Last Word on Viewpoint: Perspective on the future use of genomics in exercise prescription

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TO THE EDITOR: In reading the several commentaries submitted in response to my Viewpoint article on the future use of genomics in exercise prescription (5), a few things struck me. First, the diversity of opinion is remarkable, ranging the gamut from “unlikely” to a vision more expansive than the rather limited nature that I propose. To me, this points to a conversation worth having, as no consensus has been reached in this area, except perhaps to acknowledge that genomics studies will likely continue to inform our understanding of the underlying biology of exercise responses and adaptations.

Second, issues of complexity are emphasized, whether it be the gene-environment interactions yet to be discovered that will surely explain differential adaptations to exercise interventions or the psychological impact that such screening will have on future users of the technology. Recent commentaries on genomic medicine emphasize these same issues, cautioning against a too rapid integration of genomic information into clinical practice (2). In my Viewpoint, I’m not arguing for rapid use of such information, but am rather envisioning how such information may play a role in the future, and these complexities make any crystal ball remarkably cloudy.

Finally, many commentators emphasize that the strength of the evidence for or against a future role for genomics in exercise prescription is tenuous, and on this point I think we all agree. As recently emphasized by Khoury and Bradley (3), there is a great need for genomics research to move beyond discovery science to translational research, where identified genes are tested for clinical relevance. In the exercise science field, we could arguably benefit from more of both, as only few genes have been studied in any detail and fewer still have been studied for any clinical relevance. That said, commercial companies are marketing genome screening products related to exercise performance (e.g., 23andMe Inc., Genetic Technologies Limited), which points to a need for our community to be actively engaged in this conversation.

The impetus for my Viewpoint piece was to both stimulate discussion and promote further work in this area, and I am grateful to the Journal of Applied Physiology for providing space to do that. What is clear from even this limited exchange of ideas is that most agree that the available evidence for a genomic influence on exercise responses and adaptations is shaky, which prompts us to ask about the extent of its importance. Some also seem to agree with my contention that, should the available evidence be supported, the most valuable use of such technology will be for disease treatment, but here the evidence is even more limited. With most exercise genomics work to date having been performed in healthy individuals, there is a strong need for genomic studies examining exercise adaptations in diseased individuals, and those studies are beginning to be pursued (1, 4). Without this conversation, and the ability to debate strong and weak points in our ideas, there will be little likelihood in stimulating the future work needed to find answers to these important questions.

REFERENCES