

Vitae

Stephen F. Hanson, Ph.D.

Appointment:

55% Research, 45% Teaching

Education:

B.S. Bacteriology (Natural Science option) 1988. University of Wisconsin

Ph.D. Plant Pathology 1997. University of Wisconsin

Employment:

College of Agriculture and Home Economics 2003 – present
Dept. of Entomology, Plant Pathology, and Weed Science
New Mexico State University
Assistant Professor

Department of Entomology 2001-2003
University of Wisconsin-Madison
Post-doctoral fellow with Prof. Douglas P. Maxwell

Department of Entomology 2000-2001
University of Wisconsin-Madison
Post-doctoral fellow with Prof. Thomas L. German

Institute for Molecular Virology 1997-1999
University of Wisconsin - Madison
Post-doctoral fellow with Prof. Paul D. Freisen

Teaching Experience:

Agricultural Biotechnology, EPWS 451 / 551: MS level graduate and senior level undergraduate course on molecular biology and biotechnology related to agriculture. (2004 – present).

Major Areas of Research:

- Basic research on molecular mechanisms of geminiviral and potyvirus replication. Goal is to develop information useful for designing anti-viral strategies.

- Applied research on engineered anti-viral strategies, primarily focusing on Beet Curly Top Virus. Goal is to identify the most effective strategy for inhibition of BCTV replication in model systems for later use in engineered chile peppers.
- Discovery / characterization of natural resistance to BCTV. This work includes both field and lab studies and is being done in collaboration with several other groups, including: Dr. Erin Silva- NMSU Agronomy and Hort, Dr. Mark Renz- NMSU extension, Stephanie Walker- NMSU extension, Dr. Douglas Maxwell- UW, Dr. Phil Miklas- USDA Prosser WA, and others.
- Transformation of *Capsicum annum*. Development of biolistic methods for creation of genetically engineered Capsicum spp. Using biolistic methods. In collaboration with Dr. Champa Gopalan- NMSU Agronomy and Hort.
- Biocontrol of soil borne diseases in collaboration with Dr. Soum Sanogo.

Specific Projects:

- Identification of geminivirus Rep protein domains, and specific amino acids within these domains, that determine specificity of Rep protein binding to the origin of replication.
- Characterization of Rep protein DNA binding specificity requirements in initiation and termination of geminivirus replication.
- Characterization of transcription termination elements and mechanisms in geminiviruses.
- Regulation of cell cycle by individual BCTV gene products.
- Characterization of cap-independent translation elements and mechanisms in Potato Virus Y.
- Determination of mutation rates during BCTV replication and testing of models for BCTV evolution.
- Sequence level characterization of BCTV diversity in NM.*
- Analysis of engineered BCTV resistance genes, including dominant negative viral genes, gene silencing constructs, and genes expressing aptamers derived by in-vitro combinatorial methods.
- Development of new and / or improved genetic engineering technologies. Includes biolistic transformation of Capsicum Annum and development of vectors and strategies for introduction of multiple genes during plant

transformation. In collaboration with Prof's John D. Kemp and Dr. Champa Gopalan. **

- Testing of germplasm for BCTV resistance, includes previously characterized tomato, bean, and beet lines for resistance to NM strains of BCTV (in collaboration with Dr. Douglas Maxwell- UW, Dr. Phil Miklas USDA-Prosser, and others) and *Capsicum sp.* / wild relatives from Paul Bosland and Stephanie Walker breeding programs. ***
- Testing of previously characterized *Bacillus cereus* strains (kindly donated by Dr. Jo Handelsman, UW-Madison) for biocontrol activity against *Phytophthora capsici*. ***
- Isolation and characterization of *Bacillus* and *Streptomyces sp.* from local soils to identify natural antagonists of *Phytophthora* and *Verticillium sp.* that contribute to chile diseases. *

* Interdisciplinary with EPPWS

** Interdisciplinary within NMSU

*** Interdisciplinary within and outside of NMSU

Professional Society Membership:

American Phytopathological Society (1998-present)

Virology Committee (2003 – present)

American Society for Plant Biology (2003 – present)

Awards:

NCI postdoctoral fellowship, Viral Oncology Training Program, U. W.-Madison, 1997-1999, to study apoptosis in Dr. Paul Friesen's laboratory.