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Biopolitical Barriers to a Potterian Bioethics: The (Potentially) Missed Opportunity of Epigenetics

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Lee (2017) calls for greater attention to the shared epistemological and normative grounds of both public health ethics and environmental ethics, and to Potter's original conception of bioethics, which, as she rightly observes, has been largely disregarded in contemporary North American bioethics scholarship and practice. In a previous publication we also argued in favor of reviving the Potterian approach to bioethics; we built a case grounded in "the relatively new field of molecular epigenetics [that] provides novel information that should serve as additional justification for expanding the scope of bioethics to include environmental and public health concerns." (Dupras, Ravitsky, and Williams-Jones 2014)

Epigenetics research is demonstrating that biological variability and health inequalities cannot be explained solely by changes in the DNA sequence. In fact, a set of biochemical modifications occur during development and throughout life "over" DNA (*epi-genetic*), such as DNA methylation, and are instrumental in allowing (or impeding) access to the genes. When a particular gene is being methylated, the three-dimensional (3D) structure of DNA densifies to the point where, as a parchment, it cannot be read anymore—that is, it is silenced. Most epigenetic modifications occurring during development are normal and necessary to confer on each cell or tissue its specific biological function.

Over the past 20 years, however, many epigenetic variants have been associated with increased risk and incidence of cardiovascular, metabolic, hormonal, immune/

inflammatory, and neuropsychological conditions (Portela and Esteller 2010). Some of these variants have been associated with exposure to toxic environmental contaminants, such as diesel exhaust and pesticides (Bollati and Baccarelli 2010). Even more interesting (although still poorly explained), studies are showing that familial circumstances (e.g., parental behavior, child abuse) and social adversity (e.g., stress, socioeconomic status, racism) could also effect epigenetic programming in a significant manner, leading to long-term adverse health outcomes (McGowan and Szyf, 2010). In light of epigenetics findings, a classic genetic model—by which specific gene mutations produce disease (e.g., Huntington's) or increase risk (e.g., BRCA1/2)—seems inadequate (or at a minimum insufficient) to explain and address the most common diseases that affect us.

Epigenetics has thus begun to receive attention from a growing number of researchers in the social sciences and humanities, because it provides empirical evidence that the traditional dichotomy between "nature" (biology) and "nurture" (familial and sociocultural contexts) has been largely overstated. Epigenetics demonstrates that nature and nurture are intimately and inextricably interrelated (Landecker and Panofsky 2013). As such, it has been hailed by some as a potent driver—and ultimate symbol in the postgenomic era—of a long-hoped-for paradigm shift, from simplistic gene-centric perspectives of individuality and health, to more ecosystemic and interactionist models according to which preventive and biopsychosocial

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interventions can and should be prioritized (Meloni and Testa 2014; Hedlund 2012).

In our paper “Epigenetics and the Environment in Bioethics,” we suggested that by creating a molecular bridge between physicochemical and psychosocial environments in which children develop, on the one hand, and gene expression with its associated health implications later in life, on the other, findings in epigenetics could help justify greater investment in preventive and public health approaches and policies. In the years following this 2014 publication, we critically reflected on two of our assumptions: first, that the molecular-scale vocabulary provided by epigenetics might be more convincing than existing epidemiological studies to promote social justice and greater care for the environment; and second, that since findings in epigenetics highlight the role of socioenvironmental factors that help determine individual and population health risks, they would necessarily translate into preventive strategies rather than curative/palliative treatments.

Critically exploring these two assumptions allowed us to shed light, in a recent 2016 publication, on the influential biopolitical landscape in which scientific knowledge translation is currently embedded in Western societies (Dupras and Ravitsky 2016). This biopolitical context, which we characterized as the “neoliberal regime of truth” (a term coined first by Foucault), is subtly yet actively, we argue, challenging the already-mentioned opportunity offered by epigenetics. It may also explain, in line with Lee’s call for increased attention to public health ethics, why the substantial scientific evidence we already have regarding the close interrelation between one’s environment and future health may be insufficient to stimulate political will and drive societal change that is grounded in a Potterian bioethics.

Building on Foucauldian analyses by prominent sociologists, who identified and extensively characterized ongoing trends of *molecularization* and *biomedicalization* in Western societies, we began to question the reasons underlying our initial assumptions (Clarke et al. 2010; Lemke 2010; Rabinow and Rose 2006). We realized that we saw molecular-scale evidence and explanation as particularly convincing, precisely because we, as researchers entrenched in neoliberal “pathways of thinking,” had been granting it more scientific weight and rhetorical power. We thus assumed that it could better motivate and mobilize political will to promote social justice and environmental protections.

But this biopolitical context may, paradoxically, end up pushing toward what we have called a “clinical translation” of findings from epigenetics, based on well-established biopolitical devices (Foucault’s “*dispositifs*”) in contemporary scientific and medical research, that is, the internalization and isolation of the determinants of health (molecularization; liberal individualism), and the technologization of health care interventions inherently promoted by the requirements to commodify life itself for economic and commercial purposes (biomedicalization; economic liberalism). Such a translation would focus on

the clinical utility of epigenetics research—centered on the internal epigenetic variants as the metric of health inequality—and the development of biotechnology with which these could be revealed or manipulated.

Unfortunately, in a context of scarce public and private resources, a disproportionate investment in such a clinical translation could be detrimental to what we have called the “policy translation” of epigenetics, which would emerge from a socioenvironmental and largely preventive perspective and focus on using public policies to manage social inequalities and other external determinants of health. Instead of incarnating a Potterian bioethics—in line with the normative frames of public health or environmental ethics—the biopolitical context may lead epigenetic research to reinforce the dominant biomedical model.

The problem with our initial hypothesis was that we underestimated or paid insufficient attention to the broader sociopolitical context. This is not to say that the findings of epigenetic research cannot have a positive influence or role in shifting health policy in the direction of public health. We still think that epigenetics—by providing the missing mechanistic explanation for statistical correlations—can be a powerful argument in favor of integrating a Potterian approach in both bioethics and public policy. It is useful, but insufficient.

What is also needed is a reflection on the vectors of power and modes of influence that operate in neoliberal democracies, and thus the places where it may be possible to intervene. Powerful devices and pathways of thinking that may impede just and proportional translation of science must first be recognized, then addressed. Importantly, we—as bioethics scholars—should not solely be interested in the ethical implications of empirical data and scientific findings, but also take action along other avenues of change, such as international social and political movements pointing to the evident yet increasingly unfair conditions in which the most vulnerable among us grow up and live.

In short, Lee’s appeal to “the principle of least infringement to solidarity, interrelatedness, and the connection of human health to the health of the planet” would, we suggest, benefit from a recognition of neoliberalism’s strong biopolitical and economic pressure toward an individualized, biomedicalized model of health care. We thus call upon the global bioethics and epigenetics communities to promote the incorporation of public health and environmental considerations as a means for countering the dominant neoliberal pressures. Our hope is that such a movement will gain sufficient political capital to counterbalance the current “regime of truth,” and to convince decision-makers to work towards a proportionate allocation of investments in the various translations of scientific findings (i.e., for individual and population health). Only then will a Potterian ethics find its way through the dominant biomedical model of North American bioethics and materialize into public policy that can positively shape public and environmental health.

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Cancer Registries as a Resource for Linking Bioethics and Environmental Ethics

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Lisa Lee (2017) calls for a bridge between the fields of bioethics and environmental ethics that connects the ambitions of the past century to the practical needs and scientific potential of the present and future. She invokes the pioneering work of Aldo Leopold in environmental ethics and Van Rensselaer Potter—a biochemist and professor of oncology—in bioethics. Lee argues that between principled commitments to environmental stewardship (including pursuit of ecological justice measured in human health) and the individual well-being and autonomy associated with the care of a medical patient, public health ethics can move “all of Earth’s inhabitants toward a good life.” Indeed, there are resources and common goods that may be called into service for this purpose.

The Cancer Registry of Greater California (CRGC) exemplifies a resource and common good of this type. It

gathers individual-level data on each cancer diagnosed and/or treated within a defined geographical area comprising 48 of California’s 58 counties, and uses these data for cancer surveillance, support of specific epidemiological and public health investigations of cancer, and responses to community concerns about cancer incidence. In its support of investigations that aim to inform individual-level prevention, care, and survival, the ethics of individual autonomy are paramount. In research generally, human subjects are defined not only as identifiable living individuals, but also as data about identifiable, living individuals. Autonomy and well-being are woven into the fabric of ethics and regulatory oversight. Although the shame and social stigma associated with cancer have been reduced through science, improvements in care and survivorship, and advocacy, the existence of individual-level cancer data

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