
Results

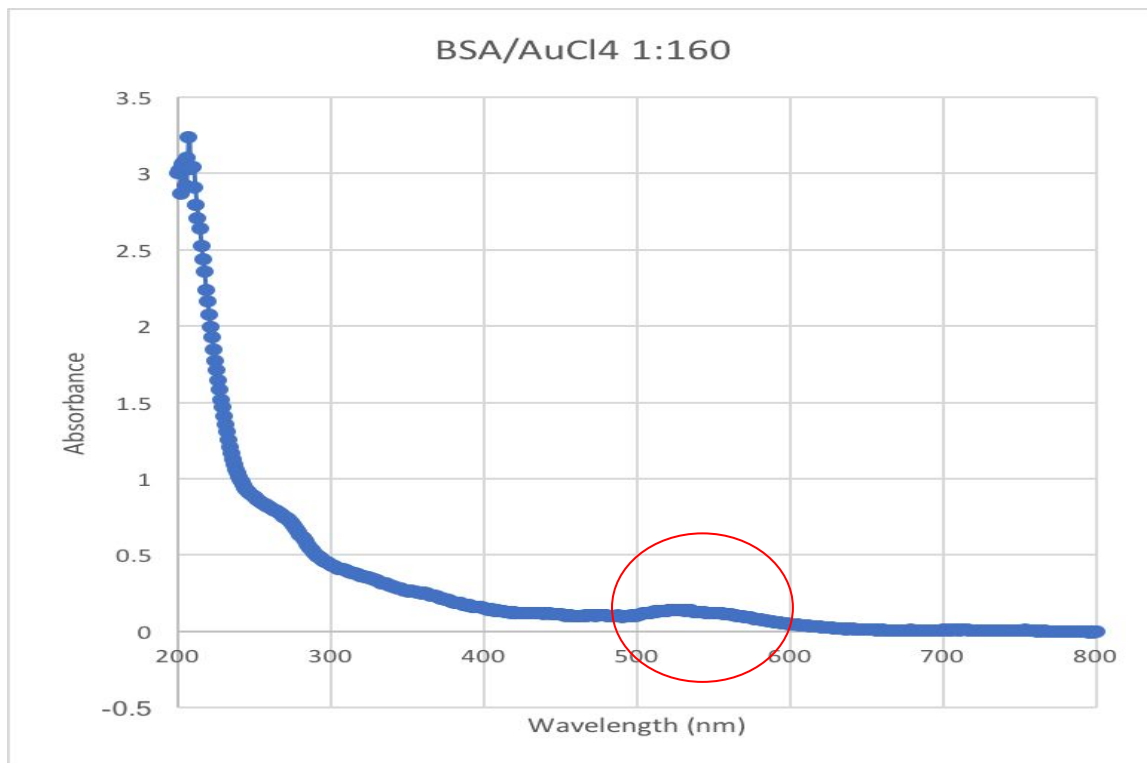
— By: Casey, Pauline, & Sanuja —

BSA and HAuCl₄ 1:80 and 1:160 Stock Solutions



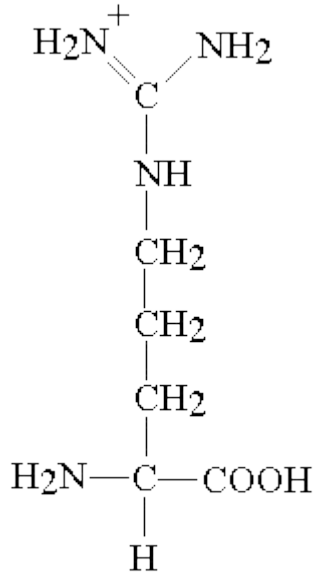
- Nanoparticles appeared in both 1:80 and 1:160 stock solutions.
- Theoretically, fibers are supposed to appear at the 1:160 solution.
- Since the 1:160 solution did not produce fibers, there was a miscalculation. Thus, ratio for the 1:160 solution is incorrect.

UV/Vis of BSA: H_{AuCl} 1:160 Stock Solution



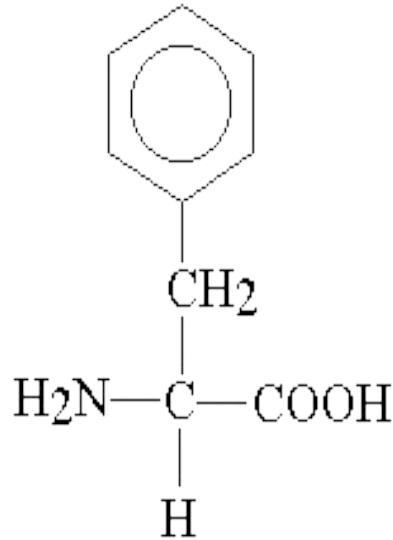
Central Question: Which amino acid in the BSA is causing the reduction of the gold?

Amino Acids Tested



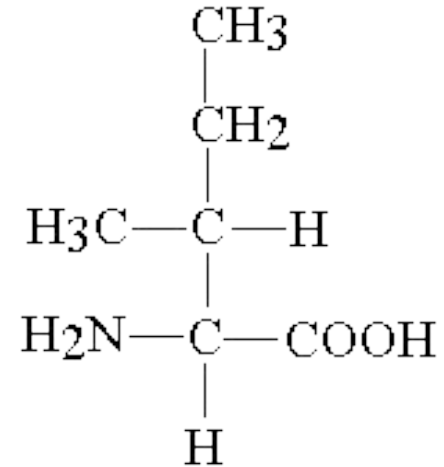
arginine

http://groups.molbiosci.northwestern.edu/holmgren/Glossary/Images/pics/amino_acids/Arginine.gif



phenylalanine

http://groups.molbiosci.northwestern.edu/holmgren/Glossary/Images/pics/amino_acids/Phenylalanine.gif



isoleucine

http://groups.molbiosci.northwestern.edu/holmgren/Glossary/Images/pics/amino_acids/Isoleucine.gif

AuNP and Amino Acid Solutions

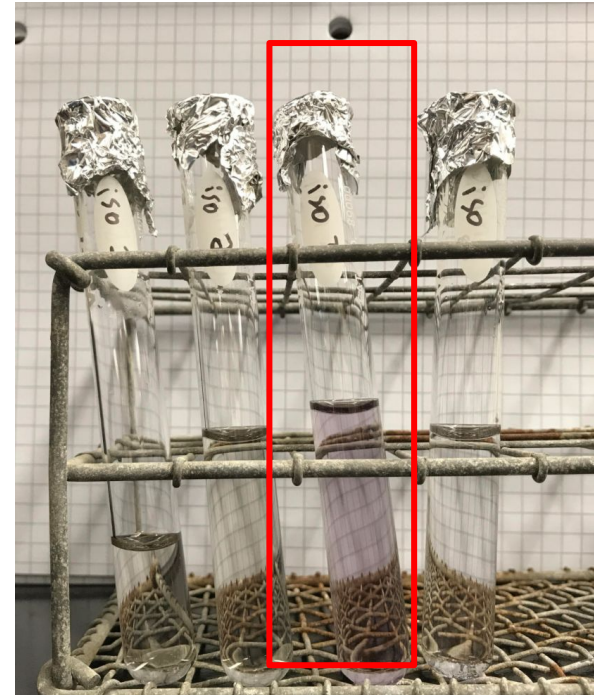
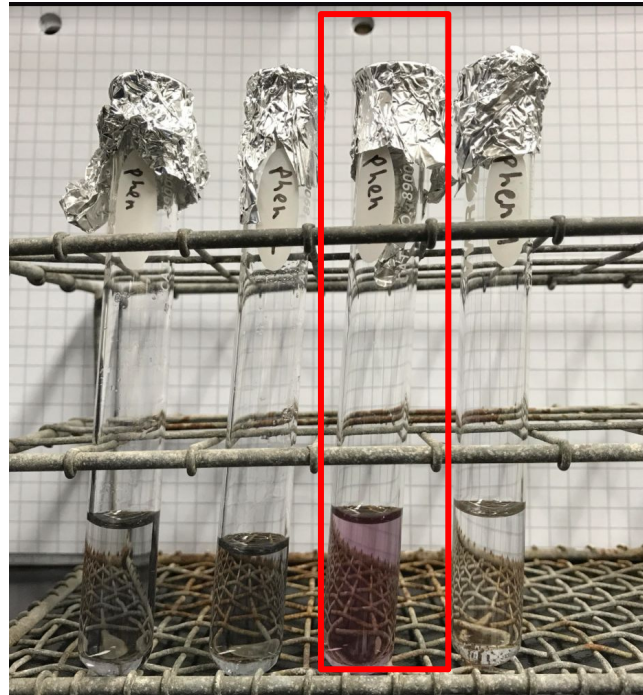
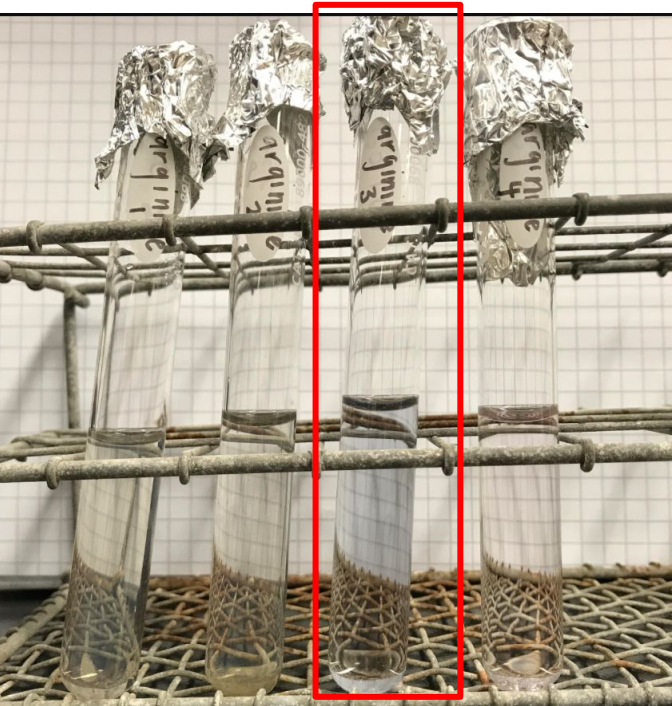
Test Tube Number	HAuCl ₄ (mL)	Amino Acid (mL)	NaOH (mL)	DI Water (mL)	Theoretical pH
1	1	1	0.5	7.5	7
2	1	1	1	7	10.4
3	1	1	0.1	7.9	12
4	1	1	1	7	14

Our prepared 5mM NaOH stock solution.

1M NaOH stock solution.

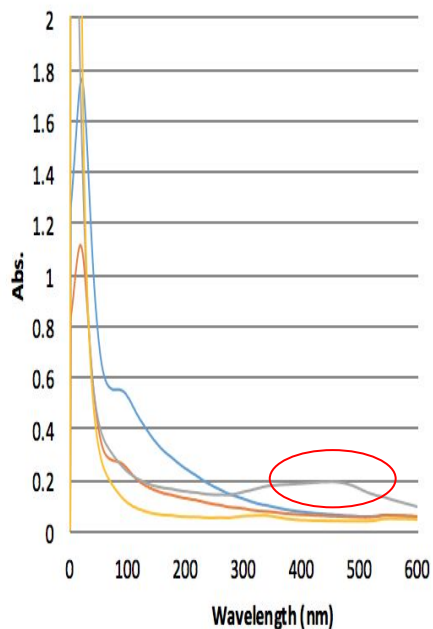
AuNP and Amino Acid Solutions

- We tested Arginine, Phenylalanine, and Isoleucine to see which would form gold nanoparticles.

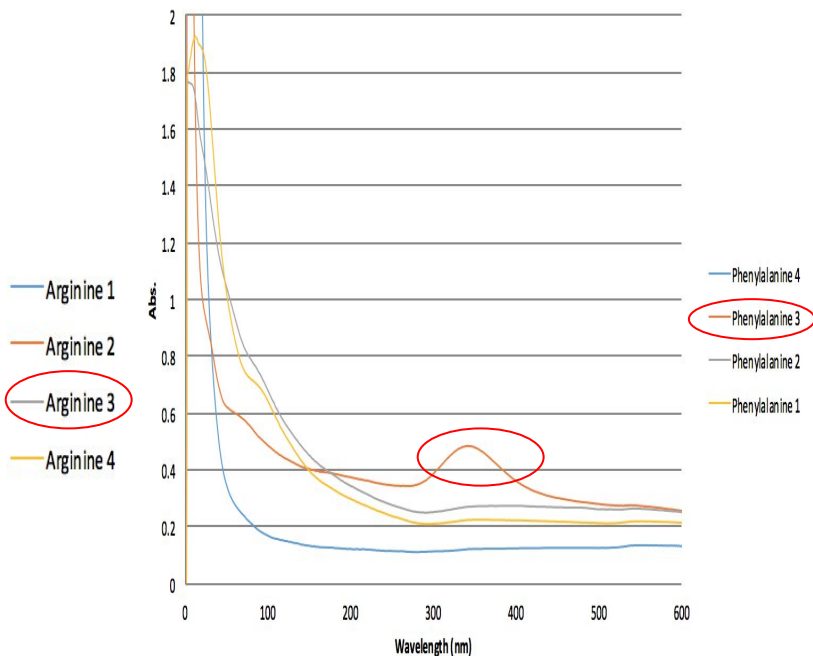


UV/ Vis of AuNP and Amino Acid Solutions

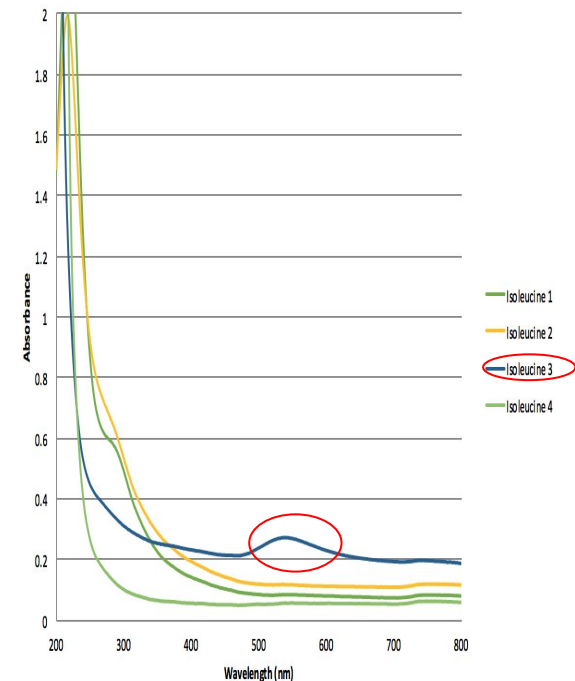
Arginine UV/Vis



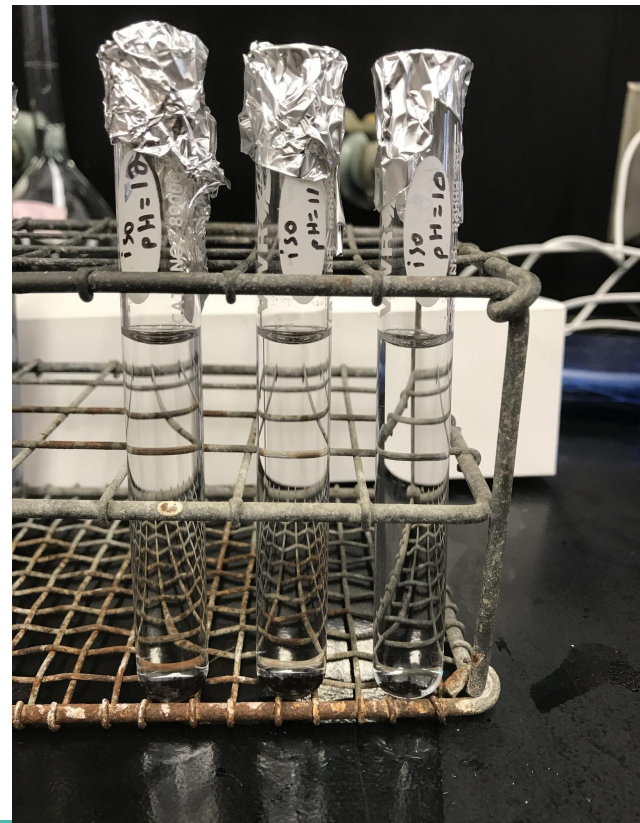
Phenylalanine UV/Vis



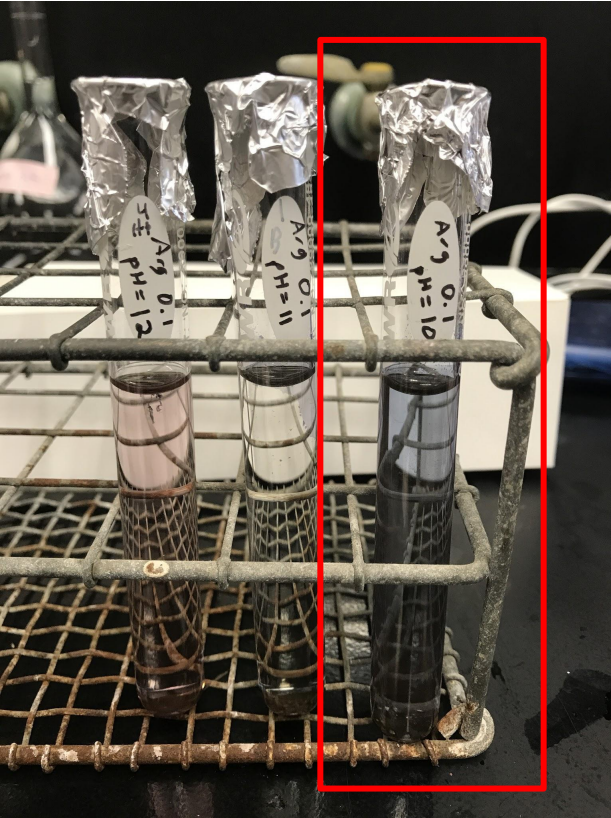
Isoleucine UV/Vis



AuNPs and Amino Acids at pH=10, pH=11, pH=12

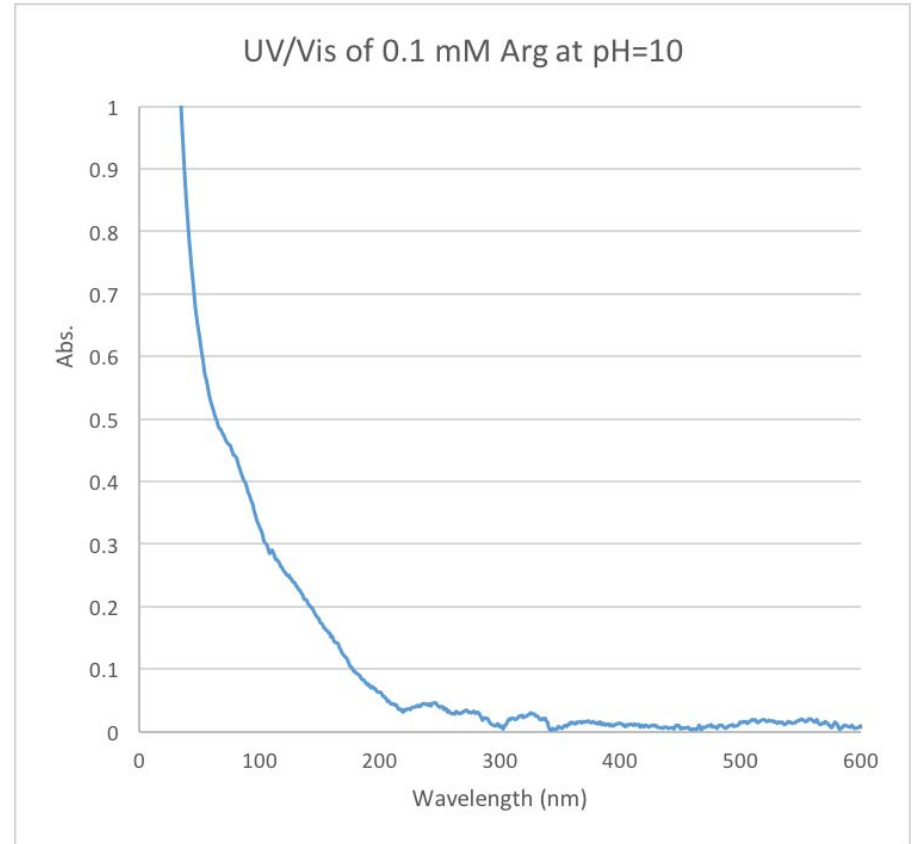


AuNPs and Arg at Different Arg Concentrations



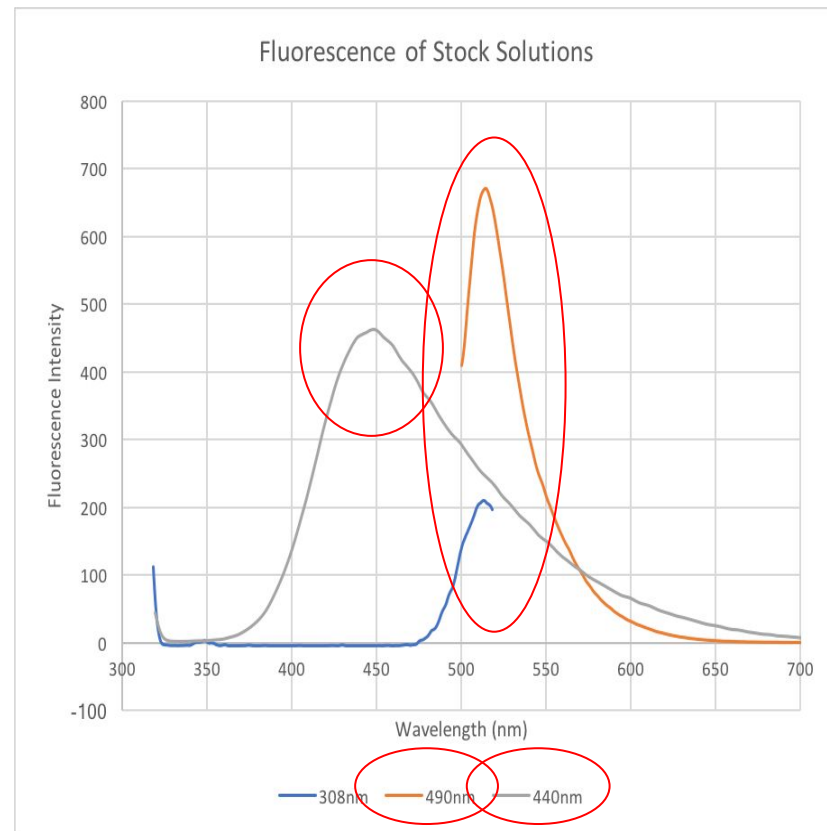
UV/Vis of AuNPs and 0.1mM Arg with pH=10

- AuNPs formed with different Arg concentrations and different pHs (10, 11, 12)
- UV/Vis was never performed at the time; Arg solutions all precipitated except for this one -->
- Even it's dark grey there is no peak in the graph
- Nothing was reduced in this sample

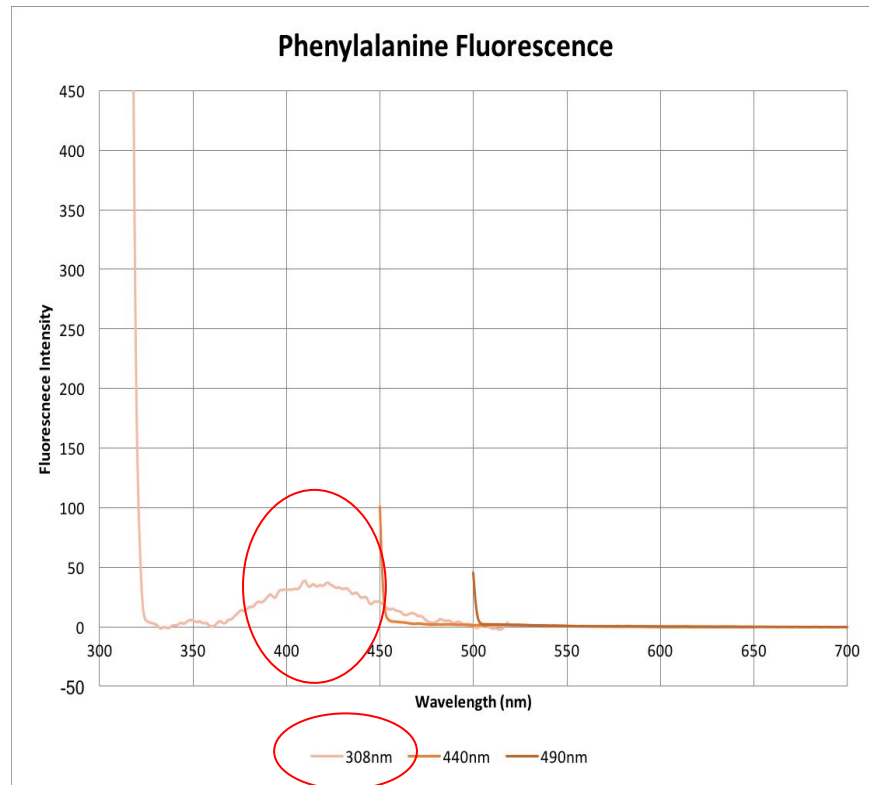
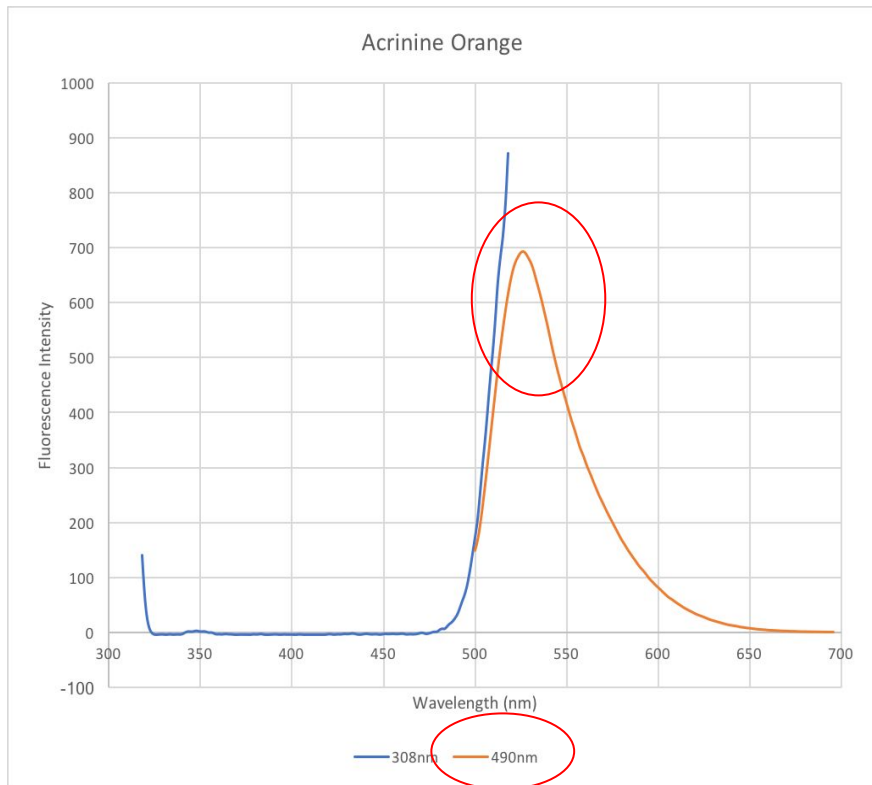


Fluorescence Analysis of AuNPs Fibers

- Measured Fluorescence for the same samples under different wavelength
- Obtained this →



Fluorescence Analysis of AuNPs Colloid



ICP-OES Concentration Analysis of AuNPs

- [Au] → Axial at 267.594nm

Solution Label	Expected Concentration (μM)	Actual Concentration (μM)
10mM HAuCl_4 Stock Solution	500	~ 401
2.5mM HAuCl_4 Stock Solution	500	~ 346
AuNP Colloid	250	~ 118
AuNP Fiber	---	---

NMR Analysis of AuNPs

