

CURRICULUM VITAE

Sergei Avdiushko

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EDUCATION

Ph. D.: Plant Biochemistry; A.N. Bakh Biochemistry Institute, Moscow, Russia
M. S.: Biochemistry; Kiev State University, Kiev, Ukraine
B. S.: Biology; Kiev State University, Kiev, Ukraine

RESEARCH INTERESTS

Specific interests include: knocking out the genes in animal systems by gene targeting. Studying signal transduction and apoptosis pathways in mammalian tissue culture cells. Regulation of gene expression in prokaryotes and eukaryotes. Other interests include: genetic improvement of crop plants utilizing tissue culture, transformation and molecular biology approaches. Plant growth and development, plant metabolic engineering, pest resistance and gene discovery.

RESEARCH AND PROFESSIONAL EXPERIENCE

2002 – present Research Associate in the Department of Oral Health Practice, University of Kentucky

1996 - 2002: Research Associate in the Department of Agronomy, University of Kentucky

1992 - 1996: Post-doctoral research in the Department of Agronomy, University of

1989 - 1992: Post-doctoral research in the Department of Plant Pathology, University of Kentucky

1987 - 1989: Post-doctoral research in the Laboratory of Plant Immunity, A. N. Bakh Biochemistry Institute, Moscow, USSR.

RESEARCH SKILLS

Molecular biology

- Basic techniques used in plant cell and tissue culture
- Agrobacterium mediated transformation of plants
- Particle bombardment and chloroplasts transformation

- Isolation and analysis of nucleic acids including Southern blot and northern blot hybridizations
- RT-PCR and Quantitative PCR
- Site directed mutagenesis
- Construction and screening of genomic and cDNA libraries
- DNA sequencing
- Vector construction using different promoters, genes of interests and terminators
- Promoter characterization
- Immunobiological techniques including immunoblot analysis and ELISA
- Transmission electron microscopy and confocal laser microscopy

Assays utilized:

- Biochemical
- Enzymes
- Northern, Southern and Western blots
- Nucleic acid and protein analysis
- Gel and SDS-PAGE electrophoresis
- Different types of chromatography: affinity, gas liquid, HPLC, FPLC, thin layer
- Work with radioisotopes

Computer skills:

- Languages: VB.6, HTML, SQL, PL/SQL
- Databases: SQL Server 7, MS Access 2000/97
- Operating Systems: MS Windows 95/98/NT, DOS
- Computer Hardware: PCs, Ethernet LAN
- Networks: TCP/IP based

Supervising the projects of undergraduate, graduate and post-graduate students.

ACADEMIC HONORS

1983: Graduation with Honorary M. S. Diploma, Kiev State University

1982 – 1983: Outstanding Masters Graduate Student, Biochemistry Department

1980 – 1981: Best Undergraduate Student Award and State Govt. Studentship

GRANT PROPOSALS PENDING

Brown, G.C., Hildebrand D.H., Avdiushko S.A. (2002) Tritrophic interactions, host plant resistance and cabbage pest biocontrol. Submitted to NRI CGP - Biological Control (in progress).

Brown, G.C., Hildebrand D.H., Avdiushko S.A. (2001) Cabbage pest management in a tritrophic context. Submitted to Southern Region IPM Program (in progress).

PROFESSIONAL SOCIETIES

American Society of Phytopathology
Weed Science Society of America
American Society of Plant Physiologists

PUBLICATIONS

1. Moon, H., Scowby, M., **Avdiushko, S.**, Hazebroek, J., Hildebrand, D.F. (1999) Glycerolipid biosynthesis in plant tissues expressing a mammalian $\Delta 9$ desaturase. *Plant Physiol.* (submitted for publication).
2. Deng, W., **Avdiushko, S.A.**, Brown, G.C., Hamilton-Kemp, T.R., Collins, G.B., Hildebrand, D.F. (1999) Elicitation of electrolyte leakage in tobacco leaves by several LOX pathway metabolites. *Plant Physiol.* (submitted for publication).
3. Ye, X.S., **Avdiushko, S.A.**, Kuc, J. (1999) Calcium and vanadate increase protein phosphorylation and inhibit H^+ -ATPase activity in the plasma membrane of tobacco, cucumber and *Arabidopsis thaliana*. *J. Biol. Chem.* (submitted for publication).
4. Wang, C., **Avdiushko, S.A.**, Hildebrand, D.F. (1999) Overexpression of a cytoplasm-localization allene oxide synthase promotes the wound-induced accumulation of jasmonic acid in transgenic tobacco. *Plant Mol. Biol.* **40**, 783-793.
5. Tuzun, S., **Avdiushko, S.A.**, Ye, X.S., Pan, S.Q., Kuc, J., Bent, E. (1999) Cloning of two most anionic peroxidase isozymes by polymerase chain reaction (PCR) and the effect of their constitutive expression in disease and insect resistance in tobacco. *Can. J. Bot.* (in press).
6. Torisky, R.S, Kovacs, L., **Avdiushko, S.**, Newman, J.D., Hunt A.G., Collins G.B. (1997) Development of a binary vector system for plant transformation based on the *supervirulent Agrobacterium tumefaciens* strain Chry5. *Plant Cell Rep.* **17**, 102-108.
7. **Avdiushko, S.A.**, Ye, X.S., Croft, K.P., Kuc, J. (1997) Phosphorylation of the proteins in cucumber exudates. *J. Plant Physiol.* **150**, 552-559.
8. **Avdiushko, S.A.**, Brown, G.C., Dahlman, D.L., Hildebrand, D.F. (1997) Methyl jasmonate exposure induces insect resistance in cabbage and tobacco. *Environ. Entomol.*, **26**, 642-654.
9. Liu, W., Torisky, R.S., McAllister, K.P., **Avdiushko, S.**, Hildebrand, D., Collins, G.B. (1996) Somatic embryo cycling: evaluation of a novel transformation and assay system for seed-specific gene expression in soybean. *Plant Cell, Tis. Org. Cult.*, **47**, 33-42.
10. **Avdiushko, S.A.**, Croft, K.P.C., Hamilton-Kemp, T.R., Brown, G.C., Jackson, D.M., Hildebrand, D. (1995) Effect of volatile methyl jasmonate on the oxylipin pathway in tobacco, cucumber and *Arabidopsis*. *Plant Physiol.*, **109**, 1227-1230.
11. Ye, X.S., Pan, S.Q., **Avdiushko, S.A.**, Kuc, J. (1995) Protein phosphorylation in tobacco plants with systemic resistance induced by tobacco mosaic virus. *Physiol. Mol. Plant Pathol.*, **47**, 269-283.
12. **Avdiushko, S.A.**, Ye, X.S., Kuc, J., Hildebrand, D. (1994) Lipooxygenase is an abundant protein in cucumber exudates. *Planta*, **193**, 349-357.

13. Ye, X.S., **Avdiushko, S.A.**, Kuc, J. (1994) Effects of polyamines on *in vitro* phosphorylation of soluble and plasma membrane proteins in tobacco, cucumber and *Arabidopsis thaliana*. *Plant Sci.*, **97**, 109-118.
14. Choi, D., Bostock, R.M., **Avdiushko, S.**, Hildebrand, D.F. (1994) Lipid-derived signals that discriminate wound- and pathogen-responsive isoprenoid pathways in plants: methyl jasmonate and the fungal elicitor arachidonic acid induce different 3-hydroxy-3-methylglutaryl-coenzyme A reductase genes and antimicrobial isoprenoids in *Solanum tuberosum* L. *Proc. Natl. Acad. Sci. USA*, **91**, 2329-2333.
15. **Avdiushko, S.A.**, Ye, X.S., Kuc, J. (1993) Detection of several enzymatic activities in leaf prints of cucumber plants. *Physiol. Mol. Plant Pathol.* **42**, 441-454.
16. **Avdiushko, S.A.**, Ye, X.S., Hildebrand, D., Kuc, J. (1993) Induction of lipoxygenase activity in immunized cucumber plants. *Physiol. Mol. Plant Pathol.* **42**, 83-95.
17. Chalova, L.I., **Avdiushko, S.A.**, Chalenko, G.I., Karavayeva, K.A., Ozeretskovskaya, O.L. (1989) Arachidonic and eicosapentaenoic acids - long-action systemic immunizers of the potato. *Dokl. Acad. Nauk SSSR* **305** (6), 124-127 (Russian).
18. Chalova, L.I., **Avdiushko, S.A.**, Karavayeva, K.A., Yurganova, L.A., Ozeretskovskaya, O.L. (1989) Active principle of potato protective reaction inducer. *Appl. Biochem. Microbiol.* **24** (6), 651-656.
19. Ozeretskovskaya, O.L., Chalova, L.I., **Avdiushko, S.A.**, Chalenko, G.I., Karavayeva, K.A. (1988) Eicosanoic compounds as inducers for increasing resistance to *Phytophthora infestans* in potato. *Physiologia rastenii* **35** (1), 175-183 (Russian).
20. **Avdiushko, S.A.**, Chalova, L.I., Ozeretskovskaya, O.L., Chalenko, G.I., Imbs, A.B., Latyshev, N.A., Bezuglov, V.V., Bergelson, L.D. (1987) Products of lipoxygenase oxidation of polyenoic acids induce resistance to *Phytophthora infestans* in potato tubers. *Dokl. Acad. Nauk SSSR* **296** (4), 1012-1014 (Russian).
21. **Avdiushko, S.A.**, Chalova, L.I., Ozeretskovskaya, O.L., Chalenko, G.I., Bezuglov, V.V., Bergelson, L.D. (1987) Ability of prostaglandins to induce resistance of potato to *Phytophthora infestans*. *Dokl. Acad. Nauk SSSR* **294** (4), 981-984 (Russian).
22. Chalova, L.I., **Avdiushko, S.A.**, Ozeretskovskaya, O.L., Khotimchenko, S.V., Romashina, N.A. (1987) The composition of lipids of *Phytophthora infestans* and their ability to induce potato phytoalexin accumulation. *Biokhimiya* **52** (9), 1445-1453 (Russian).
23. Ozeretskovskaya, O.L., **Avdiushko, S.A.**, Chalova, L.I., Chalenko, G.I., Yurganova, L.A. (1987) Arachidonic and eicosapentaenoic acids as the active ingredient of the biogenic elicitor - lipoglycoprotein complex isolated from *Phytophthora infestans*. *Dokl. Acad. Nauk SSSR* **292** (3), 738-741 (Russian).
24. Ozeretskovskaya, O.L., Chalova, L.I., Chalenko, G.I., Karavayeva, K.A., **Avdiushko, S.A.** (1986) Induction of systemic disease resistance of potato with the aid of a biogenic elicitor of defensive responses. *Izvestia Acad. Nauk SSSR, ser. biol.* **1**, 24-31 (Russian).

REFERENCES

1. **Dr. Michael Barrett**
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