

EXECUTIVE SUMMARY [NON-CONFIDENTIAL, NON-TECHNICAL ABSTRACT FOR PUBLIC INFORMATION OR PROGRAM PROMOTION]: State in layman's terms the application's broad, long-term objectives and specific aims, making reference to the potential public benefits of the project relevant to California. Do not include proprietary or confidential information. This may be distributed before the funding decision has been finalized.

Parasitic plant nematodes result in an estimated \$10 billion a year loss to U.S. agriculture, and nearly \$100 billion loss worldwide. Economic loss is not the only problem associated with plant pathogenic nematodes. Alternatives to the use of methyl bromide to control plant parasitic nematodes are urgently needed. We envision the use of programmed cell death genes to control plant parasitic nematodes. A greater understanding of early stages of plant parasitic nematode development will allow the efficient design of strategies to control them using the cell death genes. This project will study early stages of plant parasitic development using one of the most sophisticated microscopy techniques developed so far, 4D microscopy. Along the way we would have establish the necessary infrastructure to conduct other studies and training with 4D microscopy.