

Analyzing Emerging Scientific Domains in Biomedical Discourse: Case Study Comparing Microbiome, Metabolome, and Metagenome Research in Scientific Articles

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Abstract : It is increasingly difficult to analyze emerging scientific fields as contemporary scientific fields are more dynamic, their boundaries are more porous, and the relational possibilities have increased due to Big Data and new information sources. In biomedicine, where funding, medical categories, and medical jurisdiction are determined by distinct boundaries on biomedical research fields and definitions of concepts, ambiguity persists between the microbiome, metabolome, and metagenome research fields. This ambiguity continues despite efforts by institutions and organizations to establish parameters on the core concepts and research discourses. Further, the explosive growth of microbiome, metabolome, and metagenomic research has led to unknown variation and covariation making application of findings across subfields or coming to a consensus difficult. This study explores the evolution and variation of knowledge within the microbiome, metabolome, and metagenome research fields related to ambiguous scholarly language and commensurable theoretical frameworks via a semantic analysis of key concepts and narratives. A computational historical framework of cultural evolution and large-scale publication data highlight the boundaries and overlaps between the competing scientific discourses surrounding the three research areas. The results of this study highlight how discourse and language distribute power within scholarly and scientific networks, specifically the power to set and define norms, central questions, methods, and knowledge.

Keywords : biomedicine, conceptual change, history of science, philosophy of science, science of science, sociolinguistics, sociology of knowledge

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