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

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TO THE EDITOR: Roth (2) concluded that genomic information could meaningfully impact on the clinical decision-making process predominantly in two of three scenarios. However, this conclusion is largely based on genetic association methods that have many limitations. In contrast, functional genomics approaches capture both genetic and environmental influences. Gene-network activation measures are an integrated signal that associates with physiological adaptation (1) in a manageable numbers of subjects for human physiological studies (3, 4). Implementation of personalized approaches is arguably most important for healthy subjects to maximize the effectiveness of preventative strategies. Functional genomics, rather than genetics, will herald in the age of personalized medicine for complex traits and, for example, allow us to prescribe tailored exercise therapy to maximize the benefits to those who can benefit from exercise, especially in scenario 1. However, I believe Dr. Roth highlights a critical issue; while aerobic training does not improve aerobic capacity in 20% of people, it will also not increase HDL in >30%. No systematic analysis allows us to be certain that a “nonresponder” for one trait does not cluster with a poor response for another. Also, not all parameters are equal; aerobic capacity links to mortality while other responses are not proven to be so important (yet). Ultimately, we have an obligation to ensure that any intervention (even exercise) is effective for the individual, and not just across a population. For the unlucky (not so small) minority, we may yet discover strategies for overcoming the molecular “limitations” that stifle physiological adaptation.

REFERENCES

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