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Government of Hungary

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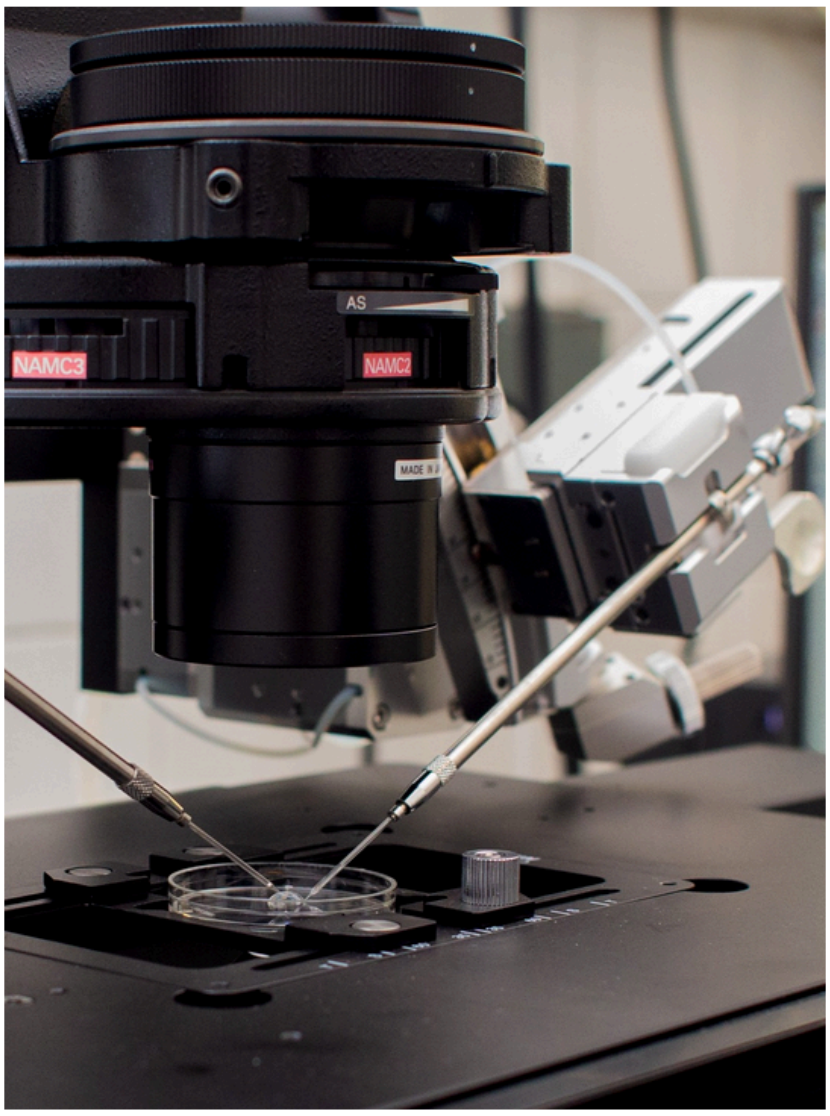
National Laboratory on Human Reproduction

NATIONAL LABORATORY ON HUMAN REPRODUCTION

HUMAN REPRODUCTION: THE MEANING OF LIFE!

The National Laboratory on Human Reproduction is dedicated to research into the stages of human conception, including a wide range of inherited and acquired disorders of the female and male organism, the assisted reproductive process and the long-term health problems of the children born after IVF. The Laboratory's methodological repertoire includes state-of-the-art molecular genetic, genomic and immunological methods, but it also deals with health economics and social issues of human reproduction. The research findings provide a technical basis for new health policy objectives, policy packages and the development of primary health care.



MAIN RESEARCH AREAS

- Assisted reproduction
- Female and male infertility
- Molecular maternal and embryo diagnostics
- Genetic problems of reproduction
- Immunological problems of reproduction
- Embryo light protection

IMPLEMENTER:
University of Pécs

PROJECT NUMBER: RRF-2.3.1-21-2022-00012

FUNDING PERIOD: 01.06.2022 - 30.06.2025

OVERALL BUDGET: 2.204.314.202 HUF

HUNGARIAN NATIONAL LABORATORY

BENEFITS TO BE EXPECTED FROM LABORATORY RESEARCH

- The research would allow the selection of the stimulation cycle and the embryo most likely to produce a healthy offspring.

- In addition to oocytes, the planned studies will also investigate granulosa and endometrial cells for possible benefits of definitive surgical therapy as detected by electron microscopy, and will also look for additional morphological changes indicative of cell quality.

- More effective treatment of male fertility disorders can significantly increase the number of successful natural and assisted reproductive pregnancies.

- The molecular mapping and comparative study of reduced or insufficient male fertility contribute to the restoration of fertility function, resulting in significant financial, risk and stress reduction.

- The research work will use state-of-the-art analytical techniques to identify biomarkers of pathogenesis and develop validated assays.

- There is a lack of information on how assisted reproduction affects metabolic status which is relevant to maternal obesity.

- A comprehensive picture of the prevalence of systemic and organ-specific autoantibodies and autoimmune pathologies in today's young Hungarian female population (20-40 years old), as well as the population-level protective effect of natural autoantibodies. This describes therapeutic targets that can be used in autoimmune diseases, both in terms of infertility and habitual abortion.

- The use of maternal peripheral white blood cell single-cell transcriptomics to study IVF treatment outcome represents a new approach, in particular the incorporation of expected outcomes into predictive clinical data models based on extensive data.

- It is also expected that molecules will be identified that can serve as biomarkers with quantitative or qualitative changes, which could lead to the development of new microfluidics-based diagnostic methods. The planned research is expected to result in a real, thriving collaboration between national and international representatives of theoretical and practical disciplines, academia and business.

- The epidemiological, social and health-economic aspects of reproduction will be placed alongside the major biomedical research. This approach reinforces the translational nature of the topic, as real-world / big-data data-driven research based on a health insurance database focusing on daily medical practice data will appear in addition to laboratory and clinical research.

THE PROFESSIONAL TEAM

The head of the National Laboratory is **Dr. Gábor L. Kovács**, Széchenyi-Prize-winning academician, emeritus professor, chairman of the Supervisory Board of the Hungarian Academy of Sciences, vice-president of the Division of Medical Sciences of the Hungarian Academy of Sciences, who has achieved significant domestic and international success in the field of neuroendocrine and metabolic regulation and the development of methods of laboratory diagnostics.

The most important elements of the National Laboratory's research programs come from the field of obstetrics and gynecology.
The head of this topic is **Dr. József Bódis**, PhD, State Secretary for Higher Education, Innovation and Vocational Training of the Ministry of Innovation and Technology, former director of the Department of Obstetrics and Gynecology of the University of Pécs, president of the Hungarian Gynecological Society and the Hungarian Assisted Reproduction Society, who was the first in Hungary to implement the application of the artificial insemination method at the Clinic of Pécs in 1988. The professional and research work of the two of them has been linked for decades. They have created a research community of about 100 people which serves as the core of the NLHR and have been working together for more than nine years, their work winning funding effectively. The foundations for the implementation of the National Laboratory on Human Reproduction (NLHR) are provided by the decades-old reproduction research at the University of Pécs.

POSSIBLE PARTNERSHIPS

Hungarian industrial partners: we are looking for partners for the development and serial production of diagnostic chip technology processes, as well as for the development and serial production of special devices used during artificial insemination.

To build an international partnership: We are looking for partners interested in IVF research for the purposes of international networking, joint research, publications and applications.

TARGET GROUP

Direct target groups of the National Laboratory of Human reproduction

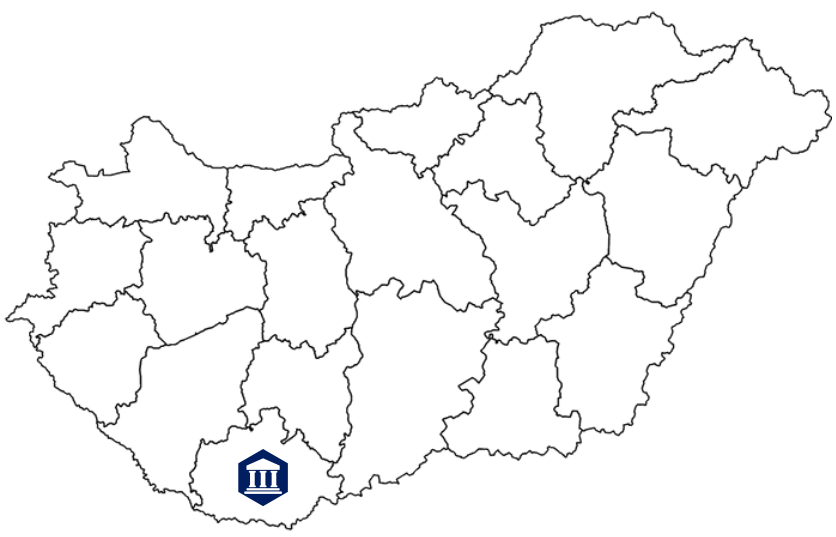
- Students
- Lecturers, researchers, young researchers, doctoral students, research assistants
- Managers responsible for the organizational and professional operation of the university
- Domestic and foreign higher education / partner institutions
- Specialists and managers of medical device and drug development SMEs involved in the project as collaborators

Indirect target groups of the program

- Units of the primary and specialist health care system: gynecological clinics and infertility centres
- Domestic population, couples affected by infertility
- National Health Insurance Fund of Hungary, health insurance companies
- Market participants of medical device, pharmaceutical and medical equipment industry

PLACE OF IMPLEMENTATION:

- Pécs



PROFESSIONAL CONTACT

PROF. DR. GÁBOR L. KOVÁCS

Head of the NLHR

kovacs.l.gabor@pte.hu

+36 72 501 500 / 29051

CONTACT

hrnl@pte.hu

hrnl.pte.hu