Prof. Eicke Latz, MD PhD

Institute of Innate Immunity

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Research Expertise

The Latz Lab has a longstanding interest in deciphering the molecular mechanisms of innate immune receptor activation. In particular, the lab is interested in understanding how innate receptors interact with their ligands and how this molecular interaction leads to receptor activation. Recently, we have also focused on the molecular details of the mechanisms that lead to the activation of the NLRP3 and AIM2 inflammasome. The NLRP3 inflammasome can respond to a broad range of cellular stressors and to substances that indicate metabolic derangements such as aggregated peptides, crystals of monosodium urate (forming in gout) or crystals of cholesterol that are found in atherosclerotic plaques. One goal of the research is to translate the molecular understanding of innate immune receptor activation into the generation of molecular tools that could lead to the development of specific diagnostics for inflammatory materials. Another goal is to devise means to pharmacologically interfere with the activation of innate immune receptors in order to develop novel approaches to treat inflammatory diseases such as Alzheimer's disease or atherosclerosis.

Education / Training

Humbolt University of Berlin, Germany, PhD, 2001
Free University of Berlin, Germany, Molecular Medicine, Hematology, MD, 1998

Appointments / Positions Held

2009 - present Full Professor of Medicine, Founder and Director of the Institute of Innate Immunity, University of Bonn, Germany
2011- present Leader, Cooperation Unit Innate Immunity in Neurodegeneration, DZNE, Bonn, Germany
2003 - present Assistant Professor of Medicine UMass Medical School
2008 Adjunct Professor II, Institute of Cancer Research and Molecular Medicine, Norwegian University of Science & Technology
2007 Founder and Co-Director of UMassNanoMed, UMassNanoMed Institute
2003-2006 Assistant Research Professor, UMass Medical School
2001 - 2003 Postdoctoral Fellow, Division of Infectious Disease UMass Medical School
2001 Postdoctoral Fellow, Evans Biomedical Research Center, Boston University of Medicine
1999 - 2001 Research Fellow, Molecular Sepsis Research Laboratories, Charité University Hospital, Humboldt-University of Berlin
1998 - 2000 Internship and Residency (Intensive Care) Department of Surgery and Surgical Oncology, Charité University Hospital, Humboldt-University of Berlin
1998 Visiting Scientist, Department of Lipid Biochemistry, Merck Research Laboratories

Honors / Awards

2015 Head of the Scientific Advisory Board of the Max-Planck-Institute for Infection Biology in Berlin
2015 Highly Cited Researcher in Immunology
2015 Listed in the 'World's Most Influential Scientific Minds'
2014 Highly Cited Researcher in Immunology
2014 Listed in the 'World's Most Influential Scientific Minds'
2014 Kavli Fellow of the United States National Academy of Sciences (NAS)
2013 ERC Consolidator Grant

10 Most Relevant Publications for Prof. Eicke Latz

1. Zimmer S, Grebe A, Bakke S, Bode N, Halvorsen B, Ulas T, Skjelland M, De Nardo D, Labzin L, Kerksiek A, Hempel C, Heneka M, Hawxhurst V, Fitzgerald M, Trebicka J, Björkhem I, Gustafsson JA, Westerterp M, Tall AR, Wright SA, Espevik T, Schultze JL, Nickenig G, Lütjohann D, **Latz E**. Cyclodextrin promotes atherosclerosis regression via macrophage reprogramming. Science Translational Medicine, April 2016, 6;8 (333)

2. Franklin BS, Bossaller L, De Nardo D, Ratter JM, Stutz A, Engels G, Brenker C, Nordhoff M, Mirandola SR, Al-Amoudi A, Mangan MS, Zimmer S, Monks BG, Fricke M, Schmidt RE, Espevik T, Jones B, Jarnicki AG, Hansbro PM, Busto P, Marshak-Rothstein A, Hornemann S, Aguzzi A, Kastenmüller W & **Latz E**. The adaptor ASC has extracellular and 'prionoid' activities that propagate inflammation. Nat Immunol, 2014, Aug;15(8):727-37

3. De Nardo D*, Labzin LI*, Kono H, Seki R, Schmidt SV, Beyer M, Xu D, Zimmer S, Lahrmann C, Schildberg FA, Vogelhuber J, Kraut M, Ulas T, Kerksiek A, Krebs W, Bode N, Grebe A, Fitzgerald ML, Hernandez NJ, Williams BR, Knolle P, Kneilling M, Rocken M, Lutjohann D, Wright SD, Schultze JL* and **Latz E***. (2014). High-density lipoprotein mediates anti-inflammatory reprogramming of macrophages via the transcriptional regulator ATF3. Nat Immunol, 15(2), 152-160.

4. Heneka MT*, Kummer MP, Stutz A, Delekate A, Schwartz S, Vieira-Saecker A, Griep A, Axt D, Remus A, Tzeng TC, Gelpi E, Halle A, Korte M, **Latz E*** and Golenbock DT*. (2013). NLRP3 is activated in Alzheimer's disease and contributes to pathology in APP/PS1 mice. Nature, 493(7434), 674-678.

5. Duewell P*, Kono H*, Rayner KJ, Sirois CM, Vladimer G, Bauernfeind FG, Abela GS, Franchi L, Nunez G, Schnurr M, Espevik T, Lien E, Fitzgerald KA, Rock KL, Moore KJ, Wright SD, Hornung V* and **Latz E***. (2010). NLRP3 inflammasomes are required for atherogenesis and activated by cholesterol crystals. Nature, 464(7293), 1357-1361.

6. Hornung V, Ablasser A, Charrel-Dennis M, Bauernfeind F, Horvath G, Caffrey DR, **Latz E*** and Fitzgerald KA*. (2009). AIM2 recognizes cytosolic dsDNA and forms a caspase-1- activating inflammasome with ASC. Nature, 458(7237), 514-518.

7. Bauernfeind FG, Horvath G, Stutz A, Alnemri ES, MacDonald K, Speert D, Fernandes- Alnemri T, Wu J, Monks BG, Fitzgerald KA, Hornung V* and **Latz E***. (2009). Cutting edge: NF-kappaB activating pattern recognition and cytokine receptors license NLRP3 inflammasome activation by regulating NLRP3 expression. J Immunol, 183(2), 787-791.

8. Hornung V, Bauernfeind F, Halle A, Samstad EO, Kono H, Rock KL, Fitzgerald KA* and **Latz E***. (2008). Silica crystals and aluminum salts activate the NALP3 inflammasome through phagosomal destabilization. Nat Immunol, 9(8), 847-856.

9. **Latz E**, Verma A, Visintin A, Gong M, Sirois CM, Klein DC, Monks BG, McKnight CJ, Lamphier MS, Duprex WP, Espevik T and Golenbock DT. (2007). Ligand-induced conformational changes allosterically activate Toll-like receptor 9. Nat Immunol, 8(7), 772-779.

10. **Latz E**, Schoenemeyer A, Visintin A, Fitzgerald KA, Monks BG, Knetter CF, Lien E, Nilsen NJ, Espevik T and Golenbock DT. (2004). TLR9 signals after translocating from the ER to CpG DNA in the lysosome. Nat Immunol, 5(2), 190-198.

* These authors contributed equally