# Na+-boosted antibacterial defense is dependent on HIF1A and NFAT5

---

Infection and inflammation induce diet-independent Na+-accumulation without commensurate water retention in afflicted tissues, which favors the pro-inflammatory activation of macrophages and augments their antibacterial and antiparasitic activity. While Na+-boosted host defense against Leishmania major is mediated by increased expression of the leishmanicidal type 2 NO synthase (NOS2), the molecular mechanisms underpinning this enhanced antibacterial defense with high Na+ (HS) exposure are unknown. Here, we provide evidence that HS-increased antibacterial activity against E. coli was neither dependent on NOS2 nor on the phagocyte oxidase. In contrast, HS-augmented antibacterial defense hinged on HIF1A/ hypoxia-inducible factor 1α-dependent increased autophagy, and NFAT5/ nuclear factor of activated T cells 5-dependent targeting of intracellular E. coli to acidic autophagolysosomal compartments. Overall, these findings suggest that the autophagolysosomal compartment is a novel target of Na+-modulated cell autonomous innate immunity.

---

Keywords : Autophagy; cell-autonomous immunity; macrophage; salt; sodium
Authors :
References : , , ,

## Authors

**Patrick Neubert 1,** Andrea Weichselbaum 1, Carmen Reitinger 2, Valentin Schatz 2, Agnes Schröder 3, John R. Ferdinand 4, Michaela Simon 2, Anna-Lorena Baer 2, Christoph Brochhausen 5, Roman Gerlach 6, Stefan Tomiuk 7, Karin Hammer 8, Stefan Wagner 9, Ger Van Zandbergen 10, Katrina J. Binger 11, Dominik N. Mueller 12, Kento Kitada 13, Menna R. Clatworthy 14, Christian Kurts 15, Jens Titze 13, Zeinab Abdullah 15, Jonathan Jantsch 2,

1. University Hospital Regensburg, Institute of Clinical Microbiology and Hygiene, Regensburg, GERMANY
2. Institute of Clinical Microbiology and Hygiene, Regensburg, GERMANY
3. 2Institute of Orthodontics, Regensburg, GERMANY
4. Molecular Immunology Unit, Cambridge, UNITED KINGDOM
5. Institute of Pathology, Regensburg, GERMANY
6. Robert Koch Institute, Wernigerode, GERMANY
7. Miltenyi Biotec GmbH, Bergisch Gladbach, GERMANY
8. Department of Internal Medicine II, Regensburg, GERMANY
9. 7Department of Internal Medicine II, Regensburg, GERMANY
10. Division of Immunology, Langen, GERMANY
11. Department of Biochemistry and Molecular Biology, Melbourne, AUSTRALIA
12. Experimental and Clinical Research Center, Max-Delbrück Center for Molecular, Berlin, GERMANY
13. Cardiovascular and Metabolic Disorders, Singapore, SINGAPORE
14. Molecular Immunity Unit, Cambridge, UNITED KINGDOM
15. Institute of Experimental Immunology, Bonn, GERMANY