

## Prof. Dr. rer. nat. Dirk Haller

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**Affiliation:** Technische Universität München  
Biofunctionality of Food (Chair)  
Faculty of Life Science  
Co-appointment at the Faculty of Medicine  
Department of Nutrition and Food Science  
ZIEL – Research Center for Nutrition and Food Science  
CDD – Center for Diet and Disease

**Address:** Gregor-Mendel-Str. 2, D-85350 Freising-Weihenstephan, Germany  
**Internet:** [www.wzw.tum.de/bflm](http://www.wzw.tum.de/bflm)

**Date of birth:** May, 22, 1968

### Education:

1990-1997 Food Technology, University of Hohenheim  
1993-1996 Nutrition Science, University of Hohenheim  
1996 Diploma in Nutrition Science 'summa cum laude'  
1997 Diploma in Food Technology 'summa cum laude'  
1999 Ph.D. in Microbiology and Immunology 'summa cum laude'  
'Modulation of the immune response by non-pathogenic bacteria'.

### Career:

1999-2000 Research Scientist at the Nestlé Research Center in Lausanne/Switzerland,  
Department of Immunology  
2001-2002 DFG Emmy Noether research fellow of excellence at the University of North  
Carolina/USA, Department of Medicine  
2003-2006 DFG Emmy Noether group leader of excellence at the Technical University of  
Munich/Germany  
2005 Declined Associate Professorship at University of Alberta, Canada  
Department of Medicine  
2007 Declined Full Professorship at ETH Zürich, Switzerland  
Nutritional Biochemistry (Chair)  
2006-2008 Associate Professor (W2) at the Technical University of Munich,  
Experimental Nutritional Medicine  
2008 to date Full Professor (W3) at the Technical University of Munich  
Biofunctionality of Food (Chair)

### Research sketch:

The main areas of research relate to the understanding of nutrition and the intestinal microbiome in the initiation, prevention and therapy of chronic inflammatory diseases. Mechanisms of microbe-host interactions are specified by the use of germ-free mouse models for inflammatory bowel diseases (IBD). A major focus is the identification of specific microbial structures relevant for the initiation and prevention of intestinal inflammation specifically targeting the epithelium as primary interface for microbe-host interaction. In addition, unfolded protein responses (UPR) related to the endoplasmic reticulum and mitochondrial stress are characterized in the context of inflammatory processes using novel tissue-specific mouse models.

### **Selected Honors and Awards:**

- Emmy Noether Career Development Award of Excellence from the German Research Foundation (DFG 2001/2003/2005)
- German American Frontiers of Science Symposium (2007, 2008, 2009)
- Editorial Board of European Journal of Nutrition (2007 – 2012) and Associate Editorial Board Member of Inflammatory Bowel Disease (2008 – to date)
- Head of the Department Nutrition and Food (2007 – to date)
- Scientific chair of the European Science Foundation (ESF) Forward Look initiative – Gene environment interaction in chronic disease (2010 and 2011)
- Section President „Microbiota, Probiota and Host“ (2008 – 2011) of the German Society of Microbiology and Hygiene (DGHM)

### **Head of coordinated research programs:**

- German Ministry of Education and Research (BMBF)  
Coordinated Research for Innovation in Food Science (2009-2014)  
Impact of high fat diet on gut functions and metabolic disorders (1.3 Mio €)
- German Research Foundation (DFG)  
PhD Training Program GRK 1482 (2011-2015)  
Interface function of the intestine between luminal factors and host signals (2.3 Mio €)
- German Research Foundation (DFG)  
Priority Program SPP 1656 (2012-2018)  
Intestinal Microbiota: a microbial ecosystem at the edge between immune homeostasis and inflammation (16 Mio €)

### **Top 10 Research Publications in Impact Factor (first or last author between 2012-1999):**

- 13.0 Von Schilke M-A, Hörmannspurger G, Weiher M, Alpert CA, Hahne H, Bäuerl C, van Huynegem K, Steidler L, Hrcir T, Pérez-Martínez G, Kuster B, Haller D. Lactocepin secreted by *Lactobacillus* exerts anti-inflammatory effects by selectively degrading pro-inflammatory chemokines. **Cell Host Microbe** 2012 Apr 19;11(4):387-96      SELECTED BY FACULTY OF 1000
- 11.6 Steck N, Hoffmann M, Sava IG, Kim SC, Hahne H, Tonkonogy SL, Mair K, Krueger D, Pruteanu M, Shanahan F, Vogelmann R, Schemann M, Kuster B, Sartor RB, Haller D. Enterococcus faecalis Metalloprotease Compromises Epithelial Barrier and Contributes to Intestinal Inflammation. **Gastroenterology** 2011 Sep;141(3):959-71      SELECTED BY FACULTY OF 1000
- 11.6 Shkoda A, Ruiz PA, Daniel H, Kim SC, Rogler G, Sartor RB, Haller D. IL-10 blocked endoplasmic reticulum stress in the intestinal epithelium: impact on chronic inflammation. **Gastroenterology** 2007;132:190-207
- 10.1 Rath E, Berger E, Messlik A, Nunes T, Liu B, Kim SC, Hoogenraad N, Sans M, Sartor RB, Haller D. Induction of dsRNA-activated protein kinase links mitochondrial unfolded protein response to the pathogenesis of intestinal inflammation. **Gut** 2012 Sep;61(9):1269-78
- 10.1 Werner T, Wagner S, Martinez I, Walter J, Chang JS, Clavel T, Kisling S, Schuemann K, Haller D. Depletion of luminal iron alters the gut microbiota and prevents Crohn's disease-like ileitis. **Gut** 2011 Mar;60(3):325-33
- 10.1 Haller D, Bode C, Hammes WP, Pfeifer AMA, Schiffrin EJ, Blum S. Non-pathogenic bacteria elicit a differential cytokine response by intestinal epithelial cell/leukocyte co-cultures. **Gut** 2000;47:79-87
- 5.7 Chang J-S, Ocvirk S, Berger E, Kisling S, Binder U, Skerra A, Lee AS, Haller D. Endoplasmic reticulum stress response promotes cytotoxic phenotype of CD8αβ+ intraepithelial lymphocytes in a mouse model for Crohn's disease-like ileitis. **J Immunol.** 2012 Aug 1;189(3):1510-20
- 5.7 Ruiz PA, Shkoda A, Kim SC, Sartor RB, Haller D. IL-10 gene deficient mice lack TGF-β/Smad signaling and fail to inhibit pro-inflammatory gene expression in intestinal epithelial cells after the colonization with colitogenic Enterococcus faecalis **J. Immunol.** 2005;174:2990-2999

- 5.1 Baur P, Martin F-P, Gruber L, Bosco N, Brahmabhatt V, Collino S, Guy P, Montoliu I, Rozman J, Klingenspor M, Tavazzi I, Thorimbert A, Rezzi S, Kochhar S, Benyacoub J, Kollias G, Haller D. Metabolic Phenotyping of the Crohn's Disease-like IBD Etiopathology in the TNF $\Delta$ ARE/WT Mouse Model. **J. Proteome Res.** **2011** Dec 2;10(12):5523-35
- 5.1 Martin FP, Rezzi S, Philippe D, Tornier L, Messlik A, Hölzlwimmer G, Baur P, Quintanilla-Fend L, Loh G, Blaut M, Blum S, Kochhar S, Haller D. Metabolic Assessment of Gradual Development of Moderate Experimental Colitis in IL-10 Deficient Mice. **J. Proteome Res.** **2009** May 1;8(5):2376-87

**Top 5 Reviews in Impact Factor (first or last author between 2012-1999):**

- 26.0 Renz H, von Mutius E, Brandtzaeg P, Cookson W, Autenrieth I, Haller D. Gene environment interaction in chronic inflammatory disease. **Nat. Immunol.** **2011** Apr 12(4):273-277
- 10.1 Steck N, Mueller K, Schemann M, Haller D. Bacterial proteases in IBD and IBS. **Gut** **2012** Nov;61(11):1610-8
- 9.1 Hoermannsperger G, Clavel T, Haller D. Gut matters: Microbe-host interactions in allergic diseases. **J Allergy Clin Immunol.** **2012** Jun;129(6):1452-9
- 9.1 Renz H, Autenrieth IB, Brandtzaeg P, Cookson WO, Holgate S, von Mutius E, Valenta R, Haller D. Gene-environment interaction in chronic disease: A European Science Foundation Forward Look. **J. Allergy Clin. Immunol.** **2011** Dec;128(6 Suppl):S27-49
- 4.8 Rath E, Haller D. Mitochondria at the interface between danger signaling and metabolism: Role of unfolded protein responses in chronic inflammation. **Inflamm Bowel Dis.** **2012** Jul;18(7):1364-77

**Top 10 Publications in Citations (first or last author between 2012-1999):**

- 220 Haller D, Bode C, Hammes WP, Pfeifer AMA, Schiffrin EJ, Blum S. Non-pathogenic bacteria elicit a differential cytokine response by intestinal epithelial cell/leukocyte co-cultures. **Gut** **2000**;47:79-87
- 113 Haller D, Blum S, Bode C, Hammes WP, Schiffrin EJ. Activation of human peripheral blood mononuclear cells by nonpathogenic bacteria in vitro: evidence of NK cells as primary targets. **Infect. Immun.** **2000**;68:752-759
- 104 Haller D, Russo MP, Sartor RB, Jobin C. IKK $\beta$  and PI3K/Akt participate in non-pathogenic Gram-negative enteric bacteria-induced RelA phosphorylation and NF- $\kappa$ B activation in both primary and intestinal epithelial cell lines. **J. Biol. Chem.** **2002**; 277:38168-38178
- 99 Shkoda A, Ruiz PA, Daniel H, Kim SC, Rogler G, Sartor RB, Haller D. IL-10 blocked endoplasmatic reticulum stress in the intestinal epithelium: impact on chronic inflammation. **Gastroenterology** **2007**;132:190-207
- 74 Ruiz PA, Shkoda A, Kim SC, Sartor RB, Haller D. IL-10 gene deficient mice lack TGF- $\beta$ /Smad signaling and fail to inhibit pro-inflammatory gene expression in intestinal epithelial cells after the colonization with colitogenic *Enterococcus faecalis*. **J. Immunol.** **2005**;174:2990-2999
- 73 Haller D, Holt L, Kim SC, Schwabe RF, Sartor RB, Jobin C. TGF- $\beta$ 1 inhibits non-pathogenic Gram-negative bacteria-induced NF- $\kappa$ B recruitment to the IL-6 gene promoter in intestinal epithelial cells through modulation of histone acetylation. **J. Biol. Chem.** **2003**;278:23851-23860
- 57 Ruiz PA, Braune A, Hölzlwimmer G, Quintanilla-Fend L, Haller D. Quercetin inhibits TNF-induced transcription factor recruitment to pro-inflammatory gene promoters in murine intestinal epithelial cells. **J. Nutr.** **2007**;137:1208-1215
- 53 Haller D and Jobin C. Interaction between resident luminal bacteria and the host: Can a healthy relationship turn sour? **J. Pediat. Gastro. Nutr.** **2004**;38:123-136
- 48 Ruiz PA, Hoffmann M, Sczesny S, Blaut M., Haller D. Innate mechanisms for *Bifidobacterium lactis* to activate transient pro-inflammatory host responses in intestinal epithelial cells after the colonization of germfree rats. **Immunol.** **2005**;115:441-450

- 48 Haller D, Colbus H, Gänzle M, Scherenbacher H, Bode C, Hammes WP. Metabolic and functional properties of lactic acid bacteria in the gastro-intestinal ecosystem: A comparative in vitro study between bacteria of intestinal and fermented food origin. *Sys. Appl. Microbiol.* 2001;24:218-226

**My favourite invited lectures (2007 – 2012):**

- 2012** International Scientific Conference of Society for Microbial Ecology and Disease (SOMED): Bacterial proteases in chronic intestinal inflammation, **Valencia, Spain**
- Host-Microbes Cross-Talk (Marie-Curie Conference): Functional analysis of microbe-host interactions under chronic inflammation, **Oslo, Norway**
- Rehbrücker Kolloquium, Deutsches Institut für Ernährungsforschung (DIFE): Mitochondrial stress responses – inflammation meets metabolism, **Nuthetal, Germany**
- European Joint Congress of EFCC, Laboratory Medicine at the clinical interface: Microbial sensing and epithelial cell function in the pathogenesis of IBD, **Dubrovnik, Croatia**
- 2011** FASEB Summer Research Conference: Unfolded protein response in intestinal inflammation, **Steamboat, USA**
- Digestive Disease Week (DDW): Impact of inflammation on fetal gut programming and disease development, **Chicago, USA**
- United European Gastroenterology Week (UEGW): Mitochondrial stress responses in intestinal inflammation, **Stockholm, Sweden**
- European Crohn's and Colitis Organization (ECCO): Metabolic functions as sensor for the microbiome, **Dublin, Ireland**
- 2010** Inflammatory Bowel Disease: Gut microbiota and metabolism at the cross-road between homeostasis and inflammation, **Capri, Italy**
- The intestinal wall as the regulatory interface in energy homeostasis – Ascona Workshop of the ETH Zurich: Interface function of the intestinal epithelium – inflammation meets metabolism, **Ascona, Italy**
- Institute of Food Research (IFR): Mitochondrial stress response in the pathogenesis of IBD, **Norwich, UK**
- Cluster Lecture – Exzellenzcluster Entzündungsforschung: Microbe-host interaction in IBD, **Borstel, Germany**
- 2009** Vanderbilt University: Bacteria-host interactions at the epithelial cell interface – inflammation meets metabolism, **Nashville, USA**
- 2008** Digestive Disease Week (DDW): Proteomics in Inflammatory Bowel Diseases, **San Diego, USA**
- 2007** German American Frontiers of Science (GAFOS) sponsored by the National Academy of Sciences of America: Microbe-host interactions in the development of degenerative chronic diseases in the Western Society, **Irvine, USA**

**Facts sheet (19.12.2012):**

Peer reviewed publications:	80 (18 Reviews)
Non peer reviewed publications:	13
Book Chapters:	4
Patents:	1
Total citations:	1733 (1555 w/o self-citation)
Cumulative Impact Factor:	361
H-Index:	24
First or last author:	75%

