

Prof. Sebastian Springer

DPhil (*Oxon*), Dipl.-Biochem.

Birthday	24.02.1966
Nationality	German
Address	Jacobs University Bremen Department of Life Sciences and Chemistry Campus Ring 1, 28759 Bremen, Germany
Telephone	+49 421 200 3243
Fax	+49 421 200 3249
E-mail	s.springer@jacobs-university.de
Web page	www.jacobs-university.de/springerlab

Positions

- 2001 to date** Assistant, 2010 Associate, 2016 **Full Professor of Biochemistry and Cell Biology**, Jacobs University Bremen, Germany
Research: Molecular mechanisms of antigen presentation; vesicular transport; microcapsule technology; proteins on surfaces
- 1996 - 2001** Postdoctoral Research Associate
with **Randy Schekman**, University of California, Berkeley.
Research: Cargo protein recruitment into COPII vesicles

Training

- 1992 - 1996** D.Phil. thesis "The biochemistry of antigen presentation" with **Alain Townsend**, University of Oxford, UK.
Research: Peptide binding to MHC class I molecules
- 1992** Diplom in Biochemistry, University of Tübingen, Germany
- 1991 - 1992** Diplom thesis with **Stefan Jentsch**, Friedrich Miescher Laboratory of the Max Planck Society, Tübingen, Germany.
Research: E3 substrate recognition proteins of the ubiquitin system
- 1988** Vordiplom (\approx BSc) in Biochemistry; University of Tübingen, Germany
- 1985 - 1992** Diplom studies in Biochemistry, University of Tübingen, Germany

Research

My group focuses on the cell biology and biochemistry of the immune system, more specifically on the **molecular mechanism of the antiviral and antitumor immune defence**. We investigate folding, peptide binding, quality control, cell surface transport, and regulated endocytic destruction of MHC (major histocompatibility complex) class I proteins to further our fundamental knowledge of protein handling by cells and to understand the boundary conditions for the creation of novel vaccination strategies. Our work is characterized by a **hypothesis-driven multi-faceted approach** to which biochemistry, cell biology, biophysics, biotechnology, and computational biology all contribute. In addition to our basic research, we have recently also developed and patented new tools for the **immunotherapy** of viruses and tumors using peptide exchange on MHC class I proteins, and we are developing novel assays based on polyelectrolyte microcapsules.

More information is located at our website, <http://www.jacobs-university.de/springerlab> .

List of Ten Most Important Publications

10. Cindy Dirscherl, Raghavendra Palankar, Mihaela Delcea, Tatiana A. Kolesnikova, and Sebastian **Springer**: Specific Capture of Peptide-Receptive Major Histocompatibility Complex Class I Molecules by Antibody Micropatterns Allows for a Novel Peptide Binding Assay in Live Cells. *Small*, (2017); [doi: 10.1002/smll.201602974](https://doi.org/10.1002/smll.201602974)
9. Sunil Kumar Saini, Heiko Schuster, Venkat Raman Ramnarayan, Hans-Georg Rammensee, Stefan Stevanović, and **Sebastian Springer**: Dipeptides catalyze rapid peptide exchange on MHC class I molecules. *Proc. Natl. Acad. Sci. USA* **112** (2015), p. 202-207; [doi: 10.1073/pnas.1418690112](https://doi.org/10.1073/pnas.1418690112)
8. Susanne Fritzsche, Esam Tolba Abualrous, Britta Borchert, Frank Momburg, and **Sebastian Springer**: Allotype-specific release from endoplasmic reticulum matrix proteins controls cell surface transport of MHC class I molecules. *Traffic* (2014), in press; [doi: 10.1111/tra.12279](https://doi.org/10.1111/tra.12279)
7. Zeynep Hein, Hannes Uchtenhagen, Esam Tolba Abualrous, Sunil Kumar Saini, Linda Janssen, Andy Van Hateren, Constanze Wiek, Helmut Hanenberg, Frank Momburg, Adnane Achour, Tim Elliott, **Sebastian Springer**, and Denise Boulanger: Peptide-independent stabilization of MHC class I molecules breaches cellular quality control. *J. Cell Sci.* **127** (2014), p. 2885-2897; [doi: 10.1242/jcs.145334](https://doi.org/10.1242/jcs.145334)
6. **S. Springer**, P. Malkus, B. Borchert, U. Wellbrock, R.A. Lesch, R. Duden, R. Schekman: Regulated oligomerization induces uptake of a membrane protein into COPII vesicles independent of its cytosolic tail. *Traffic* **15** (2014), [p. 531-545](https://doi.org/10.1111/tra.12279).
5. S.K. Saini, K. Ostermeir, V. R. Ramnarayan, H. Schuster, M. Zacharias, and **S. Springer**: Dipeptides promote folding and peptide binding of MHC class I molecules. *Proc. Natl. Acad. Sci. USA* **110** (2013), [p. 15383-8](https://doi.org/10.1073/pnas.1215383110).
4. M. A. Garstka, S. Fritzsche, I. Lenart, Z. Hein, G. Jankevicius, L. H. Boyle, T. Elliott, J. Trowsdale, A. N. Antoniou, M. Zacharias, and S. Springer: Tapasin dependence of MHC class I molecules correlates with their conformational flexibility. *FASEB J.* **25** (2011), [p. 3898-98](https://doi.org/10.1096/faseb.2011013898).
3. D. Studer, R. Palankar, M. Bédard, M. Winterhalter, and **S. Springer**: Retrieval of a Metabolite from Cells with Polyelectrolyte Microcapsules. *Small* **6** (2010), [p. 2412-2419](https://doi.org/10.1002/smll.201001419).
2. C. Howe, M.A. Garstka, M. Al-Balushi, E. Ghanem, A.N. Antoniou, A. Williams, T. Elliott, and **S. Springer**: Calreticulin retrieves suboptimally loaded MHC class I molecules from the Golgi apparatus. *EMBO Journal* **28** (2009), [p. 3730-44](https://doi.org/10.1038/embo.2009.144).
1. **S. Springer** and R. Schekman (1998): Nucleation of COPII Vesicular Coat Complex by Endoplasmic Reticulum to Golgi Vesicle SNAREs. *Science* **281** (1998) [p. 698-700](https://doi.org/10.1126/science.281.5357.698).