



Catch me if you can— Predator-prey interactions between carnivorous fungi and *C. elegans*

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The carnivorous mushroom *Pleurotus ostreatus* utilizes unknown toxin to rapidly paralyze and kill nematode prey upon contact. Here, we discover small lollypop-shaped structures (toxocysts) on fungal hyphae are required to elicit nematicide, and a volatile ketone, 3-octanone, was detected in these fragile toxocysts. Treatment of *Caenorhabditis elegans* with 3-octanone recapitulated rapid paralysis, calcium influx and neuronal cell death arising from fungal contact. Moreover, 3-octanone disrupted cell membrane integrity, resulting in extracellular calcium influx into cytosol and mitochondria, inducing cell death propagation throughout the entire organism. Finally, we demonstrate that structurally related compounds are also biotoxic to *C. elegans*, with the length of the ketone carbon chain being crucial. Our work reveals that the oyster mushroom has evolved a specialized structure to contain a volatile ketone to disrupt the cell membrane integrity, leading to rapid cell and organismal death in nematodes.



Host: Dr. Aaron Reinke

Date: Monday, January 16th, 2023

Time: 3:00 PM

Place: Mechanical Engineering Bldg Room 252