Rapid resistome mapping using nanopore sequencing - DTU Orbit (15/09/2017)

Rapid resistome mapping using nanopore sequencing

The emergence of antibiotic resistance in human pathogens has become a major threat to modern medicine. The outcome of antibiotic treatment can be affected by the composition of the gut. Accordingly, knowledge of the gut resistome composition could enable more effective and individualized treatment of bacterial infections. Yet, rapid workflows for resistome characterization are lacking. To address this challenge we developed the poreFUME workflow that deploys functional metagenomic selections and nanopore sequencing to resistome mapping. We demonstrate the approach by functionally characterizing the gut resistome of an ICU (intensive care unit) patient. The accuracy of the poreFUME pipeline is with >97% sufficient for the annotation of antibiotic resistance genes. The poreFUME pipeline provides a promising approach for efficient resistome profiling that could inform antibiotic treatment decisions in the future.

General information
State: E-pub ahead of print
Organisations: Novo Nordisk Foundation Center for Biosustainability, Bacterial Synthetic Biology, Research Groups, iLoop, University Medical Centre Utrecht
Authors: van der Helm, E. (Intern), Imamovic, L. (Intern), Ellabaan, M. M. H. (Intern), van Schaik, W. (Ekstern), Koza, A. (Intern), Sommer, M. O. A. (Intern)
Number of pages: 8
Publication date: 2017
Main Research Area: Technical/natural sciences

Publication information
Journal: Nucleic Acids Research
Volume: 45
Issue number: 8
Article number: gkw1328
ISSN (Print): 0305-1048
Ratings:
BFI (2017): BFI-level 2
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 9.28 SJR 7.397 SNIP 2.657
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 7.239 SNIP 2.639 CiteScore 9.48
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 6.576 SNIP 2.568 CiteScore 8.74
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 6.582 SNIP 2.266 CiteScore 8.46
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 6.13 SNIP 2.392 CiteScore 8.62
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 5.758 SNIP 2.172 CiteScore 7.86
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 5.24 SNIP 2.034
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 5.571 SNIP 1.869
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 4.641 SNIP 1.557