camp kesem
at University of Texas - Austin

APRIL 4TH
CK5K
FUN RUN
2026

REGISTER HERE

Join our run supporting children impacted by a parent's cancer.
Saturday, April 4th at 8am
Registration: $26 per person

Register at
ck5k-tickets.eventbrite.com

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HEY HEY 📣📣 LISTEN UP ❗ LISTEN UP‼️

The CK-5K is back up and running!!! 🏃🏃‍♀️🏃‍♀️

Sign up NOW to support kids impacted by a parent's/guardian's cancer 🐛💙💚 If you previously registered for the original date, please be sure to re-register for this new date. Scan the QR code for the registration link or find it on the Linktree in our bio!

🔥Friday 3/27 is the last day to receive a T-Shirt with registration
🔥Registration for the event is available up until race day, Saturday, April 4th

A HUGE thank you to all of our sponsors for your contributions to making this event possible 🫶

55 2

March 16

Log in to like or comment.

Dr. Iverson,

I took your Organic II class a few years ago, and I loved it enough to switch my major to chemistry. I am now a second year chemistry PhD student at The Scripps Research Institute. I’m contacting you, however, regarding another passion of yours: running and fitness. When I took your course, I was quite frankly annoyed at your frequent suggestions that your students exercise. Who was this guy to tell ME what to do with MY body? I’m sure you won’t be surprised to know that I didn’t participate in the class 5K, and I lived a very sedentary and unhealthy lifestyle. It finally caught up with me recently. In October, I went to a doctor for a routine exam. I was overweight, my cholesterol was through the roof, and I even had fatty deposits on my liver. High cholesterol? I’m only 25 years old! I never thought I would hear the word “Lipitor” in my twenties! I quickly changed my diet, including the addition of many more fruits and vegetables and the reduction of fried greasy foods. Perhaps more importantly, I started running. Slowly at first – I couldn’t jog 100 yards without losing my breath. Within a week I was feeling much better. Within a month I was even enjoying running. Four months after my health scare, I have lost 25 pounds. My cholesterol has decreased dramatically (well within normal/healthy limits), and I’ve never felt better in my life! I now run 15-20 miles a week. It takes so little time that I have no excuse not to. I am so glad I heeded your advice, even if it was a few years late. I am telling you all this hoping it might encourage your students to begin getting in shape before their health is affected like mine was.

Cheers and Happy Running,

Hello Dr. Iverson,
You may not remember me, but I was in your organic chemistry class last semester.

This past summer I was diagnosed with lymphoma cancer. Initially I had lost all hope, I kept asking myself "why me?" and kept thinking of all things I hadn't accomplished in my lifetime. Nevertheless, I soon got over that fact and started my chemotherapy treatments. Each treatment got worse and worse as I experienced more and more of the side effects. At night I couldn't fall asleep from all psychological and financial stress, couldn't eat because of mouth sores, and when I did eat I would feel sick and nauseated. It wasn't until my third treatment that I remembered the many times you told the class that running could help quality of life. It took a couple of weeks for me to convince myself to start running but I eventually started slowly.I never thought how great of an affect physical activity could have. I was never obese so I never gave running or cardio any thought. As I started running on a regular basis I started seeing my symptoms disappear slowly. Soon when I would come back from running I suddenly had an appetite, regardless of the mouth sores I was hungry enough to eat. My sleeping schedule was started falling into place because I was so tired after running. My stress levels decreased enough that I could see the difference. Best of all it gave me something to do during my days at home, saving me from depression.

Running saved my life Dr. Iverson.

Thanks again,

PNAS
RESEARCH ARTICLE | CHEMISTRY
IMMUNOLOGY AND INFLAMMATION

Viral mimicry may help explain immunogenic cell death

Matthew S. Levine[a], Jiexi Li[b], Lauren I. R. Ehrlich[c,1], Ronald A. DePinho[b,1], Brent Iverson[a,1], and Jonathan L. Sessler[a,1]

Contributed by Jonathan L. Sessler; received December 29, 2025; accepted February 4, 2026; reviewed by Jacqueline K. Barton and Gilles Gasser

Viral mimicry may be an underappreciated contributor to chemotherapeutic potency in animal models and patients. This hypothesis is based on studies of a bis-Au(I)-NHC complex that was found to generate a strong *anti-tumor immune response* in vivo in two different challenge studies using an iKAP colorectal cancer mouse model. RNA profiling of treated cells revealed the stimulation of genes that overlap with those upregulated during a viral infection. The bis-Au(I)-NHC complex generates reactive oxygen species (ROS) through the simultaneous redox cycling of the naphthoquinone moiety and inhibition of thioredoxin reductase with Au(I). This ROS increase causes endoplasmic reticulum stress, activation of the unfolded protein response pathway and upregulation of Ifih1, a gene that encodes for the viral dsRNA sensor MDA5. Activation of MDA5 triggers a strong type I interferon response and expression of chemokine ligand 10 that can recruit immune cells to the treated tumor in a manner analogous to immune responses during viral infection. This proposed mechanism bridges the gap between cytotoxicity and the innate and adaptive immune responses. We suggest viral mimicry may be a key driver of chemotherapy potency in animals and an important determinant of positive outcomes in cancer patients.

viral mimicry | cancer | immunogenic cell death

Significance

It has long been observed that cancer patients respond differently to the same cytotoxic chemotherapeutic agent. We are proposing here that cytotoxicity-induced viral mimicry contributes to so-called immunogenic cell death and could represent an underappreciated determinant of patient outcome associated with cancer chemotherapy. Viral mimicry as a proposed mechanism of action thus bridges the gap between cytotoxicity and the innate and adaptive immune responses.

Immunogenic Cell Death (ICD) is a term that has been used to indicate a type of cancer cell killing that triggers an effective anti-tumor immune response (1). Certain anthracy-

eLife
RESEARCH ARTICLE

Cytotoxic T-cells mediate exercise-induced reductions in tumor growth

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Abstract Exercise has a wide range of systemic effects. In animal models, repeated exertion reduces malignant tumor progression, and clinically, exercise can improve outcome for cancer patients. The etiology of the effects of exercise on tumor progression are unclear, as are the cellular actors involved. We show here that in mice, exercise-induced reduction in tumor growth is dependent on CD8+ T cells, and that metabolites produced in skeletal muscle and excreted into plasma at high levels during exertion in both mice and humans enhance the effector profile of CD8 + T-cells. We found that activated murine CD8+ T cells alter their central carbon metabolism in response to exertion in vivo, and that immune cells from trained mice are more potent antitumor effector cells when transferred into tumor-bearing untrained animals. These data demonstrate that CD8+ T cells are metabolically altered by exercise in a manner that acts to improve their antitumoral efficacy.

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journal homepage: www.elsevier.com/locate/ctrv

Systematic or Meta-analysis Studies

Physical activity reduces all-cause mortality in patients with cancer: a systematic review and *meta*-analysis of randomized controlled trials

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ARTICLE INFO

Keywords:
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Meta-analysis
Neoplasms
Preventive medicine
Public health
Systematic review

ABSTRACT

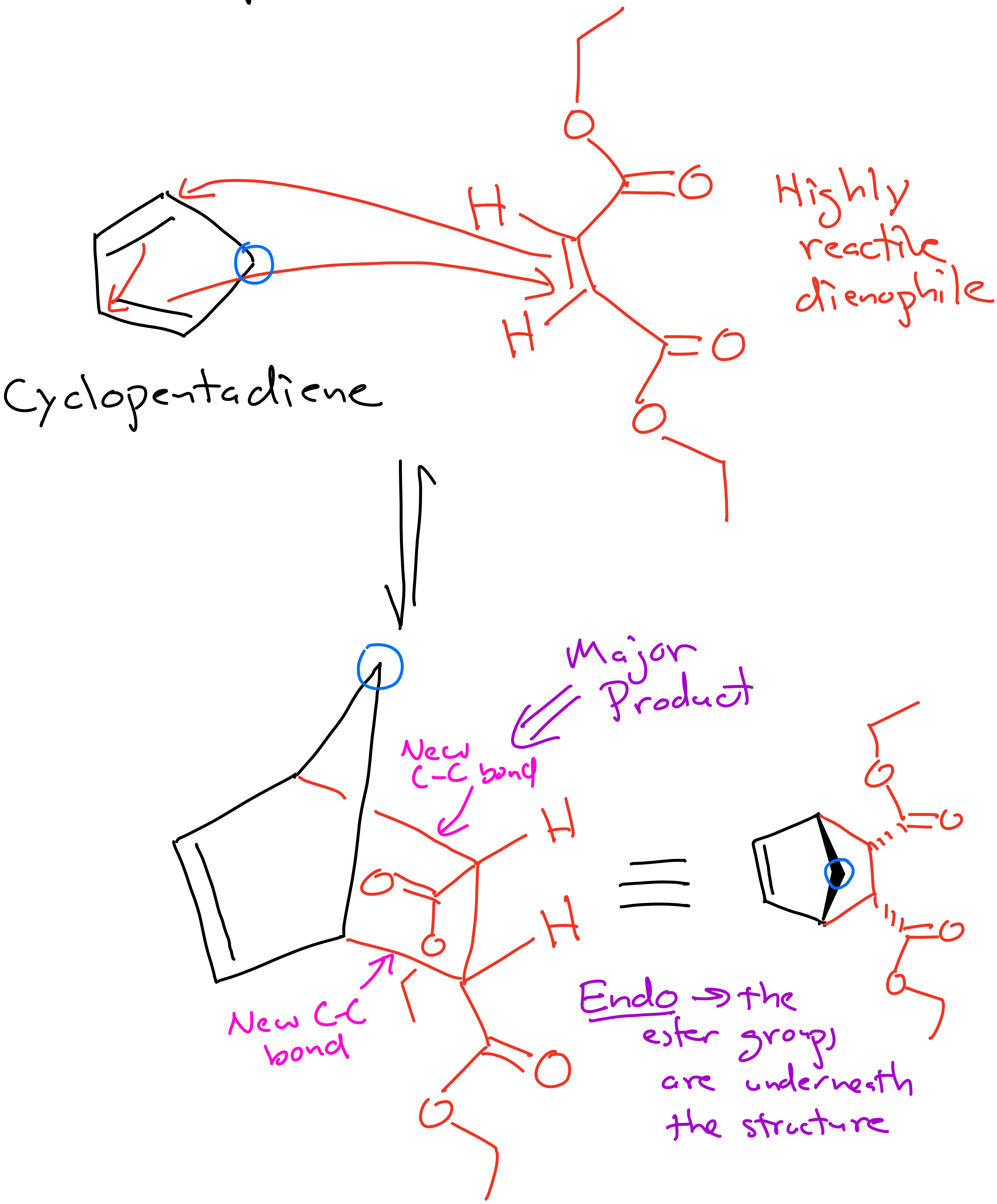
Introduction: Growing evidence suggests that physical activity (PA) may improve survival in patients with cancer. However, causal evidence from randomized controlled trials (RCTs) remains limited. This systematic review and *meta*-analysis aims to evaluate the effect of PA on all-cause mortality in patients with cancer based on RCTs evidence.

Methods: MEDLINE and CENTRAL were searched without language restrictions up to November 30, 2025. Eligibility criteria included RCTs of PA interventions reporting mortality outcomes in adult cancer patients. The risk of bias in included studies was assessed using the Cochrane Risk of Bias tool for randomized trials (RoB 2), and the quality of the studies was checked with GRADE, by two independent reviewers. Pooled hazard ratios (HRs) were calculated using inverse-variance common-effects models. The study protocol is available at PROSPERO (registration number CRD42023486651).

Results: Thirteen RCTs involving 3282 patients with cancer were included. PA reduced all-cause mortality risk by 26% compared to no PA (pooled HR 0.74, 95% CI 0.63 to 0.87, $p < 0.001$, with moderate quality of evidence), with non-significant heterogeneity ($p = 0.21$). Subgroup analyses showed consistent effects regardless of intervention duration (≥6 weeks: HR = 0.74; 95% CI: 0.63–0.87; <6 weeks: HR = 0.73; 95% CI: 0.43–1.22; $p_{\text{interaction}} = 0.93$) or hormone dependent status of cancer (non-hormonally dependent: HR = 0.75; 95% CI: 0.63–0.91; hormonally dependent: HR = 0.71; 95% CI: 0.50–1; $p_{\text{interaction}} = 0.75$). Overall, the risk of bias was moderate.

Conclusions: This *meta*-analysis of RCTs provides causal evidence that PA improves survival in cancer patients, reducing all-cause mortality by 26% (moderate quality of evidence). The results suggest that, in addition to its well-established supportive care benefits, PA should also be recommended as a part of comprehensive disease management in oncology.

The following is the only Diels-Alder reaction you are responsible for in this class



Highly reactile dienophile

Major Product

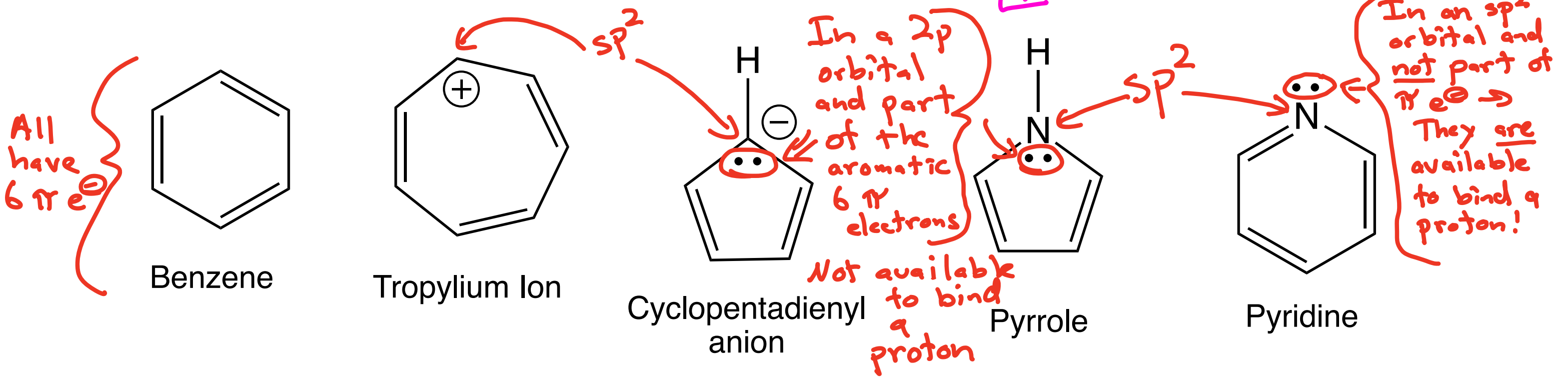
New C-C bond

New C-C bond

Endo → the ester groups are underneath the structure

Hückel's Aromaticity Criteria

1) All ring atoms are sp² (they have a 2p orbital)
2) Flat (so the 2p orbitals overlap)
3) Monocyclic (Rule 4) only applies to single rings)
4) 4n+2 pi electrons (2,6,10,14....)



Benzene

Tropylium Ion

Cyclopentadienyl anion

Pyrrole

Pyridine

All have 6 π e⊖

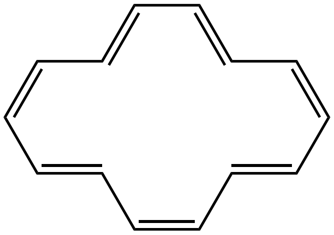
In a 2p orbital and part of the aromatic 6 π electrons

Not available to bind a proton

Pyrrole is NOT a base

Pyridine is a base!

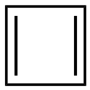
In an sp² orbital and not part of π e⊖ → They are available to bind a proton!



Annulene

14 π electrons

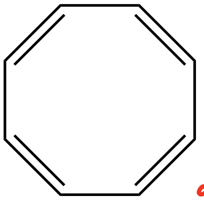
4 π electrons



Not a stable molecule

Cyclobutadiene

8 π electrons



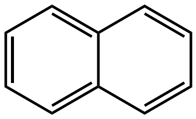
Folds so 2p orbitals do not overlap and avoids antiaromaticity

Cyclooctatetraene

Antiaromatic → These are much less stable than predicted as simple alkenes

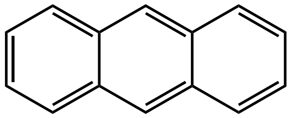
All fused benzene compounds are aromatic no matter the number of π electrons → Not monocyclic so Hückel's 4n+2 rule does not apply!

10 π electrons



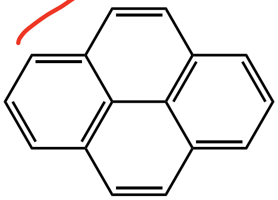
Naphtalene

14 π electrons



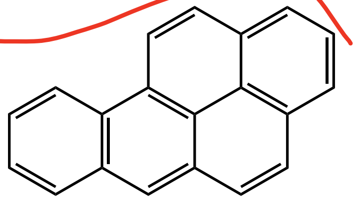
Anthracene

Still aromatic!



Pyrene

16 π electrons!



Benzo[α]pyrene

20 π electrons

Organic Chemistry is the study of carbon-containing molecules. This class has two points.

The first point of the class is to understand the organic chemistry of living systems. We will teach you how to think about and understand the most amazing molecules on the planet!!

You will learn how MRI scans work. 1/14/26

You will learn the basic principles of pharmaceutical science and how many drugs work. 1/21/26

You will learn about the special bond that holds carbohydrates such as glucose in six-membered rings, connects carbohydrate monomers together to make complex carbohydrate structures and is critical to DNA and RNA structure. 2/2/26

You will learn how soap is made from animal fat and how it works to keep us clean. 2/23/26

You will learn the important structural reason proteins, the most important molecular machines in our bodies, can support the chemistry of life. 2/16/26

You will learn how important antibiotics like penicillins work, including ones that make stable covalent bonds as part of their mode of action. 4/1/26

You will learn why carrots are orange and tomatoes are red. 3/25/26

You will learn the very cool reason that the DNA and RNA bases are entirely flat so they can stack in the double helix structure.

You will learn how energy drinks work.

You will learn even more about why fentanyl is such a devastating part of the opioid problem and how Naloxone is an antidote for a fentanyl overdose.

You will learn even more details about why Magic Johnson is still alive, decades after contracting HIV, and how the same strategy is being used to fight COVID.

You will learn about the surprising chemical reason the Pfizer and Moderna mRNA vaccines elicit strong immune responses.

The second point of organic chemistry is the synthesis of complex molecules from simpler ones by making and breaking specific bonds, especially carbon-carbon bonds.

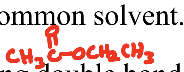
You will learn how carbon-metal bonds lead to new carbon-carbon bonds. 1/21/26

You will learn how most reactions of carbonyl compounds involve only the four common mechanistic elements operating in only a few common patterns. 1/21/26

You will learn how, by simply adding a catalytic amount of base like HO^- to aldehydes or ketones, you can make new carbon-carbon bonds, giving complicated and useful products. 3/2/26

You will learn a reaction that can convert vinegar and vodka into a common solvent. 2/11/26

CH_3CO_2H CH_3CH_2OH



$CH_3\overset{O}{\overset{\|}{C}}-OCH_2CH_3$ (Fischer esterification)

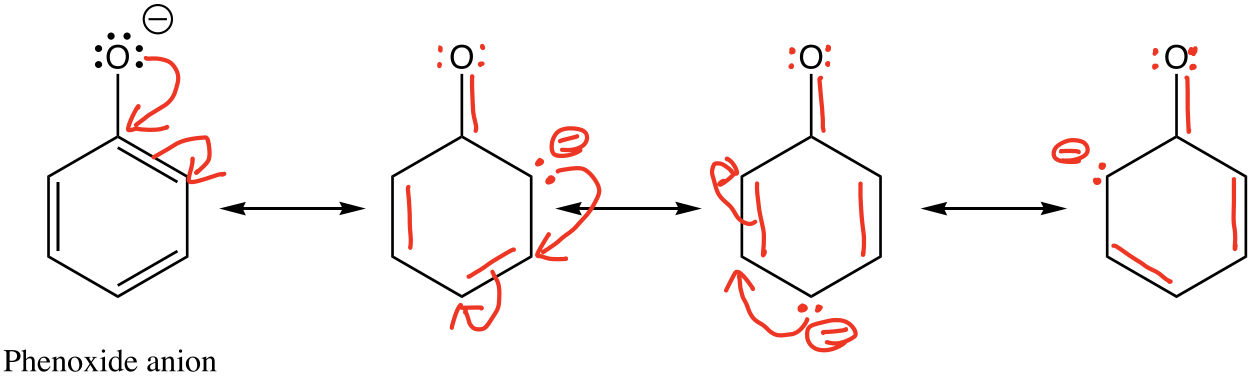
You will learn why molecules with six-membered rings and alternating double bonds are stable. 3/30/26

You will learn a reaction that can turn model airplane glue into a powerful explosive.

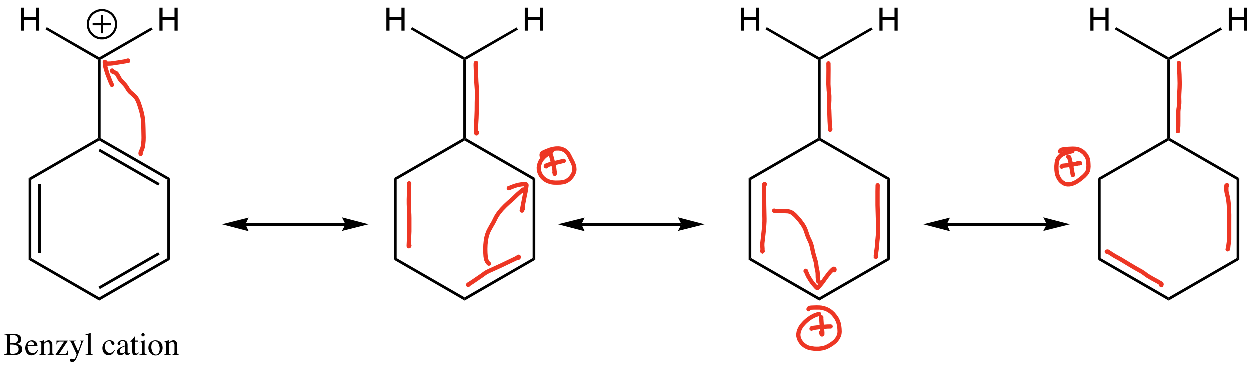
Most important, you will develop powerful critical thinking skills:

1. You will learn how to look at a molecule and accurately predict which atoms will react to make new bonds, and which bonds will break during reactions.
2. You will learn how to analyze a complex molecule's structure so that you can predict ways to make it via multiple reactions starting with less complex starting molecules.

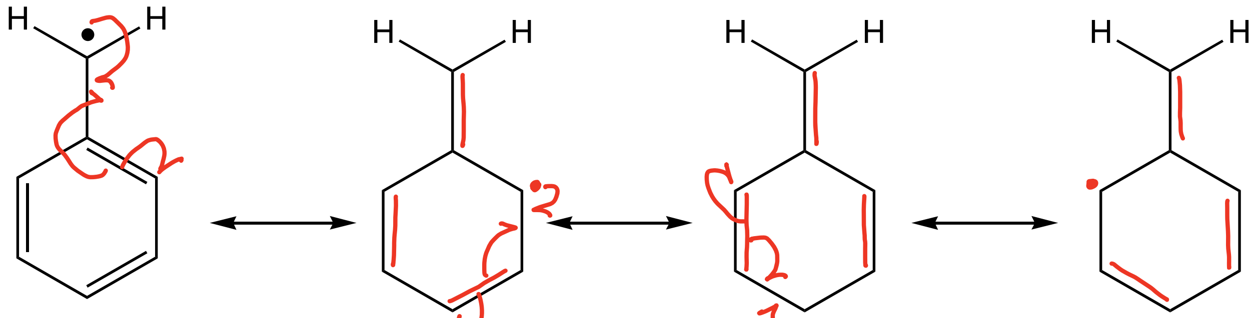
Aromatic resonance stabilization of charged species



Phenoxide anion



Benzyl cation



Benzyl radical

Important takeaways from the contributing structures

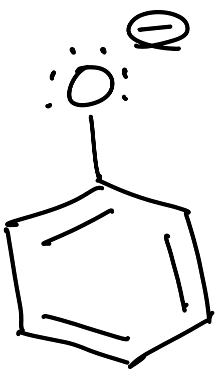
1) Benzene rings stabilize anions, cations and radicals

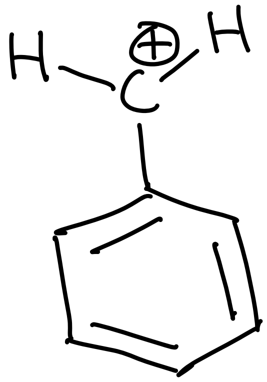
Golden Rules
5, 6 and 7

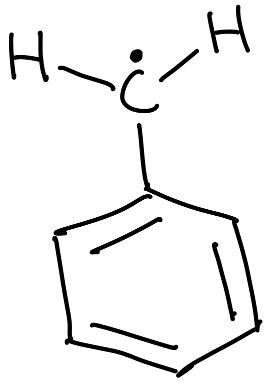
2) Molecules can have electrons on an atom outside the ring delocalized into the π system and the "extra" electrons do not count against the 4n+2 number of π electrons

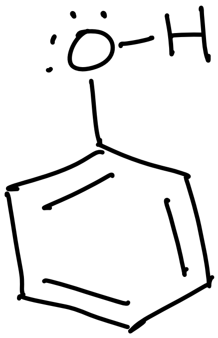
Quantum Mechanics!

Summary → Molecules below are stabilized by delocalizing the charge/unpaired electron into the aromatic ring.



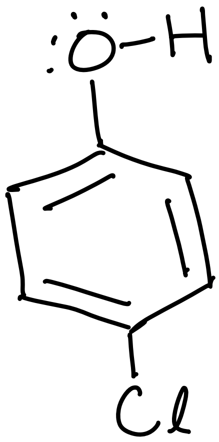




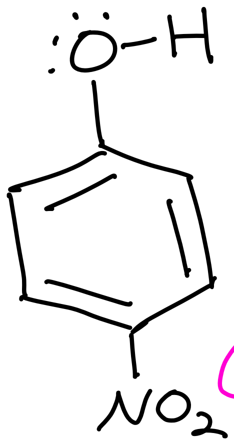


Phenol

$pK_a = 9.95$



$pK_a = 9.0$

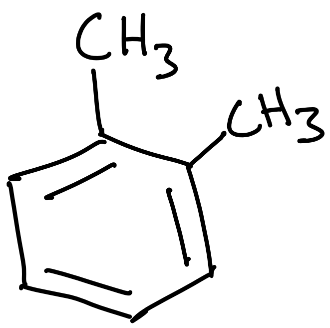


$pK_a = 7.15$

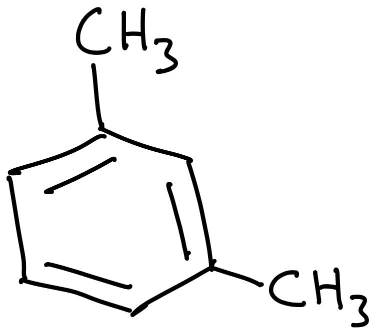
Very electron withdrawing group called a nitro group

Electron withdrawing groups on the ring stabilize the deprotonated anion, making an OH group more acidic (Inductive effect)

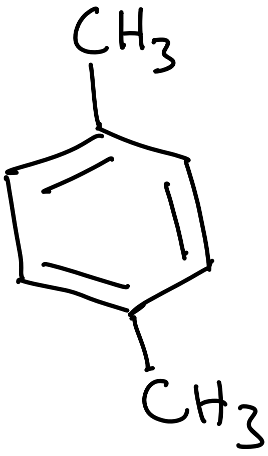
Important terms



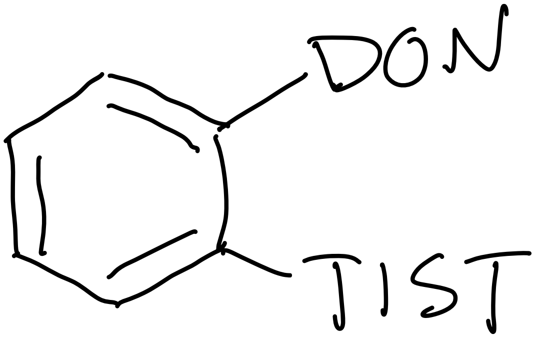
ortho

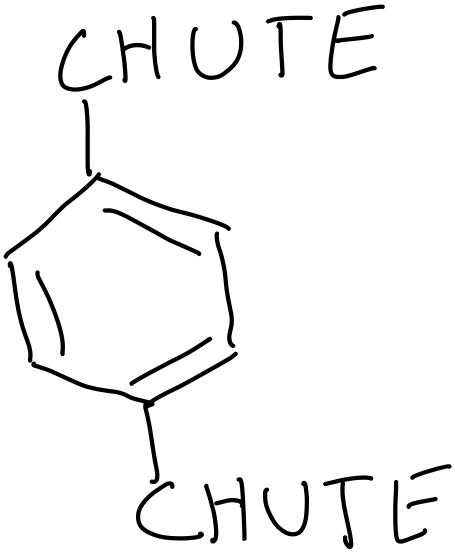


meta



para

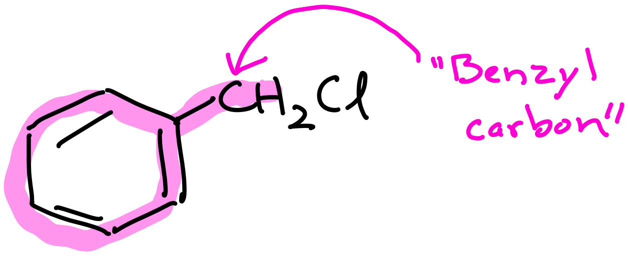

DON
TIST


CHUTE
CHUTE

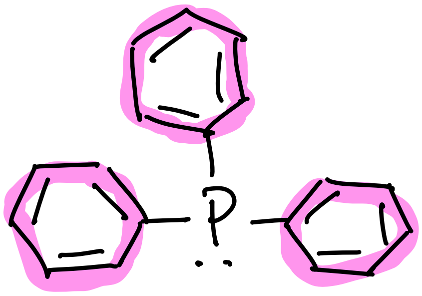
7 atoms

Benzene ring — 6 atoms

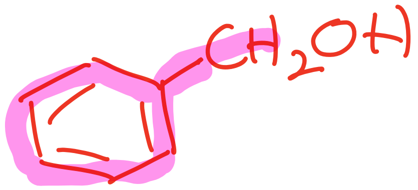
Benzyl vs. Phenyl



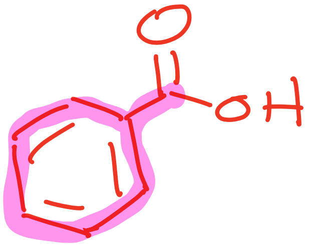
Benzyl chloride



Triphenyl phosphine



Benzyl alcohol



Benzoic acid