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Silver and Gold: No, not the Jewelry, Nanoclusters!

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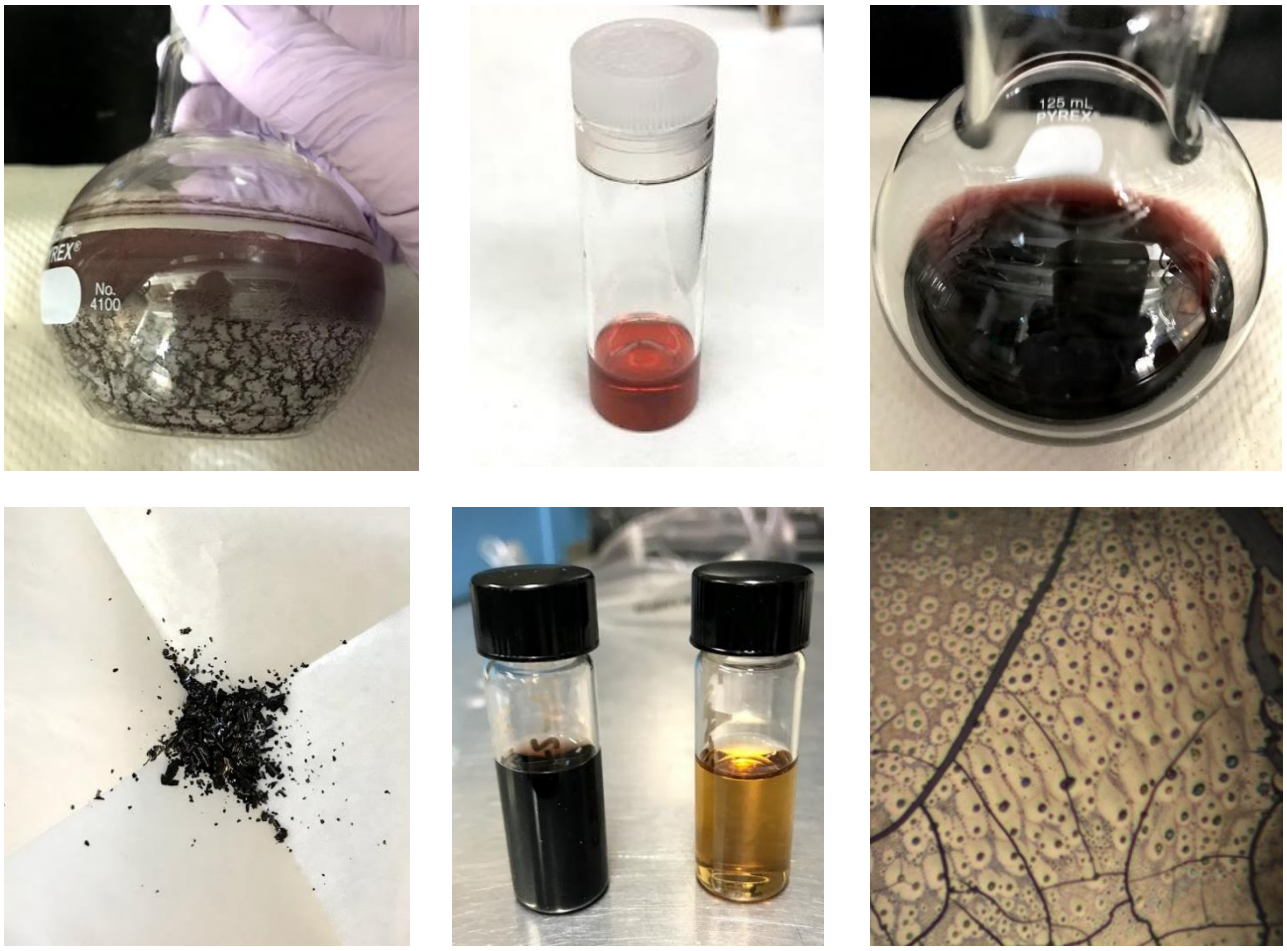
Colourful, nano-sized materials may not be what you associate with the words, “silver and gold”, but are something you see everyday in our lab. Why? I study silver and gold nanoclusters: atomically-precise nanometer arrangements (< 2 nm, whereas I’m about 1 billion nm tall) of these metals protected by organic molecules. Individually, organic molecules, like ibuprofen, and bulk metals, like those in your computer, each have important applications. Combining them to create nanoclusters yields unique properties with new applications, including medical imaging, chemical sensing, and catalysis. Studying nanoclusters also enables the discovery of structure-function relationships, which can inspire new materials. Searching for novel structure-function relationships, I incorporate azide(N_3)-functionalized organic molecules into nanoclusters. Azides undergo click chemistry, a means of easily linking different molecules together. Utilizing azides, I click new molecules on clusters to tune their properties. Who knows? Someday, maybe nanoclusters will be what you associate with “silver and gold”.



Top: Silver Nanoclusters, Bottom: Gold Nanoclusters