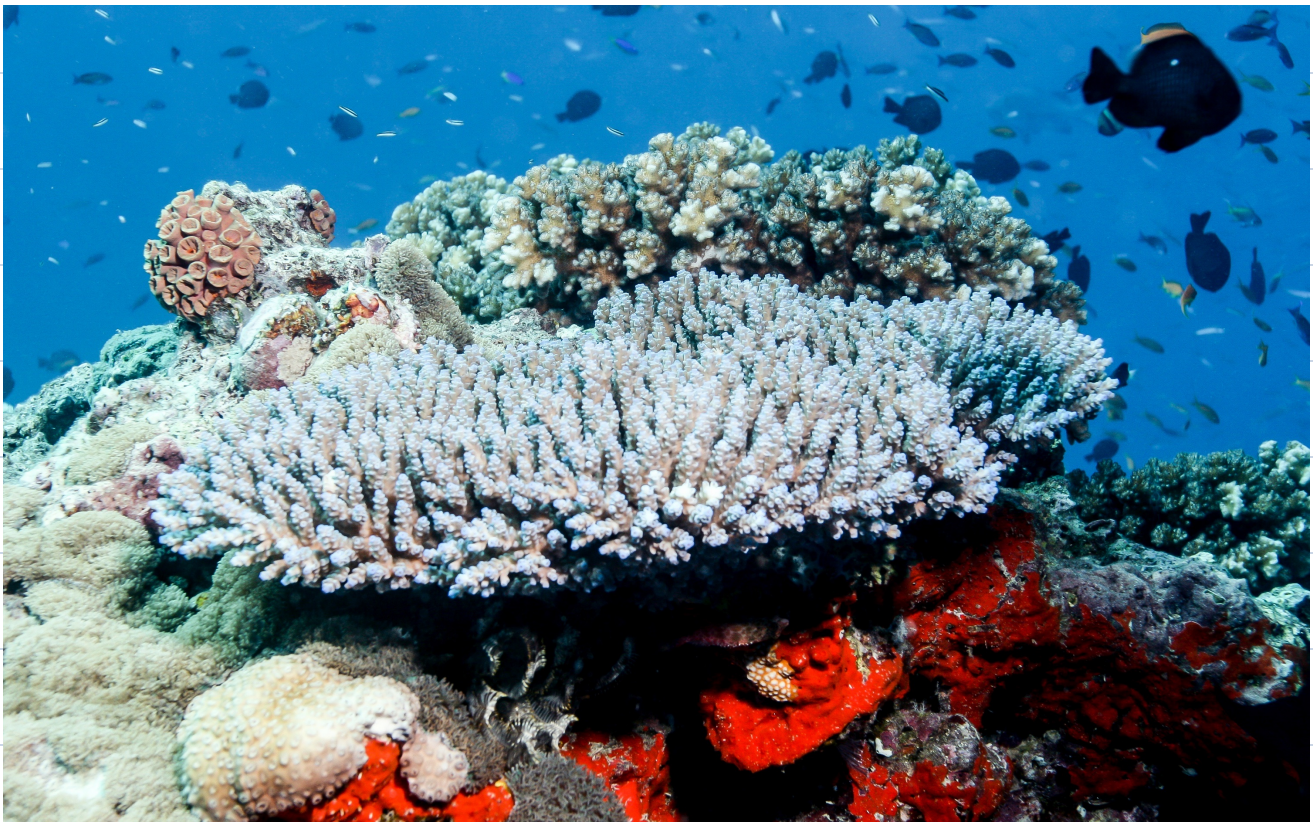
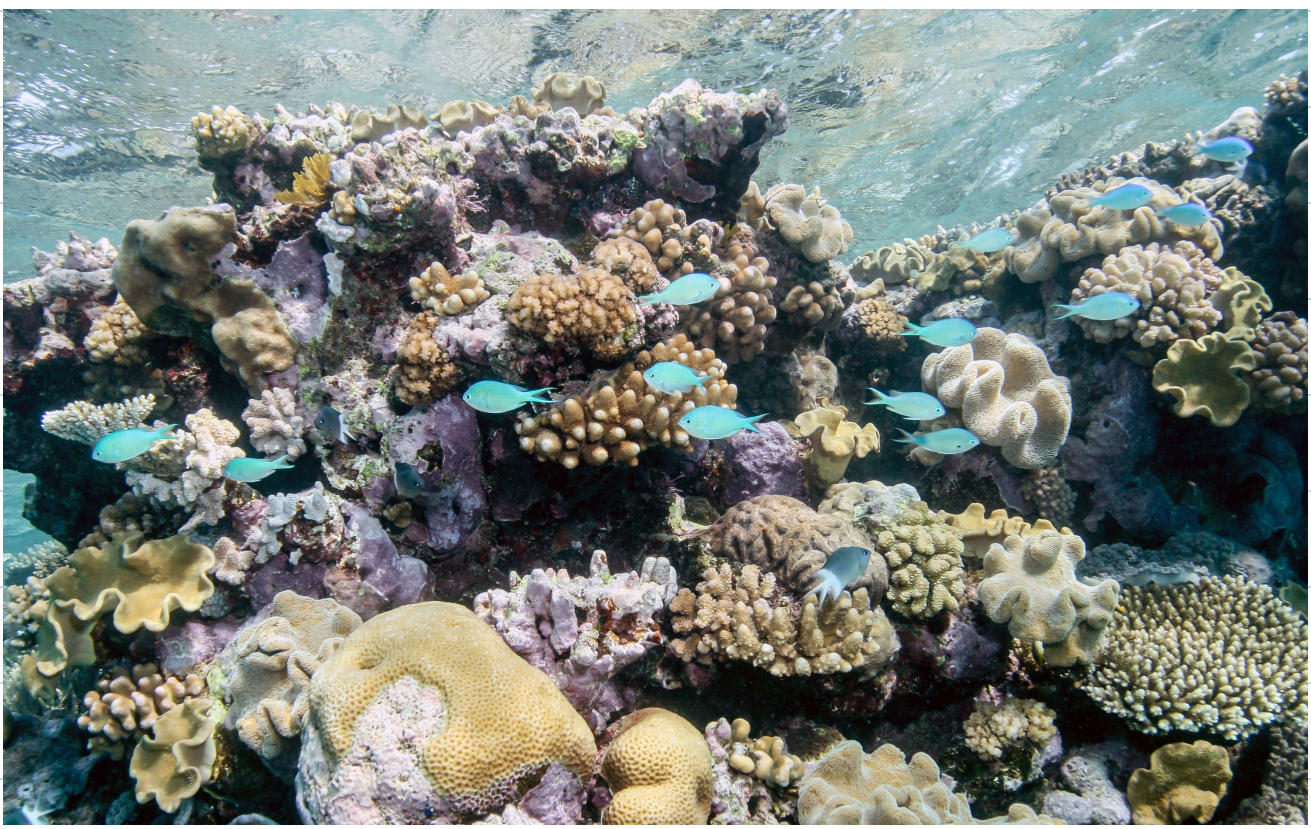
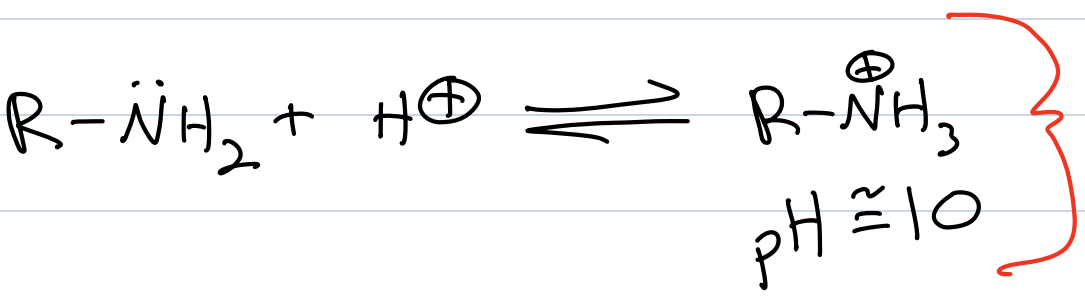




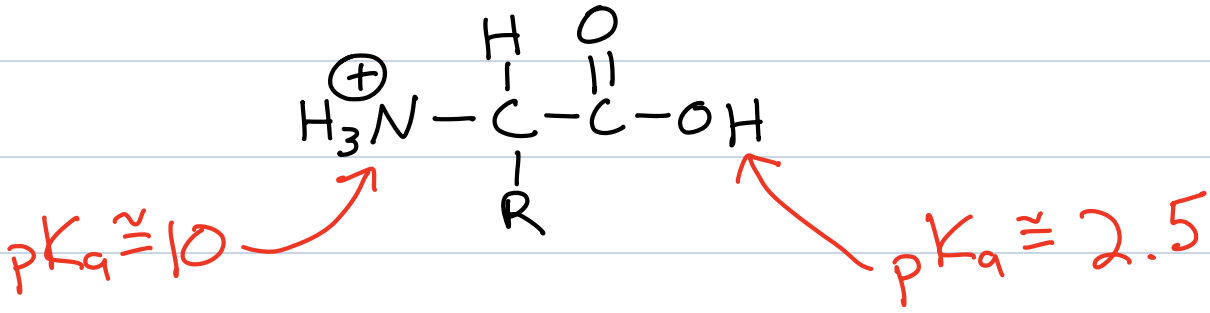
Amines → Relatively strong bases and relatively strong nucleophiles



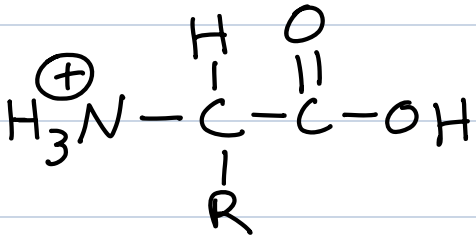
Major form present at neutral pH (pH ≅ 7)

Amines are protonated and positively-charged at neutral pH ⇒ Very important in biochemistry!

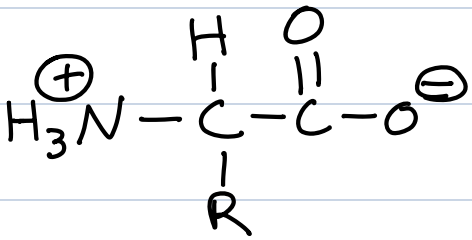
Amino Acids



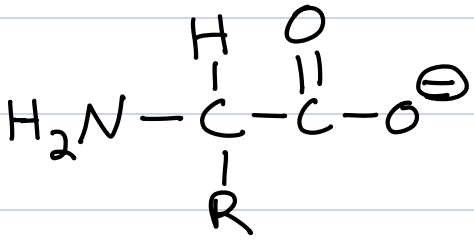
pH 1.0



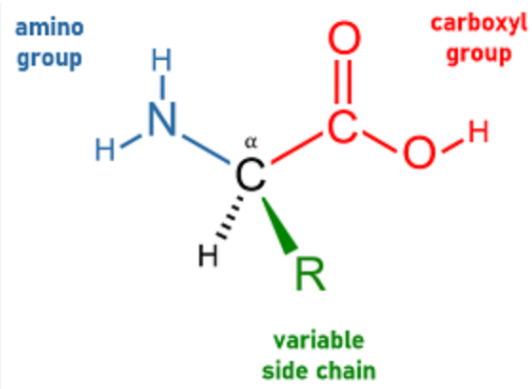
pH 7.0



pH 11.0



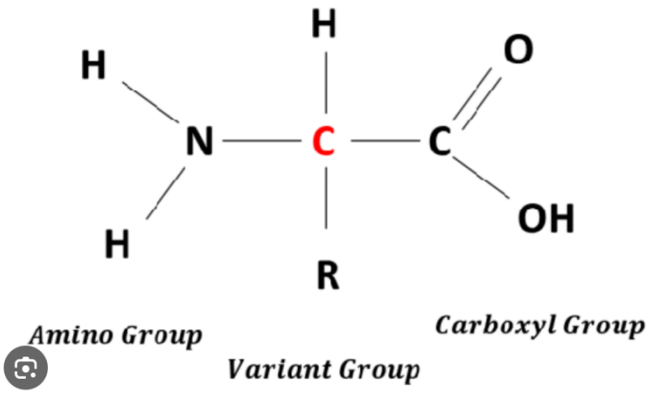
Wikipedia



File:Amino acid generic structure.png - Wikipedia

Visit >

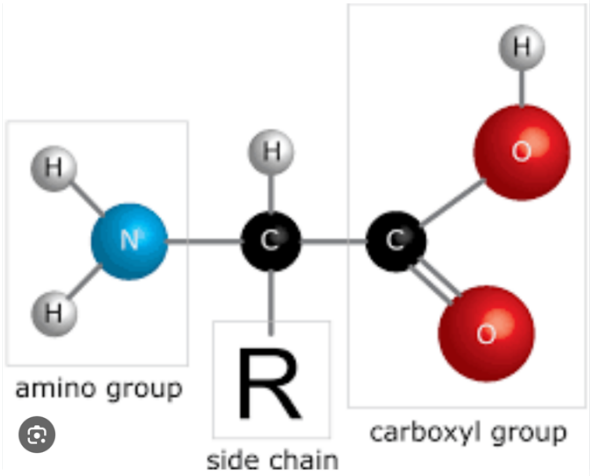
ResearchGate



amino acid structure | Download Scientific Diagram

Visit >

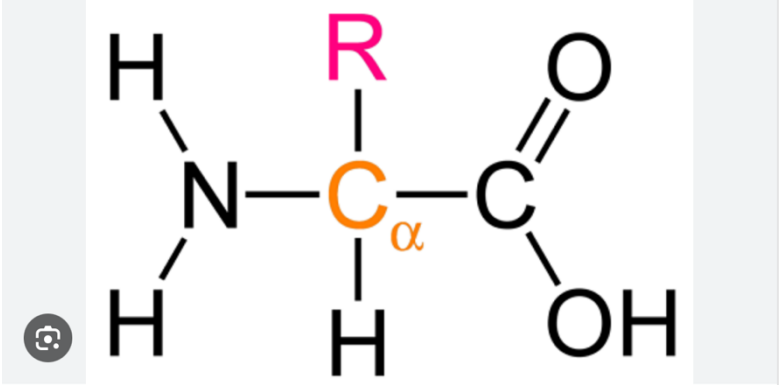
user.eng.umd.edu



Protein > Amino Acids

Visit >

Study.com



Proteins & Amino Acids | Formation, Structures & Sources - Lesson | Study.com

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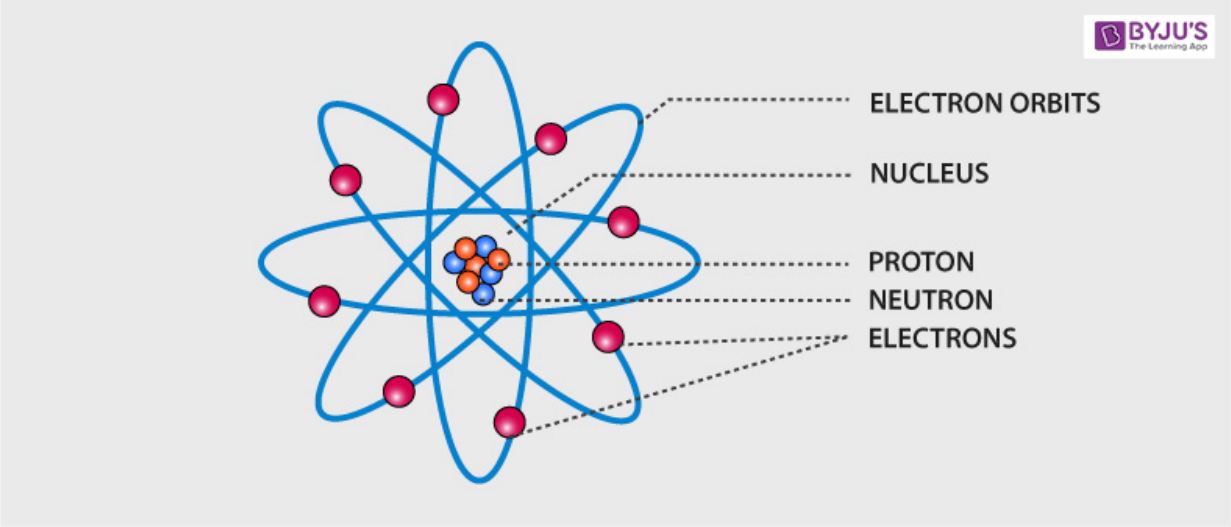
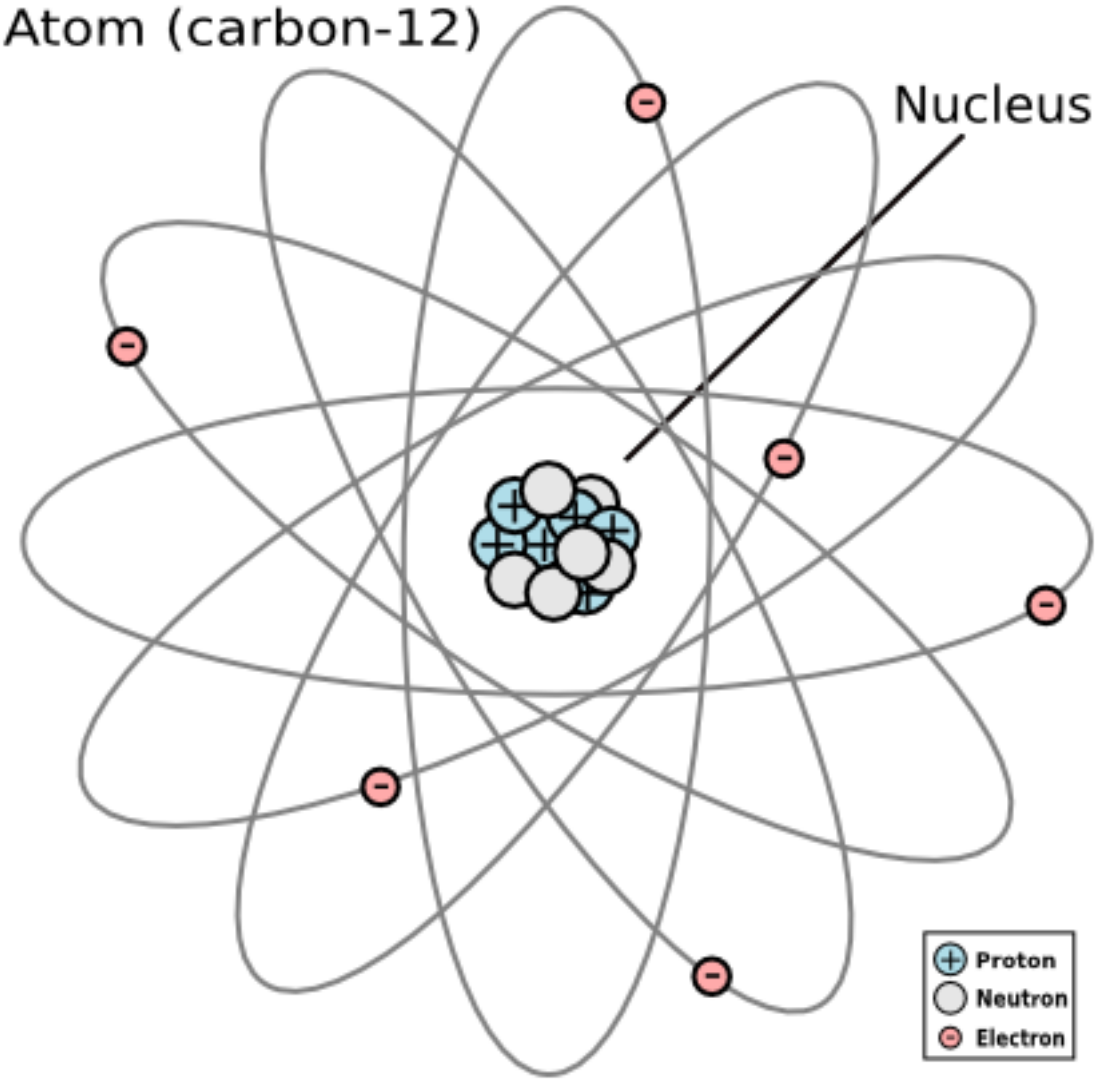
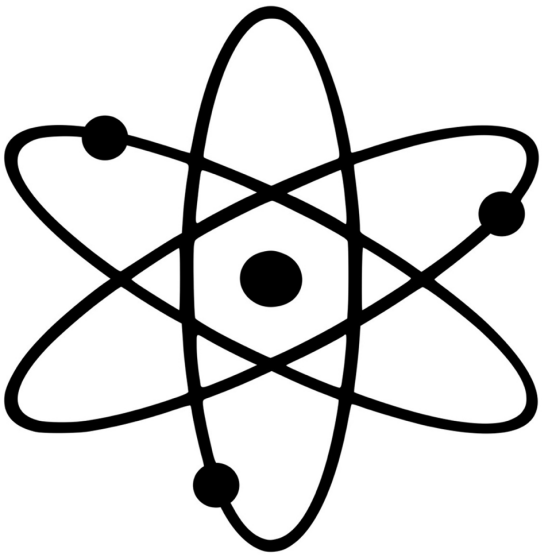
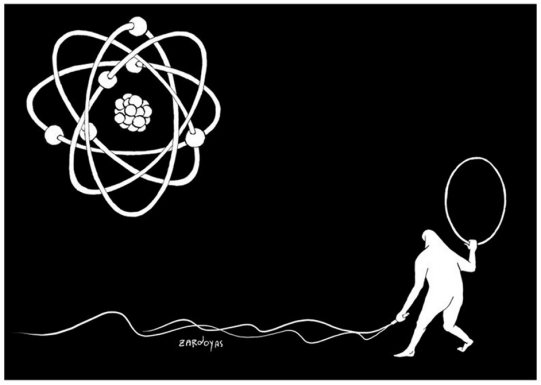
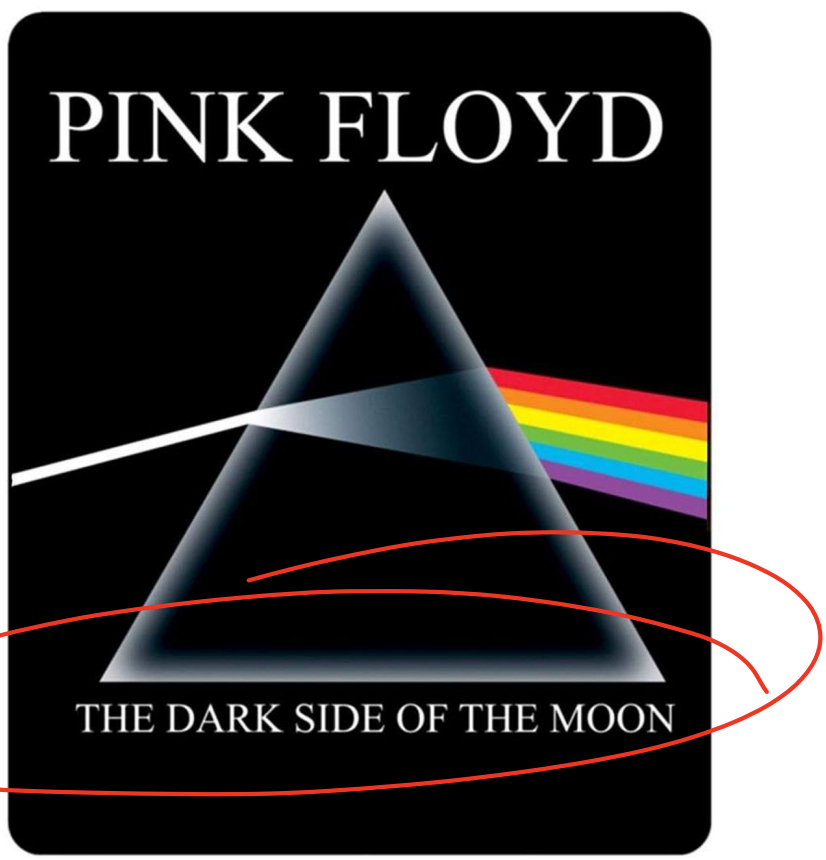

ELECTRON ORBITS
NUCLEUS
PROTON
NEUTRON
ELECTRONS


Atom (carbon-12)
Nucleus
Proton
Neutron
Electron



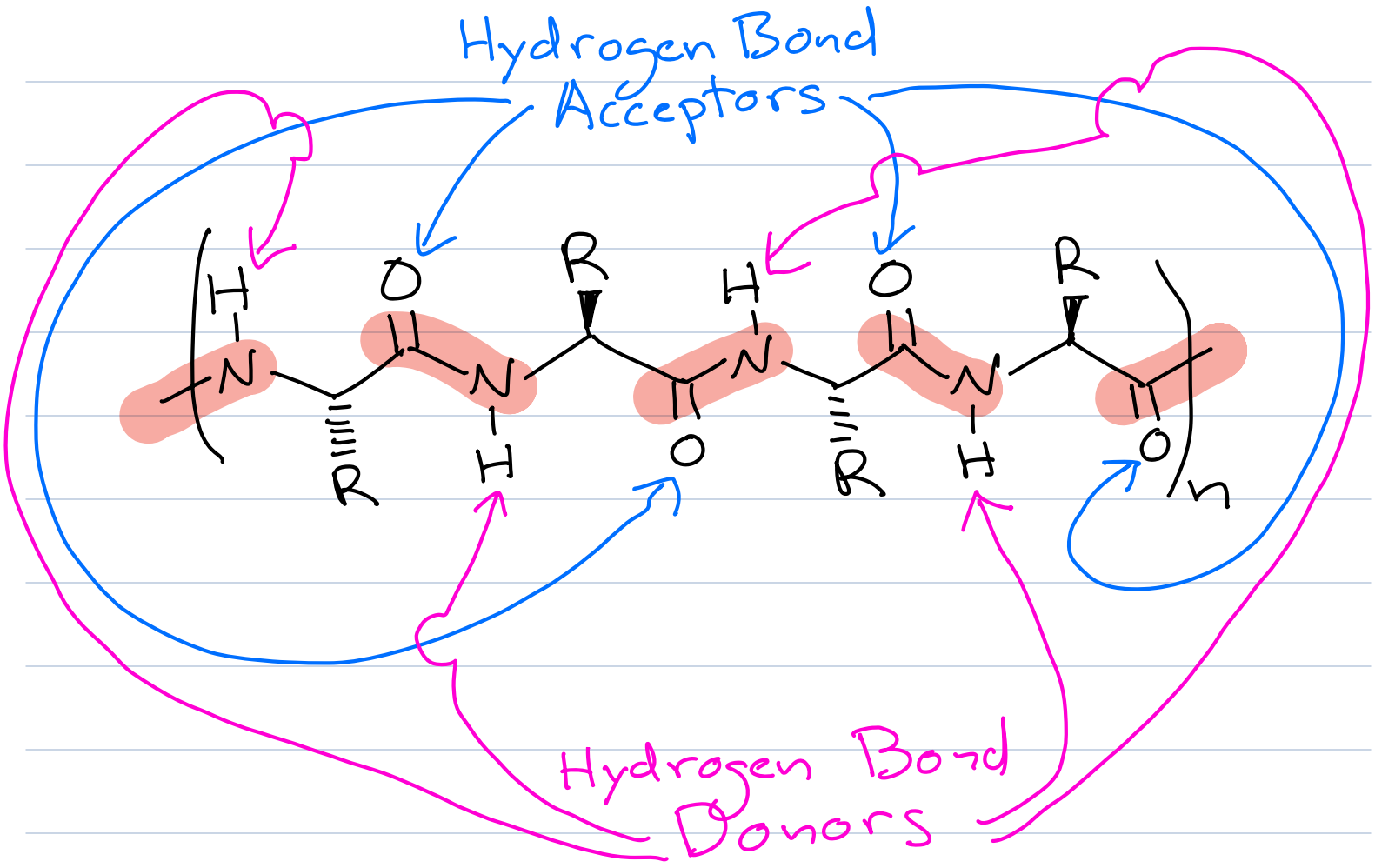

ZARDOYAS

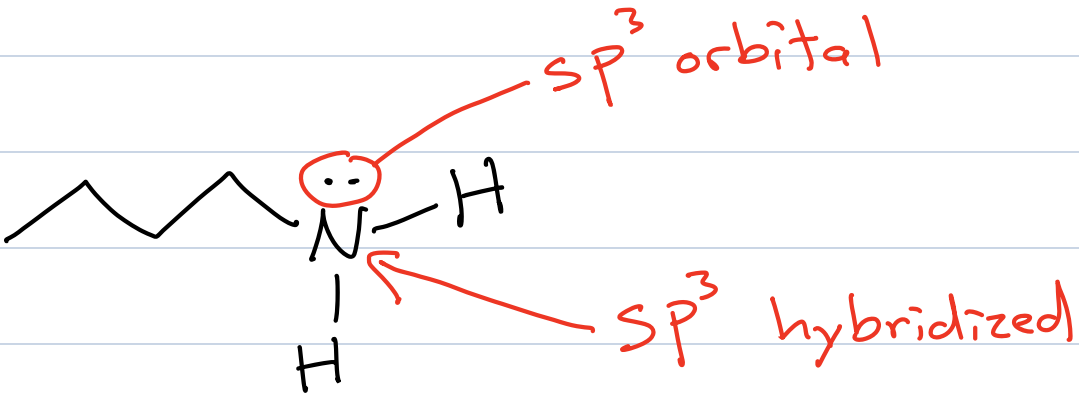

PINK FLOYD
THE DARK SIDE OF THE MOON

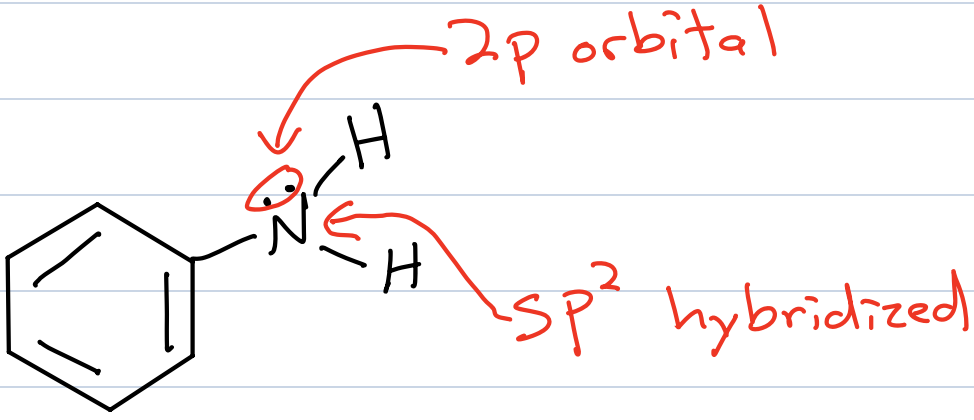
What does this means for amides:

1) The amide group can make strong hydrogen bonds

2) The C–N bond does not rotate at room temperature



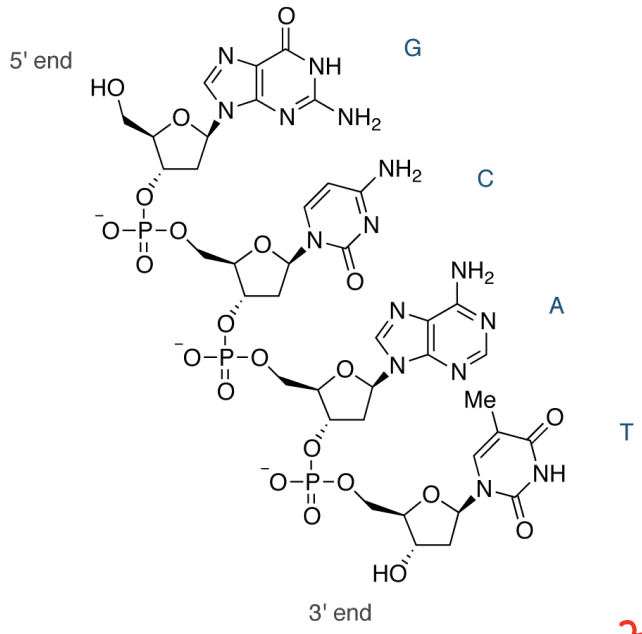


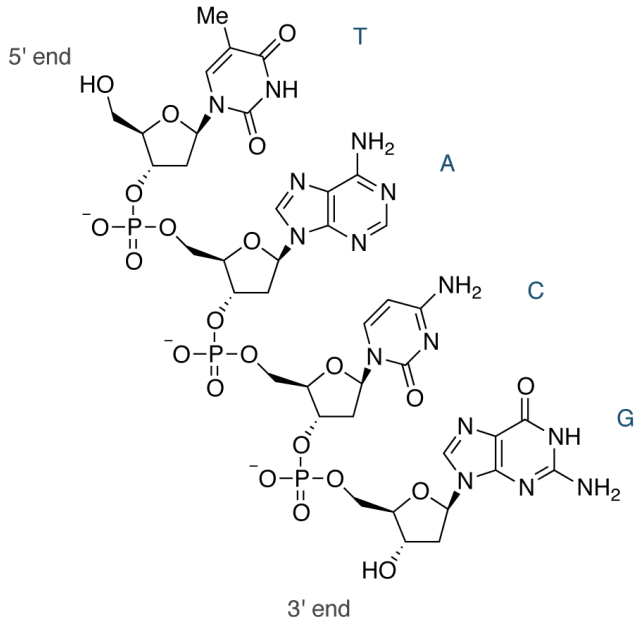


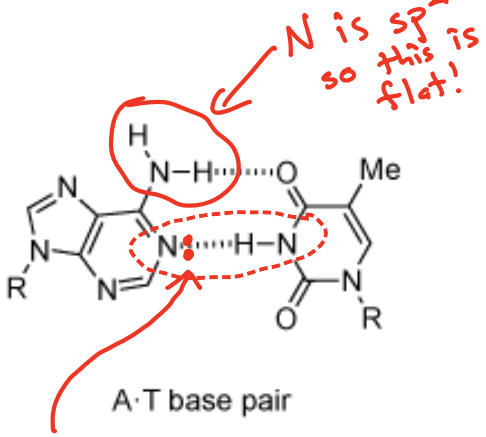
Golden rule: π electrons are more stable when delocalized

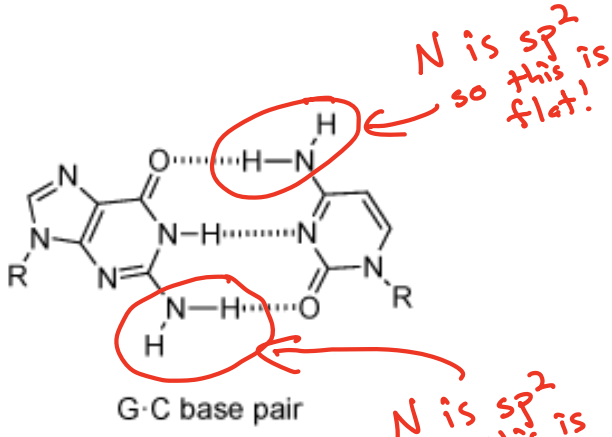
The lone pair is delocalized into the aromatic π system! The lone pair needs to be is a 2p orbital so N must sp^2 hybridized

This is critical to DNA and RNA structure: DNA bases are aromatic and the $-NH_2$ groups on the bases are sp^2 and flat

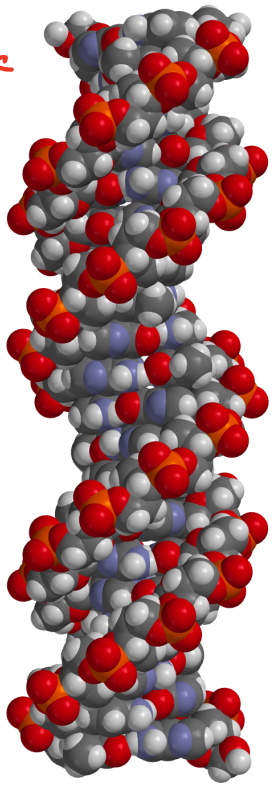


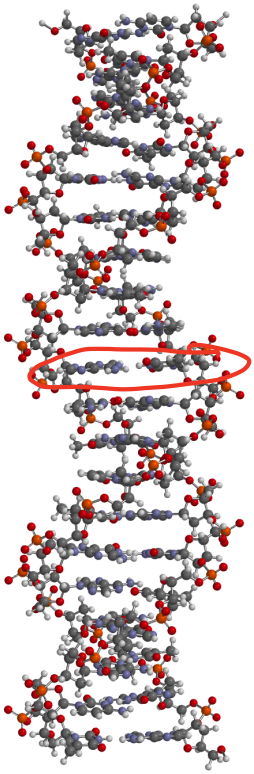






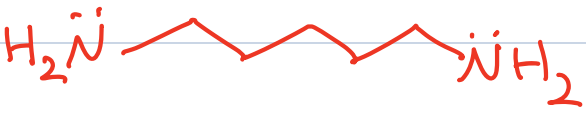
Lone pair is in an sp^2 orbital and available to make a strong hydrogen bond





base pairs are flat because N atoms are sp^2

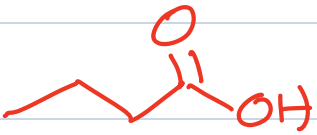
Our sense of smell is highly sensitive to certain molecules that are the result of decomposition of mammal and fish flesh among other things. Not only can we detect very small amounts of these "signal" molecules, we are hard wired to be highly nauseated when we smell them → evolutionary protection to keep us from eating what might look OK, yet would make us sick.



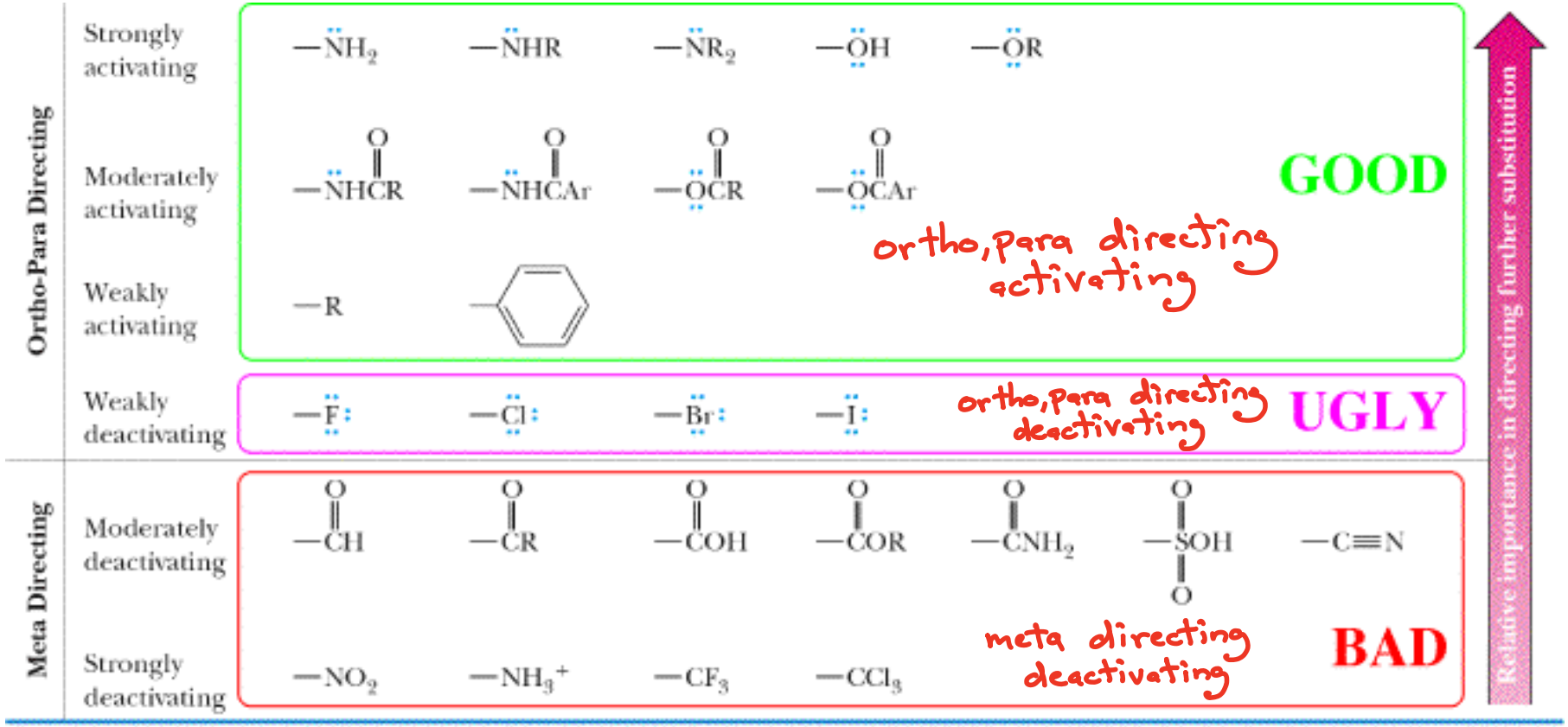
Rotten Mammal

Rotten Fish

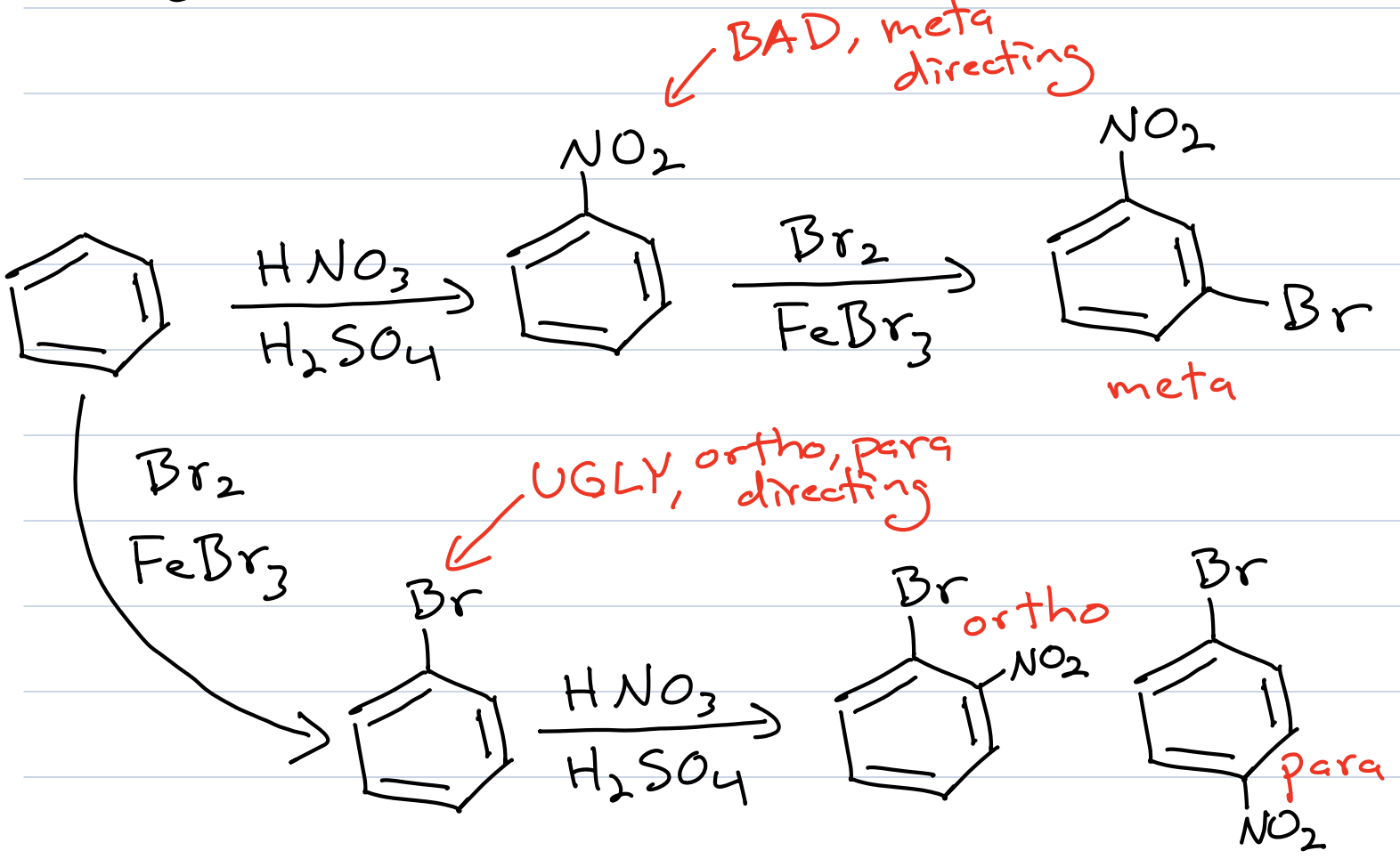
H_2S Rotten Eggs



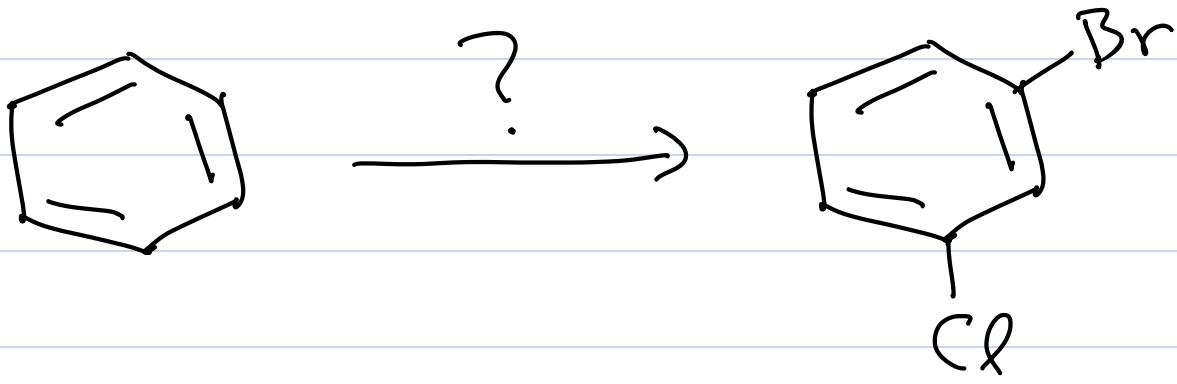
Barf


Ortho-Para Directing
Meta Directing
Strongly activating
Moderately activating
Weakly activating
Weakly deactivating
Moderately deactivating
Strongly deactivating
—NH2
—NHR
—NR2
—OH
—OR
—NHCR
—NHCAr
—OCR
—OCAr
—R
—F:
—Cl:
—Br:
—I:
—CH
—CR
—COH
—COR
—CNH2
—SOH
—C≡N
—NO2
—NH3+
—CF3
—CCl3
GOOD
ortho, para directing activating
ortho, para directing deactivating
UGLY
meta directing deactivating
BAD
Relative importance in directing further substitution

The order in which you add groups matters!



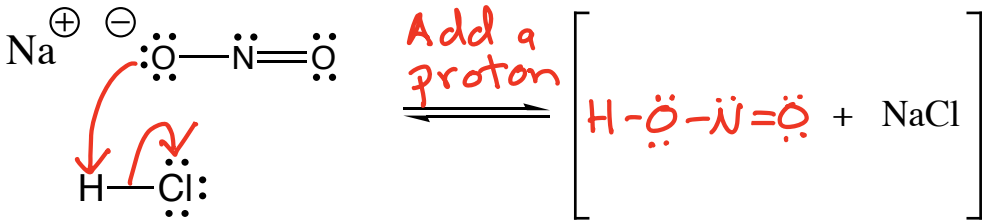
How do we carry out the following synthesis?



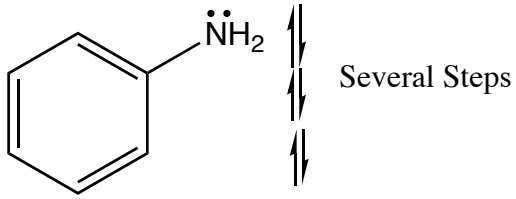
Time to call "Mr. Bill"

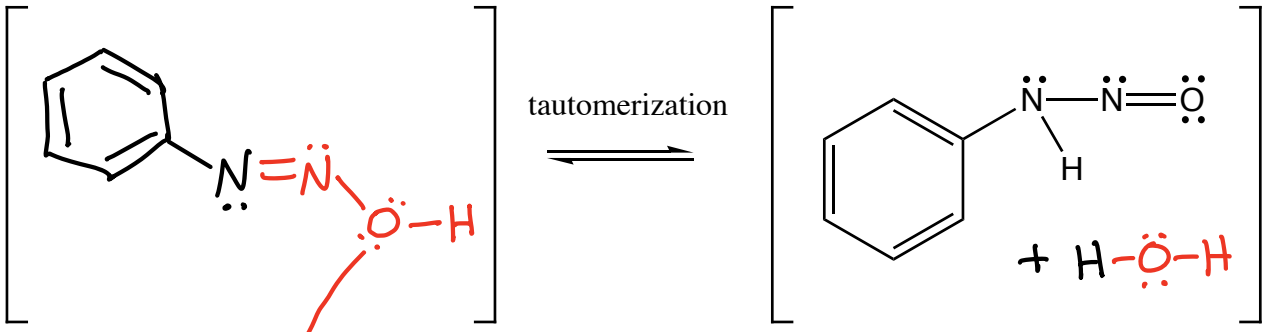
Both of these are UGLY so they are ortho, para directing. How do we introduce both of them meta to each other?

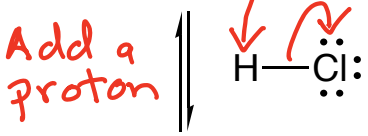
Preparation of Diazoniums, The "Mr. Bill" Reaction

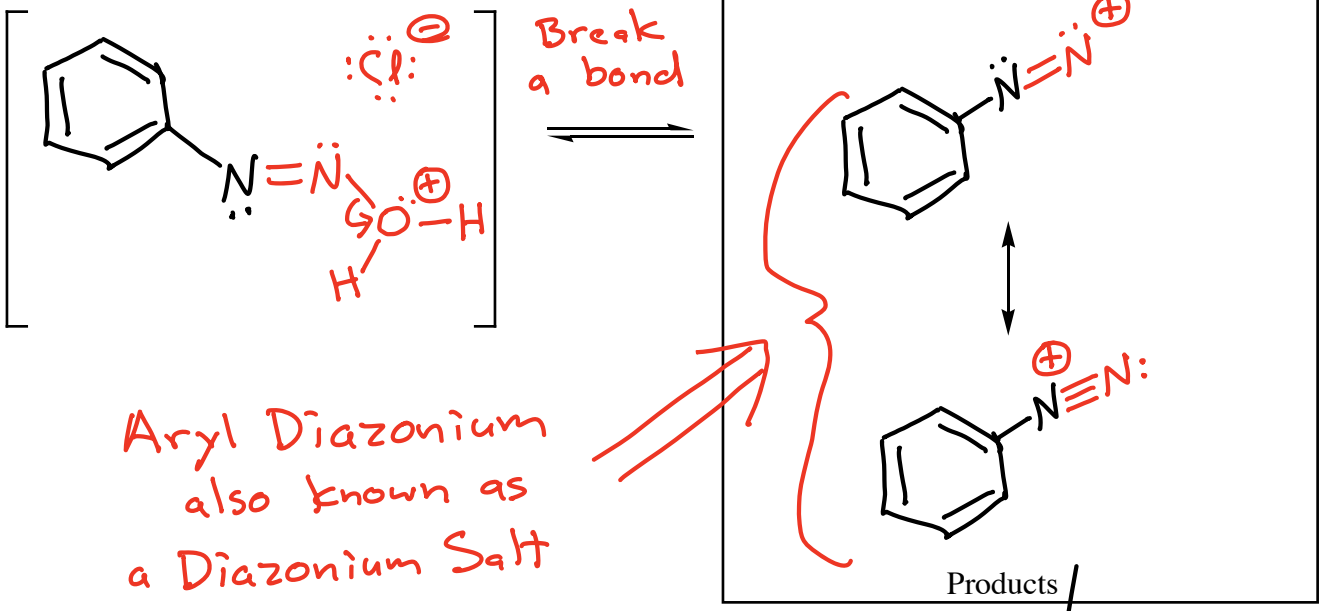


The Mr. Bill reagent



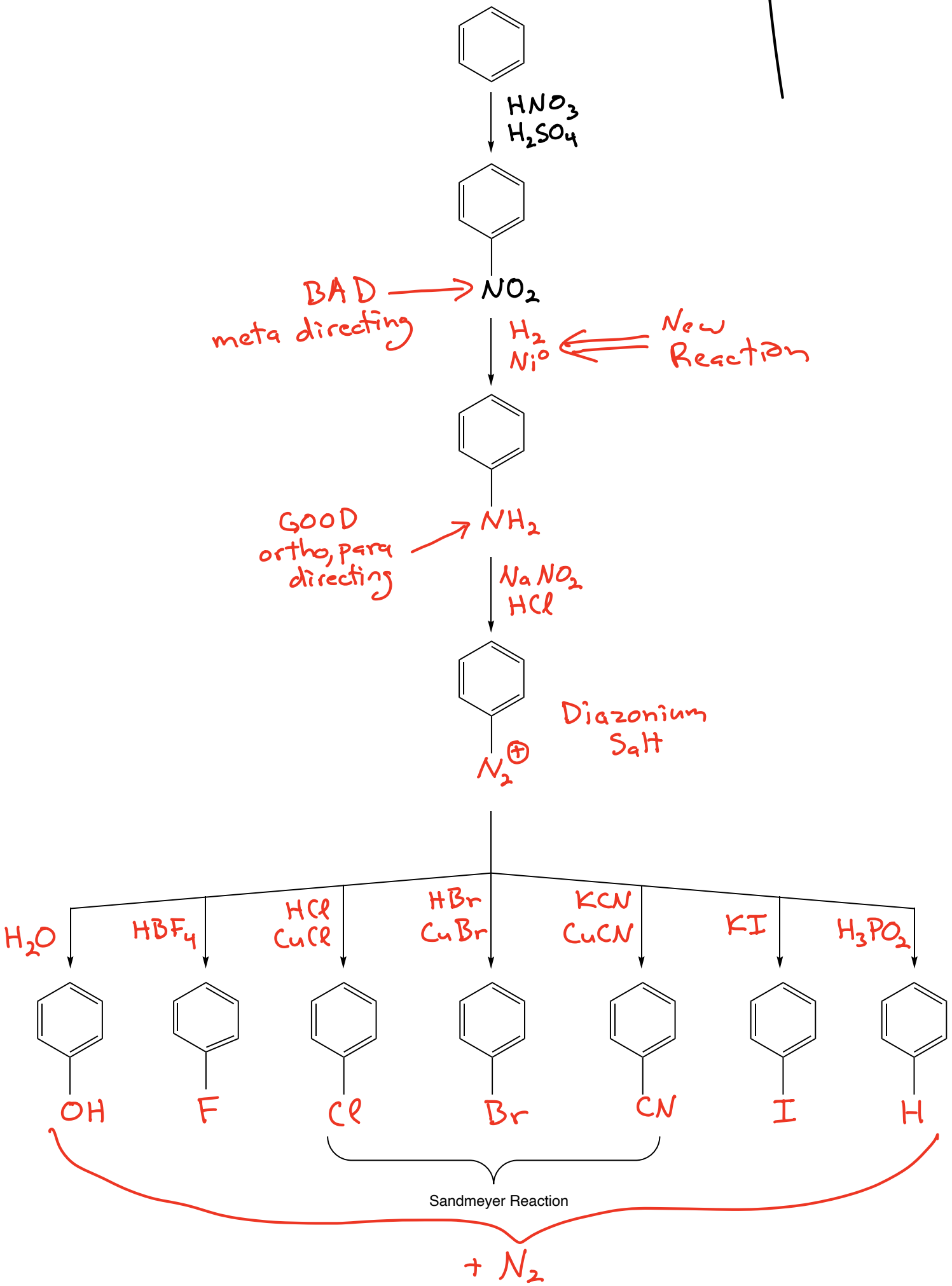




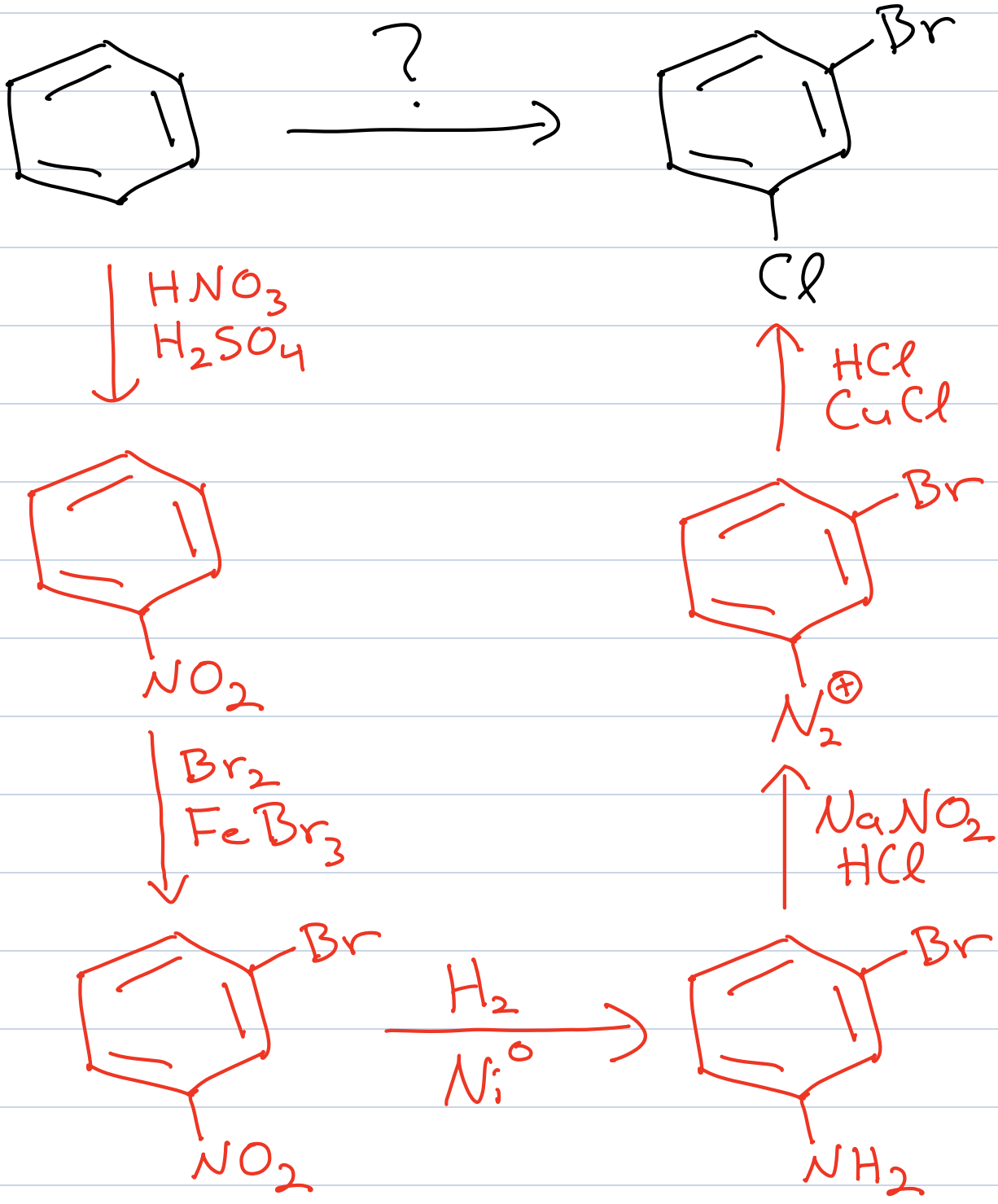


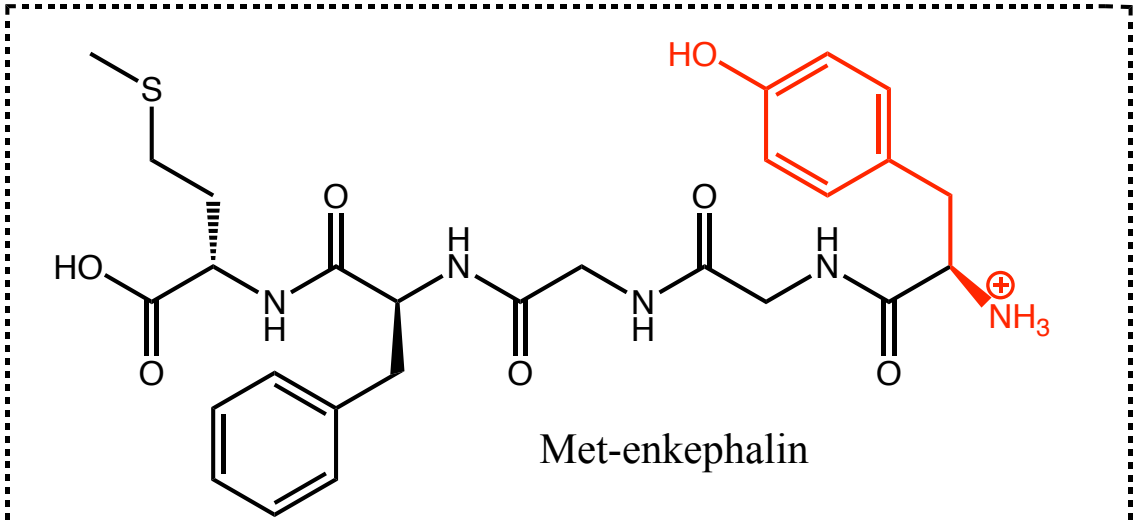
Aryl Diazonium also known as a Diazonium Salt

N_2 leaves and is replaced by a variety of reagents → Not responsible for mechanisms


HNO3
H2SO4
BAD
meta directing
NO2
H2
Ni°
New
Reaction
GOOD
ortho, para
directing
NH2
NaNO2
HCl
Diazonium
Salt
N2⊕
H2O
HBF4
HCl
CuCl
HBr
CuBr
KCN
CuCN
KI
H3PO2
OH
F
Cl
Br
CN
I
H
Sandmeyer Reaction
+ N2

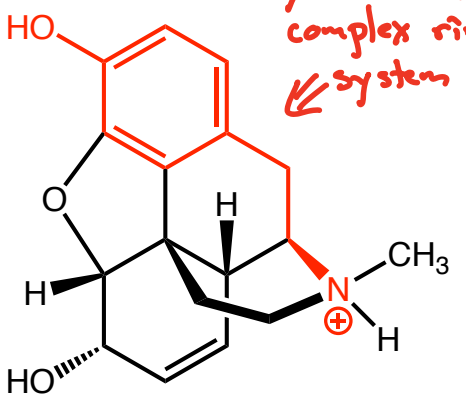
How do we carry out the following synthesis?





Met-enkephalin

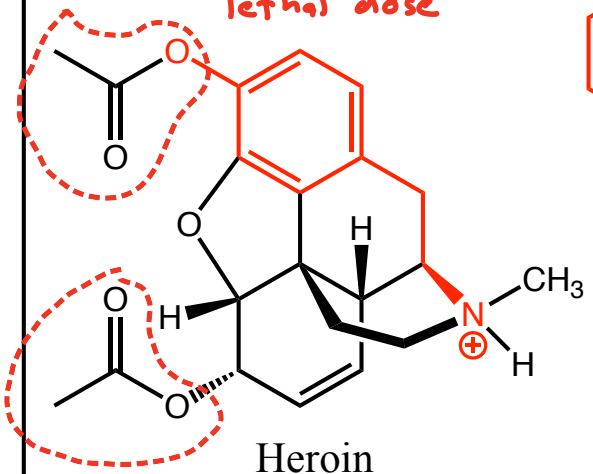
VERY difficult to synthesize this complex ring system



Morphine

Isolated from poppies grown in the Middle East

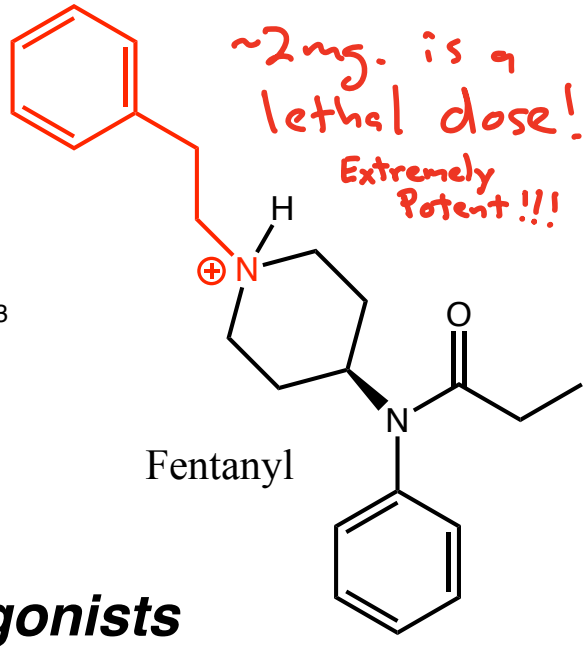
>100 mg. is a lethal dose



Heroin

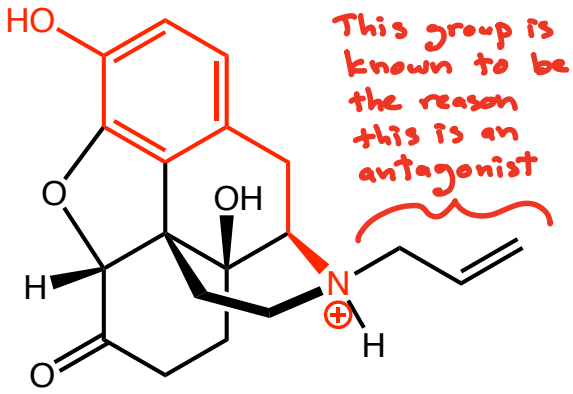
~2mg. is a lethal dose!

Extremely Potent !!!



Fentanyl

Mu-Receptor Agonists



This group is known to be the reason this is an antagonist

Naloxone

Antagonist

Means it binds to receptor and activates it

Too easy! {VERY easy to make!

Synthesized from natural morphine analog in a couple of easy steps

Means it binds to receptor but does not activate it

HEALTH

Why fentanyl is deadlier than heroin, in a single photo

By Allison Bond Sept. 29, 2016 Reprints

DEA

Menu

ONE PILL CAN KILL

DEA Fentanyl Seizures in 2024

In 2023, DEA seized more than 79.5 million fentanyl-laced fake pills and nearly 12,000 pounds of fentanyl powder. The 2023 seizures are equivalent to more than 376.7 million lethal doses of fentanyl.

The 2024 fentanyl seizures represent over 93.7 million deadly doses. *

17,900,000+ Millions of Fentanyl Pills Seized

1,813+ lbs. Pounds of Fentanyl Powder Seized

* 2 mg of fentanyl equates to a potentially deadly dose

PRESS RELEASE

13 Arrested in Connection with an LSD, Fentanyl and Methamphetamine Trafficking and Money Laundering Scheme Occurring in the West Campus Area of the University of Texas at Austin

Friday, December 4, 2020

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For Immediate Release

U.S. Attorney's Office, Western District of Texas

Austin American-Statesman
SERVING OUR COMMUNITY SINCE 1871

Jake Ehlinger's family releases statement saying Texas player died of accidental overdose

Brian Davis
Hookem

Published 4:56 p.m. CT Oct. 21, 2021 | **Updated 3:54 p.m. CT Oct. 22, 2021**

Remembering Texas linebacker Jake Ehlinger

Jake Ehlinger, younger brother of former Longhorns quarterback Sam Ehlinger, was found dead on May 6, Austin police said. *Austin American-Statesman*

SHIFT
THE CAMPUS CULTURE

SHIFT is ready for a different conversation.

For decades substance use and college campuses have been talked about as an inevitable rite of passage for college students, creating a norm that can far out shadow the dynamic pursuits of college students that revolve around academics and future opportunities.

SHIFT engages the community in dialogue that changes the culture of campus substance use from one of misuse to one of well-being.

Should I carry naloxone?

Sometimes it can be difficult to imagine how one person can have an impact on the culture of substance use – but you can! By carrying naloxone and learning the right way to administer it to someone having an opioid overdose, you have the potential to save a life. Even if you don't personally know anyone using opioids, you may find yourself in a situation where having naloxone on hand could make a huge difference. By showing that you care and taking the time to learn, you're helping to raise awareness about how important it is for each of us to play a part in shifting the culture of substance use.

How do I use naloxone?

Okay, so now you know what naloxone is, and why it's so important – but how do you actually use it on someone experiencing an opioid overdose? Great question – luckily, Operation Naloxone at UT provides free trainings for students, staff, and faculty. Email shift@utexas.edu for more information. Request an Operation Naloxone training.

How do you administer the nasal spray version of naloxone (Narcan)?

- Open the Narcan package, place the nozzle in the person's nostril and press the plunger.
- View the CDC video on how to administer Narcan.

Where can I find naloxone?

- Naloxone is available for distribution to all students, faculty, and staff at the Perry-Casteneda Library security front desk, the Longhorn Wellness Center (SSB 1.106), and the Center for Students in Recovery (Belmont 222).
- Naloxone is available for emergency access at all residence hall front desks, Sid Richardson Library, the Life Sciences Library, the Perry-Casteneda Library, and through UTPD.
- Many pharmacies dispense naloxone without a prescription, but there may be a copay depending on the insurer. You can call your insurance provider in advance to learn more about the potential copay cost.
- In Texas, you can request free naloxone via mail at MoreNarcanPlease.com.
- Map of free naloxone access sites in Austin.