

# Curriculum vitae

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Date of birth: 28th of February 1990  
Place of birth: Saint-Petersburg, Russia



## Education

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- 09/2014 – nowadays  
**Skolkovo Institute of Science and Technology**  
**The Biomedical Science and Technology (BMT) Ph.D. program**
- 09/2011 – 06/2013  
**St. Petersburg State Polytechnic University, Saint-Petersburg, Russia**  
**Department of Biophysics**  
*Master of Science in Physics, Diploma with honors*
- 09/2007 – 06/2011  
**St. Petersburg State Polytechnic University, Saint-Petersburg, Russia**  
**Department of Biophysics**  
*Bachelor of Science in Physics, Diploma with honors*

## Research Experience

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- 10/2013 – nowadays  
**Laboratory of Molecular Microbiology**  
**Research Center of Nanobiotechnologies**  
**St. Petersburg State Polytechnic University, Saint-Petersburg, Russia**  
*Engineer*  
**Supervisor:** K.V. Severinov, PhD, Dr. of Sc.  
**Project:** Investigation of Thermus, Bacillus, Pseudomonas bacteriophages
- 10/2011-09/2013  
**Research Center of Nanobiotechnologies**  
**St. Petersburg State Polytechnic University, Russia**  
*Student*  
**Supervisor:** M. Grigoriev Ph.D, Dr. of Sc; M.A. Khodorkovsky, PhD  
**MSc Thesis:** “ATPase activity of TIP49a protein”

Eukaryotic TIP49a (Pontin) and TIP49b (Reptin) AAA+ ATPases play essential roles in key cellular processes. Molecular modeling and molecular dynamics simulations identify some key residues for ATP hydrolysis. To confirm this hypothesis and to better understand the mechanism of ATP hydrolysis, point mutations were introduced in the catalytic pockets of TIP49a protein and these mutants were studied in biochemical assays. Critical role of trans-acting aspartates in the lytic water activation step that is essential for the associative mechanism of ATP hydrolysis, within TIP49a oligomeric assemblies, was understood.

- 03/2010 – 09/2011

**Laboratory of human molecular genetics, Dep. of Molecular Genetics**

**Institute of Experimental Medicine**

**Saint-Petersburg, Russia**

*Student*

**Supervisor:** N.A. Grudinina, PhD; K.V. Solovyov, PhD

**BSc Thesis:** “Fluorescent fusion protein for modeling of Transthyretin fibrillogenesis”

## Publications

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### Journal articles

- Supramolecular structures formed by TIP49A protein *in vitro* (in Russian)  
D.V. Lebedev, **M.L. Sokolova**, Y.V. Fedorova, G.E. Pobegalov, D.B. Chervyakova, S.B. Landa, M.A. Khodorkovskiy  
*St. Petersburg State Polytechnical University Journal vol. 2(170)/2013, p.156-162*
- Changing of DNA molecule mechanical properties during interaction with YOYO-1 intercalating dye (in Russian)  
G.E. Pobegalov, A.N. Arseniev, A.D. Vedyaykin, **M.L. Sokolova**, Ya.V. Fedorova, A.V. Sabantsev  
*St. Petersburg State Polytechnical University Journal vol. 1(165), 2013, p. 136-143*

### Abstracts

- Unusual RNA polymerases encoded by the PBS1 phage  
**M. Sokolova**, D. Lavysh, M. Yakunina, M. Khodorkovskiy, K. Severinov  
76th Harden Conference: Total Transcription, 1-5 September 2014, Wellcome Trust Genome Campus, Hinxton, Cambridge, UK
- Single-molecule studies of DNA-binding ATPase Pontin using optical tweezers  
Pobegalov G E, Arseniev A N , Fedorova Y V, **Sokolova M L**, Petukhov M G, Kas E, Khodorkovskiy M A, Grigoriev M  
1st International School and Conference on Optoelectronics, Photonics, Engineering and Nanostructures, 25 – 27 March 2014, St. Petersburg, Russia
- Single-molecule studies of dsDNA properties using optical tweezers  
G. Pobegalov, A. Arseniev, A. Sabantsev, Y. Fedorova, **M. Sokolova**, A. Melnikov, M. Petukhov, E. Käs, M. Grigoriev and M. Khodorkovskiy  
FEBS Journal, Special Issue: 38th FEBS Congress, Saint Petersburg, Russia, July 6–11, 2013, V. 280, Is. Sup. s1. p. 61.

- Mechanism of ATP hydrolysis by the archeal TIP49 AAA+ protein  
Afanasyeva, A. Hirtreiter, A. Schreiber, **M. Sokolova**, D. Grohmann, A. R. McKay, M. Khodorkovskiy, I. Tsaneva, M. Petukhov, F. Werner and M. Grigoriev,  
FEBS Journal, Special Issue: 38th FEBS Congress, Saint Petersburg, Russia, July 6–11, 2013, V. 280, Is. Sup. s1, p. 156.
- Supramolecular structures formed by TIP49A protein *in vitro*  
D. Lebedev, **M. Sokolova**, J. Fedorova J., D. Chervyakova, S. Landa, M. Petukhov, M. Khodorkovskii  
FEBS Journal, Special Issue: 38th FEBS Congress, Saint Petersburg, Russia, July 6–11, 2013, V. 280, Is. Sup. s1, p. 130.
- Pontin and Reptin: DNA-protein interactions at the single-molecule level using optical tweezers  
G. Pobegalov, A. Sabantsev, A. Arsenyev, Y. Fedorova, **M. Sokolova**, A. Melnikov, M. Petukhov, E. Käs, M. Grigoriev and M. Khodorkovskiy..  
1st International Workshop on Pontin and Reptin, 17-19 October 2012, Bordeaux, France.
- TIP49a/dsDNA transactions at the single-molecule level visualized in real time using optical tweezers  
G. Pobegalov, A. Sabantsev, A. Arseniev, Y. Fedorova, **M. Sokolova**, A. Melnikov, M. Petukhov, E. Käs, M. Khodorkovskiy and M. Grigoriev  
EMBO Conference - Helicases and nucleic acid translocases Co-sponsored by the Harden Conferences. 4–8 August 2013. Robinson College, Cambridge, UK

## Research Techniques

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- Work with bacteria, bacteriophages
- Molecular cloning, PCR, DNA electrophoresis etc.
- Work with proteins, protein electrophoresis, WB, affinity chromatography, measuring ATPase activity etc.

## Research Interests

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- Molecular microbiology
- Interactions between bacteria and phage
- RNA polymerases of giant phages
- Restriction modification systems
- Single-molecule studies
- Molecular genetics
- Genetic diseases

## Languages

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- Russian – native
- English – fluently

## References

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- Letters of recommendations are available on request