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Diversity is essential for good science and reproductive science is no different: a response to the recent formulation of the Burroughs Wellcome Fund Pregnancy Think-Tank



TO THE EDITORS: We are at a critical junction in our journey toward improving women's health, particularly during their reproductive years. However, the coronavirus disease 2019 pandemic has revealed an inconvenient truth we have recognized in women's health for decades: not all women have benefited equally from these advancements. Over the last 30 years, our progress in the critical arenas of maternal mortality and birth outcomes has been largely incremental. If we are going to continue to advance science and medicine, we must recognize and acknowledge the profound toll that societal and structural racism has had on not just the output of science and medicine but on those who are the future of science and medicine. In light of this, we were greatly disappointed in the makeup of the Burroughs Wellcome Fund Pregnancy Think-Tank—a group of personally and professionally affiliated white scientists (16 of 17), in which 13 of 17 were men and included only 1 practicing obstetrician—and its proposed agenda.¹ Why are we disappointed? We offer 3 reasons.

First, pregnancy is complex. Except for rare circumstances, poor pregnancy outcomes are not attributable to a single disease, single physiological pathway, or discrete set of genes. The developing fetal brain, maternal immune system, and reproductive and metabolic physiology are increasingly recognized as being particularly vulnerable to poor nutrition and stressful environments. These and other early developmental perturbations are directly linked to subsequent childhood behavioral disorders and the risk and occurrence of common noncommunicable diseases such as diabetes mellitus, cardiovascular disease, obesity, and the obstetrical syndromes of preeclampsia and preterm birth. Thus, not only systems but also environments are critical drivers of outcomes. What is missing or dissected away from current mechanistic discourse about the biology of these processes is the larger environment in which a person exists and their response to it. Known factors that influence pregnancy

include socioeconomic status, experience of institutional racism, underlying health conditions, access to healthcare, nutrition, environmental toxins, early adverse life experiences and exposure to violence or trauma, and psychological support. The ever-deepening dive into “omics”¹ absent a scientific incorporation of these other factors, and their biologic effects² has not and will not solve the problems of adverse pregnancy outcomes.

How did we get so deep in the weeds of this situation with a nearly exclusive focus on the genetics of preterm birth and adverse pregnancy outcomes?¹ We propose that this occurred because of the relative absence of essential perspectives, especially of women affected by these variables. The woman's contribution is literally absent from the word cloud of themes that emerged from the Think-Tank discussion.¹ Women bear the brunt of pregnancy's burden, but they may not see pregnancy as necessarily a “conflict” with gene expression as a weapon. Poor women such as black, indigenous, and people of color (BIPOC) and those in the lesbian, gay, bisexual, transgender/transsexual, queer/questioning, intersex, and asexual/allied (LGBTQIA) community bear the burden of the adverse effects of white supremacist heteropatriarchy on reproduction. In 2020, most medical providers of pregnant women and their children are also women. They are positioned to alert us to impending harm, be it from adverse drug reactions or exposure to environmental toxicants. Moreover, there are many women, including talented women of color, at all professional levels, who are deeply invested in women's health and who have a deep working knowledge of our field and its clinical and social ramifications. They represent multiple diverse areas of expertise including those represented in the Think-Tank, yet their stature is not leveraged to the same degree as their male colleagues. The factors undermining acknowledgment of this stature and reputation overlap with the environmental factors that result in adverse pregnancies outcomes, including structural racism and

sexism. In the academic environment, this manifests in the disparity of funding, philanthropic redlining,³ and hostile workplaces and in the lack of recognition for achievements. To find solutions to the challenges regarding women's health, we must also include women scientists who are affected by and can speak credibly to these variables.

Finally, the impact of adversity during pregnancy affects the next generation. Although the intentions of the respected Think-Tank members may well have been positive, it is the impact that is critical both now and in the future. Decisions made by those who make up this group will affect generations of scholars who will determine the mechanistic basis for critical gene-system-environment interactions and practitioners who are more likely to be female, LGBTQIA, or BIPOC. The time is now to open up seats at the table and allow them to become critical participants in developing the strategic research plan to tackle the problems of adverse pregnancy with and in the name of meaningful science. This is not an opportunity to be missed to build a large bench of scholars and leaders for the future. ■

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REPLY TO “DIVERSITY IS ESSENTIAL FOR GOOD SCIENCE AND REPRODUCTIVE SCIENCE IS NO DIFFERENT: A RESPONSE TO THE RECENT FORMULATION OF THE BURROUGHS WELLCOME FUND PREGNANCY THINK-TANK”



We thank Drs Bonney, Elovitz, and Mysorekar for their Letter to the Editors¹ regarding our Special Report in the *American Journal of Obstetrics and Gynecology*.² The primary issue raised was in the makeup of the think tank participants. Similar comments were made on social media. The small size of the think tank gathering and our intense attention to scientific diversity, seeking unique disciplines that are underrepresented in perinatal biology, led to inadequate consideration of other components of diversity. We are committed to ensuring greater representation across domains in all future events and activities.

We concur with the need to incorporate known factors that influence pregnancy, such as socioeconomic status, disparities, environmental adversity, and other social determinants of health. These were discussed by the assembled participants and were clearly highlighted in the manuscript. Future interactions that focus on these factors would be a welcome addition to this effort and an opportunity for all of us committed to improving the health outcomes for women and infants to include more diverse and global expertise.

In generating the relatively small 30-person group, our goal was to include a diversity of scientific disciplines that had strong

and untapped potential to reveal new insights into the biology of healthy pregnancy and pathologic mechanisms of gestational diseases. The basic biomedical sciences were a priority, aligned with the sponsor's, Burroughs Wellcome Fund (BWF), mission. These experts, each accomplished in their respective areas, represented some investigators already pursuing questions in reproductive sciences from various approaches. It included many experts new to pregnancy research from disciplines not historically engaged in such inquiries. One individual was invited from each scientific area. Therefore, only 2 of the participants had clinical training and practice experience in obstetrics. Notably, 2 of the 4 invited organizing committee members were women, with 1 of color.

All of the participants and the BWF are invested in diversity of gender, race and ethnicity, age, geography, and sexual orientation, which lend the needed and beneficial perspectives to discovery and prioritization. Diversity initiatives and support have been long-standing priorities of BWF for advancing the science, technology, engineering, and mathematics and biomedical pipeline (see grant-programs/diversity-science" title="https://www.bwfund.org/grant-programs/diversity-science"), and these