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## Special Issue of BioSocieties: Empirical engagements with environmental epigenetics from the lab to the clinic

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By Anna Zogas

The December 2018 issue of [BioSocieties](#) is a collection on epigenetics. Here are the abstracts. Enjoy!

[Situating the biosocial: Empirical engagements with environmental epigenetics from the lab to the clinic](#) (*open access*)

*Stephanie Lloyd, Ruth Müller*

[excerpt] Few life science research fields have met with as ambivalent a response in the social sciences as environmental epigenetics, an emerging yet influential research area exploring the interactions between gene expression and the environment. The conceptual and experimental models emerging from this field have sparked great excitement as well as skepticism in Science & Technology Studies (STS) and neighboring fields (Pickersgill, 2017), with many researchers expressing both. On the one hand, researchers have interpreted environmental epigenetics as a fundamentally novel thought style in molecular biology that recognizes the importance of the social for the biological and which could create a new “biology without biologism” (Meloni, 2014). On the other hand, researchers also remain skeptical as to whether a shift away from models of health risks and human development based on innate genetic characteristics toward a focus on acquired epigenetic modifications really indicates a less biocentric approach to human biology (Waggoner and Uller, 2015). While a variety of publications have debated these questions, few studies as yet exist that have empirically explored the practices central to epigenetic knowledge production and its relationship to emerging understandings of biology, health, and disease risk. This special issue attends to this important gap in current research.

[Situating local biologies: Anthropological perspectives on environment/human entanglements](#)

*Jörg Niewöhner, Margaret Lock*

In this paper, we posit the notion of ‘situated biologies’ as a conceptual contribution to the often-polarised debate over the material human body as

being either local or universal. To argue our case, we briefly recapitulate the medical anthropological concept of 'local biologies' before highlighting current molecular biological research on epigenetics and its implications. We discuss how different forms of 'local' arise in environment/human entanglements and how material agency becomes situated and contingent through various knowledge practices. We conclude by developing the overarching concept of 'situated biologies' to further a collaborative ethnographic agenda that explores the multiple effects of particularising or universalising material agency in research on environment/human entanglements.

[The paradox of care in behavioral epigenetics: Constructing early-life adversity in the lab](#)

*Martine Lappé*

Many epigenetic studies focus on how stress, trauma, and care become molecularly embodied, affect gene expression without changing DNA sequence, and produce changes that influence the health and behavior of individuals, their offspring, and future generations. This article describes how care has become central in research on the epigenetic effects of early-life adversity. My analysis draws on ethnographic research in a behavioral epigenetics laboratory in the United States. Building on traditions in feminist science studies, I document how care is enacted with research samples, experimental protocols, and behavioral endpoints in experiments with model organisms. My findings point to tensions between researchers' care for the data and their measurement of adversity as a discrete variable in the form of maternal interaction, neglect, and abuse in mice. I argue that these tensions suggest a 'paradox of care' that is actively shaping how epigenetic knowledge is produced and its impacts both within and beyond the lab, including for understandings of how early-life experiences shape human health, and our social expectations of mothers. This study suggests that more complex explanations of health and development promised by epigenetics are simultaneously constructed and constrained by caring practices in the laboratory.

[Epigenetics and aging research: Between adult malleability and early life programming](#)

*Ruth Müller, Georgia Samaras*

Aging research explores the basic biological mechanisms of aging and age-related disease. As the 'aging society' is framed as one of today's grand challenges, particularly in the global North, the field is gaining momentum. Epigenetic approaches have become important for aging research. This article explores which kinds of epistemic and biopolitical formations arise with the integration of epigenetics into aging research. Drawing on literature analysis, participant observation at international

conferences in Europe, and interviews with selected speakers, we identify two distinctly different ways in which epigenetics and aging have become linked. On the one hand, epigenetics has become important for research focusing on the continuous biological malleability of aging processes in adults. On the other hand, it is integral to research investigating how early life development programs aging trajectories. These perspectives do not only differ epistemically, but also entail distinctly different visions of possible clinical, social, and political responses to the challenges of the aging society. Particularly, questions of social inequality and the growing health and morbidity gap in late-capitalist Western societies figure differently in each perspective. This shows that epigenetics, rather than moving biological research in one specific direction, can participate in heterogeneous epistemic formations with diverging biopolitical momenta.

["It was there all along": Situated uncertainty and the politics of publication in environmental epigenetics](#)

*Stephanie Lloyd, Eugene Raikhel*

Drawing on two ethnographic examples from a laboratory study of a group conducting environmental epigenetics research on suicide risk, we examine the ways in which researchers go about making credible claims in the face of a range of profound uncertainties. We first explore how a range of factors led to what is now accepted as a fact or discovery being explained away, several years ago, as a combination of technical error and known background noise. To set this first example within a broader context, we turn to a debate that erupted in the lab during a journal club meeting about claims-making and publishing in science. Through these examples, we aim to demonstrate the complex terrain in which scientists manage epistemic uncertainties and produce credibility in environmental epigenetics research. Our goal is to trace uncertainties from the unknowable reasons and internal states that lead people to respond to data in a particular way, through to the technical difficulties in identifying data from noise, through to issues of ethical self-making, as students learn to become certain types of scientists. We argue that the ways in which uncertainty takes on meaning, has effects and is managed also has much to do with its situatedness.

[Calibrating cancer risk, uncertainty and environments: Genetics and their contexts in southern Brazil](#)

*Sahra Gibbon*

Drawing on empirical ethnographic research in Brazil this paper examines how in the spaces between identifying genetic markers and conditional cancer risk, environments and diverse epigenetic logics are emerging and being negotiated among research and clinical communities, patients and their families. Focusing on an arena of research and medical intervention

related to a gene variant known as R337h, thought to occur with high frequency in the south of Brazil and linked to the cancer syndrome Li–Fraumeni, it emphasises the relevance of examining epigenetics as an emic category but also its utility as an analytic category. It shows how, in a context of not yet fully knowing how and in what ways R337h contributes to increased cancer, a range of different ‘environments’ are invoked that unevenly articulate an emerging and still inchoate and unfolding terrain of understanding. In an arena of expanding genomic research and medicine, where the identification of low-risk mutations associated with cancer is increasingly common, the Brazilian case provides a particular lens on the way environments and genes are being meaningfully calibrated and how differently implicated communities resourcefully populate the gaps in knowledge and understanding with consequences for research, care and embodied risk.

[Epigenetics at work](#) (*open access*)

Rayna Rapp

[Excerpt from commentary] Stepping back, what lessons might we draw from the collective conversation these articles about “epigenetics at work” open up? As a group, they provide rich empirical analyses and theoretical interpretations that suggest a conundrum: Epigenetics research potentially opens the door to an understanding of intergenerational biosocial entanglements and continual co-productions of life-form variance, including the structures of risk for life-limiting human health impairments. Yet it also frequently shuts that door through implicit conventional cultural assumptions, whether surrounding gender and the complexity of social life; or asserting that quantifiable biological markers and arguments are not only (more easily) measurable but need remain powerfully hegemonic, as well.

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