

# Margot Olive

 [margotolive.github.io](https://margotolive.github.io)  0000-0002-8329-0327  Google Scholar  ResearchGate

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Postdoctoral fellow

Environmental Microbiology Department, Eawag

Email: [margot.olive@eawag.ch](mailto:margot.olive@eawag.ch), [margot.olive@alumni.epfl.ch](mailto:margot.olive@alumni.epfl.ch)

## Scientific statement

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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 to provide applications that meet the emerging challenges caused by infectious diseases.

## Training

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### 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

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- [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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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

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|------|---|
| 2019 | 20 <sup>th</sup> International Symposium on Health Related Water Microbiology <b>Best Poster Award</b> , Vienna (Austria) |
| 2017 | Social Impact Award (SIA) Switzerland finalist for <b>Waterdrop Vietnam</b> , Geneva (Switzerland)                        |

## Conferences

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|------|---|
| 2022 | Mechanisms of waterborne virus removal by protists (flash-talk)<br><i>Swiss Society for Microbiology - Annual congress, Lausanne (Switzerland)</i>  |
| 2022 | Mechanisms of waterborne virus removal by ciliates: toward biocontrol of viral pathogens? (talk)<br><i>7<sup>th</sup> Food and Environmental Virology Conference, Santiago de Compostela (Spain)</i>                                      |
| 2021 | Harnessing protists for the control of waterborne human viruses in wastewater (poster)<br><i>5<sup>th</sup> International Conference on Eco-Technologies for Wastewater Treatment, Milano (Italy)</i>                                     |
| 2019 | Microorganisms from surface waters contribute to the decay of human echovirus 11: toward biocontrol of viral pathogens? (poster)<br><i>20<sup>th</sup> International Symposium on Health Related Water Microbiology, Vienna (Austria)</i> |

## Academic Service - Reviewer

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- Environmental Science & Technology
- Microbial Ecology

## Mentoring and teaching

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### Undergraduate

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| 2017 – 2021 | ENV-200: Environmental Chemistry (Prof. Tamar Kohn and Prof. Urs von Gunten)<br>Various activities as a teaching assistant |
| 2017 – 2021 | Co-supervision of undergraduate semester projects  |

### Graduate

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|-------------|--|
| 2017 – 2021 | ENV-507: Fate and Behaviour of Environmental Contaminants (Prof. Tamar Kohn)<br>Various activities as a teaching assistant |
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2020 Co-supervision of a semester project for a neural-network based automatic detection of viral particles in Transmission Electron Microscopy (TEM) images

## Miscellaneous

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### 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
- 2<sup>nd</sup> Symposium “Understanding Emerging Viral Diseases and Their Public Health Impact”, Geneva Centre for Emerging Viral Diseases Campus Biotech, Geneva, Apr. 10<sup>th</sup>-12<sup>th</sup> 2019
- “Practical Holotomographic Microscopy for Live Cell Imaging” summer school, Nanolive, Aug. 2018

### Languages

English	Fluent
French	Native
German	Beginner

Spanish

Intermediate