

Ilya A. Vinnikov, M.D

Tenure Track Associate Professor, Shanghai Jiao Tong University, China

ilya.vinnikov@gmail.com i.vinnikov@sjtu.eu.cn  vinnikovLAB  <http://vinnikov.science>

EDUCATION

2004-2008: *M.D.*, Medical Faculty, University of Heidelberg, Heidelberg, Germany.

Advisor: Dr. B. Isermann

1997-2003: *M.D./M.Sc.*, Medical Faculty, Lomonosov Moscow State University, Moscow, Russia.

RESEARCH EXPERIENCE

2016-: *Tenure Track Associate Professor*, Laboratory of Molecular Neurobiology, Sheng Yushou Center of Cell Biology and Immunology, Department of Genetics and Developmental Biology, School of Life Sciences and Biotechnology, Shanghai Jiao Tong University, Shanghai, China.

2014-2016: *Joint collaboration research fellow*, Molecular Biology of the Cell I, Molecular Metabolic Control, German Cancer Research Center (DKFZ) Heidelberg, ViroQuant-CellNetworks, Bioquant, University of Heidelberg, Heidelberg, Germany.

2009-2014: *Senior research fellow*, Molecular Biology of the Cell I, German Cancer Research Center (DKFZ) Heidelberg, Heidelberg, Germany.

2008-2009: *Postdoctoral fellow*, Internal Medicine I Department, Medical Hospital, University of Heidelberg, Heidelberg, Germany.

MAIN RESEARCH INTERESTS

Ilya Vinnikov's lab has a strong interest in studying the roles of distinct cellular populations in physiology and complex trait disorders and aging. We use *C. elegans* and mice as *in vivo* models for circadian cycle, microbiome, nutrition, appetite regulation, aging and neurodegeneration research. For the first time, we have demonstrated an age-related decline of microRNAs and

their critical physiological role in dopamine neurons ([Chmielarz et al. 2017](#)). Using an originally developed stabilized microRNA mimics delivery reductionist approach ([Vinnikov et al. 2016](#), [Najam et al. 2019](#), [Murgia et al. 2022](#)), we identified specific hypothalamic microRNAs protecting from obesity in mice. Recently, the developmentally uncoupled self-inhibiting *in situ* CRISPR-Cas9 technique allowed us to validate the energy homeostasis regulating miR-29a-*Nras* circuit within the proopiomelanocortin neurons ([Ma et al. 2022](#)). For such Cas9-dependent approaches, we specifically designed an all-in-one tool to test *in vitro* the CRISPR on-target activity ([Lin et al. 2023](#)). Our studies in mice are complemented by mechanistic experiments in *C. elegans*. Recently, we have shown that micronutrients, such as vitamin A can up-regulate SKN-1/NRF-2 transcription factor in nematodes and mice. SKN-1 pathway is critical for coping with oxydative stress and is critical for vitamin A-mediated longevity extension in *C. elegans* ([Sirakawin et al. 2023](#)). Our integrated solutions to monitor and analyse metabolic and age-related parameters might help translate these research findings to patients (<http://vinnikov.science/metabolism-cloud>).

SCIENTIFIC PUBLICATIONS AND PATENTS

Selected original publications

1. Sirakawin, C., Lin, D., Zhou, Z., Wang, X., Kelleher, R., Huang, S., Long, W., Pires-daSilva, A., Liu, Y., Wang J.✉, and **Vinnikov I.A.✉** (2022) **SKN-1/NRF2 upregulation by vitamin A is conserved from nematodes to mammals and is critical for lifespan extension in *Caenorhabditis elegans*.** *Aging Cell* 00:e14064, doi: 10.1111/acel.14064.
2. Murgia N., Ma Y., Najam S.S., Liu Y., Przybys J., Guo C., Konopka W. and **Vinnikov I.A.✉** (2022) **In Vivo Reductionist Approach Identifies miR-15a Protecting Mice From Obesity.** *Frontiers in Endocrinology* 13, doi: 10.3389/fendo.2022.867929.
3. Ma Y., Murgia N., Liu Y., Li Z., Sirakawin C., Konovalov R., Kovzel N., Xu Y., Kang X., Tiwari A., Mwangi P.M., Sun D., Erfle H., Konopka W., Lai Q., Najam S.S. and **Vinnikov I.A.✉** (2022) **Neuronal miR-29a protects from obesity in adult mice.** *Molecular Metabolism* 61, doi: 10.1016/j.molmet.2022.101507.

4. Najam S.S., Zglinicki B., **Vinnikov I.A.**✉, Konopka W. (2018) **MicroRNAs in the hypothalamic control of energy homeostasis**, *Cell Tissue Res* 375(1), 173-177, doi: 10.1007/s00441-018-2876-0.
5. Chmielarz P., Konovalova J., Najam S.S., Alter H., Piepponen T.P., Erfle H., Sonntag K.C., Schütz G., **Vinnikov I.A.***✉, and Domanskyi A. *✉ (2017) **Dicer and microRNAs protect adult dopamine neurons**, *Cell Death and Disease* 8, e2813, doi: 10.1038/cddis.2017.214. *, **equally contributed senior authors**.
6. Domanskyi A., Alter H., Vogt M.A., Gass P., and **Vinnikov I.A.**✉ (2014) **Transcription factors Foxa1 and Foxa2 are required for adult dopamine neurons maintenance**, *Front Cell Neurosci* 8, doi: 10.3389/fncel.2014.00275.
7. **Vinnikov I.A.**✉, Hajdukiewicz K., Reymann J., Beneke J., Czajkowski R., Roth L.C., Novak M., Roller A., Dörner N., Starkuviene V., Theis F.J., Erfle H., Schütz G., Grinevich V. ✉, and Konopka W. ✉ (2014) **Hypothalamic miR-103 Protects from Hyperphagic Obesity in Mice**, *The Journal of Neuroscience* 34, 10659-10674, doi: 10.1523/jneurosci.4251-13.2014.
8. Isermann B.*✉, **Vinnikov I.A.***, Madhusudhan T.*✉, Herzog S., Kashif M., Blautzik J., Corat M.A.F., Zeier M., Blessing E., Oh J., Gerlitz B., Berg D.T., Grinnell B.W., Chavakis T., Esmon C.T., Weiler H., Bierhaus A., and Nawroth P.P. (2007) **Activated protein C protects against diabetic nephropathy by inhibiting endothelial and podocyte apoptosis**, *Nature Medicine* 13, 1349-1358, doi: 10.1038/nm1667. *, **equally contributed first authors**.
 - previewed in: Brownlee M. (2007) **Preventing kidney cell suicide**, *Nature Medicine* 13, 1284-1285.
 - highlighted in: Gilbert R.E., and Marsden P.A. (2008) **Activated Protein C and Diabetic Nephropathy**, *New England Journal of Medicine* 358, 1628-1630.

Selected book chapters, reviews and methodological papers

1. Lin, D., Najam, S. S., Liu, Y., Murgia, N., and **Vinnikov I.A.** (2023). **Noodles, the all-in-one system for on-target efficiency analysis of CRISPR guide RNAs.** *MethodsX*, 102481. doi: 10.1016/j.mex.2023.102481.
2. Lai, Q., Kovzel, N., Konovalov, R., and **Vinnikov I.A.** (2021). Chapter 11 - **MicroRNAs Regulating Autophagy in Neurodegeneration.** *Adv Exp Med Biol*, In Z. Xie (Ed.), *Autophagy: Biology and Diseases: Technology and Methodology* 1208, 191-264. doi:10.1007/978-981-16-2830-6_11.
3. Lai Q., Murgia N., Parkkinen I., Domanskyi A. and **Vinnikov I.A.** (2019). Chapter 8 - **Roles of microRNAs in Parkinson's and other neurodegenerative diseases.** In B. Mallick (Ed.), *AGO-Driven Non-Coding RNAs* (pp. 209-232): Academic Press.
4. Domanskyi A. and **Vinnikov I.A.** (2017) **Can we treat neurodegenerative diseases by preventing an age-related decline in microRNA expression?**, *Neural Regeneration Research* 12(10), 1602-1604.
5. **Vinnikov I.A.**, Domanskyi A., and Konopka W.: **Continuous Delivery of Oligonucleotides into the Brain.** In: *physiology*, Humana Press, 2016: 9.

Patents

Software copyright for the **Allpapers** app (6346928).

OTHER PROJECTS LED BY THE VINNIKOV LAB

AllPapers

<http://vinnikov.science/allpapers>

SELECTED HONORS AND AWARDS

- 2023: *Runer-up poster award.* CellSymposia: Molecular mechanisms and integrative physiology of obesity, Shanghai, China.

- 2011: *Neuroscience 2011's pool of "Hot Topic" newsworthy research.* Society for Neuroscience, Washington, USA.
- 2008: *Best abstract award.* Society of Thrombosis and Haemostasis, Wiesbaden, Germany.
- 2007: *Sigi-Ziering prize.* German and Austrian Societies of Clinical Chemistry and Laboratory Medicine, Vienna, Austria.

FUNDING

- 2023-2024: NSFC foreign PI grant *BC0800441*.
- 2012-2024: NSFC special grant *BC0800399*.
- 2022-2023: Shanghai Jiao Tong University-Warwick University seed grant *WH610160507*.
- 2018-2021: NSFC normal grant *BC0800209*.
- 2017-2018: Sheng Yushou Foundation joint grant.
- 2017-2021: Non-Chinese Foreign Principle Investigator Fund from Shanghai Jiao Tong University *AF0800056*.
- 2016-2020: ShengYushou Foundation and National Support for Subject Development 985/211 Fund *WF220408008*