PP-380

The Diversity of Pathogen Receptors in *Solanaceae*Plants and Characterisation of *Pectobacterium*-Specific Receptor-Like Kinases

Anastasia KOLUBAKO[1], Olga BADALYAN[1], Olga PRISYAZHNENKO[1], Yevgeny NIKOLAICHIK[1]
[1]Department of Molecular Biology, Belarusian State University, Belarus
kolubakoav@yandex.by

Aim of the study: Most plants have hundreds of rapidly evolving pathogen receptors, both transmembrane and cytoplasmic, whose genes constitute highly variable genome fraction. The genomes of *Solanaceae* plants are no exception and contain about 500 genes coding for receptor-like kinases (RLK). Few of these receptors have been characterised experimentally, but the functions of the vast majority of RLK remain unknown. In this work we aimed to review the diversity of RLK in *Solanaceae* and experimentally characterise receprors, specifically involved in recognition of important pathogen *Pectobacterium carotovorum*.

Material and Methods: Belarusian isolate 3-2 of *Pectobacerium carotovorum, N.tabacum* cv. Havana petit SR1, *S. lycopersicum* cv. Dohodny, S. tuberosum cv. Zhuravinka and wild type *N. benthamiana* and *S. bulbocastanum* plants were used throughout this work. LexA-based yeast two-hybrid system was used for protein interaction studies and TRV-based vectors – for virus-induced silencing.

Results:*Pectobacterium*-specific plant receptors have not been described before. *Erwinia amylovora* is the closest bacterium from the same *Enterobacteriaceae* family for which specific plant receptors are known. Four conserved RLK (DIPM1 to 4)recognize the DspA/E effector protein delivered by *E. amylovora* into *Malus×domestica* cells. DIPM1-4 belong to the LRRIII RLK subfamily that has about 40-50 members in *Solanaceae* plants with at most 60% amino acid identity with DIPM1-4. Using yeast two-hybrid system, we find that *P. carotovorum* effector DspE (orthologous to *E. amylovora* DspA/E) directly interacts with two receptor-like kinases, RLK2 and RLK5, from *Nicotiana tabacum* plants. We have also cloned orthologous receptors from *N. benthamiana*, *Solanum lycopersicum*, *S. tuberosum* and *S. bulbocastanum*, and verified interaction with DspE for some of these RLKs. Virus-induced gene silencing of RLK2 and RLK5 in *N. benthamiana* showed that these receptors are involved in recognition of *P. carotovorum* and are required for proper activation of signal chain controlling *PR* gene expression. We also note that *P. carotovorum* is capable of suppressing *RLK2* and *RLK5* genes during infection.

Acknowledgements: This work is supported by the State Research Programme ‘‘Biotechnology’’

Keywords: *Pectobacerium carotovorum*, *Solanaceae*, receptor-like kinases, gene expression, effectors