

LINC RNA ORCHESTRATED MOLECULAR REGULATORY NETWORKS OF HUMAN IMMUNE RESPONSE (LINCREG)



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Regulation of the immune system is critical for health: it is vital for defending us from pathogens, controlling autoimmunity and fighting cancer. T cells orchestrate the immune system and play a central role in immune response in healthy individuals. The objective of the proposed research is to gain fundamentally novel mechanistic and biologic insight into the regulation of human T cell functions and immune mediated diseases. We will focus on in-depth understanding of the role of noncoding RNA. We will combine state-of-the-art computational methods, cutting-edge experimental approaches and unique human biobanks to achieve the goals. We expect to reveal new unexpected links to gene regulatory networks and mechanisms involved

in immune regulation and disease pathogenesis. This in turn provides basis for developing new therapeutic and diagnostic strategies for patients suffering from autoimmune diseases.

Our consortium includes two research groups led by Academy Professor Riitta Lahesmaa, M.D., Ph.D. and by Professor Laura Elo, Ph.D., Research Director in Bioinformatics. Our consortium composed of experts in molecular systems immunology (Lahesmaa lab; <https://bioscience.fi/research/molecular-systems-immunology/profile/>) and experts in computational systems biology and bioinformatics (Elo lab; <https://elolab.utu.fi/>) provides ideal complementary expertise in immunology, molecular biology, computational

biology and bioinformatics to address unmet challenges in understanding immune regulation. The key benefit of the consortium is the direct access to high-quality multi-layered biological sample data that is the basis of the computational analyses. The computational findings and models, in turn, are then further experimentally validated. The PIs of the consortium have a long history of seamless collaboration enabling efficient utilization of the complementary expertise to address the ambitious goals of the project. Together with state-of-the-art infrastructure and research technologies, we expect our consortium to bring new results and knowledge that have high potential to revealing new insights into immune regulation.



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