Oscillospira and related bacteria - from metagenomics species to metabolic features

Oscillospira is an under-studied anaerobic bacterial genus from Clostridial cluster IV that has resisted cultivation for over a century since the first time it was observed. In recent years its 16S rRNA gene was identified in several human gut microbiota studies where it was often associated with interesting traits, especially leanness. However, very little is known about its metabolism or physiology. Here we used nearly complete genomes derived from shot-gun metagenomic data from the human gut to analyze Oscillospira and related bacteria. We used sequence similarity, gene neighbourhood information and manual metabolic pathway curation to decipher key metabolic features of this intriguing bacterial genus. We infer that Oscillospira species are butyrate producers, and at least some of them have the ability to utilize glucuronate, a common animal-derived sugar that is both produced by the human host and consumed by that host in diets rich in animal products. These findings could help explain diet-related inter-individual variation in faecal Oscillospira levels as well as the observation that the presence of this genus is reduced in diseases that involve inflammation.

General information
Publication status: Published
Organisations: Department of Systems Biology, Center for Biological Sequence Analysis, Department of Bio and Health Informatics, Tel Aviv University
Contributors: Gophna, U., Konikoff, T., Nielsen, H. B.
Pages: 835-841
Publication date: 2017
Peer-reviewed: Yes

Publication information
Journal: Environmental Microbiology
Volume: 19
Issue number: 3
ISSN (Print): 1462-2912
Ratings:
BFI (2017): BFI-level 2
Scopus rating (2017): CiteScore 4.83 SJR 2.209 SNIP 1.31
Web of Science (2017): Impact factor 4.974
Web of Science (2017): Indexed yes
Original language: English
Electronic versions:
Oscillospira and related bacteria. Embargo ended: 28/12/2017
DOIs:
10.1111/1462-2920.13658
Source: FindIt
Source-ID: 2350295817
Research output: Contribution to journal › Journal article – Annual report year: 2017 › Research › peer-review