Abstract Submitted
for the DFD12 Meeting of
The American Physical Society

Enhanced two photon fluorescence microfluidic sensor based on dual cladding photonic-crystal fiber[1] LYUBOV AMITONOVA, ILYA FEDOTOV, Department of Neuroscience, Kurchatov Institute National Research Center, ANDREY FEDOTOV, ALEKSEI ZHELTIKOV, Physics Department, International Laser Center, M. V. Lomonosov Moscow State University — The architecture of photonic-crystal fibers (PCFs) suggests a variety of strategies for optical sensing. A combination of TPA approaches with capabilities of fiber-optic probes offers numerous advantages, suggesting a convenient format for beam delivery, facilitating manipulation of excitation radiation, and allowing this excitation to be applied locally and selectively. In this work, we show that a PCF with a special design can realize different protocols of optical sensing, simultaneously serving, whenever necessary, for the collection and on-line monitoring of liquid-phase samples. Specially designed PCF is shown to substantially increase the guided-wave luminescent response from molecules excited through two-photon absorption (TPA) by femtosecond near-infrared laser pulses. Biophotonic implications of this waveguide TPL-response enhancement include fiber-format solutions for online monitoring of drug delivery and drug activation, interrogation of neural activity, biosensing, endoscopy, and locally controlled singlet oxygen generation in photodynamic therapy.

[1]This work was supported by the Russian Foundation for Basic Research, project 11-04-12185-ofi-m.

Lyubov Amitonova
Dept of Neuroscience, Kurchatov Institute National Research Center

Date submitted: 01 Aug 2012 Electronic form version 1.4