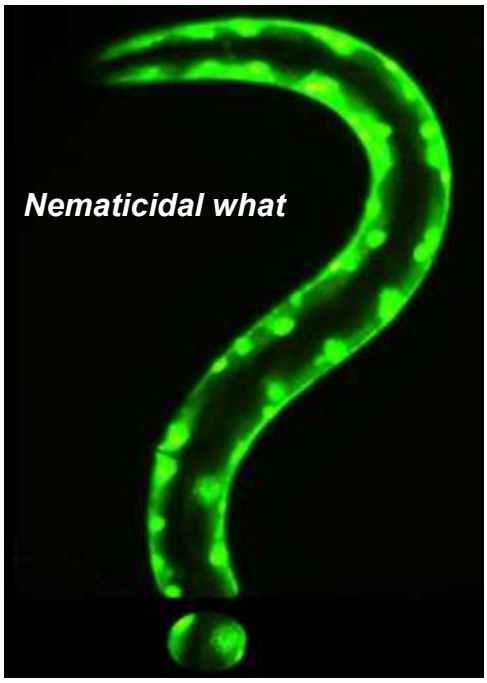
California State University, Fresno, Department of Biology presents

# "New strategies to control plant parasitic nematodes: the use of programmed cell death gene products and organic chalcones"

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**Friday, March 3, 2017**
3:00 – 4:00 PM
Science 2, room 109
For further information: www.csufresno.edu/biology

Plant Parasitic Nematodes are a major pest in agriculture causing big monetary losses, not only in the USA but also worldwide. A commonly used nematicidal agent, methyl bromide, has been banned because of its toxic effects on humans and the environment. In order to find safe and effective alternative nematicides, my laboratory focuses on the use of animal programmed cell death gene products and also identifying small organic molecules that can be effective nematicides.

Work from our laboratory demonstrated the effectiveness of the programmed cell death protein CED-4 in controlling the model free-living nematode *C. elegans*. By analyzing how CED-4 interacts with other proteins, as well as using protein structural basis, a set of potential peptides representative of the interaction domains were defined. An efficacy assay following that of the chalcone study indicated that peptides 2 and 3 located at the N terminal on the α/β domain and peptide 12 located at the C terminal on the HD-2 domain caused high levels of mortality in *C. elegans*. We have also shown that several organic chalcones (natural derivatives of 1,3 diphenyl-2-propen-1-one) are effective in controlling the model free living nematode *C. elegans* at concentrations of $10^{-4}$ M. Furthermore, out of eight tested organic chalcones two (Chalcone 17 and 25) caused 100% mortality of *C. elegans* at $10^{-5}$ M concentration. These results combined suggest that organic chalcones and/or peptide based nematicidal agents could indeed provide environmentally safe alternatives to methyl bromide and similar chemicals.