

AUTOIMMUNE DISEASE RESEARCH IN RĪGA STRADIŅŠ UNIVERSITY



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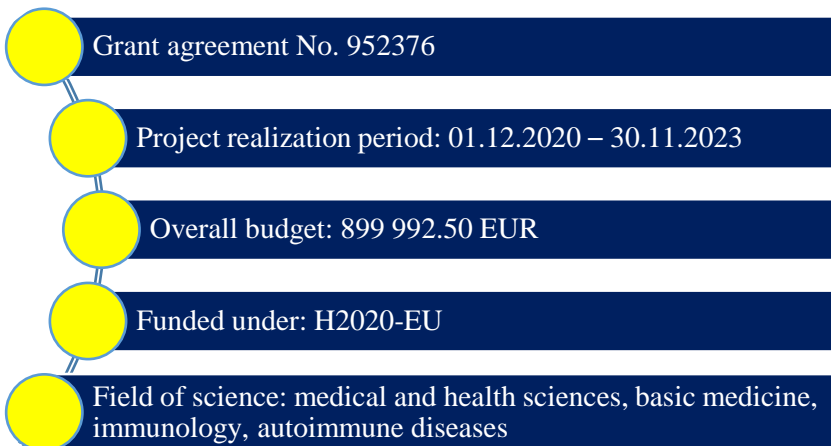
VirA PROJECT

The specific challenge of VirA Twinning project “**Reducing networking gaps between Rīga Stradiņš University (RSU) and internationally-leading counterparts in viral infection-induced autoimmunity research**” is to enhance networking activities between the RSU located in Latvia as a Widening country and internationally-leading counterparts at European Union (EU) level, in the field of autoimmunity research. RSU is an institution that has proven itself over several decades on a local and regional level as an important island of research excellence in viral infection-induced autoimmunity research. Further raising the research excellence requires widening the network and establishing closer cooperation with global leaders in science, sharpening the institutional profile of RSU.

The project **aims** at strengthening the close scientific cooperation with counterparts: in Italy – University of Ferrara, in Germany – Ulm University, and in Israel – Medical Research Infrastructure Development and Health Services Fund by the Sheba Medical Center. The partner universities are the excellence centres (world leaders) that are forerunners in immunology, virology, morphology and clinical data management and modelling, and are capable of inspiring positive change in the research field and significantly influence future developments at RSU via joint activities.

Systemic autoimmune diseases (SAD) are a significant cause of morbidity and mortality worldwide, creating a **challenge** for researchers and clinicians to find evidence-based solutions for SAD diagnostics, treatment and prevention. Due to the complexity of

autoimmune disease research, which requires multidisciplinary approaches, a problem is insufficient research capacity at low-performing EU Member State research institutions. Research capacity, able to deliver precise and early diagnostic is of high importance to move towards the development of methods for personalized medicine and better understanding of triggers and mechanisms in autoimmunity, leading to better understanding of chronic diseases and comorbidities and searching for therapy options. VirA project will optimally address the challenges and strengthen the European Research Area in autoimmunity.



OBJECTIVES

#1

Increase research excellence of the coordinating institution in the field of research as a result of the twinning exercise

#2

Enhance the reputation, attractiveness and networking channels of the coordinating institution

#3

Enhance the scientific and technological capacity of the linked institutions with a principal focus on the university or research organisation from the Widening Country

ACTIVITIES



PROJECT PARTNERS

Coordinated by:



Rīga Stradiņš
University



Project partners:



University of
Ferrara



Ulm University



Medical Research
Infrastructure Development
and Health Services Fund by
the Sheba Medical Center



CONSORTIUM

The VirA overall consortium structure including four partners out of four different countries. The present consortium has the required multidisciplinary know-how and expertise to carry out diverse project activities and create an impact on European level.

The consortium will enhance RSU research capacity in the field of autoimmune diseases and strengthen links, not only between institutions of the low-performing Member States and internationally leading institutions from the EU, but it will also strengthen collaboration between the EU and Israel. It will increase excellence in autoimmune disease research by establishing a multidisciplinary research unit including four platforms at RSU:

- Immunology,
- Virology,
- Morphology,
- Clinical data management and modelling.

Upgrading research capacity and omitting the limitations of research potential in Latvia is a valuable contribution to EU research competitiveness, synergistically joining resources and creating niches of excellence with a global future in convergence regions.

Infections and autoimmune diseases, due to their impact on global health and uneven sharing of burden between countries, make research a driving force for achieving more equal access to care, delivering prompt answers to new challenges and opening of new research fields.

Figure 1

Geographic locations of partners (Latvia, Germany, Italy, Israel)





RSU is a public University in Latvia covering 68 study programmes, among them 11 English-taught programmes, with a focus on medicine, pharmacy, rehabilitation, public health and selected areas of social sciences. The University has 9160 undergraduate, graduate and professional programme students. As a result, RSU is one of the largest entities in the Baltic States in the area of medicine, health sciences and pharmacy, and the only universal medical university in Latvia. The RSU holds a unique place in Latvia's scientific field, providing a full research cycle from laboratory to hospital bed. RSU has a high level of internationalisation with 2338 international students from 59 countries. RSU processes are ISO 9001:2008 certified (Bureau Veritas) and therefore RSU possesses a managerial capacity required by complex projects. RSU is currently amongst the top three Latvian Institutions considering research outputs such as patents and is one of the top three institutions that receive the highest funding for research in Latvia.

An ever-increasing attention is paid to the transfer of knowledge and technologies by integrating knowledge in the basic functions of the University, and transforming knowledge in to products and services that are useful to the society. There are five doctorate study programmes operating at RSU – medicine, pharmacy, sociology, law, political science and seven doctorate councils: with bases in medical science, internal medicine, surgery, medicinal biomechanics, dentistry, pharmacy, sociology.

University of Ferrara (Unife)



**Università
degli Studi
di Ferrara**

The Unife, founded in 1391, is one of the oldest in Italy. It consists of 12 Departments: Architecture, Humanities, Life Science and Biotechnology; Chemical, Pharmaceutical and Agricultural Sciences, Neurosciences and Rehabilitation, Translational Medicine, Medical Sciences, Engineering, Physics and Earth Science, Law, Management and Economics, Mathematics and Informatics.

The School of Medicine of the Unife is responsible of teaching activities for approximately 4000 students (MD, dentistry, nursing, physiotherapy degrees and sanitary/technical degrees, such as radiology, biomedical lab, audiology, etc). The School of Medicine coordinates also all the clinical activities of the three Medical Departments, and the clinical activities are carried out mostly in the S. Anna University Hospital (Azienda Ospedaliero-Universitaria), located in Ferrara.

Some facts and figures about the University: approximately 25,000 students enrolled (6% are international students); 230 Socrates/Erasmus partners; 41 international research projects funded by FP7, of which four Coordinated by Unife, and three funded in Horizon2020, several projects funded by other European research programmes; approximately 500 international cooperation agreements. There are 11 PhD programs operating in the different subject areas, including Molecular Medicine and Pharmacology; Biomedical and biotechnological Sciences.

The relevance of the participation of the University of Ferrara to this project is the availability of both Clinical Units (Endocrinology, Rheumatology, Neurology, Gynecology) and Basic Science research groups of international relevance.

www.unife.it

Ulm University (UULM)



UULM founded in 1967, enjoys an excellent reputation for innovative research and interdisciplinary training. It is part of a strong network of international partnerships, which creates opportunities for students and researchers alike and strengthens the reputation of Ulm as excellent and future-oriented University.

UULM is the youngest university in Germany, which has five faculties (i.e. Computer Science, Engineering, Mathematics and Economics, Medicine, Natural Sciences) and currently more than 10,000 students. Biomedicine and Biotechnology are at the major focus of the university's research program. With help by university network *InnoSüd* at UULM, there is unique support for technology transfer to small and medium-sized enterprises (<https://www.uni-ulm.de/en/technology-transfer/business-start-ups/>). Most recently, ERC-Proof of Concept projects by Prof. Jelezko (NDI) und Prof. Kirchhoff (Epi-X4Health) have been founded. These concepts provide a new focus on the use of peptides and technologies to understand immune deviations such as autoimmune dysfunction, and eventually lead to new treatment and disease prevention. Experiences at UULM will be highly useful to transfer to young investigators from the Baltic area. Knowledge transfer will be part of summer school initiatives as well.

www.uni-ulm.de

Medical Research Infrastructure
Development and Health
Services Fund by the Sheba
Medical Center (SMC)



Zabludowicz Center for Autoimmune Diseases at the Sheba medical center (affiliated to Tel-Aviv University (TAU), Sackler Faculty of Medicine) entails departments, outpatient clinic as well as a large day care center for treatment with biological and other therapies and a clinical studies center for the evaluation of new treatments. The center encompasses research and diagnostic laboratories that enable hospital service, collaboration between physicians and researchers from different fields (i.e. Internal Medicine, Clinical Immunology, Autoimmunity, Rheumatology, Neurology, Gastroenterology, Obstetrics and Gynecology).

In the SMC patients with different autoimmune diseases can be diagnosed and treated by a multidisciplinary team including old and new therapies, complementary medicine, psychological treatments etc. The research plan of the Zabludowicz center in collaboration with others physician and scientists in Israel and around the world.

TAU has over 2,200 faculty members, among them internationally renowned scientists who've made significant contributions to the advancement of knowledge in fields as diverse as particle physics, cell biology, biotechnology, genetics, fiber optics, the humanities, arts and social sciences. Israel's largest and most comprehensive university. TAU is comprised of nine faculties, 27 schools, 98 departments and some 130 research institutes and centres.

TAU runs Israel's largest bio-medical research and teaching framework with 1,400 scientist-clinicians at 17 affiliated hospitals. Our scientists are teaming up with pharmaceutical companies to develop new drugs and medical technologies.

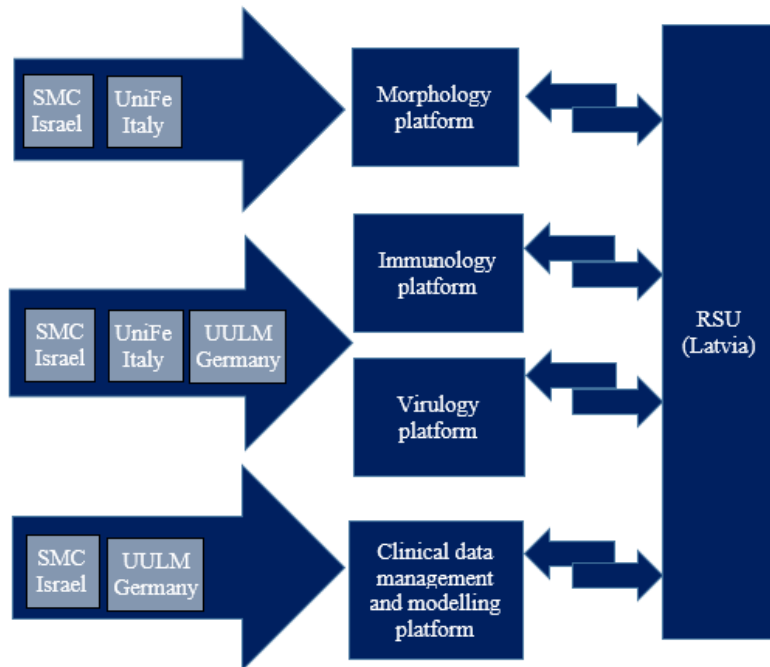
www.eng.sheba.co.il

VirA'S OPERATIONAL SCHEME

Figure 2

Project operational scheme

(SMC – Medical Research Infrastructure Development and Health Services Fund by the Sheba Medical Center; UniFe – University of Ferrara; UULM – Ulm University; RSU – Rīga Stradiņš University)



AUTOIMMUNITY RESEARCH PROJECTS IN RSU

Human herpesvirus 6 chemokine receptor mediated immunomodulating mechanism involvement in autoimmune thyroiditis development

Sultanova, A., Čistjakovs, M., Sokolovska, L., & Strojeva, S.
Latvian Council of Science

Project realization period: 1.12.2020 → 31.12.2021

Project: The Latvian Council of Science Programme → Fundamental and Applied Research projects

Human herpes virus-6 involvement in development of autoimmune thyroiditis

Sultanova, A.

European Regional Development Fund, Latvia State Budget funding,
Other funding source

Project realization period: 1.09.2017 → 31.08.2020

Project: EU Structural Funds → ERDF

VirA: Reducing networking gaps between Rīga Stradiņš University (RSU) and internationally – leading counterparts in viral infection-induced autoimmunity research

Murovska, M., Lunga, A., Doniņa, S., Nora-Krūkle, Z., Groma, V.,
Krūmiņa, A., & Rasa-Dzelzkalēja, S.

European Commission

Project realization period: 1.12.2020 → 30.11.2023

Project: EU Programmes → Horizon 2020

Dissecting the interplay between intestinal dysbiosis and B cell function in the pathogenesis of immunoglobulin A nephropathy

Čerņevskis, H., Oļeiņika, K., Kroiča, J., Kuzema, V., Pētersons, A., Berga-Švītiņa, E., Rācenis, K., Popova, A., Šlisere, B., Vasiļvolfa, A., & Saulīte, A. J.

Latvian Council of Science

Project realization period: 1.01.2020 → 31.12.2022

Project: The Latvian Council of Science Programme → Fundamental and Applied Research projects

RELEVANT PUBLICATIONS IN RSU (2017–2021)

2021

Acosta, T., Tuesca, R., Florez, K., Barengo, N. C., Anillo, L., Flórez-García, V., Acosta, J., Carvajal, L., de la Rosa, S., Pachón, M. J., & Aschner, P. (2021). Factors Associated With Low Physical Activity in Two Latin American Populations at Risk of Developing Type 2 Diabetes: An Exploratory Analysis. *Frontiers in Public Health*, *8*, 589484. [589484]. <https://doi.org/10.3389/fpubh.2020.589484>

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2020

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POTENTIAL DIRECTIONS OF COLLABORATION

According to RSU research strategy, priority areas are:

- Research of latent/persistent viral infections;
- Impact of infectious diseases on public health;
- Immunomodulatory therapy and immunomodulators;
- Antivirals and innovative vaccines;
- Viral resistance, AIDS resistance treatment regimens;
- Biotechnological methods for production of enzymes, medicinal products and functional foods;
- Immunogenetics;
- Cell immunology;
- Aberrant immune response and research on etiological factors of inflammation;
- Study of pathogen microorganisms;
- Non-genotoxic carcinogenesis, oncoimmunology, therapeutic vaccines;
- Nanotechnologies in oncology and virology – RNA aptamers, surface plasmons;
- Animal models in biomedical research;
- Express diagnostics and differential diagnostics using multiplex platforms;
- Immunovisualisation;
- Mathematical modelling of epidemics and spread of new infections.

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