

Ing. Johana Alaverdyan

Wildlife molecular biology and zoonoses



Contact

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Key abilities

DNA/RNA isolation
PCR
Primer design
STR analysis
Sanger sequencing
Molecular laboratory operation
Scientific writing

Other abilities

Drivers licence B
MS Office
English language, C1 level,
TOEIC certificate
German language level A2
Adobe Photoshop basics

Date of birth

24.10.1992

Education

September 2018 – ongoing

Ongoing Ph.D. studies • Czech University of Life Sciences (CULS) •
Department of Animal Science and Food Processing • Prague,
Czechia

June 2018

Finished Master studies acquiring the Ing. title • CULS • Department of
Animal Science and Food Processing • Prague

Laboratory experience

May 2023 – ongoing

Junior Researcher • National Radiation Protection Institute • Prague
Optimized and implemented advanced radiation exposure
measurement methods based on cytogenetic analysis, including
dicentric chromosome assays, gamma-H2AX, and micronuclei assays.
Conducting research to optimize and establish gene expression
assays for biodosimetry applications.

May 2022 – March 2023

Researcher and wildlife genetics specialist • Forezní DNA servis
s.r.o.

Conducting research in a forensic genetics lab. Development and
testing of new PCR and fragmentation analysis assays for species and
individual identification of endangered animals. Secondary laboratory
work on human genealogy or paternity tests using fragmentation
analysis and sequencing.

July 2015 – April 2022

Study research • Laboratory of Molecular Biology CULS • Prague
Since 2015, as part of my diploma and dissertation research, I have
been working in the molecular laboratory of the Czech University of
Life Sciences in Prague.

I use nested, endpoint, and real-time PCR methods, gel
electrophoresis, DNA / RNA isolation and sequencing. I have
operational responsibility for the laboratory - perfect purity and safety
of samples and human health (work with hazardous materials and
pathogens).

June 2018 - January 2020

Laboratory technician • Institute of Molecular Genetics • Czech Academy of Sciences, Prague

Working with GMO (genetically modified) zebra fish (*Danio rerio*). Care for several genetic lineages of fish - breeding, basic laboratory methods such as PCR or microscopy and electrophoresis.

Assistance with research activities related to blood cell differentiation.

October 2017 – February 2018

Laboratory intern • State Veterinary Institute • Prague

Long-term, volunteer internship at the State Veterinary Institute in Prague. Work in the laboratory of molecular biology, isolation of DNA/RNA from samples of various origins (tissues, blood, food ...), practical use of Real-time PCR and Sequencer using GenBank and other software applications. Work with pathogens of both bacterial and viral origin.

Projects

May 2023 – ongoing

Komplex metod biologické a fyzikální retrospektivní dozimetrie pro radiační mimořádné události • Ministry of the Interior • VK01020052

The current international political situation is drawing attention to the issues of the threat of misuse of ionizing radiation sources, including possible attacks on nuclear power plants and use of nuclear weapons. In the field of nuclear safety and radiation protection, it is necessary to take into account scenarios involving a large number of irradiated persons who were not equipped with conventional dosimeters. The existing system of already established methods of physical retrospective dosimetry needs to be supplemented by methods of biological dosimetry not yet implemented, and to verify their mutual compatibility and complementarity. The increase in capacity consists in the use of advanced (semi)automated biomedical technologies and interlaboratory cooperation.

January 2019 – January 2022

Spread of ticks and tick-borne diseases: new and non-negligible risks to domestic animals, livestock and humans • National Agency for Agricultural Research • QK1920258

Research topic on the prevalence of ticks (*Ixodes ricinus*) and pathogens transmitted by them. Cooperation of the CULS with the Biological Center (Czech Academy of Sciences) in České Budějovice, the Veterinary and Pharmaceutical University of Brno, and with the Veterinary Research Institute in Brno. 3-year research project. Published scientific articles and organized a Workshop (online due to Covid-19) for wider audience in 2021.

December 2020 – April 2022

Humanitarian response to the COVID - 19 pandemic (Ethiopia, Zambia) • Mobile molecular laboratory • Czech Development Agency • ADRA • CULS

Cooperation with the Czech University of Life Sciences on a startup called CZU mobiLAB. CZU mobiLAB is a project implemented in cooperation with the non-profit organization ADRA and the Czech Development Agency. This project aims to facilitate the diagnosis of SARS-CoV-2 and other pathogens in hard-to-reach areas of developing countries (currently Ethiopia and Zambia).

With the help of a unique mobile laboratory (designed by our team) that can be transported in a pick-up or off-road vehicle, diagnostics is possible even in areas with extreme conditions (the laboratory is equipped with a spacious tent with an insulating layer and air conditioning / heating). In this project I play the role of co-manager of the laboratory and I am responsible for the quality and functionality of molecular diagnostic methods and devices. Together with colleagues, we then pass on the laboratory know-how to local doctors and laboratory technicians directly in the destination area.

January 2021 – January 2022

Project dealing with early detection of dangerous influenza mutations • provisional name GECON • Army of the Czech Republic • CULS

Collaboration between the Military Health Institute of the Military Health Agency of the Army of the Czech Republic and the Czech University of Life Sciences on the GECON startup. This project deals with preventive detection of influenza mutations from databases collecting sequences of individual influenza strains (GenBank).

In this project, I play the role of an expert advisor and assistant. I am responsible for the tracking of each major mutation, and I work together with other team members to develop and properly operate the diagnostic program.

Publications

Dvořáková A, Klímová A, ALAVERDYAN J, Černý J. 2023.

Postindustrial Landscapes Are Neglected Localities That May Play an Important Role in the Urban Ecology of Ticks and Tick-Borne Diseases—A Pilot Study. *Pathogens* 12:648

HRNKOVÁ J, Golovchenko M, Musa AS, Needham T, Italiya J, Ceacero F, et al. *Borrelia spirochetes in European exotic farm animals. Frontiers in Veterinary Science* 2022;9, doi: <https://doi.org/10.3389/fvets.2022.996015>

HRNKOVÁ, J.; Schneiderová, I.; Golovchenko, M.; Grubhoffer, L.; Rudenko, N.; Černý, J. Role of Zoo-Housed Animals in the Ecology of

Ticks and Tick-Borne Pathogens—A Review. *Pathogens* 2021, 10, 210, doi:10.3390/pathogens10020210.

Černý, J.; Lynn, G.; HRNKOVÁ, J.; Golovchenko, M.; Rudenko, N.; Grubhoffer, L. Management Options for Ixodes Ricinus-Associated Pathogens: A Review of Prevention Strategies. *International Journal of Environmental Research and Public Health* 2020, 17, 1830, doi:10.3390/ijerph17061830.
