

Helping Students Understand the Link between Organic Chemistry and Drug Action:

Development of a Blackboard Learning System Based Course Supplement.

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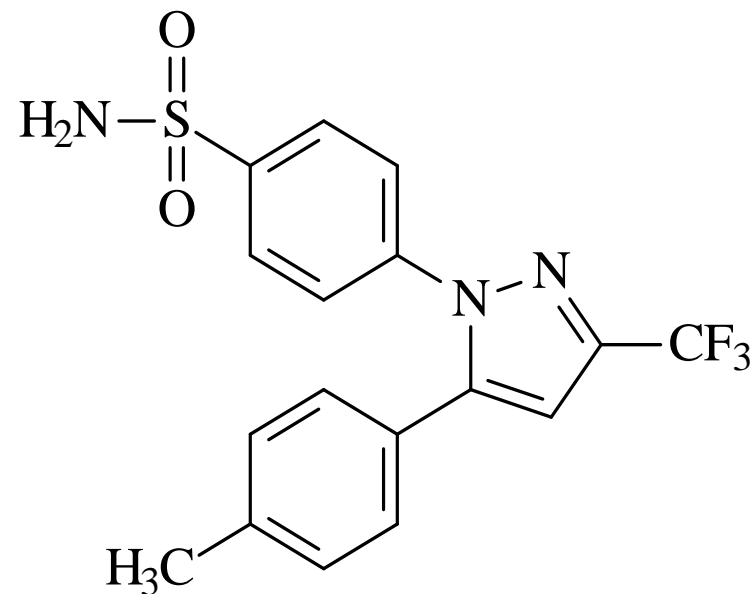
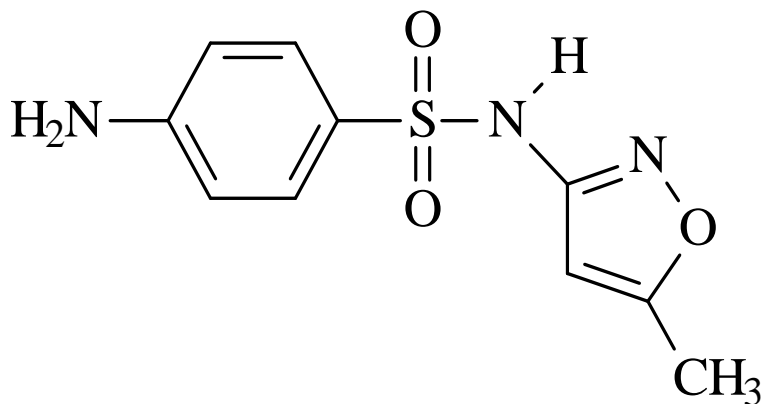


Helping Students Understand the Link between Organic Chemistry and Drug Action

What is the role of medicinal chemistry in current pharmacy practice?

Why do we need to know medicinal chemistry anyway....?

My patient has a sulfonamide allergy-is OK to take this new drug??



Why do we need to know medicinal chemistry anyway....?

“Health care practitioner colleagues expect hospital pharmacists, in particular, to be able to articulate expertise on drug compatibility...elucidate, explain and predict-not just observe and communicate....**”**

Newton DW. Drug incompatibility chemistry Am J Health-Syst Pharm 2009;66:348-57.

How prepared are our students to learn medicinal chemistry?

Upon entry to College of Pharmacy

- All students must have completed a first year general chemistry course

Upon entry to first Medicinal Chemistry Course

- All students will have completed Chem 2242, a organic chemistry course

How do our students learn medicinal chemistry?

- Medicinal Chemistry is integrated into therapeutically driven PBL cases
 - Students present learning issues in tutorial groups
 - Lecture/discussion with faculty (1 hour/week)

What resources are available to help students “help” themselves?

- Tutorials

- Harrold MW. “Basic Concepts in Medicinal Chemistry”
http://www-home.cr.duq.edu/~harrold/basic_concepts_index.html

- Case Based workbook

- Currie BL, Roche VF, Zito SW. “Medicinal Chemistry Case Study Workbook”

- Books

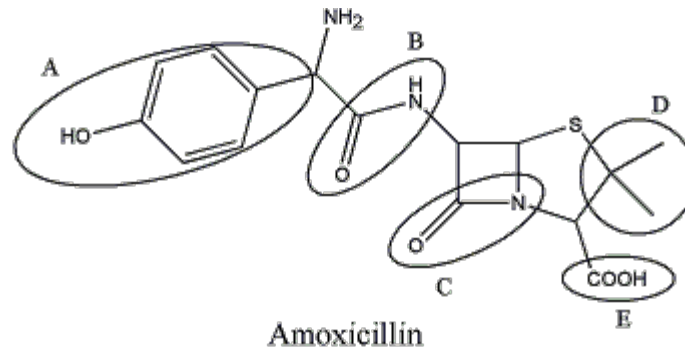
- Lemke TL. “Review of Organic Functional Groups, Introduction to Organic Chemistry”

Organic chemistry topics to include:

1. Recognizing **functional groups** commonly found on drug molecules
2. Identifying the **stereochemistry** of chiral drugs and recognizing isomers of drugs, e.g. enantiomers
3. Predicting the type of **interaction/bond** that will be formed between a drug and its **receptor/enzyme**
4. Identifying properties of drugs that make a drug more **acidic** or more **basic**
5. Determining the affects that **pH and pKa** have on the ionization of drugs
6. Identifying the positioning of substituents on the benzene ring (e.g. ortho, meta or para)
7. Identifying common reactions that occur during **metabolism**, such as oxidation, reduction, methylation etc.
8. Relating newman projections to prospective drawings of structures

A sample question

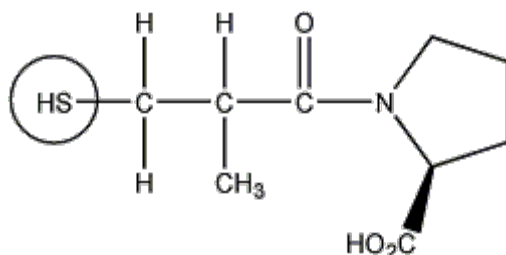
Which of the circled functional groups in Amoxicillin is the MOST acidic?



- a. A
- b. B
- c. C
- d. D
- e. E**

A sample question

The circled functional group on captopril is capable of forming which one of the following interactions with ACE?



- a. Hydrophobic Interactions
- b. Ionic Bond
- c. Covalent Bond**
- d. van der Waals Forces
- e. Dipole-dipole Interactions

How will it be implemented?

- Practice sets of MCQs
 - Incorrect responses identified
 - Reasons for some incorrect responses may be provided
 - 3 attempts at each MCQ-then correct answer given

How will it be implemented

- Quiz with mark being part of a second year course (10%?)

How will it be evaluated?

- MCQ quiz to **Year 2 Class of 2012** who haven't taken online practice sets (**April 2010**)
- MCQ quiz to **Year 2 Class of 2013** after completion of online practice sets (**April 2011**)
- MCQ quizzes to **subsequent Year 2 Classes** after completion of online practice sets

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