# Investigation of *N*-Heterocyclic Carbenes as Ligands for Stabilizing Gold Nanoclusters

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Almost all nanomaterials are prepared as mixtures and characterized by average bulk size, rather than a molecular formula. This is inherently problematic, since their properties are directly related to their size and molecular structure, leaving a true understanding of structure–property relationships nearly impossible. Ligand protected metal nanoclusters are an interesting exception to this. They are atomically precise ultra-small nanoparticles, with diameters less than 3 nm or the equivalent of 3-300 metal atoms. Despite many recent advances in this field, the stability of these materials remains a significant limitation. Fortunately, the stability of these materials can be controlled through the judicious choice of the ligands that protect the surface of the metal core. This seminar will describe the application of various *N*-heterocyclic carbenes ligands, to stabilize gold nanoclusters and discuss their resulting properties.