

VITALII KIM

Assistant project scientist. University of California, Irvine.
Department of Chemical and Biomolecular Engineering. Henry Samueli School of Engineering.
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Ph.D. in Biophysics and Bioengineering

11 years in academia

7 years in industry (R&D, own startup project)

40+ publications and patents (scholar.google.com/citations?user=o5IPtewAAAAJ&hl=en&authuser=1)

EDUCATION

- **Ph.D.** 2012-2016. Biophysics and Bioengineering. Lomonosov Moscow State University, Moscow, Russia.
- **M.S.** 2007-2012. Microelectronics. Nano- and biomedical technologies department. Saratov State University, Saratov, Russia.
- **Educational program graduate:** “Implementing of innovative technologies within major corporations”2017 Ural Federal University. Ekaterinburg, Russia.

WORK EXPERIENCE

- **2024 – present. PROJECT SCIENTIST**
Department of Chemical and Biomolecular Engineering. University of California, Irvine.
Experience: Cell transfection, immunostaining, confocal microscopy, holotomography, phase contrast microscopy, molecular biology, bioelectronics devices.
- **2019 – 2024. POST-DOCTORAL RESEARCHER**
Cell physiology and biophysics lab. Frank Reidy Research Center for Bioelectrics.
Old Dominion University, Norfolk, VA
Experience: Cell biology. Bioelectrics. Neurobiology. Expertise with mammalian cell culture. Cell experiments (neurons, CHO, HEK, BPAE, SMC). Neurostimulation. Animal experiments. Fluorescence microscopy. Computer simulation. Data analysis. Organization, planning, and conducting experiments. Improving experimental setups and methods of data analysis. Developing new methods for cell study. Maintaining, troubleshooting, and repairing laboratory equipment. Training research personnel, student supervision. Presentations, publications, and patents.
- **2012 –2018. PROJECT SCIENTIST**
Biophysics department. Lomonosov Moscow State University, Moscow, Russia.
Experience: Developing new drug delivery systems (nanocapsules) based on liposomes and inorganic nanoparticles. Designing experiments. Chemical Engineering Applying chemical synthesis techniques. Materials Science. Characterizing material properties (AFM, SEM, TEM, and spectroscopy techniques). Conducting animal experiments. Troubleshooting and problem-solving. Performing multivariate data analysis. Presentations, publications, and patents. Leading cross-disciplinary teams and collaborating. Maintaining laboratory equipment.
- **2012 –2018. LEADER OF START-UP PROJECT**
LLC “AkKoLab”, (Grafenika), Moscow, Russia
Experience: Developing nanoparticles for medical and microelectronics applications, printed bioelectronics, Chemical Engineering, Materials Science. Principal investigator, team leader. Commercialization of scientific developments. Customers: Stanford University (USA), MINES Saint-Étienne (France), Heraeus Deutschland (Germany), Durham University (UK), Clean Energy Institute. University of Washington (USA), etc. Winner of the grand prix of the start-up projects contest GenerationS. top 8 out of 4237 startups. (en.generation-startup.ru/media-center/news/31149/?sphrase_id=19169)

AWARDS AND LEADERSHIP

- **Best Post-Doc & Young Researcher Award.** 16th International Bioelectrics Symposium (BIOELECTRICS 2023), Lisbon, Portugal, 10-13th September 2023. <https://bioelectrics2023.pt/>. <https://ww1.odu.edu/bioelectrics/news/2023-news/bioelectrics-news>
- Member of the organizing committee. Frank Reidy Research Center for Bioelectrics RETREAT 2021, 2023 (Old Dominion University, Norfolk, VA, USA). (<https://ww1.odu.edu/bioelectrics/news/2023-news/bioelectrics-news>)

PATENTS

- Andrei G Pakhomov, **Vitalii Kim**, Iurii Semenov, Emily Gudvangen. Enhanced focal stimulation by spatiotemporal summation of nanosecond electric pulses. 2023/9/7. Patent number WO2023167747A2. <https://patents.google.com/patent/WO2023167747A2/en?q=WO2023167747A2>
- Gubin S.P., **Kim V.P.**, Kornilov D.Yu. et al. RU2574528 "Graphene electrical conductor and method of its fabrication (versions)" 10.22.2014. (<https://patents.google.com/patent/RU2574528C1/ru>) (<https://www.fips.ru/cdfi/fips.dll/ru?ty=29&docid=2574528>);
- Glukhovskoy E.G., **Kim V.P.**, Bretezinsky G.B. et al. RU111297 "Installation for obtaining monolayers by the Langmuir-Blodgett method in an electric field" 08.19.2011.

SELECTED PUBLICATIONS

1. **Kim, V.**; Semenov, I.; Kiester, A.S. et al. Control of the Electroporation Efficiency of Nanosecond Pulses by Swinging the Electric Field Vector Direction. *Int. J. Mol. Sci.* 2023, 24, 10921. <https://doi.org/10.3390/ijms241310921>
2. **Vitalii Kim**, Iurii Semenov, Allen S. Kiester et al. Action spectra and mechanisms of (in) efficiency of bipolar electric pulses at electroporation, *Bioelectrochemistry*, Volume 149, 2023, <https://doi.org/10.1016/j.bioelechem.2022.108319>.
3. Gudvangen, E., **Kim, V.**, Novickij, V. et al. Electroporation and cell killing by milli- to nanosecond pulses and avoiding neuromuscular stimulation in cancer ablation. *Sci Rep* 12, 1763 (2022). <https://doi.org/10.1038/s41598-022-04868-x>
4. **Kim V.**; Gudvangen E.; Kondratiev O.; Redondo, L.; Xiao S.; Pakhomov, A.G. Peculiarities of Neurostimulation by Intense Nanosecond Pulsed Electric Fields: How to Avoid Firing in Peripheral Nerve Fibers. *Int. J. Mol. Sci.* 2021, 22, 7051. <https://doi.org/10.3390/ijms22137051>.
5. E.B. Sözer, A.G. Pakhomov, I. Semenov, M. Casciola, **V. Kim**, P. Thomas Vernier, C.W. Zemlin, Analysis of electrostimulation and electroporation by high repetition rate bursts of nanosecond stimuli. *Bioelectrochemistry*. Volume 140, 2021, ISSN 1567-5394, <https://doi.org/10.1016/j.bioelechem.2021.107811>.
6. Pakhomov A.G., Xiao S., Novickij V., Casciola M., Semenov Iu, Mangalanathan U., **Kim V.**, Zemlin Ch, Sozer E., Muratori C., Pakhomova O.N. Excitation and electroporation by MHz bursts of nanosecond stimuli. *Biochemical and Biophysical Research Communications* Volume 518, Issue 4, 22 October 2019, Pages 759-764.
7. E.P. Simonenko, A.S. Mokrushin, N.P. Simonenko, V.A. Voronov, **V.P. Kim**, S.V. Tkachev, S.P. Gubin, V.G. Sevastyanov, N.T. Kuznetsov. Ink-jet printing of a TiO₂-10% ZrO₂ thin film for oxygen detection using a solution of metal alkoxoacetylacetonates. *Thin Solid Films*. 2019. Vol. 670. P. 46-53.
8. Yu. V. Gulyaev, A. A. Yaroslavov, **V. P. Kim**, G. B. Khomutov etc. "Effect of Gold Nanorods on the Remote Decapsulation of Liposomal Capsules Using Ultrashort Electric Pulses" *Journal of Communications Technology and Electronics*, 2018, Vol. 63, No. 2, pp. 158–162.
9. Vasiliev A.A., **Kim V.P.**, Tkachev S.V., Kornilov D.Y., Gubin S.P., Vlasov I.S., Jahatspanian I.E., Sizov A.S. Platinum Based Material for Additive Technology of Gas Sensors. *Proceedings* 2018, 2, 738.
10. A.E. Kushnir, D.Yu. Kornilov, S.V. Tkachev, E.V. Zaytsev, **V.P. Kim**. Printer technologies in electronics. *Materials and devices for printing – first Russian seminar (Moscow, December 15, 2017)*. RENSIT. Publisher – Russian academy of natural science. 2017. V. 9(2). P. 181-204.
11. Khomutov G.B., **Kim V.P.** etc. "Nanocomposite biomimetic vesicles based on interfacial complexes of polyelectrolytes and colloid magnetic nanoparticles" *Colloids and Surfaces A*. 532 (July 10, 2017) P. 26–35.
12. Khomutov G.B., **Kim V.P.** etc. "Langmuir monolayers and Langmuir-Blodgett films of pH-sensitive lipid" *Colloids and Surfaces A*. 532 (May 23, 2017) P.150–154.