

### **C. elegans models to understand stress responses and aging: Signalling across tissue boundaries**

**Prof. Dr. Ralf Baumeister, Bio3/Bioinformatics and Molecular Genetics, Albert-Ludwigs-University Freiburg, Germany**

The insulin/IGF and mTORC signaling pathways play a crucial role in cellular responses to external signals. They not only coordinate the metabolic adaptations to nutrients, but also the organismal responses to stress, and coordinate a plethora of mechanisms eventually determining health and longevity. Many cellular consequences of their activity have been elucidated in the last decades, but an understanding of their balanced activities in distinct tissues, and the crosstalk between these, are still in their infancies. *C. elegans* provides a unique opportunity to study such inter-tissue and even intergenerational signaling mechanisms and their molecular and genetic basis. Our work tries to understand the regulation by insulin/IGF and particularly mTORC2 to ensure organismal metabolic homeostasis and adaptations to hermetic stress.

### **Curriculum Vitae Ralf Baumeister**

#### **Personal Data**

|   |   |
|---|---|
| Title                                   | Prof. Dr.   |
| First name                              | Ralf  |
| Name                                    | Baumeister  |
| Current position                        | Professor, Ordinarius, permanent position   |
| Current institution(s)/site(s), country | Bio3/Bioinformatics and Molecular Genetics (Faculty of Biology) and ZBMZ /Institut für Molekulare Medizin und Zellforschung (Medizinische Fakultät), Albert-Ludwigs-Universität Freiburg, Germany |
| Identifiers/ORCID                       | 0000-0002-1632-4777   |

#### **Qualifications and Career**

| <b>Stages</b>                                 | <b>Periods and Details</b>  |
|---|---|
| Degree programme                              | 1987. Diploma in Biology, Friedrich-Alexander-Universität Erlangen / Nürnberg (Dipl.-Biol., Microbiology, Human Genetics, Informatics, Geobotany), Germany, 1,0 mit Auszeichnung, excellent   |
| Doctorate                                     | 02/1992 in Microbiology and Biochemistry, lab of Prof. Dr. Wolfgang Hillen, Molecular mechanisms of protein/DNA interactions in tetracycline resistance determinants. Friedrich-Alexander Universität Erlangen, Germany. 1,0 summa cum laude.<br>Research visits: Karolinska Institute, Stockholm 1989, Crystallography FU Berlin (Sänger lab) 1991 |
| <b>Stages of academic/professional career</b> |   |

|            |   |
|------------|---|
| since 2003 | Professor (Ordinarius) of Bioinformatics and Molecular Genetics, University of Freiburg, Germany. Affiliation: Faculties of Biology and of Medicine |
| since 2013 | Furtwangen University, Faculty of Medical and Life Sciences: Member of the Advisory Board   |
| 2011-2022  | Faculty of IMBS International Master Program in Biomedical Sciences w/ UBA University of Buenos Aires, Argentina                                    |
| 2007-2010  | Director of FRIAS LIFENET (Freiburg Institute for Advanced Studies, Section Life Sciences)  |
| 2005-2010  | Founding Director of ZBSA (Freiburg Center for Systems Biology)   |
| 2006-2008  | Director of Institute of Biology III  |
| 2000-2003  | Professor of Metabolic Biochemistry, Faculty of Medicine, LMU University of Munich, Germany   |
| 1998       | Founder of EleGene Inc., Pharmaceutical and Genetic Screening Company, Martinsried, Germany   |
| 1995-1992  | Group leader, Genzentrum, LMU University of Munich, Germany   |
| 1992-1995  | Postdoc, Harvard Medical School, Mass. General Hospital, Boston, USA (lab of Gary Ruvkun)   |

### Academic Distinctions

|      |   |
|------|---|
| 2008 | Alzheimer-Forschungspreis, Hans-und-Ilse-Breuer Stiftung, Germany |
| 2003 | Recipient of Qualitätsoffensive Programm, Baden-Württemberg       |
| 2002 | Familie Hansen Prize of BAYER AG                                  |
| 2001 | Philip Morris Foundation Research Prize                           |
| 1993 | PhD Prize VAAM  |

### Supplementary Career Information

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| 2006 | Professorship offered by Imperial College London: Directorship of CISBIC, Center for Integrated Systems Biology (declined) |
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### 10 selected publications

Xu F, Li R, von Gromoff ED, Drepper F, Knapp B, Warscheid B, Baumeister, R, Qi W (2023) Reprogramming of the transcriptome after heat stress mediates heat hormesis in *Caenorhabditis elegans*. Nat Commun. 2023 Jul 13;14(1):4176. doi: 10.1038/s41467-023-39882-8. PMID: 37443152; PMCID: PMC10345090.

Qi W, Gromoff EDV, Xu F, Zhao Q, Yang W, Pfeifer D, Maier W, Long L, Baumeister R. (2021). The secreted endoribonuclease ENDU-2 from the soma protects germline immortality in *C. elegans*. Nature

Commun. Feb 24;12(1):1262. Author correction: Nature Commun 2021 May 28;12(1):3315. doi: 10.1038/s41467-021-23820-7

Kienle K, Glaser KM, Eickhoff S, Mihlan M, Knöpper K, Reátegui E, Epple MW, Gunzer M, Baumeister R, Tarrant TK, Germain RN, Irimia D, Kastenmüller W, and Lämmermann T. (2021) Neutrophils self-limit swarming to contain bacterial growth in vivo. Science, 372, 6548, eabe7729. 2021. <https://doi.org/10.1126/science.abe7729>

Prentzell MT, Rehbein U, Cadena Sandoval M, De Meulemeester AS, Baumeister R, Brohée L, Berdel B, Bockwoldt M, Carroll B, Chowdhury SR, von Deimling A, Demetriades C, Figlia G; Genomics England Research Consortium, de Araujo MEG, Heberle AM, Heiland I, Holzwarth B, Huber LA, Jaworski J, Kedra M, Kern K, Kopach A, Korolchuk VI, van 't Land-Kuper I, Macias M, Nellist M, Palm W, Pusch S, Ramos Pittol JM, Reil M, Reintjes A, Reuter F, Sampson JR, Scheldeman C, Siekierska A, Stefan E, Teleman AA, Thomas LE, Torres-Quesada O, Trump S, West HD, de Witte P, Woltering S, Yordanov TE, Zmorzynska J, Opitz CA, Thedieck K. (2021) The G3BP proteins tether the TSC complex to lysosomes and suppress mTORC1 signaling Cell, 184(3):655-674.e27.; doi: 10.1016/j.cell.2020.12.024

Aspernig, H., Heimbucher, T. Qi, W., Gangurde, D., Curic., S., Yan, Y., Donner von Gromoff, E., Baumeister, R.(\*), Thien A. (2019) Mitochondrial perturbations couple mTORC2 to autophagy in *C. elegans*. Cell Reports 5; 29(6):1399-1409. (\*) corresponding author.

Thedieck, K., Holzwarth, B., Prentzell, M.T., Boehlke, C., Kläsener, K., Ruf, S., Sonntag, A.G., Maerz, L., Grellscheid, S., Kremmer, E., Nitschke, R., Kuehn, E.W., Reth, M., Hall, M.N., Baumeister, R. (2013). Inhibition of mTORC1 by Astrin and stress granules prevents apoptosis in cancer cells. Cell. 154(4):859-74. doi: 10.1016/j.cell.2013.07.031.

Fatouros, C., Pir, G.P., Biernat, J., Koushika, S.P., Mandelkow, E., Mandelkow, E., Schmidt, E., Baumeister, R. (2012). Inhibition of Tau aggregation in a novel *C. elegans* model of Tauopathy mitigates proteotoxicity. Hum Mol Genet. 21(16):3587-603. doi: 10.1093/hmg/dds190.

Rizzini, L., Favory, J.J., Cloix, C., Faggionato, D., O'Hara, A., Kaiserli, E., Baumeister, R., Schäfer, E., Nagy, F., Jenkins, G.I., Ulm, R. (2011). Perception of UV-B by the Arabidopsis UVR8 protein. Science. 332(6025):103-6. doi: 10.1126/science.1200660.

Hoppe, T., Cassata, G., Barral, J.M., Springer, W., Epstein, H.F., Baumeister, R. (2004). Regulation of the Myosin-Directed Chaperone UNC-45 by a Novel E3/E4-Multiubiquitylation Complex in *C. elegans*. Cell. 118(3):337-49.

Wittenburg, N., Eimer, S., Lakowski, B., Röhrig, S., Rudolph, C., Baumeister, R. (2000). Presenilin activity is required for proper neuron morphology and function in *C. elegans*. Nature. 406(6793):306-9.

### **Academic Distinctions**

|      |   |
|------|---|
| 2008 | Alzheimer-Forschungspreis, Hans-und-Ilse-Breuer Stiftung, Germany |
| 2003 | Recipient of Qualitätsoffensive Programm, Baden-Württemberg       |
| 2002 | Familie Hansen Prize of BAYER AG                                  |
| 2001 | Philip Morris Foundation Research Prize                           |
| 1993 | PhD Prize VAAM  |