

# Course Information

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**Office Hours:** Tues 11-12:00, Thurs 11-12:00

**Phone:** 718-951-5000 x2821

If I don't answer, email me (don't leave voicemail)

**Syllabus can be found at:**

**[http://chemscript.brooklyn.cuny.edu/web/  
Course\\_homepages.php](http://chemscript.brooklyn.cuny.edu/web/Course_homepages.php)**

**Or go to chem department website and click "course homepages" link**

**Or simply Google Search "Murelli" or "Murelli Course"**

# Your Obligations

- Come to every class and recitation on time and prepared
  - I reserve the right to throw out anyone who shows up late
- Study hard and smart outside of class (>10 hours/week))
  - Spend 2-3 hours minimum reading and understanding concepts
  - Spend 7-8 hours minimum practicing problems
  - Study in groups so that you can get feedback
- Be ethical in your approach to the course. Be honest with yourself and your instructors and don't try to take shortcuts to get better grades
- Make no excuses
  - This is your class, and it is your responsibility to do what it takes to succeed in this class.

# Grading

- I anticipate a final course average of ~C-C+.
- There is no true curve. But historically:
  - <45 overall average – F
  - 45-60 – C range
  - 60-80 – B range
  - >80 – A Range
- Exam averages are typically 50-60 (70%)
- Quiz averages are typically higher (70) (25%)

*I reserve the right, based on my own judgement, to set the final grades any way I see fit. This will be primarily based upon my assessment of different “tier’s” likely success in Organic II.*

# Quizzes (25% of Grade)

- First Quiz is in less than 2 weeks! (9/16-9/20)
- Quizzes are usually 15 minutes long and start 5 minutes into the class..
  - show up early on quiz days!
- Lowest Quiz grade will be dropped
  - This is to account for a bad day, which can be mental, transportation, or health related.
- **No makeup quizzes are allowed.**
  - If you **anticipate** missing a quiz for any reason, you can request to take it at another recitation section in advance (requests within 24 hours of your quiz will not be granted)

# EXAMS

- **Mid Terms**

  - Exam 1 (10/8)

  - Exam 2 (11/19)

- **Final Exam (12/20)**

- **General structure I shoot for**

  - 20% Easy

- 60% Moderate (Quiz Level Difficulty +)

  - 20% Very Challenging

What is Organic Chemistry?

# Introduction to Organic Chemistry

- Organic Chemistry is the study of carbon-containing compounds.

hydrogen 1 <b>H</b> 1.0079																	helium 2 <b>He</b> 4.0026						
lithium 3 <b>Li</b> 6.941	beryllium 4 <b>Be</b> 9.0122																	boron 5 <b>B</b> 10.811	carbon 6 <b>C</b> 12.011	nitrogen 7 <b>N</b> 14.007	oxygen 8 <b>O</b> 15.999	fluorine 9 <b>F</b> 18.998	neon 10 <b>Ne</b> 20.180
sodium 11 <b>Na</b> 22.990	magnesium 12 <b>Mg</b> 24.305																	aluminum 13 <b>Al</b> 26.982	silicon 14 <b>Si</b> 28.086	phosphorus 15 <b>P</b> 30.974	sulfur 16 <b>S</b> 32.065	chlorine 17 <b>Cl</b> 35.453	argon 18 <b>Ar</b> 39.948
potassium 19 <b>K</b> 39.098	calcium 20 <b>Ca</b> 40.078	scandium 21 <b>Sc</b> 44.956	titanium 22 <b>Ti</b> 47.867	vanadium 23 <b>V</b> 50.942	chromium 24 <b>Cr</b> 51.996	manganese 25 <b>Mn</b> 54.938	iron 26 <b>Fe</b> 55.845	cobalt 27 <b>Co</b> 58.933	nickel 28 <b>Ni</b> 58.693	copper 29 <b>Cu</b> 63.546	zinc 30 <b>Zn</b> 65.39	gallium 31 <b>Ga</b> 69.723	germanium 32 <b>Ge</b> 72.61	arsenic 33 <b>As</b> 74.922	selenium 34 <b>Se</b> 78.96	bromine 35 <b>Br</b> 79.904	krypton 36 <b>Kr</b> 83.80						
rubidium 37 <b>Rb</b> 85.468	strontium 38 <b>Sr</b> 87.62	yttrium 39 <b>Y</b> 88.906	zirconium 40 <b>Zr</b> 91.224	niobium 41 <b>Nb</b> 92.906	molybdenum 42 <b>Mo</b> 95.94	technetium 43 <b>Tc</b> [98]	ruthenium 44 <b>Ru</b> 101.07	rhodium 45 <b>Rh</b> 102.91	palladium 46 <b>Pd</b> 106.42	silver 47 <b>Ag</b> 107.87	cadmium 48 <b>Cd</b> 112.41	indium 49 <b>In</b> 114.82	tin 50 <b>Sn</b> 118.71	antimony 51 <b>Sb</b> 121.76	tellurium 52 <b>Te</b> 127.60	iodine 53 <b>I</b> 126.90	xenon 54 <b>Xe</b> 131.29						
caesium 55 <b>Cs</b> 132.91	barium 56 <b>Ba</b> 137.33	57-70 *	lutetium 71 <b>Lu</b> 174.97	hafnium 72 <b>Hf</b> 178.49	tantalum 73 <b>Ta</b> 180.95	tungsten 74 <b>W</b> 183.84	rhenium 75 <b>Re</b> 186.21	osmium 76 <b>Os</b> 190.23	iridium 77 <b>Ir</b> 192.22	platinum 78 <b>Pt</b> 195.08	gold 79 <b>Au</b> 196.97	mercury 80 <b>Hg</b> 200.59	thallium 81 <b>Tl</b> 204.38	lead 82 <b>Pb</b> 207.2	bismuth 83 <b>Bi</b> 208.98	polonium 84 <b>Po</b> [209]	astatine 85 <b>At</b> [210]	radon 86 <b>Rn</b> [222]					
francium 87 <b>Fr</b> [223]	radium 88 <b>Ra</b> [226]	89-102 * *	lawrencium 103 <b>Lr</b> [262]	rutherfordium 104 <b>Rf</b> [261]	dubnium 105 <b>Db</b> [262]	seaborgium 106 <b>Sg</b> [266]	bohrium 107 <b>Bh</b> [264]	hassium 108 <b>Hs</b> [269]	meitnerium 109 <b>Mt</b> [268]	ununillium 110 <b>Uun</b> [271]	unununium 111 <b>Uuu</b> [272]	ununbium 112 <b>Uub</b> [277]	ununquadium 114 <b>Uuq</b> [289]										

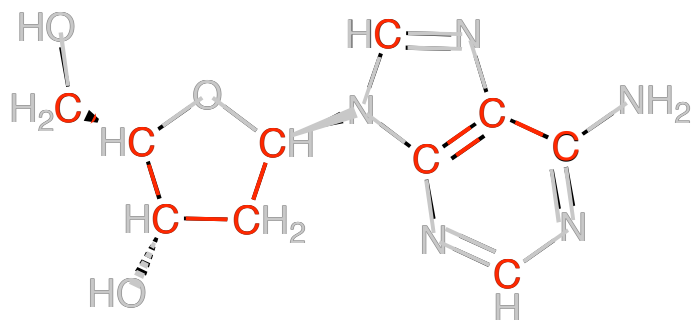
\* Lanthanide series

lanthanum 57 <b>La</b> 138.91	cerium 58 <b>Ce</b> 140.12	praseodymium 59 <b>Pr</b> 140.91	neodymium 60 <b>Nd</b> 144.24	promethium 61 <b>Pm</b> [145]	samarium 62 <b>Sm</b> 150.36	europium 63 <b>Eu</b> 151.96	gadolinium 64 <b>Gd</b> 157.25	terbium 65 <b>Tb</b> 158.93	dysprosium 66 <b>Dy</b> 162.50	holmium 67 <b>Ho</b> 164.93	erbium 68 <b>Er</b> 167.26	thulium 69 <b>Tm</b> 168.93	ytterbium 70 <b>Yb</b> 173.04
actinium 89 <b>Ac</b> [227]	thorium 90 <b>Th</b> 232.04	protactinium 91 <b>Pa</b> 231.04	uranium 92 <b>U</b> 238.03	neptunium 93 <b>Np</b> [237]	plutonium 94 <b>Pu</b> [244]	americium 95 <b>Am</b> [243]	curium 96 <b>Cm</b> [247]	berkelium 97 <b>Bk</b> [247]	californium 98 <b>Cf</b> [251]	einsteinium 99 <b>Es</b> [252]	fermium 100 <b>Fm</b> [257]	mendelevium 101 <b>Md</b> [258]	nobelium 102 <b>No</b> [259]

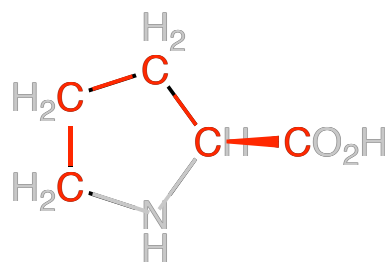
\* \* Actinide series

# Introduction to Organic Chemistry

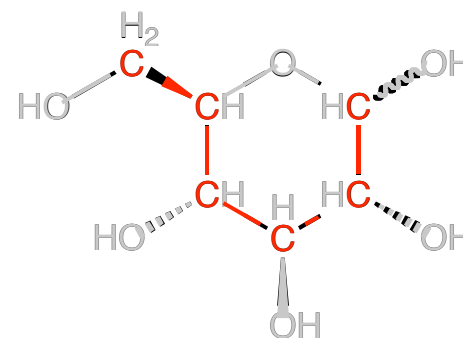
- Organic Chemistry is the study of carbon-containing compounds.
- The overwhelming majority of the building blocks of life are made up of carbon containing compounds.



Adenine (Nucleic Acid)



Proline (Amino Acid)

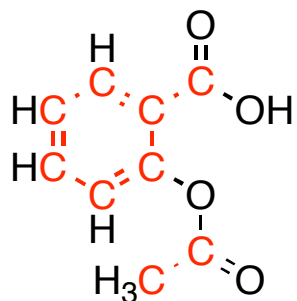


Glucose (Sugar)

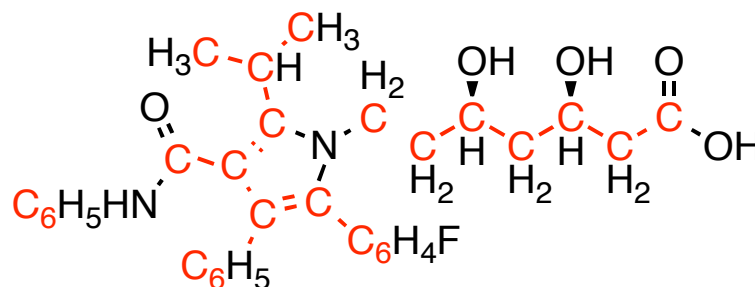


# Introduction to Organic Chemistry

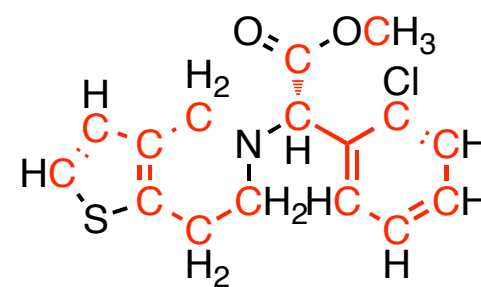
- Organic Chemistry is the study of carbon-containing compounds.
- The overwhelming majority of the building blocks of life are made up of carbon containing compounds.
- As are the vast majority of therapeutics



acetylsalicylic acid (Asprin)



atorvastatin (Lipitor)

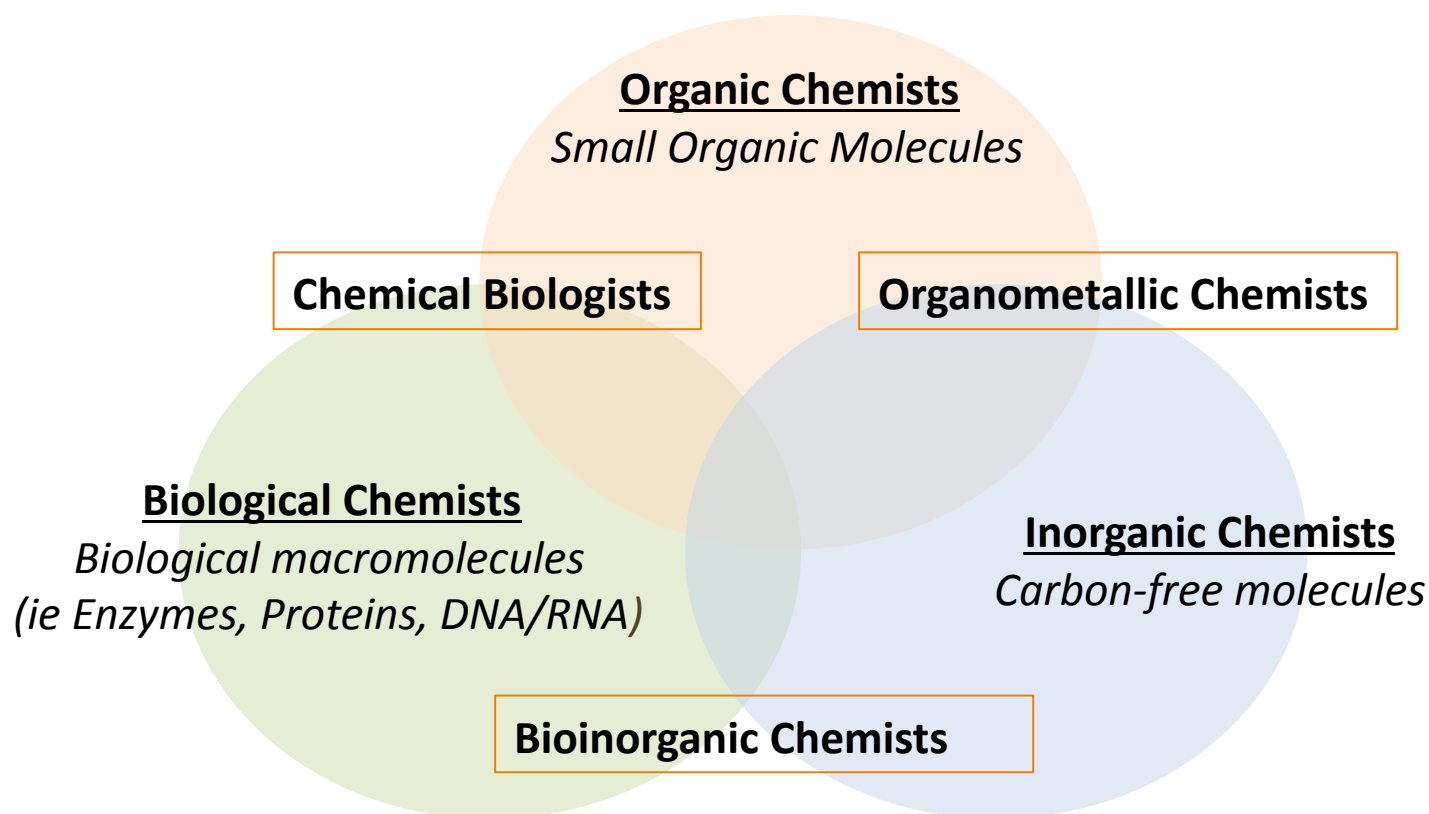


clopidogrel (Plavix)

# What is an Organic Chemist?

- Organic chemists are able to talk and think at the molecular level
- Organic Chemists have a good understanding of the reactivity of different organic molecules and predict stability of them in different environments
- Organic chemists are able to use several different “spectroscopic techniques” to solve molecular structures or learn different things about their properties.
- Many organic chemists (often called synthetic organic chemists) are able to create new molecules in the lab from simpler cheaper building blocks for various purposes

# Many other fields of chemistry have similar skill sets that are first learned in Organic Chemistry I

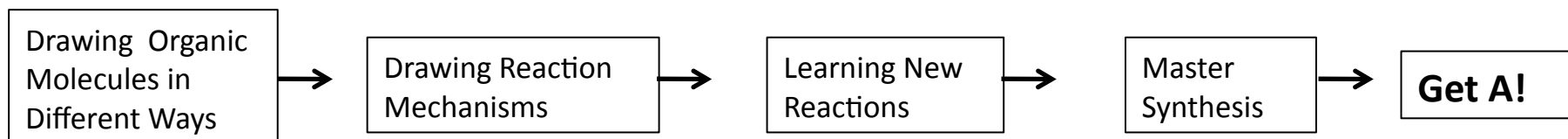


# Some Examples of Jobs for People with Strong Organic Chemistry Backgrounds

- **Medicinal Chemists**
  - Design and synthesize molecules for therapeutic applications
- **Process Chemist**
  - Come up with methods to make syntheses more efficient
- **Material Scientist**
  - Design molecules, often polymers, with favorable material properties
- **Patent Lawyers**
  - Work to protect intellectual property, often in pharmaceutical industry
- **Environmental Chemists**
  - Monitor and analyze effects of natural and manmade organic materials in the environment

# Why do students struggle?

- Many New, Necessary Skills
  - Drawing molecules “the organic chemistry way”
  - Perceiving 3-dimensional structures in 2-dimensions
  - Drawing and thinking about reactions with arrows
  - New language with new words and phrases



- Students trip up along the way and...



# Things you should already know

- **Electronegativity**
  - When there is a bond between two atoms, which atom will pull on the electrons more?
- **Valence Electrons**
  - When an element has a certain electron count, what is its charge?
  - Why does O, N, C want to have 8 total electrons, but H only 2?
- **Molecular Orbitals**
  - What do s and p orbitals look like?
  - What are bonding and antibonding orbitals?
  - What are sigma bonds and pi bonds?
- **Lewis Structures**
  - Can you draw a molecule in Lewis structure format appropriately?

If you can not answer these questions easily,  
you need to review IMMEDIATELY