National Research, Development and Innovation Office

Ministry for Innovation and Technology

HUNGARIAN NATIONAL LABORATORY

NATIONAL LABORATORY OF BIOTECHNOLOGY

BIOTECHNOLOGY FOR A HEALTHIER FUTURE

The aim of the National Laboratory of Biotechnology is to develop uniquely competitive technologies and therapeutic methods using the most advanced biotechnology tools in Hungary in three priority health areas: the spread of antibiotic-resistant bacteria, the emergence of pandemic diseases worldwide and the treatment of rare hereditary diseases.

MAIN RESEARCH AREAS

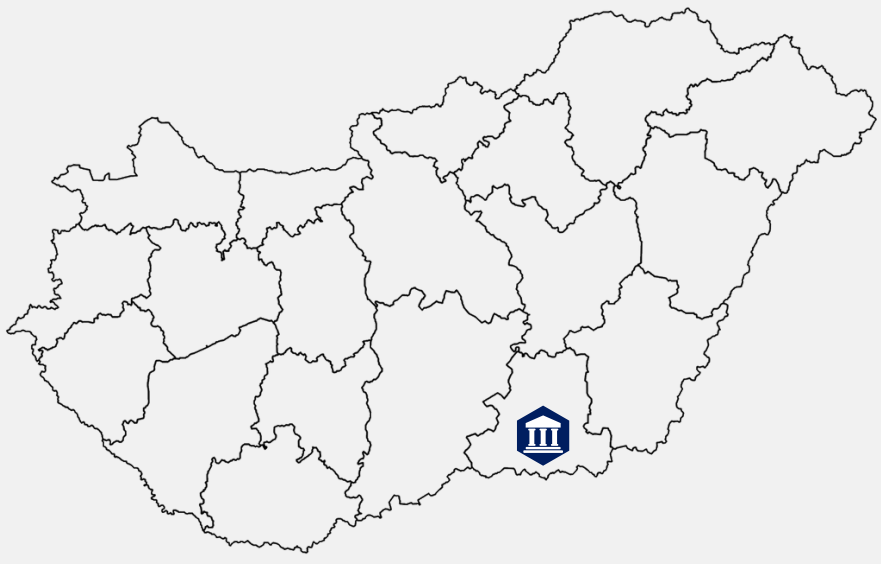
- Developing new antibiotics and alternative therapies
- mRNA-based vaccination methods
- Therapy for rare inherited diseases

National Laboratory **of Biotechnology**

IMPLEMENTER:

Biological Research Centre, Szeged

PLACE OF IMPLEMENTATION: Szeged



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BENEFITS TO BE EXPECTED FROM LABORATORY RESEARCH

- Conduct international publications and patents describing technological and pharmaceutical developments.
- Launch industrial and applied research applications with industrial partners.
- Utilise new knowledge in the teaching activities of the Doctoral School of Biology at the University of Szeged.

THE PROFESSIONAL TEAM

Ferenc Nagy (project director) graduated in biology from József Attila University in 1977. He wrote and defended his doctorate degree dissertation at the Institute of Plant Biology of the Szeged Biological Centre of the Hungarian Academy of Sciences in 1981. Between 1983 and 1987, he researched in Rockefeller University's (New York) Plant Molecular Biology Laboratory. After returning home from the USA, he continued his work in the Szeged Biological Centre, where he established his own research group. In 1997, he was granted the Doctor of Sciences of the Hungarian Academy of Sciences degree. Between 1988-1996, he was a group leader in the Friedrich-Miescher Institute (Basel), from 2000 to 2006 he worked as the General Director of the Agricultural Biotechnology Centre of Gödöllő, between 2010-17 Dr. Nagy was the Deputy Director of the Plant Biology Institute of the Biological Research Centre, Szeged. Between 1995-2010, his research projects were funded by the Howard Hughes Foundation. From 1995 to 1999, he was a member of the Board of the International Society for Plant Molecular Biology (ISPMB), EMBO membership was awarded to him in 1998. He was a member of the EMBO Council between 2008-2014 and a member of the EMBL Council between 2016-2019. He habilitated at Eötvös Loránd University in 2000 and has been an honorary professor of Freiburg University since 2001. Besides, from 2008 to 2018, Dr. Nagy carried out research as the Chair of System and Cell Biology of Edinburgh University. Since 2018, he has been the Director General of the Biological Research Centre, Szeged. In 1997, he was awarded the Humboldt Research Award, the Wolfgang Paul Research Award in 2001, the Academy Award in 2004, the Tankó Béla Award in 2005 and the Széchenyi Award in 2008. Since 2008, he has been a member of the German Academy of Sciences, a corresponding member of the Hungarian Academy of Sciences from 2010 and a full member of the Academy since 2016. In the year 2014, he was elected a member of Academia Europaea. He was awarded the Commander's Cross of the Order of Merit of Hungary in 2013.

Csaba Pál, a researcher at the Biological Research Centre, Szeged is one of the leaders of the Synthetic and System Biology Unit. His specialist fields are antibiotic resistance and genome engineering. With his work, he won the European Research Council Starting (2008-2013), Consolidator (2015-2020) and Proof of Concept (2019-) grants. He has published over 50 scientific articles, many in prestigious journals like Nature, Nature Microbiology, Nature Genetics, Science and PNAS. His research work has earned him several awards. In 2009, he won the Ignaz L. Lieben Award of the Austrian Academy of Sciences, the Szent-Györgyi Talentum Award in 2014 and the Bolyai Prize in 2015. He has been a member of Academia Europaea since 2016, the European Molecular Biology Organisation (EMBO) since 2017 and the Federation of European Microbiological Societies since 2018. He is also a member of the editorial staff of Molecular Biology and Evolution, of Plos Biology and of Biology Direct.

THE PROFESSIONAL TEAM

Bálint Kintses, a Doctor of Biochemistry, has been a Senior Scientific Research Fellow of the Institute of Biochemistry of the BRC since 2019. He has been involved in research and development for 15 years, involving 4 years at the University of Cambridge (United Kingdom). In 2018, an international committee elected him a young research group leader for the Hungarian Centre of Excellence for Molecular Medicine (founded in Szeged), where he established the Translational Microbiology Research Group. So far, he has published 20 scientific papers, most in the most prestigious scientific journals (such as Nature Microbiology or Nature Communications). His innovations in biotechnology have been marketed by international firms (Biologic, France, Sphere Fluidics, UK). He is a winner of several Hungarian and international grants and awards. In 2009, he was awarded a Marie Curie Fellowship. In 2016, he was granted the Youth Award of the Hungarian Academy of Sciences and the Bolyai János Research Fellowship.

József Mihály is a scientific advisor of the Institute of Genetics of the BRC. He obtained his diploma in molecular biology and biotechnology at Szeged University in 1992. In 1998, he earned his PhD degree at the University of Geneva (Switzerland) and won the Doctor of Sciences of the Hungarian Academy of Sciences title 2012. His specialist field is Drosophila developmental genetics. His research group, founded in 2003, studies the development of the nervous system, compound eyes and skeletal muscles. He has released 40 scientific publications, including papers in leading journals (Science, Nature Cell Biology, Molecular Cell). Besides other grants, he won the research grant issued by Pfizer pharmaceutical company as a leading researcher. In this program, he identified novel drug targets in a Drosophila cancer model caused by simultaneous activation of the Notch and AKT signaling pathways.

Norbert Pardi is working at the Division of Infectious Diseases of the Department of Medicine of the University of Pennsylvania as an assistant professor. He graduated from Szeged University as a biologist and earned his PhD degree in 2011. He then joined Drew Weissman's laboratory (University of Pennsylvania), where he became an internationally renowned researcher of the messenger RNA (mRNA) based therapy. In the past few years, he has published a number of milestone studies in highly prestigious journals like Nature and Nature Communications. He regularly delivers lectures at international conferences and is a member of numerous international and Hungarian organisations (Hungarian Society for Immunology, The American Association of Immunologists, American Society for Microbiology).

Miklós Erdélyi is the Director of the BRC's Institute of Genetics. He graduated in biology from Szeged University and earned his doctorate degree in 1993. Since 2013, he has been a doctor of sciences. His specialist fields are Drosophila early ontogeny and the genetic control of gamete development. He won a two-year EMBO fellowship in 1994, during which he achieved internationally recognized results at Heidelberg's European Molecular Biology Laboratory with the design and implementation of high-throughput genetic screening tests. On returning home, he founded the Drosophila Gamete Development Group. In the 2006-2010 period, his research was supported by the Howard Hughes Foundation. He has so far written 35 scientific publications. His research and teaching achievements were recognized with a Széchenyi Professor Scholarship (1999-2002). As the Director of the Institute of Genetics, he created the independent Drosophila genome editing laboratory, which is capable of creating some one hundred genome edited or transgenic Drosophila strains.

POSSIBLE PARTNERSHIPS

- Design of new antibiotic drugs in collaboration with a Slovenian partner.
- Establish the technology (laboratory building + methodology) suitable to produce mRNA-LNP vaccine with an American collaborator.
- Work up a partnership with domestic and/or European pharmaceutical or biotechnological companies for translational application of the results of basic and applied research.
- Applied research and form contacts with clinicians dealing with diagnosis and treatment of rare diseases.

TARGET GROUP

Companies for drug development, production and trade, companies organizing clinical trials of putative medicines, medical doctors.

Design plan of the BSL-3 laboratory of the BNL – under construction

PROFESSIONAL CONTACT

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