

Malte Gersch

✉ malte.gersch@tu-dortmund.de

✉ malte.gersch@cgc.mpg.de

☎ +49-231-133-2943

Academic career

- since 12/2018 Max Planck Institute of Molecular Physiology, Chemical Genomics Centre, Dortmund, CGC research group leader
- since 12/2018 Technical University Dortmund, Department of Chemistry and Chemical Biology, Emmy Noether research group leader
- 07/2014 – 11/2018 MRC Laboratory of Molecular Biology (LMB), Cambridge, UK, Postdoctoral Research Associate with David Komander, PhD
- 01/2014 – 06/2014 Technical University Munich (TUM), Department of Chemistry, Postdoctoral Research Associate with Prof. Dr. Stephan A. Sieber

Education

- 11/2010 – 12/2013 Technical University Munich (TUM), Department of Chemistry, PhD (Supervisor: Prof. Dr. Stephan A. Sieber), *summa cum laude*
- 01/2009 – 10/2010 Ludwig-Maximilians-University Munich (LMU), Master of Science (M.Sc.) in Chemistry, with honours
- 04/2009 – 09/2009 Stanford University, School of Medicine, Palo Alto, CA, USA, Visiting research fellowship (Supervisor: Matthew S. Bogoy, PhD)
- 10/2006 – 12/2008 Ludwig-Maximilians-University Munich (LMU), Bachelor of Science (B.Sc.) in Chemistry and Biochemistry

Fellowships & Awards

- 2019 Committee member of the IMPRS-CMB graduate school
- 2018 Emmy Noether research grant awarded by the German research council (DFG)
- 2017 Mol Cell Poster award at the EMBO meeting on Ubiquitin and SUMO 2017
- 2014 College Post-doctoral Associate at Jesus College, Cambridge, UK
- 2014 Hans-Fischer-Prize awarded by the Hans-Fischer-Society
- 2014 Friedrich-Weygand-Prize awarded by the Max-Bergmann-Kreis
- 2014 Best Talk Award at EMBO Conference on Chemical Biology, Heidelberg
- 2014 Emil Erlenmeyer Medal in recognition of an outstanding dissertation at TUM
- 2013 Travel Award for the meeting of the International Protease Society
- 2012 Biochemical Journal Award for the best poster presentation, EMBO Conference on Chemical Biology, Heidelberg

2011	PhD Fellowship of the German Chemical Industry Federation (2011 – 2013)
2010	Stipend by the Bavarian Elite Network to attend the 60th Nobel laureate meeting in Lindau, Germany
2009	Travel Grant by the German National Merit Foundation for stay at Stanford University
2006	Admission to the German National Merit Foundation (2006 – 2013)
2006	Admission to Maximilianeum College, Munich (2006 – 2011)
2005	Member of the German Team at the International Chemistry Olympiads in Taiwan and South Korea, Silver medallist, (2005 & 2006)

Teaching Experience

Chemical biology of post-translational modifications (Lecture)
at Technical University Dortmund in the Summer term 2020.

Bioorganic chemistry 1 (Lecture)
at Technical University Dortmund in the Winter term 2019/20 for 50 B.Sc. students in the chemistry and chemical biology courses (with Andreas Brunschweiger and Peter 't Hart).

Chemical Biology Literature Seminar
at Technical University Dortmund, Winter term 2019/20, for 30 M.Sc. students in the chemical biology course (with Peng Wu, Jochen Imig and Peter 't Hart).

Chemistry IA Supervision
at Cambridge University on behalf of Jesus College with 2 hours per week in the Academic years 2015/16 and 2016/17 for 3 – 4 undergraduate students.

Organic Chemistry 1 („Zentralübung“ = large tutorial done by lecturer)
at Technical University Munich with 1 hour per week in the Summer term 2013 (without evaluation), Summer term 2012 (rated 1.5 on a scale of 1 – 5) and Summer term 2011 (rated 2.0 on a scale of 1 – 5) for 200 – 300 undergraduate chemistry/biochemistry students.

Seminar / Journal Club: Frontiers in Chemical Biology
at Technical University Munich with 1.5 hours per week in the Winter term 2013/14, Winter term 2012/13 and Winter term 2011/12 for 15 – 20 students mastering in chemistry or biochemistry.

Tutor for Advanced Organic Chemistry and Mathematics for Chemists
at Ludwig-Maximilians-University Munich with 3 hours per week in the Winter term 2008/09 for 20 undergraduate chemistry students each.

Conferences and Workshops

EMBO Conference on “Ubiquitin and SUMO”, Cavtat (Croatia), 13–17/09/2019, *poster presentation*.

Biochemical Society Conference on “Deubiquitinases – From Structure to Physiology”, Edinburgh (UK), 17–19/06/2019, *poster presentation*.

Gordon Research Conference on “Proteolytic Enzymes and their Inhibitors”, Lucca (Italy), 03–08/06/2018, *oral presentation*.

EMBO Conference on “Ubiquitin and SUMO”, Cavtat (Croatia), 15–19/09/2017, *poster presentation*.

Biochemical Society Conference on “Deubiquitinases – From Structure to Physiology”, Oxford (UK), 26–28/06/2017, *oral presentation*.

EMBO Conference on “Chemical Biology 2014”, Heidelberg (Germany), 20–23/08/2014, *oral presentation*.

8th General Meeting of the International Protease Society (IPS), Cape Town (South Africa), 20–24/10/2013, *oral presentation*.

Challenges in Chemical Biology, Boston (USA), 23–26/07/2013, *poster presentation*.

11th German Peptide Symposium, Garching (Germany), 07–10/03/2013, *oral presentation*.

EMBO Conference on “Chemical Biology 2012”, Heidelberg (Germany), 26–29/09/2012, *poster presentation*.

Gordon Research Conference on “Proteolytic Enzymes and their Inhibitors”, Lucca (Italy), 17–22/06/2012, *poster presentation*.

<interact>-Life-Sciences Symposium, Munich (Germany), 30/03/2012, *oral presentation*.

4th European ABPP Meeting, Freising (Germany), 15–17/06/2010, *oral presentation*.

Publications

First-authored publications:

“Distinct USP25 and USP28 Oligomerization States Regulate Deubiquitinating Activity”
Gersch M, Wagstaff JL, Toms AV, Graves B, Freund SMV, Komander D,
Mol Cell, **2019**, 74(3), 436–451.

“Mechanism and regulation of the Lys6-selective deubiquitinase USP30”
Gersch M, Gladkova C, Schubert A, Michel M, Maslen S, Komander D,
Nat Struct Mol Biol, **2017**, 24(11), 920–930. (Also highlighted in *Nat Chem Biol*).

“Barrel-shaped ClpP proteases display attenuated cleavage specificities”
Gersch M, Stahl M, Poreba M, Dahmen M, Dziedzic A, Drag M, Sieber SA
ACS Chem Biol, **2016**, 19(11), 389–399.

“AAA+ chaperones and acyldepsipeptides activate the ClpP protease via conformational control”
Gersch M, Famulla K, Dahmen M, Goebel C, Malik I, Richter K, Korotkov VS, Sass P, Ruebsamen-Schaeff H, Madl T, Broetz-Oesterhelt H, Sieber SA,
Nat Commun, **2015**, 19(6), 6320.

“Intact protein mass spectrometry of 20S proteasomes reveals complex integrity, phosphorylation stoichiometry and inhibitor specificity”
Gersch M, Hackl M, Dubiella C, Dobrinevski A, Groll M, Sieber SA,
Chem Biol, **2015**, 22(3), 404–411.

“Disruption of oligomerization and dehydroalanine formation as mechanisms for ClpP protease inhibition”
Gersch M, Kolb R, Alte F, Groll M, Sieber SA,
J Am Chem Soc, **2014**, 136(4), 1360–1366.

“The Mechanism of ClpP Inhibition”,
Gersch M, Gut F, Korotkov V, Lehmann J, Böttcher T, Rusch M, Hedberg C, Waldmann H, Klebe G, Sieber SA,
Angew Chem Int Ed, **2013**, 52(10), 3009–3014.

"Insights into the structural network responsible for oligomerization and activity of the bacterial virulence regulator caseinolytic protease P (ClpP)"

Gersch M, List A, Groll M, Sieber SA,
J Biol Chem, **2012**, 287(12), 9484–9494.

Reviews and book chapters:

"Modulation of ClpP Protease Activity: from Antibiotics to Antivirulence"

Gersch M, Sieber SA,
In: Concepts and Case Studies in Chemical Biology, **2014**, Wiley-VCH, Weinheim.

"Electrophilic natural products and their biological targets",

Gersch M, Kreuzer J, Sieber SA,
Nat Prod Rep, **2012**, 29, 659–682.

"Disarming Clostridium difficile"

Gersch M, Sieber SA,
Chem Biol, **2010**, 17, 1165–1166.

Non-first-authored research publications:

"Selective Activation of Human Caseinolytic Protease P (ClpP)"

Stahl M, Korotkov VS, Balogh D, Kick LM, **Gersch M**, Pahl A, Kielkowski P, Richter K, Schneider S, Sieber SA,
Angew Chem Int Ed, **2018**, 57(44), 14602-14607.

"Molecular basis of USP7 inhibition by selective small-molecule inhibitors"

Turnbull AP, Ioannidis S, Krajewski WW, Pinto-Fernandez A, Heride C, Martin ACL, Tonkin LM, Townsend EC, Buker SM, Lancia DR, Caravella JA, Toms AV, Charlton TM, Lahdenranta J, Wilker E, Follows BC, Evans NJ, Stead L, Alli C, Zarayskiy VV, Talbot AC, Buckmelter AJ, Wang M, McKinnon CL, Saab F, McGouran JF, Century H, **Gersch M**, Pittman MS, Marshall CG, Raynham TM, Simcox M, Stewart LMD, McLoughlin SB, Escobedo JA, Bair KW, Dinsmore CJ, Hammonds TR, Kim S, Urbé S, Clague MJ, Kessler BM, Komander D,
Nature, **2017**, 550, 481–486.

"Deuteration of hyperpolarized ¹³C-labeled zymonic acid enables sensitivity-enhanced dynamic MRI of pH"

Hundshammer C, Düwel S, Köcher S, **Gersch M**, Feuerecker B, Scheurer C, Haase A, Glaser SJ, Schwaiger M, Schilling F,
ChemPhysChem, **2017**, 18, 2422–2425.

"Imaging of pH in vivo using hyperpolarized ¹³C-labelled zymonic acid"

Düwel S, Hundshammer C, **Gersch M**, Feuerecker B, Steiger K, Buck A, Walch A, Haase A, Glaser SJ, Schwaiger M, Schilling F,
Nat Commun, **2017**, 8, 15126.

"Insights into ClpXP proteolysis: heterooligomerization and partial deactivation enhance chaperone affinity and substrate turnover in *Listeria monocytogenes*"

Balogh D, Dahmen M, Stahl M, Poreba M, **Gersch M**, Drag M, Sieber SA,
Chem Sci, **2017**, 8, 1592–1600.

- "Molecular basis of Lys11-polyubiquitin specificity in the deubiquitinase Cezanne"
Mevisse TE, Kulathu Y, Mulder MP, Geurink PP, Maslen SL, **Gersch M**, Elliott PR, Burke JE, van Tol BD, Akutsu M, El Oualid F, Kawasaki M, Freund SM, Ovaa H, Komander D,
Nature, **2016**, 538(7625), 402–405.
- "Ubiquitin Ser65 phosphorylation affects ubiquitin structure, chain assembly and hydrolysis"
Wauer T, Swatek KN, Wagstaff JL, Gladkova C, Pruneda JN, Michel MA, **Gersch M**, Johnson CM, Freund SM, Komander D,
EMBO J, **2015**, 34(3), 307–325.
- "Selective immunoproteasome inhibition by ligand-induced active site crosslinking"
Dubiella C, Cui H, **Gersch M**, Brouwer A, Sieber SA, Krüger A, Liskamp RM, Groll M,
Angew Chem Int Ed, **2014**, 53(44), 11969–11973.
- "Structural and functional insights into caseinolytic proteases reveal an unprecedented regulation principle of their catalytic triad"
Zeiler E, List A, Alte F, **Gersch M**, Wachtel R, Poreba M, Drag M, Groll M, Sieber SA,
Proc Natl Acad Sci USA, **2013**, 110(28), 11302–11307.
- "Defining an allosteric circuit in the cysteine protease domain of Clostridium difficile toxins"
Shen A, Lupardus PJ, **Gersch M**, Puri AW, Albrow VE, Garcia KC, Bogoyo M,
Nat Struct Mol Biol, **2011**, 18(3), 364–371.

Patent:

- "pH-biosensors based on compounds produced from pyruvic acid for magnetic resonance imaging and spectroscopy and their uses"
Schilling F, Glaser SJ, Düwel S, **Gersch M**,
European patent EP3058375, filed: 15.10.2014, granted: 26.12.2018.

Dortmund, January 2020

(Malte Gersch)