



Open position for the LSM call of applications

Department/Institute: LMU Faculty of Biology, Plant Genetics

Subject areas/Research fields: Botany, Cell Biology, Genetics, Microbiology, Molecular Biology, Crop Science, Plant Protection, Mycology

Keywords: RNA biology, plant-microbe interaction, extracellular vesicles

Name of supervisor: Dr. Arne Weiberg

Project title: Pathogen extracellular vesicles in RNA effector delivery

Project description:

The plant pathogens *Botrytis cinerea* and *Hyaloperonospora arabidopsidis* deliver small RNA effectors into their host plants to suppress plant immunity genes (1, 2); a process known as cross-kingdom RNAi (3). How are pathogen small RNAs transported into plant cells? Recent studies suggest that extracellular vesicles (EVs) (4), play an important role in plant cross-kingdom host-pathogen communication (5). Are EVs a means of RNA transport during plant infection?

We are seeking for a talented young career researcher, who is passionate about molecular biology and RNA science, and is willing to join our team and take together with us the next step for uncovering the fascinating, yet unknown mechanisms involved in cross-kingdom RNAi. The research project offers to elucidate the molecular mechanisms and functions of EV-based small RNA transport from pathogens into the host plants *Arabidopsis* and tomato. By mass spec analysis, we identified protein candidates to be involved in small RNA transport and cross-kingdom RNA communication. Your task will be to unravel their functions by applying modern genetical, biochemical, and cell biological methods that will pave the way for a better understanding of the RNA delivery mechanisms from pathogens into host plants and to use this knowledge to develop innovative RNAi-based crop protection strategies.

References:

1. F. Dunker, ..., A. Weiberg, Oomycete small RNAs bind to the plant RNA-induced silencing complex for virulence. *Elife* 9, e56096 (2020).
2. A. Weiberg et al., Fungal small RNAs suppress plant immunity by hijacking host RNA interference pathways. *Science* 342, 118-123 (2013).
3. A. Weiberg, M. Wang, M. Bellinger, H. Jin, Small RNAs: a new paradigm in plant-microbe interactions. *Annu Rev Phytopathol* 52, 495-516 (2014).
4. A. Ruf, ..., A. Weiberg, Spotlight on plant RNA-containing extracellular vesicles. *Curr Opin Plant Biol* 69, 102272 (2022).
5. S. Kwon, C. Tisserant, M. Tulinski, A. Weiberg, M. Feldbrügge, Inside-out: From endosomes to extracellular vesicles in fungal RNA transport. *Fung Biol Rev* 34, 89-99 (2019).

To find out more details, you are welcome to visit our Research group website: www.weiberglab.org

For further information, please contact: **Dr. Arne Weiberg, Email:** a.weiberg@biologie.uni-muenchen.de

Apply: Please send your application through the [online portal](#) of the Graduate School Life Science Munich (LSM).