Recognition of microbial viability via TLR8 drives T<sub>FH</sub> cell differentiation and vaccine responses

**Recognition of microbial viability via TLR8 drives T<sub>FH</sub> cell differentiation and vaccine responses**

Live attenuated vaccines are generally highly efficacious and often superior to inactivated vaccines, yet the underlying mechanisms of this remain largely unclear. Here we identify recognition of microbial viability as a potent stimulus for follicular helper T cell (T<sub>FH</sub>) cell differentiation and vaccine responses. Antigen-presenting cells (APCs) distinguished viable bacteria from dead bacteria through Toll-like receptor 8 (TLR8)-dependent detection of bacterial RNA. In contrast to dead bacteria and other TLR ligands, live bacteria, bacterial RNA and synthetic TLR8 agonists induced a specific cytokine profile in human and porcine APCs, thereby promoting T<sub>FH</sub> cell differentiation. In domestic pigs, immunization with a live bacterial vaccine induced robust T<sub>FH</sub> cell and antibody responses, but immunization with its heat-killed counterpart did not. Finally, a hypermorphic TLR8 polymorphism was associated with protective immunity elicited by vaccination with bacillus Calmette-Guérin (BCG) in a human cohort. We have thus identified TLR8 as an important driver of T<sub>FH</sub> cell differentiation and a promising target for T<sub>FH</sub> cell-skewing vaccine adjuvants.

**General information**

State: Published
Organisations: Department of Biotechnology and Biomedicine, National Veterinary Institute, Adaptive Immunology, Charité-Universitätsmedizin Berlin, Free University of Berlin, Leibniz Institute, Federal Research Institute for Animal Health, Osmania University, University of Southern Denmark, Wageningen University & Research
Pages: 386-396
Publication date: 2018
Peer-reviewed: Yes

**Publication information**

Journal: Nature Immunology
Volume: 19
Issue number: 4
ISSN (Print): 1529-2908
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Scopus rating (2017): CiteScore 14.05 SJR 14.007 SNIP 4.019
Web of Science (2017): Impact factor 21.809
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 12.04 SJR 15.21 SNIP 3.92
BFI (2015): BFI-level 2
Scopus rating (2015): CiteScore 12.53 SJR 11.699 SNIP 3.768
BFI (2014): BFI-level 2
Web of Science (2014): Impact factor 20.004
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): CiteScore 17.35 SJR 15.038 SNIP 5.13
Web of Science (2013): Impact factor 24.973
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): CiteScore 16.67 SJR 18.857 SNIP 4.172
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): CiteScore 15.97 SJR 18.437 SNIP 3.926