

# KAMA ATRETKHANY, PhD

## EMBO POSTDOC/INSTITUT PASTEUR

Neuroimmunology and Systems Biology

Mentors: Gerard Eberl (Microenvironment and Immunity),  
Gabriel Lepousez and Pierre-Marie Lledo (Perception and  
action unit)

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## Summary

- Postdoctoral researcher with strong expertise in neuroimmunology, T cell biology, and mouse models of multiple sclerosis, neuroinflammation, sepsis, and cancer
- Author of 16 peer-reviewed publications and 1 academic book chapter
- Delivered numerous invited oral presentations at leading international conferences including IUIS, EFIS, and FEBS
- Selected Healthcare Business Academy Ambassador (Institut Pasteur, 2025)
- 3rd prize for best oral presentation (SFI, FEBS, Spetses 2024)
- Selected among only 600 young scientists worldwide for the prestigious Lindau Nobel Laureate Meeting (2023)
- EMBO Postdoctoral Fellow (2021–2023, Institut Pasteur, Paris)
- Recipient of the Russian Ministry Award for Outstanding Young Scientists for scientific discovery (2021)
- EFIS-IL Fellow (2019, University of Mainz, Germany)
- Active in science communication and outreach via yEFIS initiatives, including the Day of Immunology and Women in Science programs (2019, 2024)
- Highly skilled in grant writing, student mentoring, and academic teaching

## Current Project: Cognitive immunity

### Empathy as an exaptation of brain-body physiology

Abstract: We explore the intricate interplay between the immune and nervous systems in shaping behavior, using mice as a model. Our findings reveal that maintenance of core body temperature—a physiological process influenced by nervous system and adipose tissue—plays a critical role in determining resilience to inflammation and drives distinct behaviour depending on perception of the stress. This thermoregulation is modulated by Type 2 immune responses, which drive behavioral changes that support homeostasis and survival. We propose that such immune-mediated behavioral regulation may represent an evolutionary exaptation underlying empathy. Using optogenetic and immune related tools we are establishing neuronal basis of social behaviour and peripheral regulation of metabolism, as well as thermoregulation.

## RESEARCH EXPERIENCE

Institut Pasteur, France

Feb 2023 - Present

- EMBO Postdoctoral researcher, Gerard Eberl lab, Pierre-Marie Lledo lab  
I investigate how different type of psychological stressors affects brain resilience to inflammation. Using behavioural tests, optogenetic tools, confocal microscopy, metabolic and FACS analysis we investigate how emotional response affect energy allocation during inflammation.

Charite, Institute of Infectious  
diseases, immunology and  
microbiology, Germany

Jun 2021 – Dec 2022

- Postdoc, Head: Andreas Diefenbach, Supervisor: Stathis Stamatiades  
I obtained EMBO postdoc fellowship to study the role of kidney resident macrophages in sepsis using Cx3CR1 Cre Ert2 mice, confocal microscopy, FACS. We found out that kidney is not resilient to fungal infection, and tissue-resident and invading myeloid cells have distinct functions (tolerance vs resistance)

Institute of molecular biology,  
(Aug 2013- May 2021),  
Moscow

- PhD student, Head: Sergei Nedospasov  
We discovered the neuroprotective function of TNF in a brain space using EAE model and FoxP3-CrexTNFR2 fl/fl mice (PNAS, 2018). We validated and tested cell-type specific TNF inhibitor in autoimmunity and neuroinflammation (Seminars in arthritis, 2021).

Institute of molecular medicine,  
Germany, Mainz  
(2014-2019)

- Internship student, EFIS fellow, research stays per year – 3 months  
Head: Ari Waisman, Supervisor: Ilgiz Mufazalov.  
We discovered the neuroprotective function of TNF in a brain space (PNAS, 2018)  
I studied a transcriptional network in stability of TH17 cells phenotype.

## Education

**1999-2010** high school Mathematics Almaty, Kazakhstan,  
(diploma with honours, GPA (5.0 from 5))  
**2010-2015** Bachelor and Master in Immunology Moscow State university, Russia,  
(diploma with honours, GPA (5.0 from 5))  
**2016-2020** PhD in Neuroimmunology Moscow State University (Russia),  
Institut fur Molecular Medizin (Germany)

## Publications:

**Web of Science ResearcherID:** AAQ-7470-2020

**h-index:** 10

1. Gogoleva VS, Drutskaya MS, Vorontsov AI, Atretkhany KN, Belogurov AA Jr, Kruglov AA, Nedospasov SA. Lymphotoxins from distinct types of lymphoid cells differentially contribute to neuroinflammation. *Eur J Immunol.* 2024 Nov;54(11):e2350977.
2. Fibroblasts upregulate expression of adhesion molecules and promote lymphocyte retention in 3D fibroin/gelatin scaffolds. Nosenko MA, Moysenovich AM, Arkhipova AY, **Atretkhany KN**, Nedospasov SA, Drutskaya MS, Moisenovich MM. *Bioact Mater.* 2021 Mar 21;6(10):3449-3460.
3. Current Perspectives on the Role of TNF in Hematopoiesis Using Mice With Humanization of TNF/LT System. Gogoleva VS, **Atretkhany KN**, Dygay AP, Yurakova TR, Drutskaya MS, Nedospasov SA. *Front Immunol.* 2021 May 13;12:661900
4. Generation and Evaluation of Bispecific Anti-TNF Antibodies Based on Single-Chain VHH Domains. Nosenko MA, **Atretkhany KN**, Mokhonov VV, Chuvpilo SA, Yanvarev DV, Drutskaya MS, Tillib SV, Nedospasov SA. *Methods Mol Biol.* 2021;2248:91-107.
5. Distinct modes of TNF signaling through its two receptors in health and disease. **Atretkhany KN**, Gogoleva VS, Drutskaya MS, Nedospasov SA. *J Leukoc Biol.* 2020 Jun;107(6):893-905.
6. Modulation of bioavailability of proinflammatory cytokines produced by myeloid cells. Nosenko MA, **Atretkhany KN**, Mokhonov VV, Vasilenko EA, Kruglov AA, Tillib SV, Drutskaya MS, Nedospasov SA. *Semin Arthritis Rheum.* 2019 Dec;49(3S):S39-S42.
7. The Role of Microglia in the Homeostasis of the Central Nervous System and Neuroinflammation. Gogoleva VS, Drutskaya MS, **Atretkhany KS**. *Mol Biol.* 2019 Sep-Oct;53(5):790-798.
8. Intrinsic TNFR2 signaling in T regulatory cells provides protection in CNS autoimmunity. **Atretkhany KN**, Mufazalov IA, Dunst J, Kuchmiy A, Gogoleva VS, Andruszewski D, Drutskaya MS, Faustman DL, Schwabenland M, Prinz M, Kruglov AA, Waisman A, Nedospasov SA. *Proc Natl Acad Sci U S A.* 2018 Dec 18;115(51):13051-13056.
9. Proinflammatory and Immunoregulatory Functions of Interleukin 6 as Identified by Reverse Genetics. Drutskaya MS, Gogoleva VS, **Atretkhany KN**, Gubernatorova EO, Zvartsev RV, Nosenko MA, Nedospasov SA. *Mol Biol.* 2018 Nov-Dec;52(6):963-974
10. Cytokines as Mediators of Neuroinflammation in Experimental Autoimmune Encephalomyelitis. Gogoleva VS, **Atretkhany KN**, Drutskaya MS, Mufazalov IA, Kruglov AA, Nedospasov SA. *Biochemistry (Mosc).* 2018 Sep;83(9):1089-1103.
11. VHH-Based Bispecific Antibodies Targeting Cytokine Production. Nosenko MA, **Atretkhany KN**, Mokhonov VV, Efimov GA, Kruglov AA, Tillib SV, Drutskaya MS, Nedospasov SA. *Front Immunol.* 2017 Sep 1;8:1073.
12. TLR-signaling and proinflammatory cytokines as drivers of tumorigenesis. Korneev KV, **Atretkhany KN**, Drutskaya MS, Grivennikov SI, Kuprash DV, Nedospasov SA. *Cytokine.* 2017 Jan;89:127-135.
13. Chemokines, cytokines and exosomes help tumors to shape inflammatory microenvironment. **Atretkhany KN**, Drutskaya MS, Nedospasov SA, Grivennikov SI, Kuprash DV. *Pharmacol Ther.* 2016 Dec;168:98-112.
14. Myeloid-Derived Suppressor Cells and Proinflammatory Cytokines as Targets for Cancer Therapy. **Atretkhany KN**, Drutskaya MS. *Biochemistry.* 2016 Nov;81(11):1274-1283.
15. TNF Neutralization Results in the Delay of Transplantable Tumor Growth and Reduced MDSC Accumulation. **Atretkhany KS**, Nosenko MA, Gogoleva VS, Zvartsev RV, Qin Z, Nedospasov SA, Drutskaya MS. *Front Immunol.* 2016 Apr 19;7:147

16. Interleukin-6 From molecular mechanisms of signal transduction to physiological properties and therapeutic targeting. Drutskaya MS, Nosenko MA, **Atretkhany KS**, Efimov GA, Nedospasov SA. **Mol Biol.** 2015 Nov-Dec;49(6):937-43
17. Selected chapters in Immunology by A.A. Yarilin. Book In Russian. 2021. (ISBN 978-5-9704-4552-5), editor.

#### **Honours, awards and selected lectures**

1. Healthcare Bussines Academy ambassador (Institut Pasteur, 2025)
2. 3rd prize for the best oral presentation (SFI, FEBS, Molecular mechanisms of interorgan crosstalk in health and disease, 2024, Spetses)
3. Selection for highly competitive Lindau Nobel Laureate meeting (2023)
4. EMBO fellowship (2021-2023)
5. National prize for outstanding young scientist (2021, Moscow)
6. EFIL-IL fellowship (Mainz, 2019)
7. Oral presentation at IUIS (China, Beijing, 2019)

#### **Communications to the general public**

1. yEFIS Women in Immunology 2024 campaign (zoom seminar, [https://x.com/y\\_efis/status/1760225027612393918](https://x.com/y_efis/status/1760225027612393918))
2. Day of immunology campaign 2021 (<https://www.youtube.com/watch?v=VZHQkeHJbaE>)

**Skills:** Flow cytometry, gene expression analysis, behavioral tests, optogenetics, IHC, Cell isolation from organs, in vitro culture of immune cells, ELISA, metabolomics, pathological models, Python, R

**Languages:** kazakh (native), russian (native), english (C1), german (B1), french (A2/B1)

#### **References:**

- Gerard Eberl, Head of microenvironment and immunity unit, Institut Pasteur [gerard.eberl@pasteur.fr](mailto:gerard.eberl@pasteur.fr)
- Gabriel Lepousez, Advisor, Perception and action Unit, Institut Pasteur, [gabriel.lepousez@pasteur.fr](mailto:gabriel.lepousez@pasteur.fr)
- Pierre-Marie Lledo, Head of Perception and action Unit, Institut Pasteur, [pierre-marie.lledo@pasteur.fr](mailto:pierre-marie.lledo@pasteur.fr)
- Ari Waisman, Director of IMB, University Medical Centre of the Johannes Gutenberg University of Mainz, Germany, [waisman@uni-mainz.de](mailto:waisman@uni-mainz.de)
- Alexandra Desczkowska, head of Brain-Immune Communication, internal mentor since 2022, [aleksandra.deczkowska@pasteur.fr](mailto:aleksandra.deczkowska@pasteur.fr)
- Ruslan Medzhitov, Yale school of Medicine, external mentor, 2021, [ruslan.medzhitov@yale.edu](mailto:ruslan.medzhitov@yale.edu)