HORIZON 2020

Viruses and Epitranscriptomics: seeking novel targets for antiviral therapy

Reporting

Project Information

EpiViral

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Project website

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Project closed

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Periodic Reporting for period 2 - EpiViral (Viruses and Epitranscriptomics: seeking novel targets for antiviral therapy)

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Summary of the context and overall objectives of the project

Viral infections are one of the most prominent and persistent threats to human health, resulting in high mortality rates and a tremendous economic impact. The frequent mutations and emergence of new viral species undermine a large part of the existing therapeutics, mainly directed at specific viruses or strains, emphasizing the importance of discovering novel broad-spectrum antiviral strategies. Investigating common mechanisms shared by different viruses, such as the regulation of host RNA modifications (epitranscriptome) upon infection, may provide important hints for the development of novel antiviral therapies.

EpiViral aims to intensify, increase, and consolidate the scientific research on virology and epitranscriptomics at the Institute of Biomedicine, University of Aveiro (iBiMED-UAVR). The specific objectives include:
1) Boost research excellence of iBiMED-UAVR in the fields of virology and epitranscriptomics.
2) Stimulate the innovation capacity of iBiMED-UAVR and contribute to new joint teams of highly skilled researchers.
3) Promote and enhance networking and international awareness of iBiMED-UAVR research and achieve a broad societal impact for virology and epitranscriptomics research.
4) Promote the establishment of links with the industry based on the experience and best practices of the two leading partners.
5) Create advanced and sustainable virology and epitranscriptomics research network for further cooperation.

Work performed from the beginning of the project to the end of the period covered by the report and main results achieved so far

The EpiViral project organized several activities and networking events:
- EpiViral Kick-off (20th of January 2021) that brought together members of the partnering institutions to officially launch the project and discuss its implementation.
- Several EpiViral Spring Seminars and EpiViral sponsored seminars directed to iBiMED-UAVR researchers.
- Workshops on Intellectual Property Rights and Knowledge transfer organized in collaboration with UACOOPERA, the Technology Transfer Office from UAVR.
- 1st EpiViral Symposium – held online on the 10th of January 2022.
- The Symposium on Innate Immunity on Viral Infection held in Leiden from the 13th to 14th of December 2023.
- EpiViral Conference on RNA Biology in Host-Pathogen Interactions held in Porto, Portugal from June 4th to June 7th of 2024.
Staff exchanges:
- “Training on LC/MS-MS technique to identify RNA modifications” from the 13th of September to the 13th of October 2021 at GUF.
- “Researchers’ exchanges” held on the 27th of October 2021 at LUMC and on the 30th of November 2021 at GUF.
- “Researcher Support Office exchanges” held on the 27th of October 2021 at LUMC and on the 30th

of November 2021 at GUF.
- Joint Lab Retreats –three Joint Lab Retreats were organized to promote networking between the EpiViral teams and share scientific results. One additional retreat was also organized to advance scientific writing of EpiViral members.
- One “Researcher Support Office exchanges” held from the 6th to 7th December 2022 at LUMC.
- One “Training Staff Exchange” held from the 27th February to the 10th March 2023 at LUMC.
- Three virtual workshops to implement new methodologies and advance the technical skills at UAVR held from March to August 2023. The two organized by LUMC focused infection and immunity studies and the one organized by GUF focused on tRNA modification analysis.
- Two Summer Schools held at iBiMED-UAVR, one dedicated to virology and other to epitranscriptomics.
- 1st, 2nd and 3rd Annual Plenary meetings to evaluate the project's progress, discuss the major challenges and achievements, and present the way forward.
- Stakeholder's meetings with healthcare and pharmaceutical/biotech industry stakeholders to present the project and the main results.
- EpiViral Career Mentoring Programme – This programme involved 16 PhD students and postdoctoral researchers.
- EpiViral Young Scientists Conference Attendance Award – The five editions of this award covered the participation of iBiMED-UAVR ESRs in international meetings.
- Training sessions on project management – Nine training sessions on research management and administration for UAVR RSO staff and researchers were organized by UAVR RSO.
- Communication, dissemination, and exploitation activities – EpiViral engaged with the scientific community, industry, and general public and potentiate EpiViral results and initiatives promotion. Communication with different stakeholder groups was promoted through the project website, social media accounts, flyers, TV, and radio.
- 36 publications in peer-reviewed journals plus three PhD and eight MSc dissertation thesis have been accomplished.

Beyond these activities, EpiViral researchers have been invited to participate in several national and international conferences and seminars and to participate in joint research projects.

Altogether, the work developed by the Epiviral consortium contributed to: 1) increase the research excellence of iBiMED-UAVR in virology and epitranscriptomics by cooperating with LUMC and GUF; 2) increase the number of stakeholders involved in iBiMED-UAVR research, including portuguese biotech/start-up companies; 3) Improve iBiMED-UAVR capability to compete successfully for national, EU and internationally competitive research funding (with approximately a 30% increase in project grant submissions); 4) increase the ability of iBiMED-UAVR to involve early-stage researchers in virology and epitranscriptomics research, with 59 ESRs participating in EpiViral's activities, largely surpassing the initial number envision (15); 5) Strengthened research management and administration skills at UAVR by promoting staff exchanges with the European partners, which resulted in the implementation of new regulation at UAVR that contributed to increase by 25% the number of EU project proposals submitted by the Portuguese institution; 6) Establishment of long-lasting and sustainable research cooperation between UAVR, LUMC and GUF, by submission of joint research projects and supervision of joint MSc and PhD students.

Progress beyond the state of the art and expected potential impact (including the socio-economic impact and the wider societal implications of the project so far)

The EpiViral consortium created a network of cooperation that boosted the iBiMED-UAVR scientific excellence. The promotion of knowledge-sharing activities, such as training staff exchanges, expert visits, and scientific meetings, enhanced iBiMED-UAVR research excellence with an added value for commercial exploitation. The participation of EpiViral in science communication activities has promoted public awareness regarding the importance of research in virology and epitranscriptomics. Especially during the COVID-19 pandemic, several communication activities were dedicated to increasing knowledge on viral infections and discussing emerging technologies in vaccine development. The study of the epitranscriptome modulation upon viral infection produced new knowledge (such as the discovery of novel putative cellular targets for antiviral therapy and the development of new methodologies to analyse RNA modifications in viral infections) valuable not only for the scientific community but also for the industry, with a broad societal and economic impact. This contributed to start new competitive research lines at iBiMED-UAVR, in collaboration with the EpiViral partners from GUF and LUMC, that are contributing to establish this institution as an European reference in epitranscriptome research in the context of viral infections, while increasing iBiMED-UAVR competitiveness in national and international fundraising.

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EpiViral logo

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