

Name: \_\_\_\_\_

Points: \_\_\_\_\_

Prof. K. C. Nicolaou

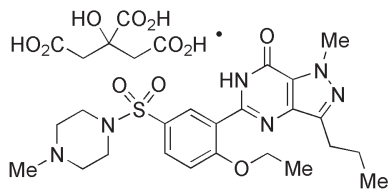
Final Exam

CHEM 151 - Molecules that Changed the World

March 16, 2010

UCSD, Department of Chemistry and Biochemistry

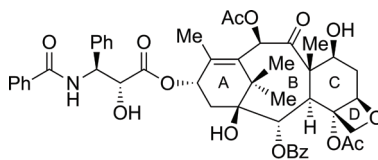
1. Assign the correct (a) name; (b) medical indication; and (c) mechanism of action to the following molecules as found in the drugs, Propranolol<sup>®</sup>, Viagra<sup>®</sup>, Prozac<sup>®</sup>, Acyclovir<sup>®</sup>, Nexium<sup>®</sup>, Zantac<sup>®</sup>, phenobarbital, Mylotarg<sup>®</sup> (calicheamicin  $\gamma_1^I$ ), vancomycin, Taxol<sup>®</sup>. (20 Points)



(a) name: \_\_\_\_\_

(b) indication: \_\_\_\_\_

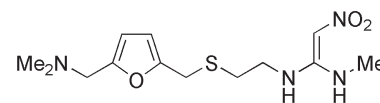
(c) mechanism: \_\_\_\_\_



(a) name: \_\_\_\_\_

(b) indication: \_\_\_\_\_

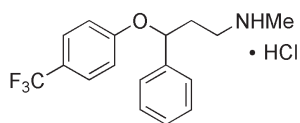
(c) mechanism: \_\_\_\_\_



(a) name: \_\_\_\_\_

(b) indication: \_\_\_\_\_

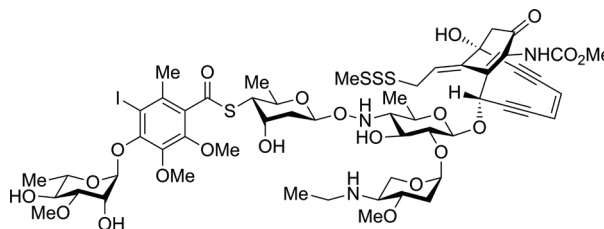
(c) mechanism: \_\_\_\_\_



(a) name: \_\_\_\_\_

(b) indication: \_\_\_\_\_

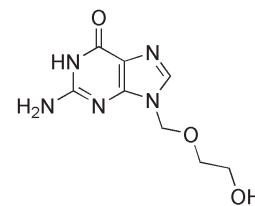
(c) mechanism: \_\_\_\_\_



(a) name: \_\_\_\_\_

(b) indication: \_\_\_\_\_

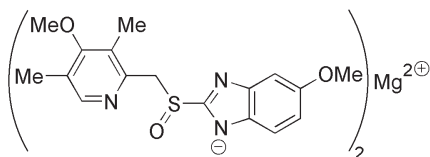
(c) mechanism: \_\_\_\_\_



(a) name: \_\_\_\_\_

(b) indication: \_\_\_\_\_

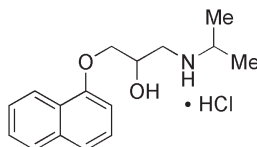
(c) mechanism: \_\_\_\_\_



(a) name: \_\_\_\_\_

(b) indication: \_\_\_\_\_

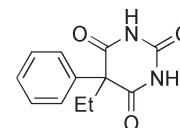
(c) mechanism: \_\_\_\_\_



(a) name: \_\_\_\_\_

(b) indication: \_\_\_\_\_

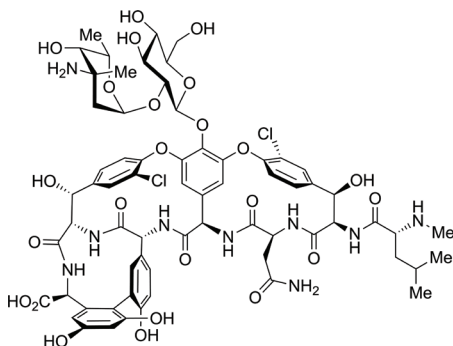
(c) mechanism: \_\_\_\_\_



(a) name: \_\_\_\_\_

(b) indication: \_\_\_\_\_

(c) mechanism: \_\_\_\_\_



(a) name: \_\_\_\_\_

(b) indication: \_\_\_\_\_

(c) mechanism: \_\_\_\_\_

2. Name a molecule associated with each of the following descriptions. (20 Points)

(a) lowers plasma cholesterol levels

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(b) allows survival of patients after an organ transplantation

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(c) induces reaction of spicy foods, such as chili

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(d) induces umami taste

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(e) used to treat patients infected with drug resistant bacteria

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(f) induces neurotoxicity through ion channel opening and rapid sodium ion influx

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(g) used to treat patients inflicted with ovarian cancer

---

(h) eradicates insects in order to improve crop production and also used to treat river blindness

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(i) used to protect animals from disease and to promote metabolic growth

---

(j) helps patients with fungal infections

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3. Name 10 Nobel Laureates in Chemistry for the last 20 years and give a one sentence citation of their prize winning contribution(s). (20 Points)

1. Name: \_\_\_\_\_

Citation: \_\_\_\_\_

\_\_\_\_\_

2. Name: \_\_\_\_\_

Citation: \_\_\_\_\_

\_\_\_\_\_

3. Name: \_\_\_\_\_

Citation: \_\_\_\_\_

\_\_\_\_\_

4. Name: \_\_\_\_\_

Citation: \_\_\_\_\_

\_\_\_\_\_

5. Name: \_\_\_\_\_

Citation: \_\_\_\_\_

\_\_\_\_\_

6. Name: \_\_\_\_\_

Citation: \_\_\_\_\_

\_\_\_\_\_

7. Name: \_\_\_\_\_

Citation: \_\_\_\_\_

\_\_\_\_\_

8. Name: \_\_\_\_\_

Citation: \_\_\_\_\_

\_\_\_\_\_

9. Name: \_\_\_\_\_

Citation: \_\_\_\_\_

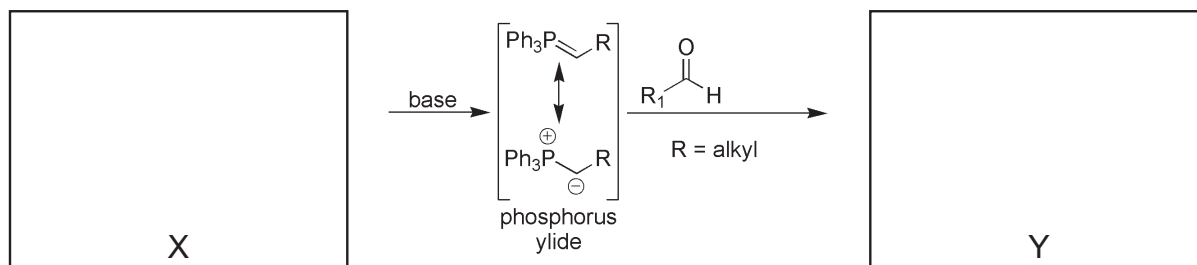
\_\_\_\_\_

10. Name: \_\_\_\_\_

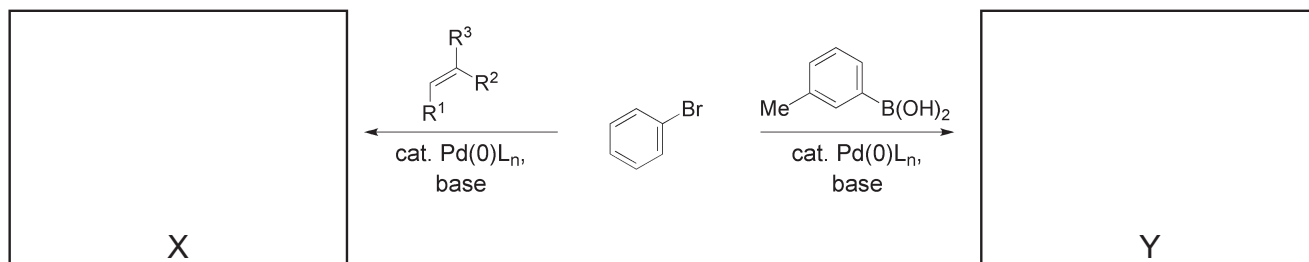
Citation: \_\_\_\_\_

\_\_\_\_\_

4. Give the missing products, starting materials, reagents or catalysts, and the scientist associated with the following reactions. (20 Points)

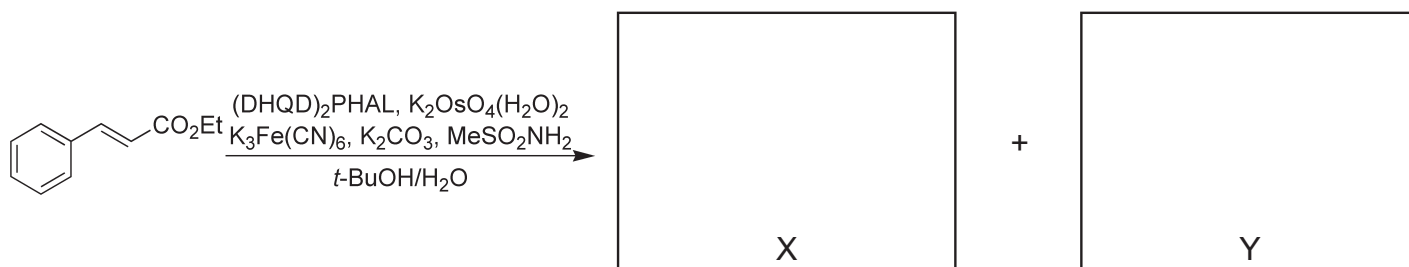


(a) name: \_\_\_\_\_



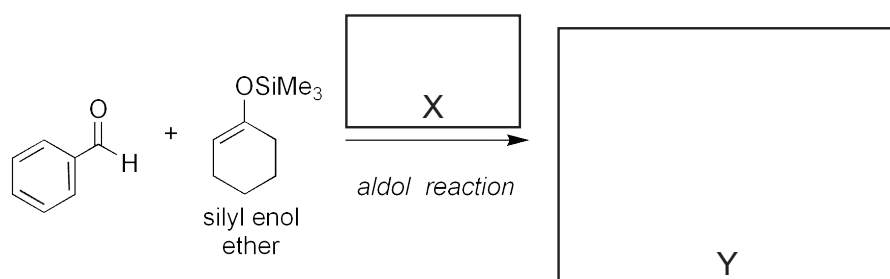
(b) name: \_\_\_\_\_

(c) name: \_\_\_\_\_

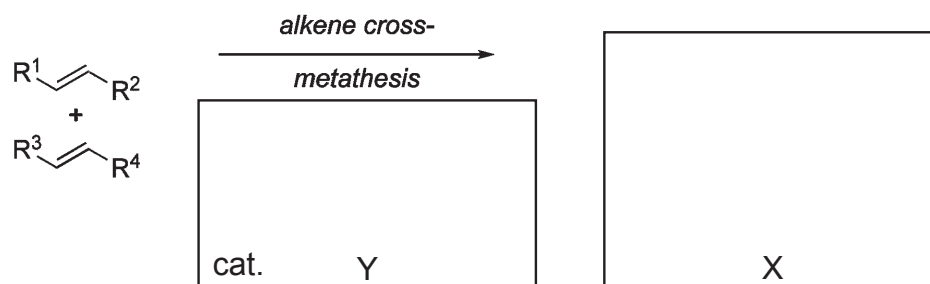


X:Y= 99:1

(d) name: \_\_\_\_\_



(e) name: \_\_\_\_\_



(f) name: \_\_\_\_\_

5. Write an essay on the emergence and contributions of biotechnology to modern medicine, highlighting the roles played by the following scientists, companies, biologic drugs, and microorganism. Paul Berg, Robert A. Swanson, H. Gobind Khorana, Kary B. Mullis, Marvin H. Caruthers, Humalin<sup>®</sup> (insulin), Epogen<sup>®</sup> (erythropoietin), *E. Coli*, Genentech, Amgen. (20 Points)

A large, empty rectangular box with a thin black border, intended for the student to write their essay response to the question above. The box occupies most of the page's vertical space.

