

EDITORIAL

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'Epigenetics and Society': a forum for the theoretical, ethical and societal appraisal of a burgeoning science

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Epigenetics Communications is proud to announce the introduction of a new section entitled 'Epigenetics and Society' (EaS). EaS offers a forum for researcher from various disciplines to engage with the theoretical, interdisciplinary, ethical, social and political dimensions of epigenetics. Authors, within and beyond academia, are invited to submit manuscripts of original research, reviews or perspectives/correspondences dealing with these different facets of epigenetics. The EaS section is meant to provide an opportunity for sharing work across disciplinary borders in ways that both illuminate the science-society intersections around epigenetics and promote their operationalization in multidisciplinary and collaborative scientific practices.

The EaS section provides a forum for novel contributions on a number of key dimensions of epigenetic research. First, this concerns studies of the Ethical, Legal and Social Aspects (ELSA) of epigenetics. The EaS section aims to bring this body of scholarship closer to a life-sciences readership and to offer life scientists a unique opportunity to share their experiences and perspectives on the ELSA of their research. The ELSA literature on epigenetics has still not found a definitive answer to some major questions [1–3]. A notable example is the use of epigenetics in public health promotion: is epigenetics

a science of the social determinants of health and their molecular effects over disease predispositions [4, 5]? What role should epigenetics play with regard to the unfair distribution of environmental and transgenerational risks in our societies [6, 7]? To what extent should public representations of this knowledge insist on positive lifestyles changes, instead of social and community interventions, when it comes to modifiable epigenetic predispositions to diseases? [8–12]. We invite researchers from all fields and backgrounds to advance the reflection on the ethical and legal dimensions of the latest developments in epigenetic research, with specific attention to techniques such as CRISPR-Cas-mediated epigenetic editing. The transient and reversible nature of epigenetic editing systems challenges the ethical intuitions crystallized by ten years of debate around genomic sequence editing. Beyond assessments of epigenetic editing as safer and less controversial option than its genetic counterpart lies the task of dissecting the specific concerns and opportunities of this technology as it approaches clinical translation [13]. We also invite contributions on best practices of study design and rules of engagement of participants in epigenetic research, especially when these fall into the category of vulnerable populations [14–17]. Finally, the EaS section welcomes ELSA assessments of understudied issues such as the societal concerns attached to the epigenetic engineering of plants.

As a second key dimension of the EaS section, we are interested in work on the utility and limitations of existing and future applications of epigenetic technologies in

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the diagnosis, stratification and prognosis of diseases. We encourage assessments of their risks and implications, as well as the development of models for responsible clinical implementation [18]. On a deeper level, we encourage submissions of work uncovering epigenetic mechanisms and pathways guiding the effects of socio-economic conditions and events on subsequent health outcomes. Such studies improve our understanding of the role of epigenetics in the long-run implications of social, economic and psychological factors on health outcomes and on societal inequality.

As a third key dimension, we envisage contributions addressing the agendas, questions and research practices of epigenetics, including discussions of how these affect the societal circulation of this knowledge. A substantive body of empirical research in the domain of Science and Technology Studies has dealt with intrinsic biases and limitations of research practices of epigenetics that may produce a controversial uptake of this science in society [19–25]. This body of work is seldomly brought to the attention of life scientists and rarely finds recognition in interdisciplinary circles, or beyond networks of social sciences collaboration. We hope that the EaS section will offer a venue for the dissemination of this work within the life sciences community. Specifically, we encourage Science and Technology Studies scholars to condense thick socio-anthropological analyses into short perspectives and/or correspondence articles. The objective of such contributions is to retain their critical and empirical outlook on practices of epigenetic research all while making this content suitable to a life sciences journal and audience. Our hope is that making this work amenable to reading and debating within a life-sciences setting will ultimately promote an interdisciplinary dialogue around epigenetics and improve those methods, biases, designs and configurations of research that Science and Technology Studies critics find wanting.

Fourth, STS and humanities scholars may consider the EaS section as an outlet for their philosophical, historical and/or socio-anthropological work on the theoretical, methodological and experimental foundations of epigenetics [26–31]. This strand of literature has interrogated how epigenetics re-iterates fundamental questions on life and biology, as well as how it challenges established conceptions of the body as self-contained entity [32, 33]. In this light, epigenetics straddles disciplinary divides (e.g. the one separating the life and social sciences) as well as research traditions in biology oscillating between mechanism and organicism, reduction and emergence, linearity and complexity, pre-determination and plasticity. While at first glance these issues may seem abstract or ‘philosophical’, they could also offer invaluable insights to the ongoing debates on the definitional and

methodological disagreements in epigenetics [34–38]. These controversies are not simply ambiguities and misconceptions that, if settled, may lay the foundations of a better ordered scientific field. Rather, they offer a unique opportunity and a prolific terrain for any empirical or conceptual inquiry into foundational questions in biology—which touch upon notions such as ‘genes’, ‘genomes’ and ‘organisms’ [39–41]. We therefore invite scientists inquiring into the theoretical stability of epigenetics and scholars working on the historicity and foundations of this question, to view EaS as a trading zone where intellectual guidance and pragmatic relevance of theoretical analysis can productively engage with one another. Through EaS we wish to offer a stable forum to bring decades of philosophical, historical and socio-anthropological work on the theoretical foundations of biological thinking into the research practices of epigenetics.

By doing so, we hope that, at a later stage of development of the EaS section, the research community will reap the benefits of a well-developed theoretical, ethical and social reflexivity with and within epigenetics. Many scholars have recognized the opportunities epigenetics offers to an integrative approach to human health in our societies [42, 43]. There exist calls for a shared theoretical, empirical or even political approach in multidisciplinary engagements around epigenetics, which often go by the qualifying adjective of *biosocial* [44]. This term is used to describe a more or less contested experimental space at the crossroad of the social and life sciences, which captures complex, non-linear social-biological transitions in the shaping of the epigenome and situates biology in its material, social and ecological environments [45]. The EaS section welcomes reports on the challenges of interdisciplinary work towards a biosocial science of health built on epigenetics, its questions, methods and approaches [46, 47]. Collaboration and interdisciplinarity are loaded practices: the encounter of cultures and traditions of research is an intricate, power-driven, often-frustrating and risky endeavour [48]. The stated objective of *Epigenetics Communications* to explore alternative conclusions/interpretations of well-established epigenetic phenomena (“negative data”) should therefore not be confined to molecular biology research. The EaS section rather wishes to extend this opportunity to those involved in more or less successful interdisciplinary experimentations.

Epigenetics Communications has taken up the ambitious mission of promoting the critical reflexivity internal to the field of epigenetics. With the launch of the EaS section, this invitation is formally extended to researchers from any disciplinary background, investigating the theoretical, ethical, social, interdisciplinary and empirical dimensions of this science. We believe that this is another

much needed development in the editorial landscape of the field: a venue for connecting and integrating different communities of researchers and distinct analytical perspectives may be a major enabler of a thriving epigenetic science. The time is ripe for the implementation of collaborative approaches that, by transcending disciplinary divides and combining different analytical sensibilities, can structure an effective contribution of epigenetics to societal flourishing.

Authors' contributions

LC took the lead in conceiving and writing the manuscript, as well as in coordination of this work. EB and GvdB participated in its conception and multiple rounds of revision. All authors read and approved this version of the manuscript.

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Availability of data and materials

Data sharing not applicable to this article as no datasets were generated during the current study.

Declarations

Competing interests

The authors have no competing interests to declare that are relevant to the content of this article.

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