

CURRICULUM VITAE

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SUMMARY

- Six years' experience in drug discovery: projects included identification and validation of new antibiotic targets and the design of effective assays for the development of a new class of antibiotics
- Ten years' experience in the development of ELISA assays for diagnostic purpose
- Fourteen years experience in biotechnology: projects included basics research on the immune response to viral and parasitic infections and development of passive prophylactic vaccines

EDUCATION

Ph.D. in Molecular Biology, State Research Center of Virology and Biotechnology, Vector, Koltsovo, Novosibirsk Region, Russia
M.S. in Biochemistry, Novosibirsk State University, Russia

WORK EXPERIENCE

2010 – Present Associate Research Professor, Biodesign Institute, Tempe, Arizona
2003 – 2009 Senior Scientist, Team Leader; Pinnacle Pharmaceuticals, Charlottesville, Virginia
2000 – 2003 Research Associate; Research Scientist, University of Virginia, Chemistry Department, Charlottesville, Virginia
1996 – 2000 Director of Laboratory, Vector-Best Biotechnology Company, Russia
1991 – 1996 Research Scientist/Senior Scientist, Institute of Molecular Biology, State Research Center of Vector Virology and Biotechnology, Russia

TEACHING EXPERIENCE

1997 – 2000 Course of Lectures - Immunoenzyme Methods in Diagnostics of Infection Diseases

RESEARCH EXPERIENCE

2010 – Present. *In vitro* translation of protein and peptides. Construction of the library of modified ribosomes and selection of the ribosome with alteration in PTC (β -puromycin assay). Study the translational behavior of modified ribosome.

2003 – 2009. Antibacterial drug discovery. Responsible for all *in vitro* preclinical laboratory activities. Developed assays for high-throughput screening of natural extracts to identify new antibacterial agents with different mechanisms of action. Identified several novel compounds with *in vitro* and *in vivo* efficacy against major human bacterial pathogens. Participated in drug developing programs including preclinical pharmacokinetics and toxicology.

2000 – 2003. Studied the mechanism of protein action applying unnatural amino acids technique.

1995 – 2000. Studied the common aspects of parasite's interaction with the immune system. Identified immunodominant antigens of *Toxoplasma gondii*. Developed ELISA kits for early diagnostic of acute toxoplasmosis, giardiasis, opisthorchosis and toxocarosis.

1991–1995. Studied antigens of especially dangerous viruses (Ebola, Marburg, Tick-Borne Encephalitis [TBE] virus) and the immune response during infection in animal models. Developed immunoglobulins for emergency prophylactic treatment of diseases induced by these viruses.

MANUFACTURING EXPERIENCE

1995 – 2000. Developed ELISA kits for diagnosing human parasitic infections. Kits for determination of antibodies to antigens of *Opisthorchis felinus*, *Toxocara canis*, *Candida albicans* and *Giardia lamblia*) have received official approval and registration from the Ministry of Health of Russia.

GRANT AWARDS

International Scientific Technical Center (ISTC) Grant:

Construction of ELISA Kits for Verification of Acute Toxoplasmosis

National Institute of health (NIH) Grants:

Identification of Antimicrobial Agents and Targets

Alteration of Protein Affinity”.

Potentiating Compounds for Aminoglycoside Antibiotics

Antiinfective Agents that Target Protein Synthesis

Selection of Modified Ribosome Using Novel Puromycin

SKILLS OF EXPERTISE

Molecular Biology: Construction of vectors for expression of proteins in bacteria, yeast and mammalian cells; PCR for analysis and mutagenesis; preparation cell-free protein synthesized system; purification and analysis of peptides and proteins (HPLC; electrophoresis; western blotting; ELISA, MALDI); purification and analysis of DNA and RNA (restriction analysis; DNA sequencing; agarose and PAAG electrophoresis; southern and northern blotting; primer extensions and others)

Immunochemistry: Purification and characterization of monoclonal antibody; testing immune response of animals during virus and bacterial infections (immunoblotting, ELISA; ELISPOT; RIA; ADCC and neutralization assays)

Biotechnology: Preparation of mammalian cells cultures and construction of assays for *in vitro* testing of antiviral and anticancer drug candidates; preparation of ELISA assays for diagnostic purposes

Bacteriology: Basic microbiology techniques (aerobic and anaerobic conditions); *in vitro* efficacy assays for selection and characterization of new antibacterial compounds (MIC and MBC assays; PAE, Time-kill assay; protein binding assay)

PUBLICATIONS AND PATENTS

Talukder, P; **Dedkova, L. M.**; Ellington, A.D.; Yakovchuk, P.; Lim, J.; Anslyn, E.V.; Hecht, Sidney M. (2016) "Synthesis of alanyl nucleobase amino acids and their incorporation into proteins" *Bioorganic & Medicinal Chemistry*, 24(18) 4177-4187.

Chowdhury, S. R., Chauhan, P, **Dedkova, L.M.**, Bai, X., Chen, S., Taluketer, P., and Hecht, S.M. (2016) "Synthesis and Evaluation of a library of fluorescent dipeptidomimetic analogues as substrates for modified bacteria ribosome" *Biochemistry*, 55(17), 2427-2440.

Chowdhury, S. R., Maini, R., **Dedkova, L.M.**, and Hecht, S.M. (2015) "Synthesis of fluorescent dipeptidomimetics and their ribosomal incorporation into green fluorescent protein" *Bioorg. Med. Letters*, 25(21), 4715-4718.

Gerasimova, Y.V., Yakovchuk, P., **Dedkova, L.M.**, Hecht, S.M., and Kolpashchikov, D.M. (2015) "Expedited quantification of mutant ribosomal RNA by binary deoxyribozyme (BiDz) sensor" *RNA*, 21(10), 1834-1843.

Maini, R., **Dedkova, L.M.**, Paul, R., Madathil, M.M., Chowdhury, S.R., Chen, S., and Hecht, S.M. (2015) Ribosome-Mediated Incorporation of Dipeptides and Dipeptide Analogues into Proteins in Vitro" *J. Am. Chem. Soc.*, 137, 11206-11209.

Maini,R., Chowdhury, S.R. **Dedkova, L.M.**, Roy, B., Daskalova, S., Paul, R., Chen, S. and Hecht, S.M. (2015) "Protein Synthesis with Ribosomes Selected for the Incorporation of

β -Amino Acids" *Biochemistry*, 54, 3694-3706.

Yu, X., Talukder, P., Bhattacharya, Ch, Fahmi, N., Lines, J.A., **Dedkova, L.M.**, Labaer, J., Hecht, S.M., and Chen, S. (2014) "Probing of CD4 binding pocket of HIV-1 gp 120 glycoprotein using unnatural phenylalanine analogue" *Bioorg. Med. Letters*, 24(24), 5699-5703.

Lines, J.A., Yu, Z., **Dedkova, L.M.**, and Chen, S. (2014). "Design and expression of a short peptide as an HIV detection probe" *BBRC*, 443, 308-312.

Maini, R., Nguyen, D., Chen, S., **Dedkova, L.M.**, Roy Chowdhury, S., Alcalá-Torano, R., and Hecht, S.M. (2013) "Incorporation of β -amino acids into dihydrofolate reductase by ribosomes having modification in the peptidyltransferase center" *Bioorganic & Medicinal Chemistry*, 21(5), 1088-1096.

Dedkova L.M., Fahmi, N., Paul, R., delRossario, M., Zhang, L., Chen, S., Feder, G. and Hecht, S.M. (2012) " β -puromycin selection of modified ribosomes for in vitro incorporation of β -amino acids" *Biochemistry*, 51, 401-415.

Nangreave, R.C., **Dedkova, L.M.**, Chen, S., and Hecht, S.M. (2011) "A new strategy for the synthesis of bisaminoacylated tRNAs" *Org. Letters*, 13(18), 4906-4909.

Hecht, S., Fahmi, N., **Dedkova, L.**, Bera, S., Kolanos, R. (2009) "Cyclodextrin derivatives as potentiator for antibiotics". WO/2009/058327

Gao, Z., Maloney, D.J; **Dedkova L.M.**, and Hecht, S.M. (2008) Inhibitors of DNA polymerase beta: activity and mechanism. *Bioorganic & Medicinal Chemistry*, 16(8), 4331-4340.

Hecht, S., Deng, J.-Z., **Dedkova, L.** (2007) Antibacterial compounds and uses thereof. WO/2007/086895

Fahmi, N.E, **Dedkova L.**, Wang, B., Golovine, S., and Hecht, S.M. (2007) Site-specific incorporation of glycosylated serine and tyrosine derivatives into proteins. *J. Am. Chem. Soc.*, 129(12), 3586-3597.

Choudhury, A.K., Golovine, S.Y, **Dedkova, L.**, Laikhter A.L., and Hecht, S.M. (2007) Synthesis of proteins containing modified arginine residues. *Biochemistry*, 46(13), 4066-4076.

Dedkova, L.M., Fahmi, N.E., Golovin, S.Y. and Hecht, S.M. (2006) Construction of modified ribosomes for incorporation of D-amino acids into proteins. *Biochemistry*, 45(51), 15541-15551.

Schmidt, F.J., **Dedkova, L.** and Hecht, S. (2006) Parallel Identification of antibacterial targets and inhibitors. WO/2006/086696

Hecht, S., Deng, J.-Z., and **Dedkova, L.** (2006) Preparation of polybromodiphenyl ethers as antibacterial agents. WO/2006/235047

Gao, R., Zhang, Y., **Dedkova, L.**, Choudhury, A.K., Rahier, N.J. and Hecht, S.M. (2006) Effects of modification of the active site tyrosine of human DNA Topoisomerase I. *Biochemistry* 45(27), 8402-8410.

Gao R., Zhang Y., Choudhury, A.K., **Dedkova, L.M.**, and Hecht, S.M. (2005) Analogues of vaccinia virus DNA topoisomerase I modified at the active site tyrosine. *J.Am.Chem.Soc.* 127, 3321-3331.

Golovine, S.Y, Hecht, S.M., **Dedkova, L.M.** (2004) Methods of protein synthesis incorporating D-amino acids using modified ribosome. PCT Int. Appl. WO/ 2004/035757

Dedkova, L.M., Fahmi N.E., Golovine, S.Y., and Hecht S.M. (2003). Enhanced D-amino acid incorporation into protein by modified ribosomes. *J.Am.Chem.Soc.* 125, 6616-6617

Poryvayeva, V.A., Aborneva, I. V., Bormotov, N.I., Gladkova, S.E., Reshetnikov, S.S., Kuvshinova, I.N., Rukavishnikov, M. Yu., **Dedkova, L.M.**, Belanov, E.F. (2003) Production and characterization of a panel of monoclonal antibodies to *Toxoplasma gondii* antigens. *Molekulyarnaya Genetika, Mikrobiologiya i Virusologiya*, N 4, 20-24 (Russ.).

Zubavichene N.M., **Dedkova L.M.**, Sergeev N.N., Ofitserov V.I. (2002) Sensitizing and virus-neutralizing characteristics of goat immunoglobulins against Ebola virus. *Voprosy Virusologii*, V.47, N 2, P. 45-48. (Russ.).

Poryvaeva V.A., Aborneva I.V., **Dedkova L.M.**, Rukavishnikov M.Yu., Bormotov N.I., Belanov E.F. (2000) Immunochemical characterization of the collection of monoclonal antibodies to the *Toxoplasma gondii* antigens. *Acta Parasitologica*, V.45, N.3. P.199-200.

Belanov E.F., Tkachenko T.N., Gladkova S.E., Poryvaeva V.A., Aborneva I.V., **Dedkova L.M.** (2000) Determination of circulating antigens of *Toxoplasma gondii* in blood sera. *Acta Parasitologica*, V.45, N.3, P.205.

Gladkova S. Ye, Bormotov N.I., **Dedkova L.M.**, Belanov E.F., Golubiatnikova A.V, Kiseleva Z.F., Reshetnikov S.S. (2000) Examining the composition of circulating immune complexes in acute toxoplasmosis. *Med. Parazitologiya* N 4, 15-18 (Russ.)

Dedkova L.M., Bormotov N.I., Gladkova S.Ye., Belanov Ye.F. (2000) Investigation of protein composition and immunochemical properties of excreted/secreted antigens of *Toxoplasma gondii*. *Med. Parazitologiya*, N1, pp.20-24 (Russ.).

Dedkova L.M., Volkov G.N., Serova O.A., Belanov Ye.F (1999) Immunoassay of antibodies to the antigens of *Lambliia trophozoites*. *Med. parazitologiya*, N.1, P.46-48. (Russ.)

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Jurkina E.A., Ofitserov V.I., Samukov V.V., **Dedkova L.M.**, Mizenko G.A. (1997) Immunoenzyme method of the determination of human chorionic gonadotropin using polyclonal antibodies. *Klinicheskaya u laboratornaya diagnostika*, NI, P.8-10. (Russ).

Kudoyarova N.M., Kizimov N.V., **Dedkova L.M.**, Smolina M.P. and Sergeev N.N. (1997) Method of preparation of geterological immunoglobulins against Ebola and Marburg virus infection. RU2089217

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Dedkova L.M., Yastrebov S.I., Ofitserov V.I. (1992) Activity of IgG subclasses, produced from hyperimmune sera against TBE virus. *Izvestiya Sibirskogo otdeleniya Akademii Nauk*, N3, P.21-24. (Russ.).