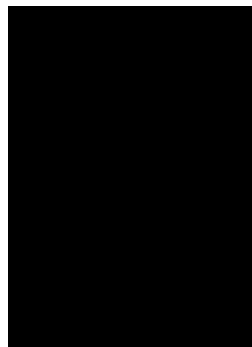


## Faculty



### **Carsten Schultz, Ph.D., PD**

#### **Research Interests**

Developing and applying Chemical Biology tools to study lung disease  
Novel probes to monitor enzyme activities in cystic fibrosis and COPD  
Proceeding from cell models to intact organisms and patients  
Novel tools to manipulate and perturb intracellular signalling networks

## Short CV

### **Affiliation**

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### **Curriculum Vitae**

1979- Study of Chemistry and diploma at the University of Bremen  
1986  
1989 Dissertation (Ph.D.) at the University of Bremen  
1989 Researcher at the University of Bremen  
1990 Postdoctoral Fellow, Dept. of Pharmacology, School of Medicine, University of California, San Diego, USA  
1992 Project Assistant, Dept. of Pharmacology, School of Medicine, University of California, San Diego, USA  
1993 Habilitation Fellow at the University of Bremen  
1996 Researcher at the University of Bremen  
1997 Habilitation in Organic Chemistry, University of Bremen  
2000 Group Leader, MPI Molecular Physiology, Dortmund  
2001 Group Leader, Gene Expression Unit, EMBL Heidelberg  
2005 Member of the Molecular Medicine Partnership Unit (MMPU)  
2008 Senior Scientist, Cell Biology & Biophysics Unit, EMBL Heidelberg

## Honours & Awards

1993 Habilitation stipend, DFG

2005 Piet Van Duijn Lecture, Int. Fed. of Soc. Histochemistry and Cytochemistry, The Netherlands

2012 Heidelberg Molecular Life Science Award 2012, shared with Michael Brunner

## Projects

### COPD/Cystic Fibrosis

- Development of protease probes relevant to lung inflammation. Tests in model cells, the CF mouse model of the Mall group and in patient cells.
- Sampling and testing of samples from CF and COPD patients, treatment with above mentioned probes and subjecting the probes to automated microscopy.
- Testing of macrophage elastase prodrugs in the CF mouse model of the Mall group.

### COPD/Lung Cancer

- Development of protease probes relevant to cancer. Tests in model cells and grafted mouse models.
- Development of bimodal probes for simultaneous MRI and fluorescence imaging.
- Development of tools to noninvasively activate signalling events downstream of the membrane receptor level (within LungSysII).

## Funding

### Federal Ministry for Education and Research (BMBF)

German Lung Research Center (DZL). 10/11-12/15

LungSysII. 02/12-01/15

### German Research Foundation (DFG)

Transregio TRR83

“Molecular architecture and cellular function of lipid/protein assemblies” Schu 943/6-1. 07/10-06/14

Schwerpunktprogramm SPP1623 . “Chemoselektive Reaktionen fuer die Synthese und Anwendung funktionaler Proteine“ Schu 943/8-1. 08/12–07/15

### European Union

Integrated Project „LIVIMODE“. 11/09-04/13

ITN “SphingoNet”. 02/12-01/15

### European Science Foundation/DFG

EUROMembrane initiative TraPPs on phosphoinositide signaling. Schu 943/7-1. 08/08-12/12

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## Selected Publications

1. Lukinavičius, G., Umezawa, K., Olivier, N., Honigmann, A., Yang, G., Plass, T., Mueller, V., Reymond, L., Correa, I. R., Luo, Z.-G., Schultz, C., Lemke, E., Heppenstall, P., Eggeling, C., Johnsson, K. A near-infrared fluorophore for live-cell superresolution microscopy of cellular proteins, *Nat. Chem.* (2013) *accepted*.
2. Rutkowska, A., Schultz, C. Protein tango: the toolbox to capture interacting partners. *Angew. Chem. Int. Ed.* **51**, 8166–8176 (2012). DOI: 10.1002/anie.2012 01717
3. Cobos-Correa, A., Stein, F., Schultz, C. Target-activated prodrugs for the auto-regulated inhibition of MMP12. *ACS Med. Chem. Lett.* **3**, 653–657 (2012). DOI: 10.1021/ml3001193
4. Gehrig, S., Mall M. A., Schultz, C. Spatially resolved monitoring of neutrophil elastase activity with ratiometric fluorescent reporters. *Angew. Chem. Int. Ed.* **51**, 6258-6261 (2012).
5. Johannesson, B., Hirtz, S., Schatterny, J., Schultz, C., Mall M. A. CFTR modifies onset and mortality of chronic obstructive lung disease in  $\beta$ ENAC-overexpressing mice. *PLoS ONE* **7**, e44059 (2012). doi:10.1371/journal.pone.0044059.
6. Lemke, E. A., Schultz, C. Principles for designing fluorescent sensors and reporters. *Nat. Chem. Biol.* **7**, 480-483 (2011). Rutkowska, A., Haering, C. H., Schultz, C. A FIAsh-based cross-linker to study protein interactions in living cells. *Angew. Chem. Int. Ed.* **50**, 12655-12658 (2011)
7. Plass, T., Köhler, C., Schultz, C., Lemke, E. Genetically encoded copper free click chemistry. *Angew. Chem. Int. Ed.* **50**, 3878-3881 (2011).
8. Mentel, M., V. Laketa, V., Subramanian, D., Gillandt, H., Schultz, C. Photoactivatable and cell membrane-permeant phosphatidylinositol 3,4,5-trisphosphate. *Angew. Chem. Int. Ed.* **50**, 3811-3814 (2011).
9. Mall, M. A., Button, B., Johannesson, B., Zhou, Z., Livraghi, A., Caldwell, R. A., Schubert, S., Schultz, C., O'Neal, W., Pradervand, S., Hummler, E., Rossier, B. C., Grubb, B., Boucher, R. C. Airway surface liquid volume regulation determines different airway phenotypes in liddle's compared to  $\beta$ ENAC-overexpressing mice. *J. Biol. Chem.* **285**, 26945-55 (2010).
10. Schultz, C. Challenges in studying phospholipid signaling. *Nat. Chem. Biol.* **6**, 473-475 (2010).
11. Subramanian, D., Laketa, V., Müller, R., Tischer, C., Zarbakhsh, S., Pepperkok, R., Schultz, C. Activation of membrane-permeant caged PtdIns(3)P induces endosomal fusion in cells. *Nat. Chem. Biol.* **6**, 324-326 (2010).
12. Cobos-Correa, A., Trojanek, J. Diemer, S., Mall, M. A., Schultz, C. MMP12 activity in pulmonary inflammation visualized by a membrane-targeted fluorescent reporter. *Nat. Chem. Biol.* **5**, 628-630 (2009).
13. Laketa, V., Zarbakhsh, S., Mortier, E., Subramanian, D., Brumbaugh, J., Dinkel, C., Zimmermann, P., Pepperkok, R., Schultz, C. Membrane-permeant phosphoinositide derivatives as modulators of growth factor signaling and neurite outgrowth. *Chem. Biol.* **16**, 1190-1196 (2009).
14. Neef, A. B., Schultz, C. Selective fluorescent labeling of lipids in living cells. *Angew. Chem. Int. Ed.* **48**, 1498-1500 (2009).
15. Yudushkin, I. A., Schleifenbaum, A., Neel, B. J., Schultz, C., Bastiaens, P. I. H. Imaging the enzyme-substrate intermediate reveals functional subpopulations of the tyrosine phosphatase PTP1B in living cells. *Science* **315**, 115-119 (2007).

