Accurate typing methods are required for efficient infection control. The emergence of whole genome sequencing (WGS) technologies has enabled the development of genomics-based methods applicable for routine typing and surveillance of bacterial pathogens. In this study, we developed the Pseudomonas aeruginosa serotyper (PAst) program, which enabled in silico serotyping of P. aeruginosa isolates using WGS data. PAst has been made publically available as a web-service, and aptly facilitate high-throughput serotyping analysis. The program overcomes critical issues such as the loss of in vitro typeability often associated with P. aeruginosa isolates from chronic infections, and quickly determines the serogroup of an isolate based on the sequence of the O-specific antigen (OSA) gene cluster. Here, PAst analysis of 1649 genomes resulted in successful serogroup assignments in 99.27% of the cases. This frequency is rarely achievable by conventional serotyping methods. The limited number of non-typeable isolates found using PAst was the result of either complete absence of OSA genes in the genomes or the artifact of genomic misassembly. With PAst, P. aeruginosa serotype data can be obtained from WGS information alone. PAst is a highly efficient alternative to conventional serotyping methods in relation to outbreak surveillance of serotype O12 and other high-risk clones, while maintaining backward compatibility to historical serotype data.

General information
State: Published
Organisations: Department of Systems Biology, National Food Institute, Infection Microbiology, Center for Biological Sequence Analysis, University of Guelph
Contributors: Thrane, S. W., Taylor, V. L., Lund, O., Lam, J. S., Jelsbak, L.
Number of pages: 7
Pages: 1782-1788
Publication date: 2016
Peer-reviewed: Yes

Publication information
Journal: Journal of Clinical Microbiology
Volume: 54
Issue number: 7
ISSN (Print): 0095-1137
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 3.55 SJR 2.256 SNIP 1.443
Web of Science (2017): Impact factor 4.054
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 3.57 SJR 2.196 SNIP 1.4
Web of Science (2016): Impact factor 3.712
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 3.56 SJR 2.206 SNIP 1.431
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 3.84 SJR 2.231 SNIP 1.528
Web of Science (2014): Impact factor 3.993
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 4.18 SJR 2.438 SNIP 1.63
Web of Science (2013): Impact factor 4.232
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 4.11 SJR 2.148 SNIP 1.626
Web of Science (2012): Impact factor 4.068
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): CiteScore 4.27 SJR 2.346 SNIP 1.699
Web of Science (2011): Impact factor 4.153
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 2.343 SNIP 1.731
Web of Science (2010): Impact factor 4.22
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 2.199 SNIP 1.691
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 2.265 SNIP 1.608
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 2.224 SNIP 1.688
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 2.212 SNIP 1.641
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 2.037 SNIP 1.65
Web of Science (2005): Indexed yes
Scopus rating (2004): SJR 1.699 SNIP 1.701
Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 1.854 SNIP 1.853
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 1.976 SNIP 1.724
Web of Science (2002): Indexed yes
Scopus rating (2001): SJR 2.066 SNIP 1.804
Web of Science (2001): Indexed yes
Scopus rating (2000): SJR 1.783 SNIP 1.935
Web of Science (2000): Indexed yes
Scopus rating (1999): SJR 1.886 SNIP 2.024
Web of Science (1999): Indexed yes

Original language: English
Electronic versions:

DOIs:
10.1128/JCM.00349-16
Source: Findit
Source-ID: 2303714027

Research output: Research - peer-review › Journal article – Annual report year: 2016