



## Ancha Baranova, PhD

Professor, School of Systems Biology

Director, the Chronic Metabolic and Rare Diseases Systems Biology Initiative (ChroMe RaDSBIn)

### Education

PhD in Molecular Biology, DSci in Genetics, Moscow State University, Moscow, Russia

### Key Interests

Human Genetics | Personalized Medicine | Metabolic Syndrome | Aging | Systemic Inflammation | Cancer | Molecular Network Analysis | Non-alcoholic Fatty Liver Disease

### CONTACT

Phone: 703-993-4293 | Email: [abaranov@gmu.edu](mailto:abaranov@gmu.edu)

Website: <http://mason.gmu.edu/~abaranov/pages/welcome.html>

### SELECT PUBLICATIONS

- › A. Baranova *et al.*, Adipose may actively delay progression of NAFLD by releasing tumor-suppressing, anti-fibrotic miR-122 into circulation. *Obes Rev* 20, 108–118 (2019).
- › E. S. Marakasova *et al.*, Prenylation of viral proteins by enzymes of the host: virus-driven rationale for therapy with statins and FT/GGT1 inhibitors. *Bioessays* 39 (2017).
- › K. C. Kural *et al.*, Pathways of aging: comparative analysis of gene signatures in replicative senescence and stress induced premature senescence. *BMC Genomics* 17, 1030 (2016).
- › M. Ivanov *et al.*, Non-random fragmentation patterns in circulating cell-free DNA reflect epigenetic regulation. *BMC Genomics* 16 Suppl 13, S1 (2015).

### Research Focus

The strongest aspect of my research program lies in its transdisciplinary nature. In over more than twenty years of active time in academia, I have developed an expertise in a variety of research fields. In many collaborations, I analyze multidimensional datasets and make sense out of this data, putting together arrays of disparate data pieces and generating testable hypotheses ready for experimental validation. With that, we are constantly building the forest out of individual trees.

My lab has discovered many biomarkers for chronic liver diseases, cancer and other illnesses, a biosynthesis of the melanin in human adipose, two novel properties of cell-free DNA, and a variety of novel functions for known biomolecules. Recently, my lab has entered a field of anti-aging research. We dissect major pathophysiological components of aging, namely systemic inflammation, insulin resistance, and organ fibrosis. Our work in personalized medicine has a particular emphasis on longitudinal monitoring and management of health in pre-symptomatic individuals, and augmenting the body's homeostasis by non-pharmacological means.

### Current Projects

- Dissection of molecular networks underpinning common human illnesses.
- Diagnosis of cancer by mapping ends of cell-free DNA in liquid biopsy.
- Profiling oxidized fraction of cell-free DNA as dynamic biomarker of stress.
- Developing *in vitro* and *in silico* models for cooperation between human tissues and working in the field of general theory of biomarkers.