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

Ema C. Brito and Paul W. Franks
Genetic Epidemiology and Clinical Research Group, Department of Public Health and Clinical Medicine, Section for Medicine, Umeå University Hospital, Umeå, Sweden

TO THE EDITOR: According to our understanding of human evolution, most common diseases likely result from complex interactions between adverse lifestyle behaviors and genetic susceptibility. It is also plausible that exercise interventions differ in their effects depending on a person’s genotype. Thus genetic information may eventually guide exercise prescriptions for disease prevention. This is the topic of a Viewpoint written by Roth (5) and published in the Journal of Applied Physiology.

Roth draws upon evidence from the HERITAGE study, which unequivocally shows that people vary in their phenotypic responsiveness to exercise and that this is related to inherited factors (1). Like others, Roth proposes that genetic differences underlie this variability. However, inherited factors can be nongenetic (2) and even in studies that carefully administered the exercise intervention, physical activity (and other behaviors) outside the training sessions was rarely controlled or monitored with any degree of precision; these factors alone could explain the variability in phenotypic response to an exercise intervention (4). So far, no study has been reported that adequately tests the extent to which human phenotypic response to exercise is under genetic control. Although other lines of evidence, including transgenic animal and human molecular genetic studies, suggest that genetic variation influences the effects of exercise on disease-related traits (3), the evidence justifying the use of genomics in exercise prescription falls short. Nonetheless, as Roth points out, remarkable advances in molecular genetics and phenotyping technologies have been made in recent years; this, combined with the formation of several large-scale consortiums to undertake adequately powered exercise-genomics studies, may mean that the foundation of evidence becomes sufficiently robust to allow Roth’s vision of genome-guided exercise prescription to become reality.

REFERENCES