UNIVERSITÄT BAYREUTH

Department of Biochemistry

Curriculum Vitae

Clemens Johannes Steegborn

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Positions

University of Bayreuth, Dept. Biochemistry, Bayreuth, Germany *Feb. 2010 - present*
Full Professor (W3) and Chair for Biochemistry
Research topic: Molecular signaling mechanisms in aging and aging-related diseases

Ruhr-University Bochum, Dept. Physiological Chemistry, Germany *March 2005 – Jan. 2010*
Jun.-Professor in Biochemistry
Research topic: Structural and biochemical studies on the regulation of signaling enzymes in aging and disease

Education

Weill Medical College of Cornell University, New York, NY, USA *Dec. 2001 – Feb. 2005*
Postdoctoral Research Associate in the laboratory of Professor Hao Wu
Research Topic: Structural studies on intracellular signaling systems

Max-Planck-Institute of Biochemistry, Martinsried, Germany *Oct. 1997 - Sept. 2001*
Ph.D. in Biochemistry, *summa cum laude*, March 2001
Thesis Advisor: Professor Robert Huber
Thesis Topic: Biochemical and X-ray crystallographic studies on transcriptional activator MalT and the pyridoxal-5'-phosphate dependent enzymes cystathionine γ-synthase and cystathionine γ-lyase

University of Bayreuth, Department of Biochemistry, Bayreuth, Germany *1992 - 1997*
Diploma (M.S.) in Biochemistry, passed with distinction, August 1997
Thesis Advisor: Professor Franz-Xaver Schmid
Thesis Topic: Structure of a folding intermediate of ribonuclease T1 studied by NMR spectroscopy

Awards

Berger Fellow of the Damon Runyon Cancer Research Foundation	*2002-2005*
Max-Planck postdoctoral fellowship	*2001*
"Boehringer Ingelheim Fonds" predoctoral fellowship	*1998-2000*
Scholarship of the "Studienstiftung des Deutschen Volkes" foundation	*1996-1997*
European Union TEMPUS scholarship	*1995*
"Fonds der chemischen Industrie" chemistry award	*1991*
"Begabtenfoerderung" (gifted pupils award) by the land Baden-Wuerttemberg	*1988*

Functions

Deputy Director, Institute for Biomacromolecules (BIOmac), Univ. Bayreuth	*2010-present*
Speaker, Profile Area "Molecular Biosciences, University of Bayreuth	6/*2012-1/2014*
Co-Speaker, Study Section Structural Biology of the German Society for Biochemistry and Molecular Biology (GBM)	*2012-present*

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Research Focus

- **Molecular signalling mechanisms in aging and disease**
  - Sirtuin family of deacetylases
  - Cyclic nucleotide signalling
  - Redox enzymes and signaling

- **Protein function and regulation analysis through biochemical studies and x-ray crystallography**

- **Structure-assisted drug development**

Selected Publications

(Out of 60 research publications, 11 reviews and editorials, 1 book chapter)

1) C. Roessler, T. Nowak, M. Pannek, M. Gertz, G.T. Nguyen, M. Scharfe, I. Born, W. Sippl, **C. Steegborn**, M. Schutkowski (2014) Chemical Probing of the Human Sirtuin 5 Active Site Reveals Its Substrate Acyl Specificity and Peptide-Based Inhibitors. *Angew. Chem. Int. Ed. Engl.* in press. doi: 10.1002/anie.201402679

2) U. Schweizer, C. Schlicker, D. Braun, J. Köhrle, **C. Steegborn** (2014) Crystal structure of mammalian selenocysteine-dependent iodothyronine deiodinase suggests a peroxiredoxin-like catalytic mechanism. *Proc. Natl Acad. Sci. USA* 111, 10526-31.

3) M.H. Suhre, M. Gertz, **C. Steegborn**, T. Scheibel (2014) Structural and functional features of a collagen-binding matrix protein from the mussel byssus. *Nat. Commun.* 5:3392.

4) S. Kleinboelting, A. Diaz, S. Moniot, J. van den Heuvel, M. Weyand, L.R. Levin, J. Buck, **C. Steegborn** (2014) Crystal structures of human soluble adenylyl cyclase reveal mechanisms of catalysis and of its activation through bicarbonate. *Proc. Natl Acad. Sci. USA* 111, 3727-32.

5) G.T.T. Nguyen, S. Schaefer, M. Gertz, M. Weyand, **C. Steegborn** (2013) Crystal structures of Sirt3 complexes with the resveratrol derivative 5-(2-(4-bromophenyl)vinyl)-1,3-benzenediol reveal binding sites and inhibition mechanism. *Chem. Biol.* 20:1375-85.

6) D. Rauh, F. Fischer, M. Gertz, M. Lakshminarasimhan, T. Bergbrede, F. Aladini, C. Kambach, C.F.W. Becker, J. Zerweck, M. Schutkowski, **C. Steegborn** (2013). An acetylome peptide microarray reveals specificities and deacetylation substrates for all human Sirtuin isoforms. *Nat. Commun.* 4:2327.

7) M. Gertz, F. Fischer, G.T.T. Nguyen, M. Lakshminarasimhan, M. Schutkowski, M. Weyand, **C. Steegborn** (2013) Ex-527 inhibits Sirtuins by exploiting their unique NAD+-dependent deacetylation mechanism. *Proc. Natl Acad. Sci. USA* 110:E2772-81.

8) G. Laurent, N.J. German, A.K. Saha, V.C. de Boer, M. Davies, T.R. Koves, N. Dephoure, F. Fischer, G. Boanca, B. Vaitheesvaran, S.B. Lovitch, A.H. Sharpe, I.J. Kurland, **C. Steegborn**, S.P. Gygi, D.M. Muoio, N.B. Ruderman, M.C. Haigis (2013) SIRT4 coordinates the balance between lipid synthesis and catabolism by repressing malonyl CoA decarboxylase. *Mol. Cell* 50, 686-98.

9) M. Lakshminarasimhan, D. Rauh, M. Schutkowski, **C. Steegborn** (2013) Sirt1 activation by resveratrol is substrate sequence-selective. *Aging* 5, 151-4.

10) S. Moniot, M. Schutkowski, **C. Steegborn** (2013) Crystal structure analysis of human Sirt2 and its ADP-ribose complex. *J. Struct. Biol.* 182, 136-43.