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Single- and Two-photon Pumped Defect-Mode Lasing in Dye-doped One-Dimensional Photonic Crystal JONGSEUNG YOON, WON-MOK LEE, Department of Materials Science and Engineering, Massachusetts Institute of Technology, STEVEN KOOI, Institute for Soldier Nanotechnologies, Massachusetts Institute of Technology, JEAN-MICHEL CARUGE, MOUNGI BAWENDI, ROBERT FIELD, Department of Chemistry, Massachusetts Institute of Technology, PRZEMYSLAW MARKOWICZ, PARAS PRASAD, Institute for Lasers, Photonics and Biophotonics, Department of Chemistry and Physics, University of Buffalo, State University of New York at Buffalo, EDWIN THOMAS, Department of Materials Science and Engineering, Institute for Soldier Nanotechnologies, Massachusetts Institute of Technology — We have developed a novel dye-doped organic/inorganic hybrid one-dimensional photonic crystal system for single- and two-photon pumped defect- mode lasing. The multilayer laser structure consists of alternating layers of titania nanoparticles and polymethylmethacrylate with an active emission layer of organic dyes. Single-mode lasing actions under one- and two-photon excitation have been observed at a defect-mode wavelength. Effective gain enhancement and low threshold one-and two photon pumped lasing of the photonic bandgap structure will be discussed.

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