

Резюме: Зарайский Андрей Георгиевич

Адрес

Федеральное государственное бюджетное учреждение науки Институт биоорганической химии им. академиков М.М. Шемякина и Ю.А. Овчинникова Российской академии наук, Москва, Россия

Контакты

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Образование

2011	Россия		Диплом профессора по специальности "молекулярная биология"
2000	Россия, Москва	Московский государственный университет имени М.В. Ломоносова (МГУ), биологический факультет	Присуждена учёная степень доктора биологических наук
1990	Россия, Москва	Московский государственный университет имени М.В. Ломоносова (МГУ), биологический факультет	Присуждена учёная степень кандидата биологических наук

Работа в ИБХ

2018–наст.вр.	Главный научный сотрудник
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Членство в советах и комиссиях ИБХ

Диссертационный совет
Ученый совет

Награды

2006	Премия РАН имени А.О. Ковалевского	За работу «Гомеобоксные гены класса ANF регуляторы раннего развития головного мозга позвоночных»
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Научные интересы

Основные работы А.Г. Зарайского посвящены структурно-функциональному изучению генов и белков, регулирующих эмбриональное развитие мозга.

Членство в сообществах

А. Г. Зарайский является членом Ученого и Диссертационного советов ИБХ РАН, редколлегий журналов «Молекулярная биология» и «Онтогенез».

Степени и звания

Профессор
Доктор наук (Биологические науки, 03.00.03 — Молекулярная биология)

Гранты и проекты

2014–2018	Изменение скорости диффузии морфогенов как механизм регуляции морфогенетического поля.
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2023– наст.вр.	Геномные механизмы эмбрионального развития и регенерации как фундаментальная основа для разработки медицинских технологий
2019– 2021	Поиск и изучение функций генов эмбрионального скейлинга
2018– 2021	Изучение роли нового трансмембранного белка-регулятора регенерации, исчезнувшего в эволюции позвоночных, с-Answer, с применением системы генного нокаута CRISPR/Cas9

Публикации

1. Bayramov AV, Yastrebov SA, Mednikov DN, Ermakova GV, **Zaraisky AG** (2024). The Origin and Mechanisms of Development of Paired Fins in Vertebrates. *RUSS J DEV BIOL* 55 (3), 99–118, [10.1134/S1062360424700097](#)
2. Bayramov AV, Ermakova GV, Kucheryavyy AV, Eroshkin FM, **Zaraisky AG** (2024). Genetic Basis of Morphological Transformations: Genes of the Noggin and Foxg1 Families as a Legacy of Whole Genome Duplications in Early Vertebrate Evolution. *PALEONTOL J* 58 (12), 1367–1388, [10.1134/S0031030124601208](#)
3. Shitikov A, Parshina E, **Zaraisky A**, Tereshina MB (2024). An improved method for whole-mount in situ hybridization in regenerating tails of *Xenopus laevis* tadpoles. *Front Cell Dev Biol* 12, 1487644, [10.3389/fcell.2024.1487644](#)
4. Timoshina PS, Nesterenko AM, Parshina EA, Orlov EE, Eroshkin FM, **Zaraisky AG** (2024). Dissecting the mystery of embryonic scaling: The Scalers Hypothesis and its confirmation in sea urchin embryos. *Cells and Development* , 203972, [10.1016/j.cdev.2024.203972](#)
5. Ermakova GV, Mugue NS, Mischenko AV, **Zaraisky AG**, Bayramov AV (2024). Foxg1 Genes of Acipenseriformes Support a Model of Ancestral Genomic Duplication Followed by Asynchronous Rediploidization. *RUSS J DEV BIOL* 55, 72–84, [10.1134/S1062360424700073](#)
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7. Ivanova ED, Parshina EA, **Zaraisky AG**, Martynova NY (2024). Isoforms of the Cytoskeletal LIM-Domain Protein Zyxin in the Early Embryogenesis of *Xenopus laevis*. *Russ. J. Bioorganic Chem.* 50 (3), 723–732, [10.1134/S1068162024030026](#)
8. Parshina EA, **Zaraisky AG**, Martynova NY (2024). Ribonucleoprotein Complex Factor Ybx1 Stabilizes the Maternal mRNA of the *ssx2ip* Gene Encoding the Centrosome Maturation Protein in *Xenopus laevis* Embryogenesis. *Russ. J. Bioorganic Chem.* 50 (3), 715–722, [10.1134/S1068162024030051](#)
9. Паршина ЕА, **Зарайский АГ**, Мартынова НЮ (2024). Фактор рибонуклеопротеиновых комплексов Ybx1 стабилизирует материнскую мРНК гена *ssx2ip*, кодирующего белок созревания centrosом, в эмбриональном развитии лягушки *Xenopus laevis*. *Биоорганическая химия* 50 (3), 338–344, [10.31857/S0132342324030133](#)
10. **Zaraisky AG**, Araslanova KR, Shitikov AD, Tereshina MB (2024). Loss of the ability to regenerate body appendages in vertebrates: from side effects of evolutionary innovations to gene loss. *Biol Rev Camb Philos Soc* , , [10.1111/brv.13102](#)
11. Bayramov AV, Yastrebov SA, Mednikov DN, Araslanova KR, Ermakova GV, **Zaraisky AG** (2024). Paired fins in vertebrate evolution and ontogeny. *Evol Dev* 26 (3), e12478, [10.1111/ede.12478](#)
12. Bayramov AV, Ermakova GV, **Zaraisky AG** (2024). Reconstruction of Ancestral Genomes as a Key to Understanding the Early Evolution of Vertebrate Genotype. *RUSS J DEV BIOL* 54, S1–S9, [10.1134/S1062360423070020](#)
13. Ermakova GV, Kucheryavyy AV, **Zaraisky AG**, Bayramov AV (2024). The Molecular Mechanism of Body Axis Induction in Lampreys May Differ from That in Amphibians. *Int J Mol Sci* 25 (4), , [10.3390/ijms25042412](#)
14. Ermakova GV, Meyntser IV, **Zaraisky AG**, Bayramov AV (2024). Loss of *noggin1*, a classic embryonic inducer gene, in elasmobranchs. *Sci Rep* 14 (1), 3805, [10.1038/s41598-024-54435-9](#)
15. Eroshkin FM, Fefelova EA, Bredov DV, Orlov EE, Kolyupanova NM, Mazur AM, Sokolov AS, Zhigalova NA,

- Prokhortchouk EB, Nesterenko AM, **Zaraisky AG** (2024). Mechanical Tensions Regulate Gene Expression in the *Xenopus laevis* Axial Tissues. *Int J Mol Sci* 25 (2), , [10.3390/ijms25020870](https://doi.org/10.3390/ijms25020870)
16. Ermakova GV, Kucheryavyy AV, Mugue NS, Mischenko AV, **Zaraisky AG**, Bayramov AV (2024). Three foxg1 paralogues in lampreys and gnathostomes—brothers or cousins? *Front Cell Dev Biol* 11, 1321317, [10.3389/fcell.2023.1321317](https://doi.org/10.3389/fcell.2023.1321317)
 17. Lyubetsky VA, Rubanov LI, Tereshina MB, Ivanova AS, Araslanova KR, Uroshlev LA, Goremykina GI, Yang JR, Kanovei VG, Zverkov OA, Shitikov AD, Korotkova DD, **Zaraisky AG** (2023). Wide-scale identification of novel/eliminated genes responsible for evolutionary transformations. *Biol Direct* 18 (1), 45, [10.1186/s13062-023-00405-6](https://doi.org/10.1186/s13062-023-00405-6)
 18. Bayramov AV, Ermakova GV, Kucheryavyy AV, Meintser IV, **Zaraisky AG** (2022). Lamprey as Laboratory Model for Study of Molecular Bases of Ontogenesis and Evolutionary History of Vertebrata. *J Ichthyol* 62 (7), 1213–1229, [10.1134/S0032945222060029](https://doi.org/10.1134/S0032945222060029)
 19. Korotkova DD, Gantsova EA, Goryashchenko AS, Eroshkin FM, Serova OV, Sokolov AS, Sharko F, Zhenilo SV, Martynova NY, Petrenko AG, **Zaraisky AG**, Deyev IE (2022). Insulin Receptor-Related Receptor Regulates the Rate of Early Development in *Xenopus laevis*. *Int J Mol Sci* 23 (16), , [10.3390/ijms23169250](https://doi.org/10.3390/ijms23169250)
 20. Parshina EA, Orlov EE, **Zaraisky AG**, Martynova NY (2022). The Cytoskeletal Protein Zyxin Inhibits Retinoic Acid Signaling by Destabilizing the Maternal mRNA of the RXR γ Nuclear Receptor. *Int J Mol Sci* 23 (10), , [10.3390/ijms23105627](https://doi.org/10.3390/ijms23105627)
 21. Orlov EE, Nesterenko AM, Korotkova DD, Parshina EA, Martynova NY, **Zaraisky AG** (2022). Targeted search for scaling genes reveals matrix metalloproteinase 3 as a scaler of the dorsal-ventral pattern in *Xenopus laevis* embryos. *Dev Cell* 57 (1), 95–111.e12, [10.1016/j.devcel.2021.11.021](https://doi.org/10.1016/j.devcel.2021.11.021)
 22. Filenko PA, Chechenina AA, **Zaraisky AG**, Eroshkin FM (2022). The Effect of Myosin Inhibitors on the Expression of Mechano-Dependent Genes in the Early Development of the Clawed Frog. *Russ. J. Bioorganic Chem.* 48 (4), 854–857, [10.1134/S1068162022040094](https://doi.org/10.1134/S1068162022040094)
 23. Ermakova GV, Kucheryavyy AV, Eroshkin FM, Martynova NY, **Zaraisky AG**, Bayramov AV (2021). Study of the Early Telencephalon Genes of Cyclostomes as a Way to Restoring the Evolutionary History of This Unique Part of the Central Nervous System of Vertebrates. *PALEONTOL J* 55 (7), 752–765, [10.1134/S0031030121070030](https://doi.org/10.1134/S0031030121070030)
 24. Martynova NY, Parshina EA, **Zaraisky AG** (2021). Cytoskeletal protein Zyxin in embryonic development: from controlling cell movements and pluripotency to regulating embryonic patterning. *FEBS J* 290 (1), 66–72, [10.1111/febs.16308](https://doi.org/10.1111/febs.16308)
 25. Ivanova AS, Tereshina MB, Araslanova KR, Martynova NY, **Zaraisky AG** (2021). The Secreted Protein Disulfide Isomerase Ag1 Lost by Ancestors of Poorly Regenerating Vertebrates Is Required for *Xenopus laevis* Tail Regeneration. *Front Cell Dev Biol* 9, 738940, [10.3389/fcell.2021.738940](https://doi.org/10.3389/fcell.2021.738940)
 26. Bayramov AV, Ermakova GV, Kucheryavyy AV, **Zaraisky AG** (2021). Genome Duplications as the Basis of Vertebrates' Evolutionary Success. *RUSS J DEV BIOL* 52, 141–163, [10.1134/S1062360421030024](https://doi.org/10.1134/S1062360421030024)
 27. Martynova NY, Parshina EA, **Zaraisky AG** (2021). Protocol for separation of the nuclear and the cytoplasmic fractions of *Xenopus laevis* embryonic cells for studying protein shuttling. *STAR Protocols* 2 (2), 100449, [10.1016/j.xpro.2021.100449](https://doi.org/10.1016/j.xpro.2021.100449)
 28. Martynova NY, Parshina EA, **Zaraisky AG** (2021). Using RNA-binding proteins for immunoprecipitation of mRNAs from *Xenopus laevis* embryos. *STAR Protocols* 2 (2), 100552, [10.1016/j.xpro.2021.100552](https://doi.org/10.1016/j.xpro.2021.100552)
 29. Ермакова ГВ, Кучерявый АВ, **Зарайский АГ**, Байрамов АВ (2021). СРАВНИТЕЛЬНЫЙ АНАЛИЗ ПАТТЕРНОВ ЭКСПРЕССИИ ГЕНОВ СЕМЕЙСТВА NOGGIN НА РАННИХ СТАДИЯХ РАЗВИТИЯ ГОЛОВНЫХ СТРУКТУР ЕВРОПЕЙСКОЙ РЕЧНОЙ МИНОГИ LAMPETRA FLUVIATILIS. *Ontogenez* 52 (1), 46–55, [10.31857/S0475145021010031](https://doi.org/10.31857/S0475145021010031)
 30. Байрамов АВ, Ермакова ГВ, Кучерявый АВ, **Зарайский АГ** (2021). ГЕНОМНЫЕ ДУПЛИКАЦИИ КАК ОСНОВА ЭВОЛЮЦИОННОГО УСПЕХА ПОЗВОНОЧНЫХ. *Ontogenez* 52 (3), 170–194, [10.31857/S0475145021030022](https://doi.org/10.31857/S0475145021030022)
 31. Ermakova GV, Kucheryavyy AV, **Zaraisky AG**, Bayramov AV (2021). Comparative Analysis of Expression Patterns of the Noggin Gene Family Genes at the Early Development Stages of Head Structures in the European River Lamprey *Lampetra fluviatilis*. *RUSS J DEV BIOL* 52, 33–41, [10.1134/S1062360421010033](https://doi.org/10.1134/S1062360421010033)
 32. Parshina E, **Zaraisky AG**, Martynova NY (2020). The Role of Maternal pou5f3.3/oct60 Gene in the

- Regulation of Initial Stages of Tissue Differentiation during *Xenopus laevis* Embryogenesis. *Russ. J. Bioorganic Chem.* 46 (6), 1172–1180, [10.1134/S1068162020060242](https://doi.org/10.1134/S1068162020060242)
33. Паршина ЕА, **Зарайский АГ**, Мартынова НЮ (2020). Роль материнского гена *rou5f3.3/oct60* в регуляции начальных этапов дифференцировки тканей в эмбриогенезе шпорцевой лягушки *Xenopus laevis*. *Bioorg Khim* 46 (6), 719–728, [10.31857/S013234232006024X](https://doi.org/10.31857/S013234232006024X)
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 35. Martynova NY, Parshina EA, Eroshkin FM, **Zaraisky AG** (2020). The Cytoskeletal Protein Zyxin Modulates the Expression of the Target Genes of the Shh Signaling Cascade in the Cells of the Neural Plate of Embryos of the Spur-Toed Frog *Xenopus laevis*. *Russ. J. Bioorganic Chem.* 46 (4), 530–536, [10.1134/S1068162020040147](https://doi.org/10.1134/S1068162020040147)
 36. Ermakova GV, Kucheryavyy AV, **Zaraisky AG**, Bayramov AV (2020). Publisher Correction: Discovery of four Noggin genes in lampreys suggests two rounds of ancient genome duplication. *Commun Biol* 3 (1), 532, [10.1038/s42003-020-01272-x](https://doi.org/10.1038/s42003-020-01272-x)
 37. Ermakova GV, Kucheryavyy AV, **Zaraisky AG**, Bayramov AV (2020). Discovery of four Noggin genes in lampreys suggests two rounds of ancient genome duplication. *Commun Biol* 3 (1), 501, [10.1038/s42003-020-01234-3](https://doi.org/10.1038/s42003-020-01234-3)
 38. Ermakova GV, Kucheryavyy AV, **Zaraisky AG**, Bayramov AV (2020). Heterochrony of the Expression of *Lanf* and *Foxg1* in the Lamprey Confirms the Appearance of the Telencephalon as an Evolutionarily Young Superstructure in the Central Nervous System of Vertebrates. *RUSS J DEV BIOL* 51, 246–254, [10.1134/S1062360420040049](https://doi.org/10.1134/S1062360420040049)
 39. Bayramov AV, Ermakova GV, **Zaraisky AG** (2020). Genetic Mechanisms of the Early Development of the Telencephalon, a Unique Segment of the Vertebrate Central Nervous System, as Reflecting Its Emergence and Evolution. *RUSS J DEV BIOL* 51, 162–175, [10.1134/S1062360420030054](https://doi.org/10.1134/S1062360420030054)
 40. Rubanov LI, **Zaraisky AG**, Shilovsky GA, Seliverstov AV, Zverkov OA, Lyubetsky VA (2019). Screening for mouse genes lost in mammals with long lifespans. *BioData Min* 12 (1), 20, [10.1186/s13040-019-0208-x](https://doi.org/10.1186/s13040-019-0208-x)
 41. Korotkova DD, Lyubetsky VA, Ivanova AS, Rubanov LI, Seliverstov AV, Zverkov OA, Martynova NY, Nesterenko AM, Tereshina MB, Peshkin L, **Zaraisky AG** (2019). Bioinformatics Screening of Genes Specific for Well-Regenerating Vertebrates Reveals *c-answr*, a Regulator of Brain Development and Regeneration. *Cell Rep* 29 (4), 1027–1040.e6, [10.1016/j.celrep.2019.09.038](https://doi.org/10.1016/j.celrep.2019.09.038)
 42. Ermakova GV, Kucheryavyy AV, **Zaraisky AG**, Bayramov AV (2019). The expression of *FoxG* in the early development of the European river lamprey *Lampetra fluviatilis* demonstrates significant heterochrony with that in other vertebrates. *Gene Expr Patterns* 34, 119073, [10.1016/j.gep.2019.119073](https://doi.org/10.1016/j.gep.2019.119073)
 43. Nesterenko AM, **Zaraisky AG** (2019). The Mechanisms of Embryonic Scaling. *RUSS J DEV BIOL* 50 (3), 95–101, [10.1134/S1062360419030044](https://doi.org/10.1134/S1062360419030044)
 44. Tereshina MB, Ivanova AS, Eroshkin FM, Korotkova DD, Nesterenko AM, Bayramov AV, Solovieva EA, Parshina EA, Orlov EE, Martynova NY, **Zaraisky AG** (2019). *Agr2*-interacting *Prod1*-like protein *Tfp4* from *Xenopus laevis* is necessary for early forebrain and eye development as well as for the tadpole appendage regeneration. *Genesis* 57 (5), e23293, [10.1002/dvg.23293](https://doi.org/10.1002/dvg.23293)
 45. Ivanova AS, Korotkova DD, Ermakova GV, Martynova NY, **Zaraisky AG**, Tereshina MB (2018). Ras-dva small GTPases lost during evolution of amniotes regulate regeneration in anamniotes. *Sci Rep* 8 (1), 13035, [10.1038/s41598-018-30811-0](https://doi.org/10.1038/s41598-018-30811-0)
 46. Байрамов АВ, Ермакова ГВ, Кучерявый АВ, **Зарайский АГ** (2018). Миноги – “живые ископаемые” в исследованиях раннего развития и регенерации позвоночных. *Ontogenez* 49 (5), S3–S14, [10.1134/S0475145018080013](https://doi.org/10.1134/S0475145018080013)
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