

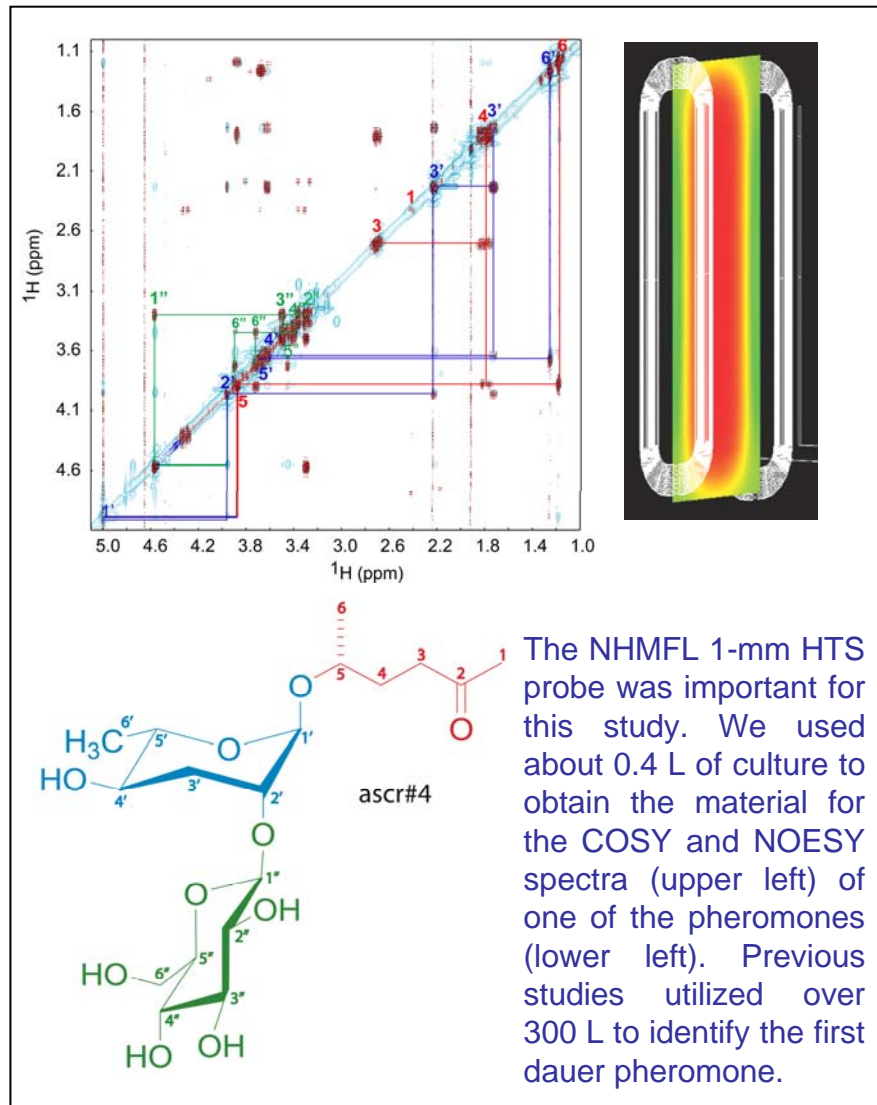
# Mating and Dauer Pheromones from *Caenorhabditis elegans*

## National High Magnetic Field Laboratory

Advanced Magnetic Resonance Imaging & Spectroscopy User Facility, University of Florida

*C. elegans* is a free-living soil-dwelling nematode that develops through four larval stages to 1-mm long adults in about 3.5 days. If food is scarce, *C. elegans* enters a developmentally arrested stage called dauer that allows animals to survive for extended periods with no food. Male *C. elegans* are chemically attracted to hermaphrodites, and we used NMR, mass spectrometry, and activity-guided fractionation to show that a group of molecules called ascarosides control both mating and dauer. At low concentrations, a synergistic mix cause male attraction and at higher concentrations, the same molecules induce dauer formation.

Srinivasan, J., Kaplan, F., Ajredini, R., Zachariah, C., Alborn, H. T., Teal, P. E. A., Malik, R. U., Edison, A. S., Sternberg, P. W., & Schroeder, F. C. *Nature*, In Press (2008).



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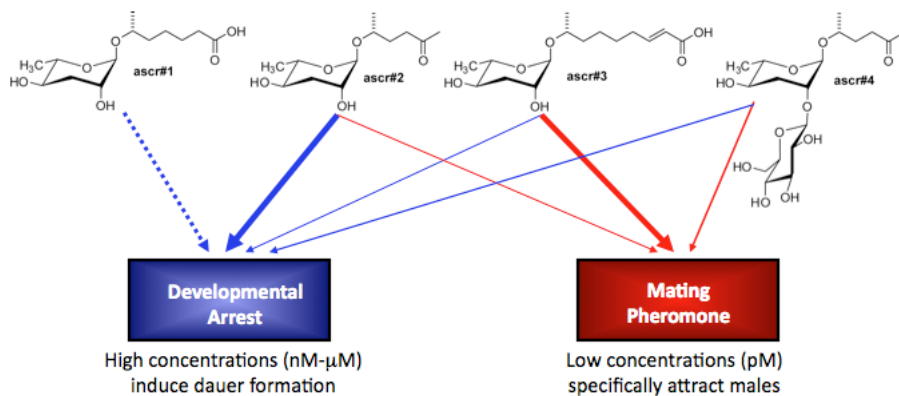
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### Pair of *C. elegans*

Male is shown with tail further to the right, with triangle shape at tip of tail.



*C. elegans* is one of the best-studied model organisms. Important discoveries using this small worm in genetics, neurobiology, and developmental biology have resulted in two recent Nobel Prizes in medicine. About 4 out of 5 individual animals on earth is a nematode, and almost all plants and animals are parasitized by at least one nematode species. Ironically, almost nothing is known about the chemical ecology of nematodes.



The same molecules mediate both mating and dauer formation in *C. elegans*.

Our study is the first to connect two major and fundamental nematode behaviors, mating and dauer formation. By understanding more about the chemical control of nematode behavior, we can discover more about animal behavior and learn new ways to control parasites.