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**Two-color spectroscopy of UV excited ssDNA complex with a single-wall nanotube (SWNT) probe: Fast nucleobase autoionization mechanism**[1] SLAVA V ROTKIN, Lehigh University, TETYANA IGNATOVA, UC Irvine, ALEXANDER BALAEFF, University of Central Florida, MING ZHENG, National Institute of Standards and Technology, MICHAEL BLADES, Lehigh University, PETER STOECKL, University of Rochester — DNA autoionization is a fundamental process wherein UV-photoexcited nucleobases dissipate energy to the environment without undergoing chemical damage. SWNT is shown to serve as a photoluminescent reporter for studying the mechanism and rates of DNA autoionization. Two-color photoluminescence (PL) spectroscopy revealed a strong SWNT PL quenching when the UV pump is resonant with the DNA absorption [Nano Research, 2015]. Semiempirical calculations of the DNA-SWNT electronic structure, combined with a Green's function theory for charge transfer, show a 20 fs autoionization rate, dominated by the hole transfer. Rate-equation analysis of the spectroscopy data confirms that the quenching rate is limited by the thermalization of the free charge carriers transferred to the nanotube reservoir. The developed approach has a great potential for monitoring DNA excitation, autoionization, and chemical damage both *in vivo* and *in vitro*.

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