

## Prof. Dr. Oliver Thorn-Seshold

Born 5 June 1985 in Sydney; married; one child (\*2021.09); Australian, Swedish and British citizenships  
Faculty of Chemistry and Food Chemistry, TU Dresden; Bergstr. 66, 01069 Dresden, DE;  
<https://tu-dresden.de/mn/chemie/oc/chembio>; oliver.thorn-seshold@tu-dresden.de; +49 351 463 34081

### Research Program

We use chemical biology approaches to analyse conceptual barriers in cell biology, imaging, and biochemistry, then design functional small molecule reagents to overcome them. We use organic chemistry to synthesise these reagents, then apply them to empower research from biophysics across to cellular and *in vivo* biology. Major topics:

- (1) **photoswitchable** inhibitors and materials: high-precision tools for biology and soft matter;
- (2) chemical diagnostics and prodrugs to harness **redox and metabolism** in cancer;
- (3) new chemical methods to drive optical **imaging**: super-resolution, probes, photoacoustics.

Recurring methods also include: (a) photochemistry, for photoresponsive materials and imaging; (b) chemical biology and cell biology techniques, for high-precision pharmaceutical applications.

### Scientific Career

from 2024.08 Professor of Organic Chemistry II (W3/full), TU Dresden  
2018 – 2024 DFG Emmy Noether group leader, LMU Munich Dept. Pharmacy  
2016 – 2018 Independent Researcher, LMU Munich Dept. Pharmacy  
2013 – 2016 Postdoc, LMU Munich Dept. Chemistry (Prof. Dirk Trauner)

### Academic Education

2009 – 2013 PhD (chemistry), Ecole Normale Supérieure de Lyon, France (16.09.2013)  
Thesis: *Development of Auto-Immolative Spacers for Fluorogenic Probes of Enzyme Activity*; Advisor: Prof. Jens Hasserodt; *Très honorable* (top grade)

2007 – 2009 MSc (chemistry). 2008/09 at ENS Lyon, France (bioorganic chemistry), with MSc Thesis on *Enzyme-responsive MRI probes* (Prof. Jens Hasserodt; top grade).  
2007 at University of Sydney, Australia (physical/theoretical chemistry), with First Class Honours & Goulston Prize in Organic Chemistry

2004 – 2006 Bachelor of Science, Advanced (chemistry double major) at University of Sydney, Australia (2006: exchange to Gothenburg University, Sweden).  
Top grade (Dean's Honours List) & Hush Prize & Burfitt Scholarship in Chemistry

1998 – 2003 Sydney Grammar School, Australia. High School Certificate: 99.85<sup>th</sup> percentile  
35<sup>th</sup> International Chemistry Olympiad: Silver medal (Athens, 2003)  
34<sup>th</sup> International Chemistry Olympiad: Bronze medal (Groningen, 2002)  
2002 & 2003: national Australian Student's Prizes for outstanding achievement  
2001-2003: after-school inorganic chemistry research, leading to first papers

### Research Group and Supervision Ethos

**Current group:** 7 PhD students, 2 postdocs, + permanent staff (2024.10)

The continuing education and support of research group members is a top priority, covered by initiatives e.g. (a) a week-long **Research Retreat** each year teaching paper writing, data modelling, project planning, grant writing skills, and scientific culture issues e.g. gender equality in academia; (b) supporting students to develop **independent projects and funding** and earn co-corresponding authorships (three papers so far); (c) providing full financing for 3-6 month "**PhD externships**" during PhD time at a renowned group (so far: Harvard, Scripps, UC Berkeley, NYU, Tokyo), with no strings attached, to gain new skillsets and build a network; (d) extensive career support to group members, who in the last 3 years have won **30 prizes & scholarships**, incl. four PhD fellowships and four independent research grants ([list online](#)).

## Completed Supervisions (2016 – 2024)

*Direct Supervisions completed:* 6 PhDs (four *summa cum laude*); 1 Dr. med.; 9 MScs (three prizes for best MSc Thesis at LMU, in Chemistry or overall); 6 exchange scholars at MSc level; 14 interns personally supervised (BSc / 4th year); 13 postdocs in preclinical spinoffs *CytoSwitch* and *NanoCapture*; 3 postdocs in basic research.

*Supervisions in the group:* 38 further internships completed. At LMU, our group was active in the organic synthesis "OC Lit" lab mentoring program, international lab exchanges (AMGEN), and in hosting school students for German National Chemistry Olympiad practical work (FChO).

## Teaching Overview

from 2025 Organic Chemistry 2 (BSc lecture); Basic Organic Chemistry (BSc practical)  
from 2024 Heterocycles: Structure, Reactivity, and Biological/Industrial Applications (MSc)  
from 2024 Fundamentals of Biological Chemistry (MSc refresher course)  
2020 – 2023 Chemical Biology of Vitamins (15 lecture hours; 3<sup>rd</sup> year; in German)  
2018 – 2023 Optical Spectroscopic Analysis (15 lecture hours; 2<sup>x</sup>per year; 2<sup>nd</sup> year; in German)

## Funding Overview

### Current Grants

2023 – 2025 Boehringer Ingelheim Exploration Grant: Superfluorophores & super-res imaging  
2022 – 2025 Boehringer Ingelheim Exploration Grant: Photoacoustic imaging agents  
Since 2018 DFG Emmy Noether: Chemical tools for controlling endogenous microtubules

### Completed Grants (selected)

2017 – 2024 DFG SFB1032 (B09): Nanoagents for spatiotemporal control  
2019 – 2024 DFG SPP1926 (XVIII): Photo/photoredox-switchable ligands  
2018 – 2022 DFG SFB TRR152 (P24): Photochemical reagents for TRP channel modulation  
\* 2016 – 2022 3 BMBF GO-Bio translational grants: Tumour-targeted therapeutics  
\* 2017 – 2020 2 BMWi EXIST translational grants: Photopharmaceuticals for tumour treatment  
\* translational / spinoff projects launched then transferred to postdocs in the group  
2017 & 2021 Munich Centre for Nanoscience grants: Redox Membranes; and Drug Targeting  
2012 – 2013 3 grants: French ARC & ENSL & CLARA: *Microtubule Photocontrol* (taken to LMU)

## Main Research Collaborations Ongoing (selected)

Redox/Metabolism probes & tools: Elias Arnér (Karolinska Institutet, SWE), Matt Hall (NIH, USA)  
Tubulin photoswitches: Anna Akhmanova (Utrecht, NL), Michel Steinmetz (PSI Villigen, CH)  
TRP switches: Michael Schaefer (Leipzig), Trese Leinders-Zufall (Saarland), Robin Bon (Leeds)  
High-end imaging: Viktorija Glembockyte (MPI Heidelberg), Johannes Broichhagen (FMP)  
Photoacoustic imaging: Vasilis Ntziachristos (Helmholtz Munich), Achim Hartschuh (LMU)  
Photoswitch theory: Theo Lohmüller (LMU), Bert Nickel (LMU), Benjamin Dietzek-Ivansic (Jena)

## Awards and Fellowships (selected)

2023 Research Prize of the *Otto-Röhm-Gedächtnisstiftung*  
2022 GDCh/DPhG Med Chem *Innovation Prize* (German Chemical/Pharmaceutical Societies)  
2022 SCS *Bürgerstock Junior Scientist* (JSP) Fellowship (Swiss Chemical Society)  
2020, 2022 Munich Centre for Nanoscience *Publication Awards* for outstanding papers  
2015 Merck Serono medicinal chemistry *Innovation Cup* winner (oncology)  
2015 Talk Prizes, RSC Chem Bio (ETH, CH) & French Microtubule (Grenoble, FR) conferences  
2009 – 2012 French Research Ministry PhD Scholarship with Teaching Fellowship  
2008 – 2009 Ampere Masters Scholarship  
2007 Edna Maude Goulston prize for Organic Chemistry Honours  
2006 Walter Burfitt Chemistry Scholarship N° 1 (BSc chemistry); Hush Prize for Theoretical Chemistry; Royal Australian Chemical Institute's Student Chemistry Prize  
2004 Physics Scholarship N° 1  
2004 – 2007 University of Sydney Scholarship with Merit (highest scholarship at USyd)  
2003 *Headmaster's Exhibition* - high school academic travel prize  
2002 & 2003 Bronze & Silver medals, International Chemistry Olympiad (Athens/Groningen)

## Prior Institutional Responsibilities (from LMU Munich)

Since 2019 PhD examiner for ~20 PhD theses at LMU Dept.s Pharmacy and Chemistry  
Since 2019 Organised, hosted and funded 25 [invited seminars](#) of (inter)national researchers  
2018 Organised teaching section's large equipment purchases for the year (120.000€)  
Since 2017 Member of 6 external thesis advisory committees (TUM, LMU Klinikum, LMU)

## Organisation of Conferences, Symposia, and Workshops

- **2024:** Organiser, "Chemmy" *Emmy Noether* annual meeting, LMU Munich, 29.02-01.03.2024
- **2023:** Co-organiser, 30<sup>th</sup> *Bioorganische Chemie Symposium*, LMU Munich, 13-15.09.2023
- **2022:** "Corona Zoom group seminar exchanges" with other PIs in Chemical Biology
- **2023.03, 2022.09, 2019.10, 2019.02:** Designed and taught weeklong Research Retreats for group members: skills for paper & grant writing, presentations, data modelling, project planning, and scientific culture e.g. gender equality in academia, Traunkirchen (Austria) & Herrsching (DE).
- **2022, 2019, 2018:** Initiated and organised LMU *Junior Research Groups* seminars for Chemistry and Pharmacy students (afternoon events, 100-140 students).

## Ad Hoc Reviewer Duties

**Grants:** ERC Adv. & Starting Grant; DFG Emmy Noether, RTG/GRK, Walter Benjamin, SBH

**Journals:** *Angewandte*; *JACS Au*; *JACS*; *Nat Chem*; *Chem*; *Nat Chem Biol*; *J Med Chem*; *Chem Sci*; *ChemBioChem*; *Org Biomol Chem*; *RSC MedChem*; *Chem Eur J*; *Eur J Org Chem*; *MedChemComm*; *Mol Pharm*; *ACS Chem Neuro*; *JoVE*

**Prizes:** Houska Prize (AT)

## Society Memberships

**Duties:** Deputy Chair, German *Joint Study Section on Chemical Biology* (since 2024)

**Societies:** German Chemical Society (GDCh), German Pharmaceutical Society (DPhG), German Biochemical Society (GBM), American Chemical Society (ACS); Royal Chemical Society (RSC); Society for Free Radical Research Europe (SFFR-Europe)

## Other Information

**Teaching in:** German (proficient), English (native), French (fluent)

**Other languages:** Swedish (intermediate); Old Norse (basic); Italian (basic)

**IT:** OS proficiency (Mac/Win/Unix); programming basics (Fortran, XML, bash, Arduino)

**Other activities:** classical chamber music (cellist); hiking and camping

## Publication List (updated list maintained [online](#))

ORCID: [orcid.org/0000-0003-3981-651X](https://orcid.org/0000-0003-3981-651X); Google Scholar: [tinyurl.com/ThornSeshold-GS](https://tinyurl.com/ThornSeshold-GS)

- **Independent career:** 43 papers of which **24** \*as senior author, 3 book chapters; 6 patents.

### 1. Ten Key Senior Author Publications

#### • Area A: Photoswitches as high-precision biology reagents, and as novel imaging tools

Until the 2010s, photoswitches were applied in biology by only a few researchers. In the last decade, we could contribute *systematic advances* that are fuelling growth in chemical tool creation, but particularly also in the biological adoption and use, of high-precision switch tools: (A1) demonstrating the first photoswitches that control *cytosolic* biology from cells to animals; (A2) introducing *metabolically stable, imaging-orthogonal* photoswitches for practical biology; (A3) pioneering *high-performance imaging with switches* for fluorescence and photoacoustics; (A4-A5) pioneering *general methods for in vivo photocontrol*, incl. the first switch-based logics for photocontrol with near-infrared light, and without variability from drug biodistribution.

- A1. M Borowiak, *et al.*, D Trauner\*, O Thorn-Seshold\*; [Cell 2015](#)  
*Photoswitchable inhibitors of microtubule dynamics optically control mitosis and cell death.*
- A2. L Gao, *et al.*, O Thorn-Seshold\*; [JACS 2022](#)  
*In vivo photocontrol of microtubules and migration, by GFP-imaging-compatible photoswitches.*
- A3. M Müller, *et al.*, O Thorn-Seshold\*; [Angewandte 2024 VIP](#)  
*Merged molecular switches excel as optoacoustic dyes: azobenzene-cyanines for NIR imaging.*
- A4. B Baumgartner, *et al.*, O Thorn-Seshold\*; [ChemRxiv 2024: doi.org/mtnw](#)  
*Proximity-dependent triplet states as a general method for NIR photoswitching in biology.*
- A5. M Müller, *et al.*, M Schaefer\*, O Thorn-Seshold\*; [BioRxiv 2024: doi.org/m75j](#)  
*Ideal efficacy photoswitches deliver spatiotemporally-resolved **chromocontrol** in live tissues.*

#### • Area B: Multistep cascade probes, redox biochemistry, and in vivo anticancer prodrugs

We are pioneering a new logic for chemical probes to tackle a key problem in biology, i.e. that it has been almost impossible to rationally design compounds so they only interact with *one target protein*. The classical framework of structure-based drug design has poor success in this, and it cannot really be used with undefined or plastic active sites like the redox enzymes we are interested in. We developed a new framework, where probes must *undergo multiple, sequential, reversible steps* with an enzyme target, before they are triggered to perform a function; and where each step contains a different type of bias acting *against off-targets*. The accumulation of these biased steps should prevent chemically similar off-target proteins from triggering the end result. With this approach, we could pioneer the first molecular probes for crucial, but low-expression-level, dithiol-type reductases (B1): incl. probes that distinguish their targets in live cells at >98% selectivity, despite chemisimilar off-targets being 1 million-fold more concentrated (B2). No docking is involved; the entire selectivity is set by kinetic biases from regiochemistry or stereochemistry, pKas, tension, preorganisation, and reaction molecularity; and by forcing on- and off-target pathways to diverge (B3). This research holds stringent standards for high-quality chemical probes (B4), and delivers new possibilities for molecular imaging in redox metabolism as well as for tumor-selective cancer therapy (B5). Most importantly, this logic using *fine chemical control* (usually reserved for synthesis in the flask) to *design for multistep chemical reactivity within live cells* can succeed, rationally, where screening or docking frameworks have failed.

- B1. J Felber, *et al.*, O Thorn-Seshold\*; [JACS 2021](#)  
*Selective, modular probes for thioredoxins by rational tuning of a unique disulfide structure motif.*
- B2. L Zeisel, *et al.*, O Thorn-Seshold\*; [Chem 2022](#)  
*Selective cellular probes for mammalian TrxR1: rational design of a 1,2-thiaselenane redox probe.*
- B3. L Zeisel, *et al.*, O Thorn-Seshold\*; [JACS 2024](#)  
*Piperazine-fused cyclic disulfides: high-performance bioreduction-activated probes & reagents.*
- B4. J Felber, *et al.*, O Thorn-Seshold\*; [Nat Comm 2022](#)  
*Cyclic 5-membered disulfides are not selective redox substrates but are opened nonspecifically.*
- B5. J Felber, *et al.*, O Thorn-Seshold\*; [ACS Central Science 2023](#)  
*Cyclic dichalcogenides extend the reach of bioreductive prodrugs to the thioredoxin system.*

## 2. Publications from independent career (\*as senior author)

### Papers In Review or Preprinted (all primary research)

- 43\* M Müller, K Niemeyer, NK Ojha, SA Porav, D Vinayagam, N Urban, F Büchau, K Oleinikov, M Makke, CC Bauer, AV Johnson, SP Muench, F Zufall, D Bruns, Y Schwarz, S Raunser, T Leinders-Zufall, RS Bon, M Schaefer\*, **O Thorn-Seshold\***; Ideal efficacy photoswitches for TRPC4/5 channels harness high potency for spatiotemporally-resolved control of TRPC function in live tissues.  
[BioRxiv 2024: doi.org/m75j](https://doi.org/10.1101/2024.07.15.601751)
- 42\* B Baumgartner, V Glembockyte, A Gonzalez-Hernandez, A Valavalkar, R Mayer, L Fillbrook, A Müller-Deku, J Zhang, F Steiner, A Wiegand, C Gross, M Reynders, H Munguba, A Arefin, A Ofial, J Beves, T Lohmüller, B Dietzek-Ivansic, J Broichhagen, P Tinnefeld, J Levitz, **O Thorn-Seshold\***; A General Method for Near-Infrared Photoswitching in Biology, Demonstrated by the >700 nm Photocontrol of GPCR Activity in Brain Slices.  
[ChemRxiv 2024: doi.org/mtnw](https://doi.org/10.26434/chemrxiv-2024-mtnw)
- 41\* B Baumgartner, V Glembockyte, RJ Mayer, AJ Gonzalez-Hernandez, RO Kindler, A Valavalkar, AJ Wiegand, A Müller-Deku, L Grubert, F Steiner, C Gross, M Reynders, V Grenier, J Broichhagen, S Hecht, P Tinnefeld, AR Ofial, B Dietzek-Ivanšic, J Levitz, **O Thorn-Seshold\***; Azobenzenes can achieve near-infrared photocontrol in biological systems, with quantitative Z→E photoisomerization, via singlet manifold photoredox.  
[ChemRxiv 2023: doi.org/ks9v](https://doi.org/10.26434/chemrxiv-2023-ks9v)

### Publications (all are primary research, except the two marked →)

- 40\* M Reynders\*, S Willems, J Marschner, T Wein, D Merk\*, **O Thorn-Seshold\***; A High-Quality Photoswitchable Probe that Selectively and Potently Regulates the Transcription Factor RORγ.  
[Angewandte Chemie 2024, e202410139](https://doi.org/10.1002/ange.202410139)
- 39\* M Reynders, M Garścia, A Müller-Deku, M Wranik, K Krauskopf, L de la Osa de la Rosa, K Schaffer, A Jötten, A Rode, V Stierle, Y Kraus, B Baumgartner, A Ali, A Bubeneck, T Seal, MO Steinmetz, P Paulitschke, **O Thorn-Seshold\***; A photo-SAR study of photoswitchable azobenzene tubulin-inhibiting antimetotics identifying a general method for near-quantitative photocontrol.  
[Chemical Science 2024 12301-12309](https://doi.org/10.1002/anie.202412301)
- 38\* C Schmitt, P Mauker, N Vepřek, C Gierse, JCM Meiring, J Kuch, A Akhmanova, L Dehmelt, **O Thorn-Seshold\***; A Photocaged Microtubule-Stabilising Epothilone allows Spatiotemporal Control of Cytoskeletal Dynamics.  
[Angewandte Chemie 2024, e202410169](https://doi.org/10.1002/ange.202410169)
- 37\* M Müller, N Liu, V Gujrati, A Valavalkar, S Hartmann, A Telek, B Dietzek-Ivanšić, A Hartschuh, V Ntziachristos, **O Thorn-Seshold\***; Merged molecular switches excel as optoacoustic dyes: azobenzene-cyanines are loud and photostable NIR imaging agents.  
[Angewandte 2024 VIP article, e202405636](https://doi.org/10.1002/ange.202405636)
- 36\* P Mauker, D Beckmann, A Kitowski, C Heise, C Wientjens, AJ Davidson, S Wanderoy, G Fabre, A Harbauer, W Wood, C Wilhelm, J Thorn-Seshold, T Misgeld, M Kerschensteiner, **O Thorn-Seshold\***; Fluorogenic chemical probes for wash-free imaging of cell membrane damage in ferroptosis, necrosis, and axon injury.  
[Journal of the American Chemical Society 2024, 11072-11082](https://doi.org/10.1021/ja.3c11072)
- 35\* L Zeisel, J Felber, K Scholzen, C Schmitt, A Wiegand, L Komissarov, E Arnér, **O Thorn-Seshold\***; Piperazine-fused cyclic disulfides: high-performance bioreduction-activated cores for bifunctional probes and reagents.  
[Journal of the American Chemical Society 2024, 5204-5214](https://doi.org/10.1021/ja.3c5204)

- 34\* F Coelho, L Zeisel, **O Thorn-Seshold\***, S Matile\*; Selenium-Centered Cascade Exchangers and Conformational Control Unlock Unique Patterns of Thiol-Mediated Cellular Uptake. [Chemistry Europe 2024, e202400032](#)
- 33\* J Felber, A Kitowski, L Zeisel, M Maier, C Heise, J Thorn-Seshold, **O Thorn-Seshold\***; Cyclic dichalcogenides as new bioreductive prodrugs to harness the thioredoxin system. [ACS Central Science 2023, 763-776](#)
- 32\* L Zeisel\*, M Maier, **O Thorn-Seshold\***; Efficient and scalable syntheses of 1,2-thiaselenane-4-amine and 1,2-thiaselenane-5-amine. [Synthesis 2023, 1385-1393](#)
- 31 M Wranik\*, MW Kepa\*, EV Beale, et al., K Krauskopf, L Gao, **O Thorn-Seshold**, C Bostedt, C Bacellar, MO Steinmetz, C Milne, J Standfuss; A multi-reservoir extruder for time-resolved serial protein crystallography and screening at X-ray free electron lasers. [Nature Communications 2023, 7956](#)
- 30 F Coelho, S Saidjalolov, D Moreau, **O Thorn-Seshold**, S Matile\*; Inhibition of Cell Motility by Cell-Penetrating Dynamic Covalent Cascade Exchangers: Integrins Participate in Thiol-Mediated Uptake. [JACS Au 2023, 1010-1016](#)
- 29 C Velasco, R Mellwig, M Schorb, L Gao, **O Thorn-Seshold**, A Llobet\*; Microtubule depolymerization contributes to spontaneous neurotransmitter release. [Communications Biology 2023, 488](#)
- 28\* J Felber\*, **O Thorn-Seshold\***; Synthetic duocarmycins: structural evolution from SAR to prodrugs and ADCs - a searchable structure/function database. [JACS Au 2022, 2636-2644 \(\\*ACS Editors' Choice\)](#) → *critical review article with A0 Poster*
- 27\* L Zeisel, J Felber, L Poczka, K Scholzen, D Cheff, M Maier, Q Cheng, M Shen, M Hall, E Arnér, J Thorn-Seshold, and **O Thorn-Seshold\***; Selective cellular probes for mammalian thioredoxin reductase TrxR1: rational design of RX1, a 1,2-thiaselenane redox probe. [Chem 2022, 1493-1517 \(Redox Highlight, Chem Highlight\)](#)
- 26\* L Gao, J Meiring, A Varady, I Ruider, C Heise, M Wranik, C Velasco, J Taylor, B Terni, J Standfuss, C Cabernard, A Llobet, M Steinmetz, A Bausch, M Distel, J Thorn-Seshold, A Akhmanova, and **O Thorn-Seshold\***; *In vivo* photocontrol of microtubule dynamics and integrity, migration and mitosis, by the potent GFP-imaging-compatible photoswitchable reagents SBTubA4P and SBTub2M. [Journal of the American Chemical Society 2022, 5614-5628](#)
- 25\* J Felber, L Poczka, K Scholzen, L Zeisel, M Maier, S Busker, U Theisen, C Brandstädter, K Becker, E Arnér, J Thorn-Seshold, and **O Thorn-Seshold\***; Cyclic 5-membered disulfides are not selective substrates of thioredoxin reductase, but open nonspecifically. [Nature Communications 2022, 13, 1754](#)
- 24\* L Gao, Y Kraus, A Stegner, T Wein, C Heise, L von Brunn, E Fajardo-Ruiz, J Thorn-Seshold, **O Thorn-Seshold\***; Self-reporting styrylthiazolium photopharmaceuticals: mitochondrial localisation as well as SAR drive biological activity. [Organic and Biomolecular Chemistry 2022, 20, 7787-7794](#)
- 23\* A Müller-Deku, **O Thorn-Seshold\***; Exhaustive catalytic ortho-alkoxylation of azobenzenes: flexible access to functional diverse yellow-light-responsive photoswitches. [Journal of Organic Chemistry 2022, 16526-16531](#)
- 22\* M Müller, K Niemeyer, N Urban, N Ojha, F Zufall, T Leinders-Zufall, M Schaefer, **O Thorn-Seshold\***; BTDAzo - a photoswitchable TRPC5 channel activator. [Angewandte Chemie 2022, 61, e202201565](#)
- 21 J Rushworth, *et al.*, **O Thorn-Seshold**, M Fuchter; [5]-Helistatins: Tubulin binding helicenenes with antimetabolic activity. [JACS Au 2022, 2561-2570](#)

- 20 M Scheck, *et al.*, G Barba-Spaeth, **O Thorn-Seshold**, A Krug, S Endres, S Rothenfusser\*, J Thorn-Seshold\*; FluorRNT: A robust, efficient assay for the detection of neutralising antibodies against yellow fever virus 17D. [PLoS One 2022, 17, e0262149](#)
- 19 F Küllmer, N Vepřek, *et al.*, **O Thorn-Seshold**, H-D Arndt, D Trauner; Next Generation Opto-Jasplakinolides Enable Local Remodeling of Actin Networks. [Angewandte Chemie 2022, 61, e202210220](#)
- 18 M Ober, A Müller-Deku, *et al.*, **O Thorn-Seshold**, B Nickel; SAXS measurements of azobenzene vesicles reveal buffer-dependent photoswitching and quantitative Z→E isomerisation by X-rays. [Nanophotonics 2022, 11, 2361-2368](#)
- 17\* L Gao, J Meiring, C Heise, A Rai, A Müller-Deku, A Akhmanova, J Thorn-Seshold, and **O Thorn-Seshold\***; Photoswitchable epothilone-based microtubule stabilisers allow GFP-imaging-compatible, optical control over the microtubule cytoskeleton. [Angewandte Chemie 2021, 61, e202114614 \(\\*VIP paper\)](#)
- 16\* A Sailer, J Meiring, C Heise, L Pettersson, A Akhmanova, J Thorn-Seshold, and **O Thorn-Seshold\***; Pyrrole hemithioindigo antimetabolites with near-quantitative bidirectional photoswitching photocontrol cellular microtubule dynamics with single-cell precision. [Angewandte Chemie 2021, 60, 23695-23704](#)
- 15\* J Felber, L Zeisel, L Poczka, K Scholzen, S Busker, M Maier, U Theisen, C Brandstädter, K Becker, E Arnér, J Thorn-Seshold, and **O Thorn-Seshold\***; Selective, modular probes for thioredoxins enabled by rational tuning of a unique disulfide structure motif. [Journal of the American Chemical Society 2021, 143, 8791-8803](#)
- 14\* L Gao, J Meiring, Y Kraus, M Wranik, T Weinert, S Pritzl, R Bingham, E Ntoulidou, K Jansen, N Olieric, J Standfüß, L Kapitein, T Lohmüller, J Ahlfeld, A Akhmanova, M Steinmetz, and **O Thorn-Seshold\***; A robust, GFP-orthogonal photoswitchable inhibitor scaffold extends optical control over the microtubule cytoskeleton. [Cell Chemical Biology 2021, 28, 228-241](#)
- 13\* A Müller-Deku, J Meiring, K Loy, Y Kraus, C Heise, R Bingham, K Jansen, X Qu, F Bartolini, L Kapitein, A Akhmanova, J Ahlfeld, D Trauner, **O Thorn-Seshold\***; Photoswitchable paclitaxel-based microtubule stabilisers allow optical control over the microtubule cytoskeleton. [Nature Communications 2020, 11, 4640](#)
- 12\* Y Kraus, C Glas, B Melzer, L Gao, C Heise, M Preuß, J Ahlfeld, F Bracher, **O Thorn-Seshold\***; Isoquinoline-based biaryls as a robust scaffold for microtubule inhibitors. [European Journal of Medicinal Chemistry 2020, 186, 111865](#)
- 11\* A Sailer, F Ermer, Y Kraus, R Bingham, F Lutter, J Ahlfeld and **O Thorn-Seshold\***; Potent hemithioindigo-based antimetabolites photocontrol the microtubule cytoskeleton *in cellulo*. [Beilstein Journal of Organic Chemistry 2020, 16, 125-134](#)
- 10\* **O Thorn-Seshold\***; Comment on “Photo-Controlled Reversible Microtubule Assembly”. [Angewandte Chemie 2020, 59, 7652-7654](#) → *critical challenge of published results*
- 9 U Theisen, A Ernst, R Heyne, T Ring, **O Thorn-Seshold**, R Köster; Microtubules and motor proteins support zebrafish neuronal migration by directing cargo. [Journal of Cell Biology 2020, 219, e201908040](#)
- 8 M Borowiak, *et al.*, **O Thorn-Seshold**, D Trauner, H-D Arndt; Optical manipulation of F-actin with photoswitchable small molecules. [Journal of the American Chemical Society 2020, 142, 9240-9249](#)
- 7 A Kopf, *et al.*, **O Thorn-Seshold**, D Trauner, H Häcker, K-D Fischer, E Kiermaier, M Sixt; Microtubules control cellular shape and coherence in amoeboid migrating cells. [Journal of Cell Biology 2020, 219, e201907154](#)
- 6 M Bischof, S Olthoff, C Glas, **O Thorn-Seshold**, M Schaefer, K Hill; TRPV3 endogenously expressed in murine colonic epithelial cells is inhibited by the novel TRPV3 blocker 26E01. [Cell Calcium 2020, 102320](#)

- 5\* A Sailer, F Ermer, Y Kraus, F Lutter, C Donau, M Bremerich, J Ahlfeld and **O Thorn-Seshold\***; Hemithioindigos for cellular photopharmacology: desymmetrised molecular switch scaffolds enabling design control over the isomer-dependency of potent antimetabolic bioactivity. [ChemBioChem 2019, 20, 1305-1314](#)
- 4 A Singh, *et al.*, **O Thorn-Seshold**, J Klingauf, M Galic, M Matis; Polarized microtubule dynamics directs cell mechanics and coordinates forces during epithelial morphogenesis. [Nature Cell Biology 2018, 20, 1126-1133](#)
- 3 K Eguchi, Z Taoufiq, **O Thorn-Seshold**, *et al.*, T Takahashi; Wild-type monomeric  $\alpha$ -synuclein can impair vesicle endocytosis and synaptic fidelity via tubulin polymerization at the calyx of Held. [The Journal of Neuroscience 2017, 37, 6043-6052](#)
- 2 J Zenker, *et al.*, **O Thorn-Seshold**, S Bissiere, N Plachta; A microtubule-organizing center directing intracellular transport in the early mouse embryo. [Science 2017, 357, 925-928](#)
- 1\* M Borowiak, *et al.*, D Trauner\*, **O Thorn-Seshold\***; Photoswitchable Inhibitors of Microtubule Dynamics Optically Control Mitosis and Cell Death. [Cell 2015, 162, 403-411](#)

### 3. Book Chapters (with review only by the Editors)

- 46 C Berndt\*; coauthors incl. **O Thorn-Seshold** & 88 more; M Conrad\*; Ferroptosis in Health and Disease. *Our section is #6.3.1: Fluorescent Probes to Investigate Ferroptosis.* [Redox Biology 2024 special issue, 103211](#) (essentially a book, but published via journal)  
• Section in the consortium reference work on "current standards in ferroptosis research"
- 45\* **O Thorn-Seshold\***; Photoswitchable Cytotoxins.  
Chapter 36 in [Molecular Photoswitches \(Pianowski, ed.; Wiley, 2022\)](#)  
• Chapter in the authoritative reference work for photoswitches in chemistry and biology
- 44\* **O Thorn-Seshold\***, J Meiring;  
Photocontrolling Microtubule Dynamics with Photoswitchable Chemical Reagents.  
Chapter 26 in [Microtubules - Methods and Protocols \(Inaba, ed.; Springer, 2022\)](#)  
• Chapter in the leading practical reference work for microtubule cytoskeleton biologists

### 4. Patents & Patent Applications

- 52\* **O Thorn-Seshold\***, V Glembockyte, B Baumgartner, A Wiegand; Stabilised Fluorophores, compositions, methods of preparation, conjugates thereof, and methods of use. Patent Application US 18/737536, **2024**
- 51\* **O Thorn-Seshold\***, L Zeisel, J Felber; Cyclic Dichalcogenide ADC Linker Units and Uses Thereof. Patent Application [US 18/587313](#), **2024**
- 50\* **O Thorn-Seshold\***, L Zeisel, J Felber; Dichalcogenide Prodrugs.  
Patent Application [WO 2022/059280 \(EP21167187.0\)](#), **2021** (actively maintained)
- 49\* **O Thorn-Seshold\***, J Felber, J Thorn-Seshold, L Zeisel; Disulfide prodrug compounds.  
Patent Application [WO 2022/200347 \(EP21163944.8\)](#), **2021** (actively maintained)
- 48\* **O Thorn-Seshold\***, F. Bracher, B. Melzer; Isoquinoline biaryl compounds.  
Patent Application [EP18207030](#), **2018** (lapsed in 2021)
- 47\* **O Thorn-Seshold\***, M Borowiak, D Trauner, J Hasserodt; Azoaryls as Reversibly Modulatable Tubulin Inhibitors. Patent [WO2015166295](#), **2014** (maintained until 2021)

### 5. Prior to independent career

see [web list](#)