**Kalina Mrozek**
Proteome and Metabolome Research, Faculty of Biology, Bielefeld University, Germany
e-mail: kalina.mrozek@uni-bielefeld.de
**Petra Lutter**
Proteome and Metabolome Research, Faculty of Biology, Bielefeld University, Germany
**Karsten Niehaus**
Proteome and Metabolome Research, Faculty of Biology, Bielefeld University, Germany

## Modelling calcium transients in plant pathogen defence reactions

Recognition of so-called pathogen-associated molecular patterns (PAMPs) triggers the plant immunity. As a first line of defence the production of reactive oxygen species (ROS) is started. ROS are able to kill the invading pathogen and to crosslink cell wall components forming a barrier to block the infection. The plant receptors perceive the PAMPs on the cell surface and transfer a signal into the cell. As a consequence, the release of calcium from internal stores is mediated, generating a spike of the cytosolic calcium concentration. This increase depends on the type of elicitor and can differ in lag time, magnitude, peak time, intensity and duration. The project focuses on the establishment of a mathematical model and the simulation of the cytosolic calcium signals upon pathogen contact and also should be expandable for integrating other components of this signal transduction chain. Initially, the cytosolic calcium levels are measured in aequorin-transformed tobacco cell cultures. Simultaneously, the cytosolic calcium concentration is mathematically described, based on a system of differential equations. The MatLab software is used for running simulations. The simulations imply the variation of different sets of parameters to describe the different kinetics of calcium transients, dose-response-relationship curves and additionally reproducing the refractory behavior of the cytosolic calcium increase for comparison with the measured datasets.