

Head of the group

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Area of research:

The study of plant proteomes changes under the action of natural inductors of plant immunity against biotrophic and necrotrophic pathogens - chitosans, salicylic acid and jasmonic acid, and identification of proteins, regulated by them.

The main findings:

1. For the first time the possibility of intermolecular signal competition between chitosan and - N-carboxymethylchitosan residues was shown. N-carboxymethylchitosan residues inhibited the expression of a number of chitosan-induced defense proteins and induced proteins characteristic of the intensively growing plants at their chemical introduction in chitosan molecule. More than 40 proteins, the content of which was altered under the action of salicylic and jasmonic acids were identified. The proteins components of the heteroligomeric protein complexes up regulated by salicylic acid were revealed.
2. For the first time using the labeled 14C amino acids there was revealed a group of salicylate dependent proteins the inhibition of which didn't influence their content. This fact is probably due to inhibition of proteases involved in the degradation of these proteins.
3. The features of the crosstalk between the salicylic acid and methyl jasmonate in plant root proteomes were revealed.

Publications:

1. Yakovleva V.G., Tarchevsky I.A., Levov A.N., Egorova A.M. Effect of chitosan and N-carboximethyl chitosan on the growth and soludle proteins of pea (PISUM SATIVUM L.) roots. EUCHIS'11 ADVANCES IN CHITIN SCIENCE, Proceedings of the 10-th International Conference of the European Chitin Society, Edit. By V.Varlamov et al., Saint-Petersburg, Russia , 2011. Vol.XI. P. 327-332.

2. Yakovleva V.G., Tarchevsky I.A., Egorova A.M. A salicylate-induced change in the protein composition and content in pea roots. Dokl Biochem Biophys. 2007. V. 415. P. 228-31.

3. Tarchevsky I.A., Yakovleva V.G., Egorova A.M. Proteomic analysis of changes in pea roots caused by the apoptosis inducing concentration of salicylic acid. Dokl Biochem Biophys. 2008; V. 422. P. 274-8.

4. Tarchevsky I.A., Yakovleva V.G., Egorova A.M. Salicylate-induced modification of plant proteomes. Applied Biochemistry and Microbiology. 2010. V. 46 P. 241–252.

5. Tarchevsky I.A., Yakovleva V.G., Egorova A.M. Proteomic analysis of salicylate-induced proteins of pea (*Pisum sativum* L.) leaves. Biochemistry (Mosc). 2010. V. 75. P. 590-597.

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7. Tarchevsky I.A., Yakovleva V.G., Egorova A.M. Effect of salicylic acid on protein content and incorporation of 14C amino acids in pea roots
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Russian Journal of Plant Physiology. 2011. V. 58. P. 580–588.

8. Yakovleva V.G., Tarchevsky I.A., Levov A.N., Egorova A.M. Effect of chitosan and N-carboximethyl chitosan on the growth and soluble proteins of pea (*Pisum sativum* L.) roots. EUCHIS'11 ADVANCES IN CHITIN SCIENCE, Proceedings of the 10-th International Conference of the European Chitin Society, Edit. By V.Varlamov et al.,
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, 2011. V. XI. P. 327-332.

9. Yakovleva V.G., Egorova A.M., Tarchevsky I.A. Effect of methyl jasmonate on pea root proteomes. Doklady Biochemistry and Biophysics. 2013. V. 449. P. 90–93.