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Research Summary:

- Synthesis of magnetic, semiconducting, and metal oxide nanoparticles with controllable size and shape.
- Design and synthesis of multicomponent nanoparticles such as core-shell and dumb-bell structures.
- Preparation of multifunctional materials through nanoparticle self-assembly and analysis of the collective properties of such materials.

Selected Recent Publications:

E. V. Shevchenko; M. Ringler; A. Schwemer; D. V. Talapin; T. A. Klar; A. L. Rogach; J. Feldmann; A. P. Alivisatos. "Self-Assembled Binary Superlattices of CdSe and Au Nanocrystals and Their Fluorescence Properties," *J. Am. Chem. Soc.* **2008**, *130*, 3274.

E. V. Shevchenko; M. I. Bodnarchuk; M. V. Kovalenko; D. V. Talapin; R. K. Smith; S. Aloni; W. Heiss; A. P. Alivisatos. "Gold(Core)-Iron Oxide(Hollow Shell) Nanoparticles," *Adv. Mater.* **2008**, *20*, 4323.

E. V. Shevchenko; J. B. Kortright; D. V. Talapin; S. Aloni; A. P. Alivisatos. "Quasi-Ternary Nanoparticle Superlattices Through Nanoparticle Design," *Adv. Mater.* **2007**, *19*, 4183.

E. V. Shevchenko; D. V. Talapin; C. B. Murray; S. O'Brien. "Structural Characterization of Self-Assembled Multifunctional Binary Nanoparticle Superlattices," *J. Am. Chem. Soc.* **2006**, *128*, 3620.

E. V. Shevchenko; D. V. Talapin; N. A. Kotov; S. O'Brien, C. B. Murray. "Structural Diversity in Binary Nanoparticle Superlattices," *Nature* **2006**, *439*, 55.