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Legal Rights of Microbes: Workshop Report

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Workshop organized by:

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GENEVA GRADUATE INSTITUTE | GLOBAL HEALTH CENTRE

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List of Participants

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4. **Catherine Larose**, Microbiologist, Centre national de la recherche scientifique (CNRS)/Université Grenoble Alpes, France
5. **Davina Höll**, Literary and Cultural Scholar, Eberhard Karls University Tübingen, Germany
6. **Emily Jones**, International Lawyer and Researcher, Newcastle Law School, Newcastle University, UK
7. **Facundo Rivarola Ghiglione**, PhD Candidate in Anthropology and Sociology (Workshop Reporter), Geneva Graduate Institute, Switzerland
8. **Frédéric Keck**, Anthropologist/Research Director, Laboratory of Social Anthropology at CNRS-Collège de France-EHESS, Paris, France.
9. **Gian Luca Burci**, Senior Visiting Professor, International Law, Academic Advisor, Global Health Center, Geneva Graduate Institute, Switzerland
10. **Jamie Lorimer**, Geographer, Professor of Environmental Geography, University of Oxford, United Kingdom
11. **Louis-Patrick Haraoui**, Professor, Faculté de médecine et des sciences de la santé FMSS Dép. de Microbiologie et Infectiologie, Université de Sherbrooke, Québec, Canada
12. **Nicolas Seidler**, Executive Director, Geneva Science-Policy Interface, Switzerland
13. **Niko Soininen**, Environmental Lawyer and Professor of Law, University of Eastern Finland, Finland
14. **Thomas Brooks**, Chief Scientist at the International Union for Conservation of Nature (IUCN), Switzerland
15. **Vinh-Kim Nguyen**, Co-director, Global Health Center/Professor of Anthropology and Sociology, Geneva Graduate Institute, Switzerland

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Meeting Theme

Traditionally seen as harmful or peripheral, microbes are now recognized as fundamental to ecosystems, human health, and planetary stability. However, these essential microorganisms face increasing threats from human activities. For decades, microbiologists have raised concerns about dysbiosis –disruptions in the composition of microbial communities – which can have profound implications for the well-being of plants, animals and environmental stability.

Recognizing that the health and sustainability of ecosystems are deeply interconnected with microbial life, this workshop aimed to explore the potential for non-anthropocentric approaches to microbes in international law. The workshop brought together experts in microbiology, law, anthropology, and environmental policy in order to explore how scientific advancements and ethical considerations could inform legal reforms or upend legal precedents, ultimately reshaping human interactions with microbial ecosystems.

Key Ideas

1. **Microbes as Fundamental Building Blocks**
   Microorganisms have shaped Earth's atmosphere and ecosystems for billions of years, making them critical to planetary health. Despite their invisibility, they play essential roles in oxygen production, nitrogen fixation, and soil regeneration, yet remain overlooked in conservation policies.

2. **Microbes and Cultural Perception**
   Literature and art have historically influenced how microbes are perceived, oscillating between fascination and fear. Fiction and speculative thought have long imagined microbial agency, expanding non-anthropocentric perspectives and challenging human-centric narratives.

3. **Shifting Scientific Ontologies**
   Advances in microbiology challenge traditional evolutionary models, shifting from species-based to function-based frameworks. The recognition of horizontal gene transfer complicates species classification, raising legal and ethical questions about microbial identity and conservation.

4. **Ethical and Legal Implications**
   Microbial rights force a reconsideration of ethical frameworks, balancing intrinsic and utilitarian values. Legal systems must address microbial agency while navigating complex questions, such as whether harmful microbes should also have rights.

5. **Conservation and Governance Challenges**
   Conservation policies focus primarily on macroscopic life, leaving microbial communities vulnerable to human-driven environmental changes. Policy institutions are beginning to question the exclusion of microscopic life from conservation frameworks, signaling a need for new governance approaches.

6. **Microbes in the Anthropocene: Human Intervention and Microbial Futures**
   The Anthropocene has significantly altered microbial ecosystems through climate change, pollution, and industrialization. The discussion explored whether human intervention should focus on "rewilding" microbial life, supporting probiotic ecosystems, or regulating microbial interactions to balance planetary health. A central question emerged: Are humans merely visitors in a microbial world, or active agents responsible for maintaining microbial diversity and ecological stability?

7. **Future Directions and Policy Implications**

   The discussions emphasized the need for collaboration between microbiologists, legal scholars, and environmental policymakers to bridge disciplinary gaps in understanding microbial life. Recognizing microbial rights could reshape laws in agriculture, medicine, and environmental protection, requiring not only innovative legal and scientific strategies but also careful "translation" of concepts across disciplines to develop a shared framework for action.

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Summary of Presentations

Louis-Patrick Haraoui and Anne Saab: Opening Remarks and Introductions: The workshop began with welcoming remarks from Louis-Patrick Haraoui and Anne Saab, who expressed their enthusiasm for convening an interdisciplinary group of experts to explore the intersection of microbiome research and international law. They highlighted the importance of rethinking legal and ethical frameworks in relation to microbial life, emphasizing the need for innovative discussions on the legal recognition of microbes. The workshop aimed to foster intellectual exchange and set the foundation for future collaborative research.

Workshop participants represented diverse academic and professional backgrounds, including law, microbiology, anthropology, environmental science, and policy. Many shared their research interests and experiences, emphasizing the complexity of microbial interactions in ecosystems, health, and governance. Several speakers reflected on past collaborations and the growing global attention on microbial rights.

Panel 1: Making Microbes Intimate

Catherine Larose, Université Grenoble Alpes (Keynote speaker): In her presentation, *Microbes as fundamental building blocks*, Larose emphasized how microbes can be seen as the dominant life-form on Earth, shaping its environments and sustaining life, as through the Great Oxidation Event that makes life as we know it today possible. Microbes, including bacteria, archaea, and fungi, are the most diverse and abundant life forms, making up 80% of known biodiversity, driving digestion, soil health, and cultural practices like cheese and wine production. Larose argued that microbial evolution and distribution are better understood through ecological niches rather than traditional species concepts. She emphasized that microbial functions evolve dynamically in response to environmental pressures rather than being fixed traits of specific organisms, reinforcing the idea that functions—not species—should be the focus when studying microbial life. This perspective challenges conventional biodiversity frameworks and it is key when considering microorganisms' conservation strategies.

Davina Höll, University of Tübingen (Keynote speaker): In her presentation, *What would a microbe say? Past, present, and future non-anthropocentric perspectives on the microbial world*, Höll explored historical, scientific, and artistic perspectives on microbes while advocating for a non-anthropocentric approach to microbial life. She traced the dual perception of microbes as both fascinating and threatening—from William Heath's *Monster Soup* (1828) to 19th-century microbiology debates. Höll highlighted how literature and art, from Mark Twain's *3000 Years Among the Microbes* to Adam Dickinson's poetic exploration of the human microbiome, challenge human-centered narratives. Höll discussed the ethical and philosophical implications of microbial entanglements, emphasizing planetary health, microbial rights, and interconnectedness and critiqued the "othering" of microbes, especially in crises like pandemics, and explored how

bioartists like Sonja Bäumel visualize microbial agency. By reimagining microbial relationships beyond disease, she called for a paradigm shift—one that acknowledges microbes as fundamental, coexisting beings rather than mere threats or resources.

Jamie Lorimer, University of Oxford (Discussant): Lorimer reflected on the interconnected themes of the panel, emphasizing the evolving relationship between microbiology, ecology, and conservation. He highlighted how contemporary microbiology challenges traditional evolutionary models, shifting focus from species-based classification to functions, processes, and ecological interactions. This shift parallels transformations in macroecology, where conservation efforts are increasingly prioritizing ecosystem functions over individual species protection. The discussant introduced the concept of charismatic microbes, reflecting on how some species of microbes can be compared to flagship species in conservation, and discussed the idea of identifying keystone microbes which play disproportionate roles in shaping ecosystems. He also discussed the probiotic turn, a response to the negative consequences of antibiotic-based ecological management, advocating for approaches that support microbial diversity. Finally, he addressed ethical questions regarding microbial rights, considering whether microbes should be valued for their contributions to human and animal health or recognized as entities with intrinsic worth, challenging anthropocentric legal and ethical frameworks.

Vinh-Kim Nguyen, Geneva Graduate Institute, Open Discussion (Moderator): Nguyen summarized the key points of the discussion. The discussion explored the invisibility of microbes, emphasizing how their rapid replication requires technological and imaginative tools to perceive and understand them. Participants reflected on shifting microbial ontologies, as scientific advancements move from species-based classifications to function-based ecological roles. Charisma and power dynamics were central themes, with microbes examined in terms of cultural, scientific, and political visibility. Another key theme that participants pointed was the ethical and legal implications of microbial rights, questioning whether rights-based frameworks are inherently anthropocentric or if they can, indeed, recognize microbes' intrinsic value. Some argued microbial extinction matters mainly for human survival, while others stressed conservation should go beyond human interests. The complexity of microbial systems raised governance and ethical concerns. Finally, participants discussed how fiction and imagination shape microbial discourse, particularly through dystopian and utopian narratives that influence public perception.

Panel 2: International Legal Frameworks

Emily Jones, Newcastle University (Keynote speaker): In her presentation, *Rights of Nature (RoN) and its application: from the local to the global*, Jones described how legal frameworks are increasingly recognizing nature's rights, with greater advancements at local and regional levels than in international law. Over 30 countries, including Ecuador, Bolivia, and New Zealand, have adopted Rights of Nature (RoN) in different ways—some granting rights to nature as a whole (Ecuador) and others focusing on specific ecosystems (Colombia's rivers). She highlighted

Indigenous peoples' crucial role while cautioning against oversimplifying their perspectives. Legal personhood models (New Zealand) and rights-based approaches (Ecuador) present distinct challenges, particularly in balancing nature's rights against corporate interests. While RoN provisions exist in global discussions, they remain mostly symbolic, often framed as "harmony with nature" rather than enforceable rights. Jones suggests applying RoN to microbial life through existing legal precedents, such as the right to a healthy environment, but warns of obstacles in implementation due to corporate influence and legal contestations.

Niko Soininen, University of Eastern Finland (Keynote speaker): In his presentation, *Complex Legal Systems Governing Complex Biophysical Systems*, Soininen explored how complexity theory applies to legal systems. He defines complexity as systems with self-organizing components interacting unpredictably, distinguishing it from mere complication. Complexity theory, originating in physics and later applied to social and ecological sciences, highlights legal systems as emergent, adaptive structures influenced by multiple actors, norms, and materials across governance levels. Traditional reductionist legal views contrast with complexity-based perspectives, which recognize law's dynamic nature. Soininen outlines two approaches to legal change: adaptive management for specific regulatory contexts and adaptive governance, which institutionalizes bottom-up social organization. He also discusses legal leverage points, where targeted interventions can trigger systemic shifts. Applying these insights to microbial rights, he suggested that complexity theory informs effective legal strategies but does not provide a normative basis for protection. Instead, ethical and policy arguments, like those in Rights of Nature discussions, must guide such efforts.

Gian Luca Burci, Geneva Graduate Institute (Discussant): Gian Luca Burci provided a critical reflection on the presentations, highlighting tensions between working within existing legal and governance systems and pushing for more radical shifts in environmental and microbial rights frameworks. He acknowledged the anthropocentric biases of international law but emphasized that strategic entry points—such as human rights law and emerging legal precedents—could be leveraged to advance microbial rights within current structures. Burci also discussed the role of governance and institutions, pointing to potential mechanisms for addressing legal and ethical challenges in microbial conservation. He noted the importance of transdisciplinary collaboration, advocating for new academic and policy frameworks integrating complexity science, legal studies, and governance to navigate this evolving landscape.

Anne Saab, Geneva Graduate Institute, Open Discussion (Moderator): The discussion centered on the tension between working within existing legal systems and pushing for transformative change, particularly in defining microbial rights. Participants debated whether rights frameworks should adapt to recognize microbial relationships rather than assigning rights based on traditional legal concepts. Questions were raised about who represents nature in legal processes, with suggestions that scientists, artists, and literary scholars could bring alternative perspectives. Another key theme was the role of governance, with some advocating for self-organizing civil

society responses when governments fail to act, while others explored how international law might evolve through incremental changes. The lack of institutional recognition for microbes was also noted, with support for more explicit integration into global governance. Finally, discussions touched on anthropocentrism, questioning whether moving beyond human-centered frameworks is realistic or if legal systems should focus on balancing human and ecological interests more effectively.

Plenary: Rights of Microbe (RoM) Working Paper

The plenary discussion explored the intellectual and practical dimensions of granting rights to microbes. Participants debated whether microbes should be considered separate entities with intrinsic rights or as essential components of ecosystems, influencing broader legal and ethical frameworks [i.e. the Rights *of* Microbes (RoM) vs the Right *to* Microbes (RtM)]. Participants further debated whether microbes should be granted rights or if alternative legal mechanisms (e.g., environmental protection frameworks) could be more effective. The practical aspect focused on how legal systems could integrate microbial considerations. A central question was whether microbes need rights for conservation purposes or if legal frameworks should facilitate better human-microbe relationships. Discussions also addressed the impact of human activity on microbial diversity and functions, raising concerns about microbial adaptation, resilience, and potential risks such as antibiotic resistance and emerging pathogens.

Ultimately, the discussion aimed to redefine legal perspectives on microbes, moving from anthropocentric models to a more relational and ecological understanding of rights and governance. A key theme was the relational perspective, where microbes are not isolated entities but part of broader ecological and social networks. The debate questioned whether existing laws can accommodate microbial governance or if a new legal paradigm is needed. Participants also explored the role of public perception, indigenous knowledge, and potential case studies to illustrate microbial governance issues.

The session concluded with next steps, including refining the working paper, securing funding, and exploring communication strategies to engage broader audiences, such as mock trials or artistic interventions. The session also considered publishing strategies for the working paper, targeting both legal and scientific audiences. The goal remains to integrate microbes into legal and environmental discourse in a pragmatic yet transformative way.

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Key Publications

Cosens, B., Ruhl, J. B., Soininen, N., Gunderson, L., Belinskij, A., Blenckner, T., ... & Similä, J. (2021). Governing complexity: Integrating science, governance, and law to manage accelerating change in the globalized commons. *Proceedings of the National Academy of Sciences*, *118*(36), e2102798118.

Höll, D., & Bossert, L. (2022). "What Would a Microbe Say?": Paving the Way to Multispecies Communication. *Transpositiones*, *1*(1), 103-118.

Jones, E. (2021). Posthuman international law and the rights of nature. In *Posthuman Legalities* (pp. 82-101). Edward Elgar Publishing.

Larose, C., Maccario, L., & Vogel, T. M. (2022). Microbiology of the Cryosphere: Diversity, Habitat Constraints and Ecology. In Chemistry in the Cryosphere (In 2 Parts) (pp. 755-794).

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Group Picture

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