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REASERCH INTERESTS

Intracellular membrane trafficking - regulation of protein targeting and degradation; oligomerization and substrate processing by AAA ATPases; ESCRT-dependent enveloped virus budding; role of tethering factors and small Rab GTPases in correct membrane targeting; lipid trafficking; role of lipid membrane composition in membrane fusion.

EDUCATION

2006 – now

Graduate Student
University of Utah, Department of Biology.
Expected degree: Ph.D. in Biology

2004 – 2006

M. S. Biology
University of Arkansas for Medical Sciences (UAMS),
Department of Physiology and Biophysics.
Theses: “Role of the COG complex in the membrane trafficking”

2003 - 2004

M.S. in Microbiology
Shupyka L.P. Postgraduate Medical Academy of Ukraine,
Department of Virology.
Theses: “Definition of an adsorption activity of rota- and enteroviruses on the bentonite clay”

1997 - 2003

M.D. Preventive Medicine
National Medical University (NMUU) of Ukraine, Kiev.
Major: Preventive medicine.

RESEARCH EXPERIENCE

2006-now

Graduate Student

University of Utah, Department of Biology

Laboratory of Markus Babst

“Regulation of the MultiVesicular Bodies (MVBs) sorting pathway”.

Cell surface receptors are targeted for degradation in vacuole via MVBs. ESCRT (Endosomal Sorting Complex Required for Transport)-0, I, II and III act sequentially on the endosomal membrane where they concentrate cargo and drive intraluminal vesicle formation. Vps4 ATPase interaction with ESCRT-III solubilizes ESCRT-III and allows multiple rounds of vesicle formation. We study precise sites of interaction of Vps4 with ESCRT-III and ESCRT-III-associated proteins.

2004-2006

Graduate Student

University of Arkansas for Medical Sciences,

Department of Physiology and Biophysics.

Laboratory of Vladimir Lupashin.

“The Conserved Oligomeric Golgi (COG) complex – mediated recycling of Golgi enzymes”.

The COG complex is a tethering molecule, which resides on the cis-Golgi and functions in tethering of the retrograde intra-Golgi vesicles to the proper Golgi compartments. COG complex orchestrates proper intra-Golgi trafficking via binding to Rabs and stabilizing intra-Golgi SNARE-complex formation.

2003-2004

Graduate Student

Postgraduate research at the Department of Virology, NMUU.

“Adsorption activity of natural sorbents”.

Rotaviral infection, major cause of the newborn diarrhea, is treated with mineral sorbents that adsorb and clear rotavirus from the organism. This research focused on the environmental physical factors (pH and salt concentration) that change adsorption activity of rotavirus on the bentonite clay.

2002-2003

Undergraduate research

National Medical University of Ukraine,

Department of Epidemiology.

Laboratory of Yuriy Gotz.

“Epidemic analysis of Botulism, Measles and Hepatitis B in Ukraine for the period 1950-1995”.

TEACHING EXPERIENCE

2010

“Molecular Biology of DNA”,
Teaching assistant, senior undergraduate laboratory course,
University of Utah, Department of Biology.

2008

“Introductory Cell Biology Course”
Teaching assistant, senior undergraduate level,
University of Utah, Department of Biology.

PUBLICATIONS

Davies BA, Azmi IF, Payne J, Shestakova A, Horazdovsky BF, Babst M, Katzmann DJ. Coordination of substrate binding and ATP hydrolysis in Vps4-mediated ESCRT-III disassembly. *Mol Biol Cell*. 2010 Oct;21(19):3396-408.

Shestakova A, Hanono A, Drosner S, Curtiss M, Davies BA, Katzmann DJ, Babst M. Assembly of the AAA ATPase Vps4 on ESCRT-III. *Mol Biol Cell*. 2010 Mar;21(6):1059-71.

Shestakova A, Suvorova E, Pavliv O, Khaidakova G, Lupashin V. Interaction of the conserved oligomeric Golgi complex with t-SNARE Syntaxin5a/Sed5 enhances intra-Golgi SNARE complex stability. *J Cell Biol*. 2007 Dec 17;179(6):1179-92.

Sun Y, Shestakova A, Hunt L, Sehgal S, Lupashin V, Storrie B. Rab6 regulates both ZW10/RINT-1 and conserved oligomeric Golgi complex-dependent Golgi trafficking and homeostasis. *Mol Biol Cell*. 2007 Oct;18(10):4129-42.

Shestakova, S. Zolov and V. Lupashin. COG complex-mediated recycling of Golgi glycosyltransferases is essential for normal protein glycosylation. *Traffic*. 2006 Feb;7(2):191-204.

LABORATORY TECHNIQUES

Standard molecular biology procedures;

Yeast cell culture - general genetic, biochemical and fluorescence microscopy techniques;

Mammalian tissue cell culture - transfection, general biochemical and fluorescence microscopy techniques;

Protein analysis – immunoblotting, immunoprecipitation, chromatography (size exclusion, affinity, ion-exchange);

Organelle separation and analysis;

Recombination proteins – design and purification;

AWARDS

2010

Graduate travel award from the Graduate School, University of Utah.

2008

Graduate travel award from the Department of Biology, University of Utah.

2005

Travel award from American Society of Cell Biology (ASCB).

Travel award from the UAMS Student Research Days.

2002

Best scientific project award at the *57-th* international student medical conference. Section of epidemiology and virology, Art. "Epidemiology analysis of botulism in Ukraine during 1991-2001 years"

INVITED TALKS

2005

7th Young Scientists Meeting German Society for Cell Biology, Jena, Germany, September 22-24, 2005. "Role of the COG complex in the recycling of Golgi glycosyltransferases"

<http://www.zellbiologie.de/nachwuchs/group.html>

CONFERENCE PRESENTATIONS

2010

"Role of the linker in the function of Vps4 ATPase" at the American Society of Cell Biology (ASCB) annual meeting, Philadelphia, December 11-15, 2010.

2010

"Role of the linker in the function of Vps4 ATPase" at the American Society for Biochemistry and Molecular Biology (ASBMB) meeting "The Biochemistry and Cell Biology of ESCRTs in Health and Disease". Snowbird, UT, October 11-14.

2008

"Role of the Vps4 ATPase in the MVB sorting pathway" at the American Society of Cell Biology (ASCB) annual meeting, San Francisco, December 13-17, 2008

2005

"The COG complex-mediated recycling of Golgi glycosyltransferases" at the American Society of Cell Biology (ASCB) annual meeting, San Francisco, December 9-15, 2005.

REFERENCES

Markus Babst

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University of Arkansas for Medical Sciences.
4301 W. Markham, Slot 505, Little Rock, AR, 72205, USA.
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University of Arkansas for Medical Sciences.
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