ESSR Journal Club

Covered Article: “Exercise and the Gut Microbiome”
Authors: Lucy J. Mailing, Jacob M. Allen, Thomas W. Buford, Christopher J. Fields, Jeffrey A. Woods
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1) What is the gut microbiota? What factors influence the composition of the gut microbiota?

2) How do culture-based methodologies differ from molecular approaches for studying the gut microbiota?

3) What is the difference between alpha and beta diversity?

4) Describe some of the changes in the gut microbiota that occur with exercise training in animal studies and name two factors that might explain the discrepancies between individual studies.

5) Explain why cross-sectional studies cannot adequately determine whether exercise training changes the gut microbiome.

6) The short-chain fatty acid butyrate is produced from the bacterial fermentation of dietary fiber. Why is butyrate important, and how is butyrate influenced by exercise training in human longitudinal studies?

7) Name some of the potential mechanisms by which aerobic exercise might change the gut microbiota.

8) The authors propose that exercise could act as a hormetic stressor to the gut barrier. Explain what this means and discuss how it compares to adaptations seen during resistance training of skeletal muscle.

9) In mouse models, voluntary wheel running has been shown to be protective against colitis. Explain how we know that this effect is at least partly mediated by beneficial exercise-induced changes in the gut microbiome.

10) Exercise is known to be beneficial for cognition and mental health. Discuss how exercise-induced changes in the gut microbiota could peripherally affect the brain.