We have developed a library of sulfur and selenium precursors to synthesize highly fluorescent cadmium chalcogenide core/shell nanocrystals in a single step. This expands upon recent thio- and selenourea precursor development in the Owen Lab, which for the first time controlled nanocrystal size via chemical control over precursor conversion rates instead of halting a reaction early.

In this work, we combine two precursors with well-defined conversion kinetics yielding highly reproducible core/shell or alloyed nanocrystal products. Additionally, we have extended the utility of this method towards the synthesis of 2D nanoplatelets and more complex 3D CdS/CdSe/CdS spherical quantum well structures for solid state lighting applications.