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What is the Impact of "Big Data" on the Science of Metabolism?

In this seminar, I discuss how "big data"—or the so called rise of bigger, faster, and better technologies and ways of using data—is impacting the science of metabolism. In other words, I discuss how scientific efforts to re-configure metabolism with big data are impacting understandings of cells and metabolic processes, and are also leading to new ways of intervening into health and disease. This is important in the contemporary biomedical landscape, because knowledge of metabolism is central to emerging disease interventions and medical systems, as well as to how people experience their bodies, environment, and health.

With big data, as biomedical research is increasingly carried out with computerized and statistical tools, metabolism is changing as a conceptual, technological, and therapeutic object. Scientists are moving away from linear and reductionist notions of disease causation, and are embracing the complexity, probability, variability, and dynamism of biological systems and networks. At the same time, scientists are casting their work in terms of its potential use in paradigms such as "translational research," the movement and application of laboratory research to clinical issues, as well as "precision medicine," the shifting of disease categories away from clinical symptoms and towards molecular pathologies.

In this talk, I discuss how five years of ethnographic research and interviews in the field of metabolomics—the post-genomic study of the molecules and processes that make up metabolism—provides a case study for understanding the role and impact of big data in biomedicine. Consequently, this talk first focuses on explaining the meaning and significance of buzz words like big data, omics, metabolomics, and translational research. Secondly, it asks how the "stuff" of big data, e.g. the practices and technologies that make up the backbone of everyday big data research, enables scientists to ask certain types of questions and envision metabolism in certain ways. Thirdly, this talk asks how big data enables scientists to produces certain forms of knowledge and values about health, which ultimately guide the development of metabolic diagnostics and therapeutics.