking other science courses more meaningful
- a **triage**, with each student's background and interests in mind
- a **matchmaker**, where students' interests = instruction materials
- a **forum**, where students can interact with others who have common interests
- a **launching platform** for a successful career

# Course Instructor and Coordinator



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**HHMI Professor**  
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**Web sites:** <https://compass2g.illinois.edu/>  
<http://butane.chem.illinois.edu/chem199/>