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

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TO THE EDITOR: There is considerable intra- and interphenotype variability in the health-related response to exercise (1). This heterogeneity is attributed to genetic and environmental factors that are poorly understood (3). These observations provide the foundation for the promise and challenge of the use of kinesiogenomics in personalized medicine. The promise of this approach is the eventual use of genetic and clinical information to individualize exercise prescription for targeted or at-risk phenotypes. However, work in kinesiogenomics presents significant challenges (6). Reasons include: the biologic complexity of the phenotypes and pathways examined, a focus on individual genetic variants, inadequate statistical power, publication bias, and population stratification (2). Recent work from our laboratory has revealed that Caucasian, middle-aged, overweight men with pre-to stage 1 hypertension who are genetically predisposed to cardiovascular disease lower blood pressure after lower intensity, aerobic exercise (40% of peak oxygen consumption, V̇O₂ peak); whereas men less genetically predisposed to cardiovascular disease lower blood pressure after moderate intensity, aerobic exercise (60% V̇O₂ peak; Refs. 4, 5).

These findings illustrate the limitations of a “one-size fits all” approach to exercise prescription. For a person who has a positive response to one dose of exercise may have a non- or even an adverse response to a different dose exercise for the same targeted or at-risk phenotype. Exercise will continue to be recommended to nearly all people for its numerous health benefits. However, kinesiogenomics will eventually enable exercise science professionals and clinicians to tailor exercise prescriptions for subgroups of people to maximize the effectiveness of exercise as therapeutic option.

REFERENCES