CURRICULUM VITAE

Sergei S. Ryazansky

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Education

2014: PhD Molecular Biology, Institute of Molecular Genetics RAS, Moscow, Russia (supervisor A. Kalmykova).

2005: M.S. Biochemestry, Moscow State University, Biological department, Moscow, Russia (with distinction, supervisor V. Gvozdev).

2004: B.S. Biochemistry, Moscow State University, Biological department, Moscow, Russia (with distinction, supervisors V. Gvozdev and V. Vagin).

Advanced training courses:

CSHL: High-Throughput Biology: From Sequences to Networks (New York Genome Center, 2015)

Rosnano: Omics data analysis in biology and medicine (Skoltech, 2015)

Coursera: Computing for Data Analysis (2012), Phylogenetic Analysis (2013), Introduction to Data Science (with distinction, 2013), Computing for Data Analysis (with distinction, 2013), Statistical Inference (with distinction, 2014), R Programming (with distinction, 2014), Reproducible Research (with distinction, 2014), Regression Models (with distinction, 2014), Getting and Cleaning Data (with distinction, 2014), Exploratory Data Analysis (with distinction, 2014), The Data Scientist's Toolbox (with distinction, 2014).

Intuit: Programming in Perl (2011), Graph Theory (2016).

Research interests

RNAi-related mechanisms; evolution of genes and transposable elements; identification, evolution, functions and expression regulation of miRNAs; piRNA-mediated silencing; development of germline tissues.

Computer and bioinformatic skills

The analysis of the Next Generation Sequencing data: Small RNAs, genomic DNA assembling, identification of SV, differential analysis of gene expression, etc.: (bowtie, bwa, samtools, bedtools, picard, Kent tools, egeR, Galaxy, etc.).

Analysis of DNA sequence similarity and evolution (BLAST, Clustal, PAUP, MEGA etc).

Analysis of microarray data (GenePix, limma) and GO terms enrichment.

Programming: Perl/BioPerl, bash, R/Bioconductor, Python; mySQL.

Web: HTML, basic PHP, MediaWiki.

Server administration: Rocks computer cluster, UCSC Genome Browser and Galaxy mirrors, MediaWiki.

Experimental skills

Molecular biology methods: molecular cloning, DNA sequencing, Northern-blot analysis, RT-PCR, qRT-PCR, inverse PCR, long range PCR etc.

Analysis of chromatin structure: DNA in situ hybridisation, ChIP, DNase assay.

Drosophila genetic techniques: receiving lines, mobilisation of P-element constructs, FRT-FLP deletion, transgenesis; some practical skills of working with mice and plants.

Cell biology and immunology techniques: cell cultures, FISH, immunostaining.

Microscopy techniques: inverse, phase contrast, fluorescent, confocal.

Participation in research support grants

Grants, scholarships and fellowships:

- Russian Foundation for Basic Research: 12-04-31352 (2012-2013), 15-04-99645 (2015-p/t., 16-34-60176 (2016-p/t);
- Travel grants (Russian Foundation for Basic Research): 07-04-08569-z (2007), 11-04-09424-mob_z (2011);
- 'Future of the Molecular Genetics' foundation Scholarship (2008-2009, 2010-2011, 2012-2013);
- 'Dynasty' foundation Scholarship (2015);
- SkolTech & Rosnano Scholarship (2015);
- SkolTech Fellowship in Systems Biology (2016-p/t.).

Participation in other grants:

- Russian Foundation for Basic Research: 10-04-00535-a, 11-04-00017-a, 11-04-12027_ofi_m, 12-04-00996-a; 13-04-00699; 16-04-01107; 15-34-21031, 16-54-150003, 16-34-00090, 16-04-01107, 16-04-01764.
- Russian Academy of Sciences: “Physical-chemical Biology” and “Molecular and Cellular Biology” programs.
- Special Federal Programs: № 02.522.11.2005 and 16.512.12.2004.
- Russian Science Foundation: 14-14-01076 (2014-p/t), 16-14-10167 (2016-p/t)

Awards

- Gold medal for excellent study in Moscow State University;
- Winner of the Young Scientists Competition of the Institute of Molecular Genetics, Moscow (2008, 2010, 2012).
- Academia Europaea Prize for young scientists (2016)

Paper reviewing:

PLOS One, Molecular Biology (Moscow), Biochemestry (Moscow), Russian Journal of Plant Physiology, Russian Journal of Developmental Biology, Russian Journal of Genetics, Silence, Journal of Data Mining in Genomics & Proteomics.

Invited seminars:

- Institute of Molecular Biology (Moscow, Russia, 2014, 2015)
- European Research Institute for the Biology of Aging (Groningen, Netherlands, 2013)

- Umeo University (Umeo, Sweeden, 2014)
- ScolTech Seminar in Systems Biology (Moscow, Russia, 2016)

Talks at the conferences:

- XII Lomonosov international conference of students (2005, Moscow, Russia).
- International conference of young scientists, PhD students and students on molecular biology and genetics (2007, Kyiv, Ukraine)
- 9th Conference of the young scientists (Moscow, Russia, 2010)
- 11th Conference of the young scientists (Moscow, Russia, 2012)
- Keystone symposia: "Non-coding RNAs in development and cancer" (Vancover, Canada, 2013)

Languages

Russian (native), English (fluent reading and writing, intermediate speaking).

Names of references:

Vladimir A. Gvozdev, Professor, Head of Department of Animal Molecular Genetics, Institute of Molecular Genetics,123182, Kurchatov sq., Moscow, Russia. PHONE (095)1960012; Email gvozdev@img.ras.ru

Alla I. Kalmykova, PhD, Head of the Genomic Repeats of Eukaryotes Lab, Institute of Molecular Genetics, 123182, Kurchatov sq., Moscow, Russia. PHONE (095)1960019; Email allakalm@gmail.com

Publications

Research papers:

1. E. Radion*, **S. Ryazansky***, N. Akulenko, Ya. Rozovsky, D. Kwon, V. Morgunova, I. Olovnikov, A. Kalmykova. (**2016**) Telomeric retrotransposon HeT-A contains a bidirectional promoter that initiates divergent transcription of piRNA precursors in *Drosophila* germline. *J. Mol. Biol*. (in press)

2. **Ryazansky, S.S.**, Kotov, A.A., Kibanov, M. V., Akulenko, N. V., Korbut, A.P., Lavrov, S.A., Gvozdev, V.A., and Olenina, L. V. (**2016**) RNA helicase Spn-E is required to maintain Aub and AGO3 protein levels for piRNA silencing in the germline of *Drosophila*, *Eur. J. Cell Biol.*, 95 (9), 311–322. [PMID: 27320195]

3. S. Yu. Funikov*, **S. S. Ryazansky***, A. A. Kanapin, A. V. Snezhkina, E. S. Zelentsova, N. G. Shostak, D. G. Garbuz, M. B. Evgen'ev, O. G. Zatsepina, The effect of severe heat shock on microRNA expression pattern in *Drosophila.* (**2016**), Interplay between RNA interference and heat shock response systems in *Drosophila melanogaster*. *Open Biology*: 6(10):160224 [PMID: 27805906]

4. S.Y. Funikov, **S.S. Ryazansky**, E.S. Zelentsova, V.I. Popenko, O.G. Leonova, D.G. Garbuz, M.B. Evgen'ev, O.G. Zatsepina, (**2015**). The peculiarities of piRNA expression upon heat shock exposure in Drosophila melanogaster. *Mob. Genet. Elements*, (doi:10.1080/2159256X.2015.1086502)

5. **S. Ryazansky**§, E. Mikhaleva, N. Akulenko, O. Olenkina (**2014**), Testis-expressed cluster of microRNAs 959-964 controls spermatid differentiation in *Drosophila*. *bioRxiv* (doi:10.1101/013243).

6. S. Shpiz*, **S. Ryazansky***, I. Olovnikov, Yu. Abramov, A. Kalmykova, (**2014**) Euchromatic transposon insertions trigger production of novel pi- and endo-siRNAs at the target sites in the *Drosophila* germline. *PLOS Genetics:* 10(2):e1004138 [PMID: 24516406].

7. I. Olovnikov*, **S. Ryazansky***, S. Shpiz, S. Lavrov, Yu. Abramov, Ch. Vaury, S. Jensen, A. Kalmykova, *De novo* piRNA cluster formation in the *Drosophila* germline triggered by transgenes containing a transcribed transposon fragment, *Nucleic Acids Res*: **2013**, 41(11):5757-68 [PMID: 23620285].

8. G. Kogan, L. Usakin, **S. Ryazansky**, V. Gvozdev. Expansion and Evolution of the X-Linked Testis Specific Multigene Families in the *melanogaster* Species Subgroup. *PLOS ONE*: **2011**, 7(5): e37738 [PMID: 22649555]

9. MV Kibanov, KS Egorova, **SS Ryazansky**, OA Sokolova, AA Kotov, OM Olenkina, AD Stolyarenko, VA Gvozdev, LV Olenina. A novel organelle, the piNG-body, in the nuage of *Drosophila* male germ cells is associated with piRNA-mediated gene silencing. *Mol. Biol. Cell*: **2011**, 22(18);3410-9 [PubMed: 21775629]

10. **SS Ryazansky**§, VA Gvozdev, E Berezikov, Evidence for post-transcriptional regulation of clustered microRNAs in *Drosophila*. *BMC Genomics*: **2011**, 12:371 [PubMed: 21771325]

11. PP. Pashkovskyi, **SS. Ryazanskii**, NL. Radyukina, VA. Gvozdev, VV. Kuznetsov. MIR398 and expression regulation of the cytoplasmic Cu/Zn-superoxide dismutase gene in *Thellungiella halophila* plants under stress conditions. *Rus. J. Of Plant Physiology*: **2010**, 57(5);707-14 [WOS: 000281543600014]

12. MS. Klenov, SA. Lavrov, AD. Stolyarenko, **SS. Ryazansky**, AA. Aravin, T. Tuschl, VA. Gvozdev. Repeat-associated siRNAs cause chromatin silencing of retrotransposons in the *Drosophila melanogaster* germline. *Nucleic Acids Res*. **2007**; 35(16):5430-8. [PMID: 17702759]

Reviews:

13. **S. Ryazansky**§, A. Stolyarenko, M. Klenov, V. Gvozdev. (**2017**) Piwi as inducer of transposon silencing system in *Drosophila melanogaster. Biochemistry (Mosc.)* (in press).

14. **S. Ryazansky**§, E. Mikhaleva, O. Olenkina, Essential functions of microRNAs in the reproductive system of animals (**2014**). *Mol Biol (Mosk)*, 48(3), 319-331. [PMID: 25831886]

15. P. Pashkovskiy, **S. Ryazansky**§, (**2013**) Biogenesis, evolution and functions of plant microRNAs. *Biochemistry (Mosc.)*, 78(6) 627-37 [PMID: 2398889].

16. **SS Ryazansky**§, VA Gvozdev. (**2008**) Small RNAs and cancerogenesis. *Biochemistry (Mosc.)*, 73(5);514-27 [PMID: 18605976]

17. MS Klenov, AD Stolyarenko, **SS Ryazansky**, OA Sokolova, IN Konstantinov, and VA Gvozdev. (**2007**) Role of Short RNAs in Regulating the Expression of Genes and Mobile Elements in Germ Cells. *Rus. J. of Dev. Bio*., 38(3); 171-83 [PMID: 17621977]

* - contributed equally, § - corresponding author

Selected presentations

S Ryazansky, E Mikhaleva, O Olenkina, V. Gvozdev, "Testis-specific cluster of microRNAs controls spermatid individualization in *Drosophila*", Keystone symposia: "Non-coding RNAs in development and cancer" (oral presentation), (Jan. 20–25, 2013, Vancouver, British Columbia, Canada), Abstract Book p.91.

Ryazansky S., Berezikov E, Gvozdev V., "Expression of *Drosophila* clustered microRNA can be regulated on post-transcriptional level", 16th annual meeting of the RNA society "RNA 2011", (June 14-19 2011, Kyoto, Japan), Abstract Book #361.

Pashkovskiy P, **Ryazansky S**, Radyukina N, Kuznetsov V, "Cu/Zn superoxide dismutase mRNA

levels in T*hellungiella halophila* opposite correlate with expression of miR398 under abiotic stresses", Joint Annual Meeting of American Society of Plant Biologists and Canadian Society of Plant Physiologists (July 31 – Aug 4, 2010, Montreal, Canada), Abstract Book p.98.

Klenov M., Lavrov S., Stolyarenko A., **Ryazansky S.**, Aravin A., Tucshl T., Gvozdev V., "Germline repeat-associated short interfering RNAs and chromatin silencing of selfish elements in *Drosophila melanogaster*" (oral presentation by M. Klenov), Keystone symposia: "MicroRNAs and siRNAs: Biological Functions and Mechanism" (Jan. 28 – Feb. 2, 2007 г., Keystone, Colorado, USA), Abstract Book p.77.

Vagin V., Olenkina O., **Ryazansky S.** et al., "Production and function of rasiRNA in *Drosophila*" (oral presentation by V. Vagin), Keystone symposia: "Diverse Roles of RNA in Gene Regulation" (Jan. 8-14, 2005, Breckenridge, USA), Abstract Book p.69.