

# In Biomedicine of Environmental, Microbiome Research and the Perspectival Body are Important

Rojalina Sarkar\*

Department of Biotechnology, Utkal University, Bhubaneswar, India

## Abstract

Human health is fundamentally connected with the ecology of microbial communities living on and in our bodies, according to microbiome studies. This raises problems about the categorical separation of organisms from their environments, which has been important to biomedicine. The field of biomedicine now faces an empirical challenge: determining causal linkages between host health, microbiome, and environment. To think about this topic, we recommend using the concept of environmental. Environmental is a fully perspectival notion that describes the state or characteristic of being an environment for something else in a specific context. Its strength stems in part from what Isabelle Stengers refers to as the efficacy of the

term itself, in contrast to the prevailing understanding of the word environment as both external and fixed. We suggest that environmental can assist think about the causality of microbiota on host health in a processual, relational, and situated manner, spanning scales and temporalities, using three case studies. We place this intervention in the context of biomedical thinking history, emphasising on the difficulty that microbiome research provides to an aperspectival body. We believe that tackling entanglements between microbial and human lives necessitates bringing the environment into the clinic, hence reducing the time spent there.

## Keywords

Microbiome, Biomedicine, Human Health

## Correspondence to:

Rojalina Sarkar,

Department of Biotechnology,  
Utkal University, Bhubaneswar, India  
Email: rojalina.s@uu.ac.in

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## 1. Introduction

We claim in this work that the rise of microbiome research in the twenty-first century is causing changes in the position of the environment in biomedicine. The biological boundaries between creatures and environments are questioned, and categorical distinctions between them are questioned. We suggest that this raises questions about how the term „environment“ should be used: what defines an environment, for whom, and with what health implications? From the 19<sup>th</sup> century onwards, we locate microbiome research within medical and biological currents of thinking, notably in relation to the rise to supremacy of a site-neutral medicine. Then, in answer to the difficulty of proliferating settings in microbiome research, we suggest a conceptual response [1].

The microbiome is the genetic makeup of bacteria, viruses, archaea, and fungi that live on and in another organism's body (a host, e.g., a human). Microbiome composition varies from person to person, appears to have far-reaching effects on host health and wellbeing, and evolves over time as a result of a variety of factors including food, social contacts, location, and antibiotic use. This

complex assemblage of microscopic creatures is frequently referred to as an inner environment or ecology in metabolic conversation with the surrounding environment [2].

It's also been characterized as an element of the macro-organism, with the microbiota and the host forming a holobiont. Microbiome study, from any perspective, brings organisms and their environments closer together: they co-constitute over time and across scales from macro to microscopic. This paper was part of a larger drive-in microbiology to learn more about the commensal microorganisms that live on and in human bodies, which finally led to the formation of the Human Microbiome Project in 2007. The authors clearly compared the scale and nature of the project to the study of other natural ecosystems when describing its importance: The human biome is as much, if not more, an undiscovered frontier as the collection of life found at deep-sea thermal vents [3].

Highlighting ecological co-existence with microbes was thus more than just a rhetorical tactic to promote an intriguing and understudied study subject; it was also a substantive response to the rising recognition of the depth and complexity of the human-microbe entanglement. Disease, in general, has to be viewed

through this lens as an environmental phenomenon, or at the very least as constantly possessing environmental characteristics [4].

If the growth of biomedicine in the late 19<sup>th</sup> and early 20<sup>th</sup> centuries was distinguished by a dramatic leap in understanding of the inner workings of human beings, the Human Microbiome Project was a practical and conceptual effort to close the gap between bodies and environments. Along with this ontological impact, microbiome research has made another significant contribution: as research into the human microbiome progressed, microbes were discovered to be involved in many of the major health issues confronting post-industrial societies, including metabolic, inflammatory, immune, and systemic disorders, as well as a variety of mental disorders. As more and more countries see huge industrial improvements and movements toward urbanized living, all of these diseases are on the rise. It appears that the deep evolutionary microbiological embedding and co-existence of humans and microorganisms has been disrupted [5].

## 2. Conclusion

We review the landscape of microbiome study via the perspective of environmentality in this last conversation. We return to the disparity between the genome and microbiome initiatives, as well as the difficulty of describing human-environmental relationships, demonstrating how these contested contrasts lead to environmentality. We bring to the fore ideas from Isabelle Stengers' work that help us explain the concept and discuss the kinds of work it might accomplish, as well as reflect on how environmentality has revealed some of the conundrums facing biology and the health sciences for us. We claimed in this work that microbiome research requires organism and environment to be co-constructed: When an organism is isolated from its environment or investigated without reference, clinically

significant aspects are concealed. The limitations of zoo breeding programmers, the persistence of health disparities, and the difficulties of translation between laboratory animal studies and the real-world situations they model all point to this. Yet, rather than being seen as constitutive and a possible resource for knowledge, the entanglements that underpin these problems are instead treated as noise to be removed. This is often for good reason—to produce quantitative forms of knowledge or to address resource constraints or environmental degradation—but we believe the moment has come to put co-constitution and environmentally embeddedness front and centre. In biology, biomedicine, and medicine, the time has come for a more perspectival body.

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