Margot Olive

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Scientific statement

I am deeply interested in understanding water quality's impact on human health, especially waterborne pathogens' role in transmitting infectious diseases. I have specialized in studying host-pathogen and predator-prey interactions, which are intrinsically related to the fate of pathogens in the environment. The outcomes of such interactions range from inactivation to protection from external stressors. Through my research, I apply quantitative microbiology and molecular biology tools to comprehensively understand the underlying mechanisms of these interactions. My goal is to provide biological engineered applications that meet the emerging challenges caused by infectious diseases.

Training

2022 – on **Post-doctorate**
LeCo: Legionella control in buildings
Department Environmental Microbiology, Eawag (Switzerland)
Adviser: Dr. Frederik Hammes

2017 – 2021 **Doctorate**
Toward biocontrol of waterborne pathogens: contributions of protists to virus removal and associated mechanisms
Environmental Chemistry Laboratory (LCE), EPFL (Switzerland)
Adviser: Prof. Tamar Kohn

2011 – 2016 **Master and bachelor degree**
Environmental Sciences and Engineering master program, EPFL (Switzerland)
Thesis: Desalination via reverse osmosis and monitoring of membrane fouling, UNESCO-IHE (The Netherlands)
Results presented in Wetsus Membrane Technologies Conference and IDA World Congress on Desalination
Advisers: Prof. Urs Von Gunten (EPFL, Eawag), Prof. Sergio Salinas (IHE)

Peer-reviewed publications

[1] **Olive, M.**, Moerman, F., Fernandez-Cassi, X., Altermatt, F., and Kohn, T. Apr. 2022. "Removal of Waterborne Viruses by *Tetrahymena Pyriformis* Is Virus-Specific and Coincides with Changes in Protist Swimming Speed". In: *Environmental Science & Technology* 56.7, pp. 4062–4070. ISSN: 0013-936X, 1520-5851. DOI: 10.1021/acs.est.1c05518.

[2] **Olive, M.**, Gan, C., Carratalà, A., and Kohn, T. Jan. 2020. "Control of Waterborne Human Viruses by Indigenous Bacteria and Protists Is Influenced by Temperature, Virus Type, and Microbial Species". In: *Applied and Environmental Microbiology* 86.3. Ed. by K. N. Johnson, e01992–19. ISSN: 0099-2240, 1098-5336. DOI: 10.1128/AEM.01992-19.

[3] Ismail, N. S., **Olive, M.**, Fernandez-Cassi, X., Bachmann, V., and Kohn, T. Aug. 2020. "Viral Transfer and Inactivation through Zooplankton Trophic Interactions". In: *Environmental Science & Technology* 54.15, pp. 9418–9426. ISSN: 0013-936X, 1520-5851. DOI: 10.1021/acs.est.0c02545.

[4] Salinas Rodriguez, S. G., Sithole, N., Dhakal, N., **Olive, M.**, Schippers, J. C., and Kennedy, M. D. Mar. 2019. "Monitoring Particulate Fouling of North Sea Water with SDI and New ASTM MFI0.45 Test". In: *Desalination* 454, pp. 10–19. ISSN: 00119164. DOI: 10.1016/j.desal.2018.12.006.

In preparation:

- **Olive, M.**, Daraspe, J., Genoud, C., Kohn, T. "Mechanism of removal of human adenovirus type 2 by *Tetrahymena pyriformis*".

Awards and honors

2019 20th International Symposium on Health Related Water Microbiology **Best Poster Award**, Vienna (Austria)

2017 Social Impact Award (SIA) Switzerland finalist for **Waterdrop Vietnam**, Geneva (Switzerland)

Conferences

2022 Mechanisms of waterborne virus removal by protists (flash-talk)
Swiss Society for Microbiology - Annual congress, Lausanne (Switwerland)

2022 Mechanisms of waterborne virus removal by ciliates: toward biocontrol of viral pathogens? (talk)
7th Food and Environmental Virology Conference, Santiago de Compostela (Spain)

2021 Harnessing protists for the control of waterborne human viruses in wastewater (poster)
5th International Conference on Eco-Technologies for Wastewater Treatment, Milano (Italy)

2019 Microorganisms from surface waters contribute to the decay of human echovirus 11: toward biocontrol of viral pathogens? (poster)
20th International Symposium on Health Related Water Microbiology, Vienna (Austria)

Academic Service - Reviewer

- Environmental Science & Technology
- Microbial Ecology

Mentoring and teaching

Undergraduate

2017 – 2021 ENV-200: Environmental Chemistry (Prof. Tamar Kohn and Prof. Urs von Gunten)
Various activities as a teaching assistant

2017 – 2021 Co-supervision of undergraduate semester projects

Graduate

2017 – 2021 ENV-507: Fate and Behaviour of Environmental Contaminants (Prof. Tamar Kohn)
Various activities as a teaching assistant

2020 Co-supervision of a semester project for a neural-network based automatic detection of viral particles in Transmission Electron Microscopy (TEM) images

Miscellaneous

Non-academic activities

2021 – 2022 Fix the Leaky Pipeline program (peer-mentoring program)
Group co-leader

2017 – 2018 Co-founder of Waterdrop Vietnam
Non-profit organization with a scientific focus:
- Water needs assessment in Mekong Delta remote areas through inhabitant interviews
- Water quality characterization in these areas (rivers, rainwater, storage tanks)
- Findings transmitted to 1001 Fontaines and Asiatic Research Center on Water (Prof. Bui Xuan-Thanh, CARE, HCMUT)

2017 Quality Health Security and Environment graduate trainee, 6 months, HFR, Fribourg (Switzerland)
- Management of high-risks biological wastes across the five hospital sites
- Digitalization of the prostheses workflow

Technical skills

- **Virology:** propagation of mammalian viruses and phages, infectivity assays, monitoring of inactivation kinetics, basics in physicochemical disinfection methods
- **Molecular biology:** DNA/RNA extraction, purification, PCR (16s, 18s), (RT)qPCR, ddPCR, amplicon-based sequencing (Illumina)
- **Culturing techniques:** mammalian cells, various protist species, and BSL2 bacteria
- **Host-pathogen systems:** co-infection and co-culture assays for amoebae-Legionella
- **Water microbiology:** biofilm analysis, biological removal of viral contaminants measurement, proteolytic enzyme activity assay, virus recovery
- **Flow cytometry:** TCC, ICC, method development for cell state differentiation (for instance, amoebae cysts, pseudocysts, trophozoites)
- **Imaging methods:** Transmission Electron Microscopy, trained in sample observation and image acquisition, epifluorescence
- **Programming:** R, Matlab

Continuous education

- Amplicon-based sequencing training, ETH Zürich, Summer 2022
- 2nd Symposium "Understanding Emerging Viral Diseases and Their Public Health Impact", Geneva Centre for Emerging Viral Diseases Campus Biotech, Geneva, Apr. 10th-12th 2019
- "Practical Holotomographic Microscopy for Live Cell Imaging" summer school, Nanolive, Aug. 2018

Languages

English	Fluent
French	Native
German	Beginner

Spanish	Intermediate