Curriculum vitae: Andrey Zaraisky

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Education

2011	Russia, Moscow		professor in molecular biology
2000	Russia, Moscow	M.V. Lomonosov Moscow State University (biological faculty)	DSc in molecular biology and developmental biology
1990	Russia, Moscow	M.V. Lomonosov Moscow State University (biological faculty)	PhD in molecular biology

IBCh positions

2018–to date	Principal research fellow

IBCh memberships

Dissertation council
Scientific council

Awards

2006	Премия РАН имени А.О. Ковалевского

Scientific interests

The main scientific interests of Dr. Zaraisky are focused on structural and functional study of genes and proteins that regulate embryonic development of the brain.

Scientific societies' membership

Dr. Zaraisky is a member of the Academic and Dissertation councils of Shemyakin-Ovchinnikov Institute of Bioorganic Chemistry Russian Academy of Sciences, Editorial Boards of the journals Molecular Biology and Russian Journal of Developmental Biology.

Titles

Professor
Doctor of Science (Biological sciences)

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Grants and projects

2014–2018	-Изменение скорости диффузии морфогенов как механизм регуляции морфогенетического поля.

2023–to date	-Геномные механизмы эмбрионального развития и регенерации как фундаментальная основа для разработки медицинских технологий
2019–2021	-Поиск и изучение функций генов эмбрионального скейлинга
2018–2021	-

Publications

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
6. Ermakova GV, Kucheryavyy AV, **Zaraisky AG**, Bayramov AV (2024). Three Foxg1 Genes in Lampreys: The Heritage of Whole-Genome Duplications at the Early Stages of Vertebrate Evolution. *RUSS J DEV BIOL* 55, 15–25, 10.1134/S1062360424700024
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 центросом, 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

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
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
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
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
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 RXRγ Nuclear Receptor. *Int J Mol Sci* 23 (10), , 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
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
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
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
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
26. Bayramov AV, Ermakova GV, Kuchryavyy AV, **Zaraisky AG** (2021). Genome Duplications as the Basis of Vertebrates' Evolutionary Success. *RUSS J DEV BIOL* 52, 141–163, 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
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
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
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
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
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

33. Паршина ЕА, **Зарайский АГ**, Мартынова НЮ (2020). Роль материнского гена pou5f3.3/oct60 в регуляции начальных этапов дифференцировки тканей в эмбриогенезе шпорцевой лягушки Xenopus Laevis. *Bioorg Khim* 46 (6), 719–728, 10.31857/S013234232006024X
34. Parshina EA, Eroshkin FM, Orlov EE, Gyoeva FK, Shokhina AG, Staroverov DB, Belousov VV, Zhigalova NA, Prokhortchouk EB, **Zaraisky AG**, Martynova NY (2020). Cytoskeletal Protein Zyxin Inhibits the Activity of Genes Responsible for Embryonic Stem Cell Status. *Cell Rep* 33 (7), 108396, 10.1016/j.celrep.2020.108396
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
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
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
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
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
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
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-answer, a Regulator of Brain Development and Regeneration. *Cell Rep* 29 (4), 1027–1040.e6, 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
43. Nesterenko AM, **Zaraisky AG** (2019). The Mechanisms of Embryonic Scaling. *RUSS J DEV BIOL* 50 (3), 95–101, 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
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
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
47. Kotlobay AA, Sarkisyan KS, Mokrushina YA, Marcet-Houben M, Serebrovskaya EO, Markina NM, Gonzalez Somermeyer L, Gorokhovatsky AY, Vvedensky A, Purtov KV, Petushkov VN, Rodionova NS, Chepurnyh TV, Fakhranurova LI, Guglya EB, Ziganshin R, Tsarkova AS, Kaskova ZM, Shender V, Abakumov M, Abakumova TO, Povolotskaya IS, Eroshkin FM, **Zaraisky AG**, Mishin AS, Dolgov SV, Mitiouchkina TY, Kopantzev EP, Waldenmaier HE, Oliveira AG, Oba Y, Barsova E, Bogdanova EA, Gabaldón T, Stevani CV, Lukyanov S, Smirnov IV, Gitelson JI, Kondrashov FA, Yampolsky IV (2018). Genetically encodable bioluminescent system

from fungi. *Proc Natl Acad Sci U S A* 115 (50), 12728–12732, 10.1073/pnas.1803615115
48. Eroshkin FM, Kremnev SV, Ermakova GV, **Zaraisky AG** (2018). Development of Methods and Techniques to Visualize Mechanical Tension in Embryos Using Genetically Encoded Fluorescent Mechanosensors. *RUSS J DEV BIOL* 49 (6), 362–369, 10.1134/S1062360418060024
49. Bayramov AV, Ermakova GV, Kucheryavyy AV, **Zaraisky AG** (2018). Lampreys, “Living Fossils,” in Research on Early Development and Regeneration in Vertebrates. *RUSS J DEV BIOL* 49 (6), 327–338, 10.1134/S1062360418080015
50. Ivanova AS, Martynova NY, Komarov PA, Orlov EE, Ermakova GV, **Zaraisky AG**, Tereshina MB (2018). Obtaining of Agr2 Specific Antibodies and Determination of the Agr2 Protein Distribution Pattern during Early Embryonic Development and Tadpole Regeneration in Xenopus laevis. *RUSS J DEV BIOL* 49 (6), 393–397, 10.1134/S1062360418060036
51. **(conference)** Байрамов АВ, Ермакова ГВ, Ерошкин ФМ, Иванова АС, Мартынова НЮ, Терёшина МБ, **Зарайский АГ** (2018). Гены, исчезнувшие в эволюции, как регуляторы развития мозга и регенерации. *Современные проблемы физикохимической и клеточной биологии: от молекул к живым системам* , 36.
52. Ivanova AS, Ermakova GV, **Zaraisky AG**, Tereshina MB (2018). Patterns of Mitosis and Activation of the Map-Kinase Cascade during Tadpole Tail Regeneration in the Refractory Period of Xenopus laevis Development. *RUSS J DEV BIOL* 49 (5), 260–263, 10.1134/S1062360418050028
53. Martynova NY, Parshina EA, Ermolina LV, **Zaraisky AG** (2018). The cytoskeletal protein Zyxin interacts with the zinc-finger transcription factor Zic1 and plays the role of a scaffold for Gli1 and Zic1 interactions during early development of Xenopus laevis. *Biochem Biophys Res Commun* 504 (1), 251–256, 10.1016/j.bbrc.2018.08.164
54. **(conference)** Иванова АС, Мартынова НЮ, Ермакова ГВ, Короткова ДД, **Зарайский АГ** (2018). GENES MISSING IN AMNIOTES REGULATE REGENERATION IN ANAMNIOTES. *EMBO Conference* , 124.
55. Eroshkin FM, Bayramov AV, Ermakova GV, **Zaraisky AG**, Martynova NY (2018). Molecular Mechanisms of the Xanf1 Homeobox Gene Expression Regulation during the Early Development of the Forebrain Rudiment in the Clawed Frog. *Russ. J. Bioorganic Chem.* 44 (3), 310–321, 10.1134/S1068162018030032
56. Ivanova AS, Korotkova DD, Martynova NY, Averyanova OV, **Zaraisky AG**, Tereshina MB (2018). Methods of In Vivo Gene-Specific Knockdown Using Morpholino and Vivo-Morpholino Oligonucleotides. *Russ. J. Bioorganic Chem.* 44 (3), 358–361, 10.1134/S106816201803007X
57. Martynova NY, Eroshkin FM, **Zaraisky AG** (2018). Effect of a Heterodimeric Complex of the Transcription Factors SoxD (Sox15) and Xanf1 on the Formation of the Xanf1 Gene Expression Zone during the Early Development of the Forebrain in the Spur-Toed Frog. *Russ. J. Bioorganic Chem.* 44 (3), 362–365, 10.1134/S106816201803010X
58. **(conference)** Иванова АС, **Зарайский АГ** (2018). The secreted factor Ag1 and small GTPases Ras-dva missing in amniotes regulate fins regeneration in Danio rerio. *2nd International FishMed Conference on Zebrafish Research* , 104.
59. Martynova NY, Eroshkin FM, Orlov EE, **Zaraisky AG** (2018). HMG-box factor SoxD/Sox15 and homeodomain-containing factor Xanf1/Hesx1 directly interact and regulate the expression of Xanf1/Hesx1 during early forebrain development in Xenopus laevis. *Gene* 638, 52–59, 10.1016/j.gene.2017.09.024
60. Bayramov AV, Ermakova GV, Eroshkin FM, Kucheryavyy AV, Martynova NY, **Zaraisky AG** (2017). Presence of homeobox gene of Anf class in Pacific lamprey Lethenteron camtschaticum confirms the hypothesis about the importance of emergence of Anf genes for the origin of telencephalon in vertebrate evolution. *RUSS J DEV BIOL* 48 (4), 241–251, 10.1134/S1062360417040026
61. **(conference)** Korotkova D, Ivanova A, Lyubetsky V, Seliverstov A, Martynova N, Nesterenko A, Tereshina M, **Zaraisky A** (2017). Novel FGF-signaling modulator c-Answer revealed by bioinformatics screening for genes present only in well-regenerative animals. *Mech Dev* (145), S49–PS1.82, 10.1016/j.mod.2017.04.089
62. Eroshkin FM, Martynova NY, Bayramov AV, Ermakova GV, Ivanova AS, Korotkova DD, **Zaraisky AG** (2017). Interaction of secreted factor Agr2 with its potential receptors from the family of three-finger proteins. *Russ. J. Bioorganic Chem.* 43 (3), 344–346, 10.1134/S1068162017030049
63. Orlov EE, Nesterenko AM, Martynova NY, **Zaraisky AG** (2017). Vizualizing the morphogen adsorption gradient in the Xenopus laevis embryo using fluorescently labeled heparin-binding motif of BMP4 morphogen.

Russ. J. Bioorganic Chem. 43 (3), 347–349, 10.1134/S1068162017030128
64. Eroshkin FM, **Zaraisky AG** (2017). Mechano-sensitive regulation of gene expression during the embryonic development. *Genesis* 55 (4), , 10.1002/dvg.23026
65. Nesterenko AM, Kuznetsov MB, Korotkova DD, **Zaraisky AG** (2017). Morphogene adsorption as a Turing instability regulator: Theoretical analysis and possible applications in multicellular embryonic systems. *PLoS One* 12 (2), e0171212, 10.1371/journal.pone.0171212
66. Bayramov AV, Eroshkin FM, Martynova NY, Orlov EE, Borodulin AV, **Zaraisky AG** (2017). The secreted protein Noggin4 is an activator of the Wnt/PCP-signaling pathway. *Russ. J. Bioorganic Chem.* 43 (2), 216–219, 10.1134/S1068162017020029
67. Bayramov AV, Ermakova GV, Eroshkin FM, Kucheryavyy AV, Martynova NY, **Zaraisky AG** (2016). The presence of Anf/Hesx1 homeobox gene in lampreys suggests that it could play an important role in emergence of telencephalon. *Sci Rep* 6, 39849, 10.1038/srep39849
68. Bayramov AV, Eroshkin FM, Borodulin AV, Martynova NY, Ermakova GV, **Zaraisky AG** (2016). Secreted protein Noggin4 participates in the formation of forebrain structures in Xenopus laevis by inhibiting the Wnt/beta-catenin signaling pathway. *RUSS J DEV BIOL* 47 (4), 202–206, 10.1134/S1062360416040020
69. Martynova NY, Nesterenko AM, Orlov EE, Eroshkin FM, Borodulin AV, Bayramov AV, **Zaraisky AG** (2016). The interaction of secreted proteins Noggin4 and Wnt8 from Xenopus laevis embryos. *Russ. J. Bioorganic Chem.* 42 (3), 340–342, 10.1134/S1068162016030110
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72. Matlashov ME, Bogdanova YA, Ermakova GV, Mishina NM, Ermakova YG, Nikitin ES, Balaban PM, Okabe S, Lukyanov S, Enikolopov G, **Zaraisky AG**, Belousov VV (2015). Fluorescent ratiometric pH indicator SypHer2: Applications in neuroscience and regenerative biology. *BIOCHIM BIOPHYS ACTA* 1850 (11), 2318–2328, 10.1016/j.bbagen.2015.08.002
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