Assembly and analysis of 100 full MHC haplotypes from the Danish population

Assembly and analysis of 100 full MHC haplotypes from the Danish population

Genes in the major histocompatibility complex (MHC, also known as HLA) play a critical role in the immune response and variation within the extended 4 Mb region shows association with major risks of many diseases. Yet, deciphering the underlying causes of these associations is difficult because the MHC is the most polymorphic region of the genome with a complex linkage disequilibrium structure. Here we reconstruct full MHC haplotypes from de novo assembled trios without relying on a reference genome and perform evolutionary analyses. We report 100 full MHC haplotypes and call a large set of structural variants in the regions for future use in imputation with GWAS data. We also present the first complete analysis of the recombination landscape in the entire region and show how balancing selection at classical genes have linked effects on the frequency of variants throughout the region.

General information
State: Accepted/In press
Organisations: Aarhus University, The Danish Pan-Genome Consortium
Publication date: 2017
Peer-reviewed: Yes

Publication information
Journal: Genome Research
ISSN (Print): 1088-9051
Ratings:
BFI (2019): BFI-level 2
Web of Science (2019): Indexed yes
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Scopus rating (2017): CiteScore 11.65 SJR 12.367 SNIP 2.35
Web of Science (2017): Impact factor 10.101
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 11.88 SJR 12.594 SNIP 2.373
Web of Science (2016): Impact factor 11.922
BFI (2015): BFI-level 2
Scopus rating (2015): CiteScore 14.3 SJR 14.278 SNIP 2.943
BFI (2014): BFI-level 2
Scopus rating (2014): CiteScore 13.75 SJR 14.817 SNIP 2.954
BFI (2013): BFI-level 2
Scopus rating (2013): CiteScore 14.86 SJR 15.228 SNIP 2.897
Web of Science (2013): Impact factor 13.852
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): CiteScore 15.03 SJR 14.306 SNIP 3.072
Web of Science (2012): Impact factor 14.397
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): CiteScore 13.83 SJR 14.017 SNIP 2.968
Web of Science (2011): Impact factor 13.608
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 12.476 SNIP 2.567
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 10.404 SNIP 2.572
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 8.588 SNIP 2.101
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 6.922 SNIP 2.228
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 7.935 SNIP 2.388
Web of Science (2005): Indexed yes
Scopus rating (2004): SJR 7.78 SNIP 2.314
Scopus rating (2003): SJR 6.795 SNIP 2.301
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 6.762 SNIP 2.031
Scopus rating (2001): SJR 6.272 SNIP 2.134
Scopus rating (2000): SJR 5.823 SNIP 2.113
Scopus rating (1999): SJR 5.892 SNIP 2.315
Original language: English
Electronic versions:
DOIs:
10.1101/gr.218891.116
Source: PublicationPreSubmission
Source-ID: 134679962
Research output: Research - peer-review > Journal article – Annual report year: 2017