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Gut scrum - the rugby microbiome team

The microorganisms that reside in the gut, or gut microbiome, of professional athletes is distinct from that of the general public both functionally (i.e., what they do) and metabolically (i.e., what they produce).

So say scientists at the Science Foundation Ireland-funded APC Microbiome Institute and Teagasc, together with collaborators at Imperial College London, who have taken their research on the microbiome of professional rugby players to a whole new league. The study is just published in the prestigious scientific journal, *Gut*.

In particular, the scientists found that the athlete's microbiome is primed for tissue repair and to harness energy from the diet, reflecting the significant energy demands and high cell-turnover evident in elite sport. Thus, the state of physical fitness is not limited to the athlete alone; it appears to also include conditioning of the microbiota.

The team had previously found that the gut microbes of professional rugby players differ considerably from that of healthy controls. The research, which involved 40 rugby players on the Irish squad, suggested links between diet and exercise and the diversity of microbes in the gut.

"Our earlier work, also published in *Gut*, had shown that the microbiome of the athletes differed in composition from that of non-athletes but now we have found that the functional behaviour of the microbiome separates the athletes and controls to an even greater degree," said Professor Fergus Shanahan, Director of the APC Microbiome Institute in Cork.

"Elaboration and further exploration of the components of this exercise and diet-microbiome paradigm may inform the design of exercise and fitness programmes, including the area of tailored nutrition for both athletes and non-athletes," noted Dr Orla O'Sullivan, senior author on the publication.

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Full reference

Wiley Barton, Nicholas C. Penney, Owen Cronin, Isabel Garcia Perez, Michael G. Molloy, Elaine Holmes, Fergus Shanahan, Paul D. Cotter, Orla O'Sullivan (2017) 'The microbiome of professional athletes differs from that of sedentary subjects not only in composition but particularly at the functional metabolic level' *Gut* <http://dx.doi.org/10.1136/gutjnl-2016-313627>

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About the APC Microbiome Institute

The APC Microbiome Institute (APC; <http://apc.ucc.ie>) was formed in 2003 with funding from Science Foundation Ireland and in conjunction with key industry partners. It represents a seamless collaboration between University College Cork, Teagasc (the Irish Agriculture and Food Development Authority) and Cork Institute of Technology. It is widely recognised that the gut microbiota plays an important role in human health and has become one of the most dynamic, complex and exciting areas of research in both food and pharmaceutical arenas. Over the last decade the APC has established itself as one of the leading global centres in gut microbiota research. The APC has made several landmark discoveries and has published over 1,000 research articles in peer-reviewed journals, generating many journal covers and associated editorials. The APC comprises over 300 individuals, from the scientific PI’s (the APC Faculty) funded by the partner Institutions, the management team, and a dedicated group of research scientists, research assistants and postgraduates students.