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Research Summary:

- Synthesis and characterization of nanoscale inorganic materials and bioinorganic hybrids and assembly in organized structures.
- Study of semiconductor assisted photocatalysis, solar fuel production and solar energy conversion, and light induced charge transfer across bioinorganic surfaces.
- Expertise in *in situ* electron paramagnetic resonance (EPR) spectroscopic characterization of charge separation and transfer processes in inorganic and bioinorganic materials.

Selected Recent Publications:

E. A. Rozhkova; I. Ulasov; B. Lai; **N. M. Dimitrijevic**; M. Lesniak; T. Rajh. "A High Performance Nano-Bio Photocatalyst for Targeted Brain Cancer Therapy," *Nano Lett.* **2009**, 9, 3337.

S. Tepavcevic; S. B. Darling; **N. M. Dimitrijevic**; T. Rajh; S. J. Sibener. "Improved Hybrid Solar Cells via *in situ* UV Polymerization," *Small* **2009**, 5, 1776.

N. M. Dimitrijevic; E. A. Rozhkova; T. Rajh "Dynamics of Localized Charges in Dopamine-Modified TiO₂ and their Effect on the Formation of Reactive Oxygen Species," *J. Am. Chem. Soc.* **2009**, 131, 2893.

L. Chen; M. E. Graham; G. Li; D. R. Genter; **N. M. Dimitrijevic**; K. A. Gray. "Photoreduction of CO₂ by TiO₂ Nanocomposites Synthesized Through Reactive Direct Current Magnetron Sputter Deposition," *Thin Solid Films* **2009**, 517, 5641.

G. Li; **N. M. Dimitrijevic**; L. Chen; J. M. Nichols; T. Rajh; K. M. Gray. "The Important Role of Tetrahedral Ti⁴⁺ Sites in the Phase Transformation and Photocatalytic Activity of TiO₂ Nanocomposites," *J. Am. Chem. Soc.* **2008**, 130, 5402.

G. Li; S. Ciston; Z. V. Saponjic; L. Chen; **N. M. Dimitrijevic**; T. Rajh; K. A. Gray. “Synthesizing Mixed-Phase TiO₂ Nanocomposites Using a Hydrothermal Method for Photooxidation and Photoreduction Applications,” *J. Catal.* **2008**, 253, 105.

N. M. Dimitrijevic; Z. V. Saponjic; B. M. Rabatic; O. G. Poluektov; T. Rajh. “Effect of Size and Shape of Nanocrystalline TiO₂ on Photogenerated Charges. An EPR Study,” *J. Phys. Chem. C* **2007**, 111, 14597.

S. J. Clarke; C. A. Hollmann; Z. Zhang; D. Suffern; S. E. Bradforth; **N. M. Dimitrijevic**; W. G. Minarik; J. L. Nadeau.“Photophysics of Dopamine-Modified Quantum Dots and Effects on Biological Systems,” *Nature Mater.* **2006**, 5, 409.