



## **UALR Team Fast Forwards Seed Germination with Nanotubes, Becomes Published**

Dr. Mariya V. Khodakovskaya, P3 researcher, UALR assistant professor of applied science, and Dr. Alex Biris, director of the Nanotechnology Center at UALR, have demonstrated how seeds exposed to carbon nanotubes in the agar medium sprouted up to two times faster than control seed, signifying a growth enhancement having significant potential on agriculture as well as plant-based biofuel production. The results of the UALR interdisciplinary experiments have demonstrated, apparently for the first time, that carbon nanotubes can penetrate the thick seed coat and speed up water uptake inside seeds. “The activated process of water uptake could be responsible for the significantly faster germination rates and higher biomass production for the plants that were exposed to carbon nanotubes,” Khodakovskaya and Biris said. The research team placed sterile tomato seeds on standard agar medium supplemented with different concentrations of carbon nanotubes in order to test their theory that synthesized carbon nanotubes could affect germination and development of crop seedlings. The tomato seeds placed on the medium with various concentrations of carbon nanotubes (CNTs) germinated on the third day, while the tomato seeds placed on regular mediums had not germinated by that time. The germination percentage rates during the next days were dramatically higher for seeds that were treated with nanoparticles. The germination percentage for seeds that were placed on regular medium averaged 32 percent in 12 days and 71 percent in 20 days, while germination percentage of the seeds placed on medium supplemented with CNTs averaged 74 to 82 percent in 12 days and 90 percent in 20 days. Executives of a Midwest manufacturer of innovative non-pesticide products for landscapes, horticulture and agriculture is making plans to meet with Khodakovskaya and Biris to talk about possible collaboration to further develop and commercialize the discovery. Khodakovskaya’s and Biris’ results have been published in *The Economist* and *ACS Nano*.