Mariya Khodakovskaya, PhD
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Academic interests: Biochemistry, cell and molecular, and membrane biology.
Research Focus & Techniques of Expertise: Plant Tissue Culture and Transformation: Tissue, cell and protoplast culture of common dicots and monocots. Agrobacterium-mediated transformation of canola, tomato, soybean, potato, carrot, petunia, chrysanthemums, roses, Panax ginseng, Rubia cordifolia, Lithospermum erythrorhizon and others; Cloning techniques; Southern and Western blot analysis, PCR; Analysis of gene expression by Northern blot and qRT-PCR; RNAi technique; cDNA library construction and screening; Microarray analysis, Yeast one-hybrid and two–hybrid systems, Proteomics (protein expression, purification and analysis).
Commonly use Growth chambers, Laminar hood, Autoclave, Centrifuges, Equipment for gel electrophoresis and gel documentation, Water baths, Shakers, Thermocycler, Real-time PCR machine.

Current Research Projects:

Currently I am working on Enhancing Stress Tolerance and Nutraceutical Value in Crops for Earth Agriculture and Human Space Exploration. My research work focus on enhancing nutraceutical value in tomato by increasing lycopene content, improvement of tolerance to abiotic stress in tomatoes by genetic regulation of plant stress signal transduction pathways; identification of new transcription factors involved in plant stress signaling pathways.

- Recently, we demonstrated that **r**educing the concentration inositol 1,4,5-trisphosphate ($InsP_3$), which is involved in the signal transduction pathways of several abiotic stresses, resulted in increased drought tolerance, biomass, and fruit lycopene content in tomatoes (Khodakovskaya et al., 2008, manuscript in preparation). Lycopene is a one of the most potent antioxidants among dietary carotenoids. Tomato products containing lycopene has been shown to be associated with decreased risk of chronic diseases, such as cancer and cardiovascular diseases (Agarwal and Rao 2000; Weisburger 2002). Thus, there is a considerable interest in engineering tomato plants with high production of lycopene. In our study, established transgenic tomato plants combined increased production of lycopene with improved tolerance to drought.

(P3- 202) Regulation of specialized ("secondary") metabolism in tomato by genetic manipulation of the phosphoinositol pathway

PI: Dr. Mariya Khodakovskaya, UALR; **Co-PIs:**Dr. Nawab Ali, UALR; Dr. Stephen Grace, UALR; Dr. Fabricio Medina-Bolivar, ASU

(P3-206) Photoregulation of Phenylpropanoid Antioxidant Production in Tomato

PI: Stephen Grace (UALR); **Co-PIs:** Mariya Khodakovskaya (UALR), and JD Swanson (UCA)