

**1. Prepare Stock Solutions**

$$\begin{aligned}
 -2.5\text{mM HAuCl}_4 &= 2.5 \cdot 10^{-3} \text{ M} \\
 (339.79\text{g/mol}) \cdot (2.5 \cdot 10^{-3} \text{ mol/L}) &= 0.89475\text{g/L} \\
 (0.89475\text{g/L}) \cdot (0.05\text{L}) &= \mathbf{0.0424\text{g HAuCl}_4 \text{ in } 50\text{mL H}_2\text{O}}
 \end{aligned}$$

$$\begin{aligned}
 -250\mu\text{M BSA} &= 2.5 \cdot 10^{-4} \text{ M} \\
 (65,000\text{g/mol}) \cdot (2.5 \cdot 10^{-4} \text{ mol/L}) \cdot (0.05\text{L}) &= \mathbf{0.8125\text{g BSA in } 50\text{mL H}_2\text{O}}
 \end{aligned}$$

**2. Prepare AuNPs for the below Au:BSA Molar Ratios**

$$\begin{aligned}
 -80:1 \\
 [(1\text{mL Au}) / (80)] \cdot 10 &= \mathbf{0.125\text{mL BSA in } 8.875\text{mL H}_2\text{O}}
 \end{aligned}$$

$$\begin{aligned}
 -160:1 \\
 [(1\text{mL Au}) / (160)] \cdot 10 &= \mathbf{0.0625\text{mL BSA in } 8.9375\text{mL H}_2\text{O}}
 \end{aligned}$$

**3. Practice Measurements**-Precision & Accuracy of Pipettes

pipette	water mass	calculated volume	theoret volu	% error				
P-200	0.20133	0.202041185	0.2	1.021				
	0.4345	0.436034843	0.4	9.009			glass mass	13.143
	0.603335	0.605466241	0.6	0.911040195			density@ 27.8	0.99648
	0.80627	0.809118096	0.8	1.14				
	1.01	1.013	1	1.339				
	1.214	1.218	1.2	1.487				

-Preparing Solutions

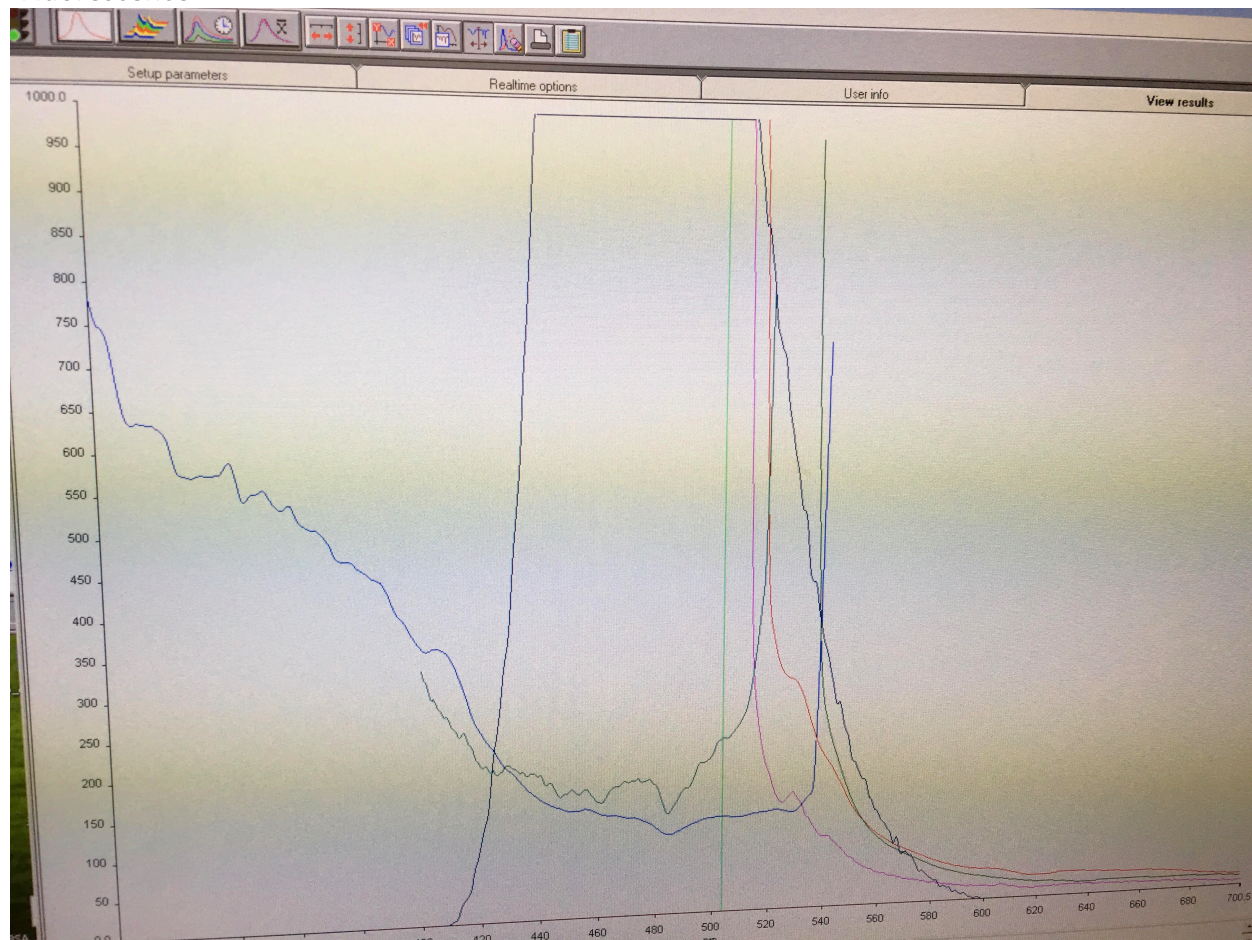
$$\begin{aligned}
 -100\text{mL of } 1.71\text{mM NaCl} &\text{ from solid} \\
 (1.71 \cdot 10^{-3} \text{ M NaCl}) \cdot (0.1\text{L}) &= 1.71 \cdot 10^{-4} \text{ mol NaCl} \\
 (1.71 \cdot 10^{-4} \text{ mol NaCl}) \cdot (58.44\text{g/mol NaCl}) &= \mathbf{0.00999\text{g NaCl in } 100\text{mL H}_2\text{O}}
 \end{aligned}$$

-25mL of 13.5 $\mu$ M dye from stock

$$[(0.025L) \cdot (13.5 \cdot 10^{-6}M)] / (161 \cdot 10^{-3}M) = 0.002096 \text{ dye} = 2.09 \mu\text{L dye in 25mL H}_2\text{O}$$

### -Reagent Purities

### -Fluorescence





-UV Vis

