

# TOBIAS RITTER, PH.D.

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## MAX-PLANCK-INSTITUT FÜR KOHLENFORSCHUNG

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## APPOINTMENTS

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Managing Director, Max-Planck-Institut für Kohlenforschung, Mülheim an der Ruhr, Germany  
Professor, RWTH Aachen University, Aachen, Germany  
Chemist, Department of Radiology, Massachusetts General Hospital  
Founder SciFluor Life Sciences, Cambridge, Massachusetts

## EDUCATION

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2004	<b>Ph.D.</b> Organic Chemistry, ETH Zurich, Switzerland
1999	<b>M.S.</b> Technical University of Braunschweig, Germany

## RESEARCH INTERESTS

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Late-Stage functionalization of complex small molecules; Synthetic organic and organometallic chemistry; development of new synthetic methods based on transition metal catalysis; molecular positron emission tomography (PET) imaging

## EXPERIENCE

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### Max-Planck-Institut für Kohlenforschung | Mülheim an der Ruhr, Germany

2018–present	Managing Director
2015–present	Director, Department of Organic Synthesis

### RWTH Aachen university | Aachen, Germany

2017–present	Professor of Chemistry
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### Harvard University | Cambridge, MA, USA

2015–2017	Visiting Professor of Chemistry and Chemical Biology
2012–2015	Professor of Chemistry and Chemical Biology
2010–2012	Associate Professor of Chemistry and Chemical Biology

2006–2010 Assistant Professor of Chemistry and Chemical Biology

**Massachusetts General Hospital** | Boston, MA, USA

2014–present Chemist, Radiology

2012–2014 Associate Chemist, Radiology

2010–2012 Assistant Chemist, Radiology

**California Institute of Technology** | Pasadena, CA, USA

2004–2006 Post-Doctoral Fellow; Advisor: Prof. Robert H. Grubbs

**Swiss Federal Institute of Technology** | ETH Zürich, Switzerland

1999–2004 Ph.D. Thesis; Advisor: Prof. Erick M. Carreira

**Stanford University** | Stanford, CA, USA

1998–1999 Master Thesis; Advisor: Prof. Barry M. Trost

**Swiss Federal Institute of Technology** | Lausanne, Switzerland | 1997–1998

**University of Bordeaux** | Bordeaux, France | 1997–1997

**Technical University of Braunschweig** | Braunschweig, Germany | 1995–1997

## AWARDS

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Chinese Chemical Society Award in Fluorine Chemistry, 2018 | RSC Fluorine Chemistry Prize, 2013 | Klung-Wilhelmy-Weberbank Preis, Berlin, Germany, 2012 | Popular Science Brilliant 10 Award, 2011 | Camille Dreyfus Teacher Scholar Award, 2011 | BASF Catalysis Award, 2011 | Roslyn Abramson Award for Excellence in Teaching Undergraduates, 2010 | AstraZeneca Excellence in Science Award, 2010 | Amgen Young Investigator Award, 2010 | Alfred P. Sloan Research Fellowship, 2010 | NSF Career Award, 2010–2015 | Air Force Young Investigator Award, 2010–2013 | Eli Lilly Grantee Award, 2010–2012 | Bayer Early Excellence in Science Award, 2009 | Massachusetts Life Science Center Young Investigator Award, 2009–2011 | Smith Family Award for Excellence in Biomedical Research, 2008–2011 | Milton Fund Award, Harvard Medical School, 2008 | Thieme Chemistry Journals Award, 2007 | Postdoctoral Fellowship (DAAD), 2004–2006 | Kekulé-Scholarship of the Fond der Chemischen Industrie e.V., 2000–2002 | Winterfeld Award - Towards the Total Synthesis of Teretifolione B, 2000 | Fellowship of the Konrad-Adenauer-Foundation, 1998–1999 | Scholarship of the Swiss National Science Foundation, 1997–1998 | Scholarship of the European Union, 1997 | Scholarship of the Konrad-Adenauer-Foundation, 1996–1999

## PUBLICATIONS; H-FACTOR 47, SUM OF TIMES CITED 10,422

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107. G. S. Clemente, J. Rickmeier, I. F. Antunes, T. Zarganes-Tzitzikas, A. Dömling, T. Ritter, P. H. Elsinga “[<sup>18</sup>F]Atorvastatin: synthesis of a potential molecular imaging tool for the assessment of statin-related mechanisms of action” *EJNMMI Res.* **2020**, doi:10.1186/s13550-020-00622-4.
106. E. M. Alvarez, M. B. Plutschack, F. Berger, T. Ritter “Site-selective C–H functionalization–sulfination sequence to access aryl sulfonamides” *Org. Lett.* **2020**, doi: 10.1021/acs.orglett.0c00982.
105. P. Xu, D. Zhao, F. Berger, A. Hamad, J. Rickmeier, R. Petzold, M. Kondratiuk, K. Bohdan, T. Ritter “Site-selective late-stage aromatic <sup>18</sup>F-fluorination via aryl sulfonium salts” *Angew. Chem. Int. Ed.* **2020**, 59, 1956–1960.
104. J. Chen, J. Li, M. B. Plutschack, F. Berger, T. Ritter “Regio- and stereoselective thianthrenation of olefins to access versatile alkenyl electrophiles” *Angew. Chem. Int. Ed.* **2019**, 59, 5616–5620.
103. J. Li, J. Chen, R. Sang, W.S. Ham, M. B. Plutschack, F. Berger, S. Chhabra, A. Schnegg, C. Genicot, T. Ritter “Photoredox catalysis with aryl sulfonium salts enables site-selective late-stage fluorination” *Nature Chem.* **2019**, 12, 56–62.
102. L. Tanwar, J. Börgel, T. Ritter “Synthesis of benzylic alcohols by C–H oxidation” *J. Am. Chem. Soc.* **2019**, 141, 17983–17988.
101. R. Sang, S. Korkis, W. Su, F. Ye, P. S. Engl, F. Berger, T. Ritter “Site-selective C–H oxygenation via aryl sulfonium salts” *Angew. Chem. Int. Ed.* **2019**, 58, 16161–16166.

100. P. S. Engl, A. P. Häring, F. Berger, G. Berger, A. Pérez-Bitrián, T. Ritter "C–N cross-couplings for site-selective late-stage diversification via aryl sulfonium salts" *J. Am. Chem. Soc.* **2019**, *141*, 13346–13351.
99. J. Hillenbrand, W.S. Ham, T. Ritter "C–H pyridonation of (hetero-)arenes by pyridinium radical cations" *Org. Lett.* **2019**, *21*, 5363–5367.
98. T. Ritter, F. Berger "Abkürzung zu komplexen Molekülen" *Spektrum der Wissenschaft* **2019**, *8*, 23–25.
97. F. Ye, F. Berger, H. Jia, J. Ford, A. Wortman, J. Börgel, C. Genicot, T. Ritter "Aryl sulfonium salts for site-selective late-stage trifluoromethylation" *Angew. Chem. Int. Ed.* **2019**, *58*, 14615–14619.
96. Q. Cheng, T. Ritter "New directions in C–H Fluorination" *Trends Chem.* **2019**, *1*, 461–470.
95. J. Chen, T. Ritter "Late-stage deoxyfluorination of phenols with PhenoFluorMix" *Org. Synth.* **2019**, *96*, 16–35.
94. F. Berger, M. B. Plutschack, J. Riegger, W. Yu, S. Speicher, M. Ho, N. Frank, T. Ritter "Site-selective and versatile aromatic C–H functionalization by thianthrenation" *Nature* **2019**, *567*, 223–228.
93. E. M. D'Amato, J. Börgel, T. Ritter "Aromatic C–H amination in hexafluoroisopropanol" *Chem. Sci.* **2019**, *10*, 2424–2428.
92. W.S. Ham, J. Hillenbrand, J. Jacq, C. Genicot, T. Ritter "Divergent Late-Stage (Hetero)Aryl C–H Amination by the pyridinium radical cation" *Angew. Chem. Int. Ed.* **2019**, *58*, 532–536.
91. D. Zhao, P. Xu, T. Ritter "Palladium-Catalyzed late-stage direct arene cyanation" *Chem* **2019**, *5*, 97–107.
90. F. Pan, G. B. Boursalian, T. Ritter "Palladium-Catalyzed Decarbonylative Difluoromethylation of Acid Chlorides at Room Temperature" *Angew. Chem. Int. Ed.* **2018**, *57*, 16871–16876.
89. J. Börgel, L. Tanwar, F. Berger, T. Ritter "Late-stage aromatic C–H oxygenation" *J. Am. Chem. Soc.* **2018**, *140*, 16026–16031.
88. J. Rickmeier, T. Ritter "Site-Specific Deoxyfluorination of Small Peptides with [<sup>18</sup>F]Fluoride" *Angew. Chem. Int. Ed.* **2018**, *57*, 14207–14211.
87. F. Serpier, F. Pan, W.S. Ham, J. Jacq, C. Genicot, T. Ritter "Selective methylation of arenes: A radical C–H functionalization/ cross-coupling sequence" *Angew. Chem. Int. Ed.* **2018**, *57*, 10697–10701.
86. X. Sun, J. Chen, T. Ritter "Catalytic dehydrogenative decarboxyolefination of carboxylic acids" *Nat. Chem.* **2018**, *10*, 1229–1233.
85. G. B. Boursalian, T. Ritter "Palladium-Mediated Fluorination for Preparing Aryl Fluorides" In J. Hu, & T. Umemoto (Eds.), *Fluorination, Synthetic Organofluorine Chemistry 1*. Springer Nature Singapore **2018**.

84. G. B. Boursalian, T. Ritter "Nickel-Mediated Fluorination for Preparing Aryl Fluorides" In *J. Hu, & T. Umemoto (Eds.), Fluorination. Synthetic Organofluorine Chemistry 1. Springer Nature Singapore* **2018**.
83. K. Yamamoto, J. Li, J. A. O. Garber, J. D. Rolfes, G. B. Boursalian, J. C. Borghs, C. Genicot, J. Jacq, M. van Gastel, F. Neese, T. Ritter "Palladium-catalysed electrophilic aromatic C–H fluorination" *Nature* **2018**, *554*, 511–514.
82. C. N. Neumann, T. Ritter "Facile C–F bond formation through a concerted nucleophilic aromatic substitution mediated by the PhenoFluor Reagent" *Acc. Chem. Res.* **2017**, *50*, 2822–2833.
81. M. G. Strebl, A. J. Campbell, W.-N. Zhao, F. A. Schroeder, M. M. Riley, P. S. Chindavong, T. M. Morin, S. J. Haggarty, F. F. Wagner, T. Ritter, J. M. Hooker "HDAC6 brain mapping with [<sup>18</sup>F]Bavarostat enabled by a Ru-mediated deoxyfluorination" *ACS Cent. Sci.* **2017**, *3*, 1006–1014.
80. M. H. Beyzavi, D. Mandal, M. G. Strebl, C. N. Neumann, E. M. D'Amato, J. Chen, J. M. Hooker, T. Ritter "<sup>18</sup>F-Deoxyfluorination of phenols via Ru π-complexes" *ACS Cent. Sci.* **2017**, *3*, 944–948.
79. F. Ye, J. Chen, T. Ritter "Rh-catalyzed anti-Markovnikov hydrocyanation of terminal alkynes" *J. Am. Chem. Soc.* **2017**, *139*, 7184–7187.
78. H. Lee, J. Börgel, T. Ritter "Carbon–fluorine reductive elimination from nickel(III)" *Angew. Chem. Int. Ed.* **2017**, *56*, 6966–6969.
77. M. G. Campbell, J. Mercier, C. Genicot, V. Gouverneur, J. M. Hooker, T. Ritter "Bridging the gaps in <sup>18</sup>F PET tracer development" *Nat. Chem.* **2017**, *9*, 1–3.
76. N. W. Goldberg, X. Shen, J. Li, T. Ritter "AlkylFluor: Deoxyfluorination of alcohols" *Org. Lett.* **2016**, *18*, 6102–6104.
75. C. N. Neumann, T. Ritter "C–H fluorination: U can fluorinate unactivated bonds" *Nat. Chem.* **2016**, *8*, 882–883.
74. H. Lee, M. G. Campbell, R. Hernández Sánchez, J. Börgel, J. Raynaud, S. E. Parker, T. Ritter "Mechanistic Insight Into High-Spin Iron(I)-Catalyzed Butadiene Dimerization" *Organometallics* **2016**, *35*, 2923–2929.
73. H. Shi, A. Braun, L. Wang, S. H. Liang, N. Vasdev, T. Ritter "Synthesis of <sup>18</sup>F-Difluoromethylarenes from Aryl (Pseudo) Halides" *Angew. Chem. Int. Ed.* **2016**, *55*, 10786–10790.
72. C. N. Neumann, J. M. Hooker, T. Ritter "Concerted nucleophilic aromatic substitution (C<sub>S</sub>NAr) with <sup>19</sup>F<sup>−</sup> and <sup>18</sup>F<sup>−</sup>" *Nature* **2016**, *534*, 369–373.
71. G. B. Boursalian, W. S. Ham, A. R. Mazzotti, T. Ritter "Charge-transfer-directed radical substitution enables *para*-selective C–H functionalization" *Nat. Chem.* **2016**, *8*, 810–815.
70. A. J. Hoover, M. Lazari, H. Ren, M. K. Narayanam, J. M. Murphy, R. M. van Dam, J. M. Hooker, T. Ritter. "A Transmetalation Reaction Enables the Synthesis of [<sup>18</sup>F]5-Fluorouracil from [<sup>18</sup>F]Fluoride for Human PET Imaging" *Organometallics* **2016**, *35*, 1008–1014.

69. J. Börgel, M. G. Campbell, T. Ritter "Transition Metal d-Orbital Splitting Diagrams: An Updated Educational Resource for Square Planar Transition Metal Complexes" *J. Chem. Educ.* **2016**, *93*, 118–121.
68. E. McNeill, T. Ritter "1,4-Functionalization of 1,3-dienes with low-valent iron catalysts" *Acc. Chem. Res.* **2015**, *48*, 2330–2343.
67. E. M. D'Amato, C. N. Neumann, T. Ritter "Selective aromatic C–H hydroxylation enabled by  $\eta^6$ -coordination to Iridium(III)" *Organometallics* **2015**, *34*, 4626–4631.
66. M. G. Campbell, A. G. Hoover, T. Ritter "Transition metal-mediated and metal-catalyzed carbon-fluorine bond formation" *Top. Organomet. Chem.* **2015**, *52*, 1–53.
65. X. Shen, C. N. Neumann, C. Kleinlein, N. Goldberg, T. Ritter "Alkyl aryl ether bond formation with PhenoFluor" *Angew. Chem. Int. Ed.* **2015**, *54*, 5662–5665.
64. H. Shi, D. Babinski, T. Ritter "Modular C–H functionalization cascade of aryl iodides" *J. Am. Chem. Soc.* **2015**, *137*, 3775–3778.
63. C. N. Neumann, T. Ritter "Late-stage fluorination: Fancy novelty or useful tool?" *Angew. Chem. Int. Ed.* **2015**, *54*, 3216–3221.
62. F. Sladojevich, E. McNeill, J. Börgel, S.-L. Zheng, T. Ritter "Condensed-phase, halogen-bonded  $\text{CF}_3\text{I}$  and  $\text{C}_2\text{F}_5\text{I}$  Adducts for perfluoroalkylation reactions" *Angew. Chem. Int. Ed.* **2015**, *54*, 3712–3716.
61. T. Fujimoto, T. Ritter "PhenoFluorMix: Practical chemoselective deoxyfluorination of phenols" *Org. Lett.* **2015**, *17*, 544–547.
60. M. Campbell, T. Ritter "Modern carbon-fluorine bond forming reactions for aryl-fluoride synthesis" *Chem. Rev.* **2015**, *115*, 612–633.
59. T. Fujimoto, F. Becker, T. Ritter "PhenoFluor: Practical synthesis, new formulation, and deoxyfluorination of heteroaromatics" *Org. Proc. Res. Develop.* **2014**, *18*, 1041–1044.
58. H. Ren, H.-Y. Wey, M. Strebl, R. Neelamegam, T. Ritter, J. Hooker "Synthesis and imaging validation of [ $^{18}\text{F}$ ]MDL100907 enabled by Ni-mediated fluorination" *ACS Chem. Neurosci.* **2014**, *5*, 611–615.
57. S. Parker, J. Börgel, T. Ritter "1,2-Selective hydrosilylation of conjugated dienes" *J. Am. Chem. Soc.* **2014**, *136*, 4857–4860.
56. M. G. Campbell, T. Ritter "Late-stage fluorination: From fundamentals to application" *Org. Proc. Res. Develop.* **2014**, *18*, 474–480.
55. E. Regalado, M. Kozlowski, J. Curto, T. Ritter, M. Campbell, A. Mazzotti, B. Hamper, C. Spilling, M. Mannino, L. Wan, J.-Q. Yu, J. Liu, C. Welch "Support of academic synthetic chemistry using separation technologies from the pharmaceutical industry" *Org. Biomol. Chem.* **2014**, *12*, 2161–2166.
54. D. C. Powers, T. Ritter "Oxidation of carbon–metal bonds" *Comprehensive Organic Synthesis II* **2014**, chapter 7.23.

53. T. Liang, T. Ritter "Synthesis of fluorides" *Comprehensive Organic Synthesis II* **2014**, chapter 6.06.
52. K. P. Kornecki, J. F. Berry, D. C. Powers, T. Ritter "Metal–metal bond-containing complexes as catalysts for C–H functionalization" *Prog. Inorg. Chem.* **2014**, *58*, 223–300
51. J. R. Brandt, E. Lee, G. B. Boursalian, T. Ritter "Mechanism of electrophilic fluorination with Pd(IV): fluoride capture and subsequent oxidative fluoride transfer" *Chem. Sci.* **2014**, *5*, 169–179.
50. A. R. Mazzotti, M. G. Campbell, P. Tang, J. M. Murphy, T. Ritter "Palladium(III)-catalyzed fluorination of arylboronic acid derivatives" *J. Am. Chem. Soc.* **2013**, *135*, 14012–14015.
49. M. G. Campbell, S.-L. Zheng, T. Ritter "One-Dimensional Palladium Wires: Influence of Molecular Changes on Supramolecular Structure" *Inorg. Chem.* **2013**, *52*, 13295–13297.
48. G. B. Boursalian, M.-Y. Ngai, K. N. Hojczyk, T. Ritter "Pd-catalyzed aryl C–H imidation with arene as the limiting reagent" *J. Am. Chem. Soc.* **2013**, *135*, 13278–13281.
47. T. Liang, Constanze N. Neumann, T. Ritter "Introduction of fluorine and fluorine-containing functional groups" *Angew. Chem., Int. Ed.* **2013**, *52*, 8214–8264.
46. D. Powers, T. Ritter "A transition state analogue for the oxidation of binuclear palladium(II) to binuclear palladium(III) complexes" *Organometallics* **2013**, *32*, 2042–2045.
45. A. Kamlet, C. Neumann, E. Lee, S. Carlin, C. Moseley, N. Stephenson, J. Hooker, T. Ritter "Application of palladium-mediated <sup>18</sup>F-fluorination to PET radiotracer development: overcoming hurdles to translation" *PLOS one* **2013**, *8*, e59187.
44. F. Sladojevich, S. Arlow, P. Tang, T. Ritter "Late-Stage Deoxyfluorination of alcohols with PhenoFluor" *J. Am. Chem. Soc.* **2013**, *135*, 2470–2473.
43. D. C. Powers, T. Ritter "Bimetallic catalysis with palladium" *Science of Synthesis* **2012**, *4*, 1–31.
42. J. Raynaud, J. Y. Wu, T. Ritter "Iron-catalyzed polymerization of isoprene and other 1,3-dienes" *Angew. Chem., Int. Ed.* **2012**, *51*, 11805–11808.
41. E. Lee, J. M. Hooker, T. Ritter "Nickel-mediated oxidative fluorination for PET with aqueous [<sup>18</sup>F]fluoride" *J. Am. Chem. Soc.* **2012**, *134*, 17456–17458.
40. D. C. Powers, E. Lee, A. Ariafard, M. S. Sanford, B. F. Yates, A. J. Canty, T. Ritter "Connecting Binuclear Pd(III) and Mononuclear Pd(IV) Chemistry by Pd–Pd Bond Cleavage" *J. Am. Chem. Soc.* **2012**, *134*, 12002–12009.
39. D. C. Powers, T. Ritter "Bimetallic redox synergy in oxidative palladium catalysis" *Acc. Chem. Res.* **2012**, *45*, 840–850.
38. M. G. Campbell, D. C. Powers, J. Raynaud, M. J. Graham, P. Xie, E. Lee, T. Ritter "Synthesis and structure of solution-stable one-dimensional palladium wires" *Nature Chem.* **2011**, *3*, 949–953.
37. E. Lee, A. S. Kamlet, D. C. Powers, C. N. Neumann, G. B. Boursalian, T. Furuya, D. C. Choi, J. M. Hooker, T. Ritter "A fluoride-derived electrophilic late-stage fluorination reagent for PET imaging" *Science* **2011**, *334*, 639–642.

36. C. Huang, T. Liang, S. Harada, E. Lee, T. Ritter "Silver-mediated trifluoromethoxylation of aryl stannanes and arylboronic acids" *J. Am. Chem. Soc.* **2011**, *133*, 13308–13310.
35. P. Tang, W. Wang, T. Ritter "Deoxyfluorination of phenols" *J. Am. Chem. Soc.* **2011**, *133*, 11482–11484.
34. T. Furuya, A. S. Kamlet, T. Ritter "Catalysis for Fluorination and Trifluoromethylation" *Nature*, **2011**, *473*, 470–477.
33. P. Tang, T. Ritter "Silver-mediated fluorination of aryl silanes" *Tetrahedron* **2011**, *67*, 4449–4454.
32. D. C. Powers, T. Ritter "Pd(III) in Synthesis and Catalysis" *Top. Organomet. Chem.* **2011**, *35*, 129–156.
31. G. J. Chuang, W. Wang, E. Lee, T. Ritter "A Dinuclear Palladium Catalyst for  $\alpha$ -Hydroxylation of Carbonyls with O<sub>2</sub>" *J. Am. Chem. Soc.* **2011**, *133*, 1760–1762.
30. D. C. Powers, D. Y. Xiao, M. A. L. Geibel, T. Ritter "On the Mechanism of Palladium-Catalyzed Aromatic C–H Oxidation" *J. Am. Chem. Soc.* **2010**, *132*, 14530–14536.
29. D. C. Powers, D. Benitez, E. Tkatchouk, W. A. Goddard, III, T. Ritter "Bimetallic Reductive Elimination from Dinuclear Pd(III) Complexes" *J. Am. Chem. Soc.* **2010**, *132*, 14092–14103.
28. J. Y. Wu, B. N. Stanzl, T. Ritter "A Strategy for the Synthesis of Well-Defined Iron Catalysts and Application to Regioselective Diene Hydrosilylation" *J. Am. Chem. Soc.* **2010**, *132*, 13214–13216.
27. T. Ritter "Catalysis: Fluorination Made Easier" *Nature* **2010**, *466*, 447–448.
26. P. Tang, T. Furuya, T. Ritter "Silver-Catalyzed Late-Stage Fluorination" *J. Am. Chem. Soc.* **2010**, *132*, 12150–12154.
25. T. Furuya, E. M. N. Klein, T. Ritter "C–F Bond Formation for the Synthesis of Aryl Fluorides" *Synthesis* **2010**, 1804–1821.
24. T. Furuya, D. Benitez, E. Tkatchouk, A. E. Strom, P. Tang, W. A. Goddard, III, T. Ritter "Mechanism of C–F Reductive Elimination from Palladium(IV) Fluorides" *J. Am. Chem. Soc.* **2010**, *132*, 3793–3807.
23. D. C. Powers, M. A. L. Geibel, J. E. M. N. Klein, T. Ritter "Bimetallic Palladium Catalysis: Direct Observation of Pd(III)–Pd(III) Intermediates" *J. Am. Chem. Soc.* **2009**, *131*, 17050–17051.
22. J. Y. Wu, B. Moreau, T. Ritter "Iron-Catalyzed 1,4-Hydroboration of 1,3-Dienes" *J. Am. Chem. Soc.* **2009**, *131*, 12915–12917.
21. T. Furuya, T. Ritter "Fluorination of Boronic Acids Mediated by Silver Triflate" *Org. Lett.* **2009**, *11*, 2860–2863.
20. D. P. Powers, T. Ritter "Bimetallic Pd(III) Complexes in Palladium-Catalyzed Carbon–Heteroatom Bond Formation" *Nature Chem.* **2009**, *1*, 302–309.
19. T. Furuya, A. E. Strom, T. Ritter "Silver-Mediated Fluorination of Functionalized Arylstannanes" *J. Am. Chem. Soc.* **2009**, *131*, 1662–1663.



18. B. Moreau, J. Y. Wu, T. Ritter "Iron-Catalyzed 1,4-Addition of Olefins to Dienes" *Org. Lett.* **2009**, *11*, 337–339.
17. T. Furuya, C. Kuttruff, T. Ritter "Carbon–Fluorine Bond Formation" *Curr. Opin. Drug Disc. Dev.* **2008**, *11*, 308–319.
16. T. Furuya, T. Ritter "Carbon–Fluorine Reductive Elimination from a High-Valent Palladium Fluoride" *J. Am. Chem. Soc.* **2008**, *130*, 10060–10061.
15. T. Furuya, H. M. Kaiser, T. Ritter "Palladium-Mediated Fluorination of Arylboronic Acids" *Angew. Chem., Int. Ed.* **2008**, *47*, 5993–5996.

## PREVIOUS PUBLICATIONS

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14. A. P. Blum, T. Ritter, R. H. Grubbs. "Synthesis of N-heterocyclic Carbene-Containing Metal Complexes from 2-(pentafluorophenyl)-imidazolidines" *Organometallics*, **2007**, *26*, 2122–2124.
13. J. M. Berlin, K. Campbell, T. Ritter, T. W. Funk, A. Chlenov, R. H. Grubbs: "Ruthenium-Catalyzed Ring-Closing Metathesis to Form Tetrasubstituted Olefins" *Org. Lett.* **2007**, *9*, 1339–1342.
12. E. Despagnet-Ayoub, T. Ritter: "N-heterocyclic carbenes as ligands for olefin metathesis catalysts" *Top. Organomet. Chem.* **2007**, *21*, 193–218.
11. T. Ritter, A. Hejl, A. G. Wenzel, T. W. Funk, R. H. Grubbs. "A Standard System of Characterization for Olefin Metathesis Catalysts" *Organometallics* **2006**, *25*, 5740–5745.
10. T. Ritter, M. W. Day, R. H. Grubbs. "Rate Acceleration in Olefin Metathesis through a Fluorine–Ruthenium Interaction" *J. Am. Chem. Soc.* **2006**, *128*, 11768–11769.
09. A. W. Waltman, T. Ritter, R. H. Grubbs. "Rearrangement of N-Heterocyclic Carbenes Involving Heterocycle Cleavage" *Organometallics* **2006**, *25*, 4238–4239.
08. T. Ritter, L. Kværnø, M. Werder, H. Hauser, E. M. Carreira. "Heterocyclic Ring Scaffolds as Small-Molecule Cholesterol Absorption Inhibitors" *Org. Biomol. Chem.* **2005**, *3*, 3514–3523.
07. T. Ritter, E. M. Carreira. "1,2,4-Oxadiazolidinones as Configurationally Stable Chiral Building Blocks" *Angew. Chem., Int. Ed.* **2005**, *44*, 936–938.
06. T. Ritter, E. M. Carreira. "C–H Transformation of Terminal Alkynes" in: *Handbook of C-H Transformations: Applications in Organic Synthesis*, G. Dyker (Ed), Wiley-VCH, **2005**.
05. L. Kværnø, T. Ritter, M. Werder, H. Hauser, E. M. Carreira. "Brush Border Membrane Vesicles as the First In Vitro Assay for Intestinal Cholesterol Absorption Inhibitors" *Angew. Chem., Int. Ed.* **2004**, *43*, 4653–4656.
04. T. Ritter, P. Zarotti, E. M. Carreira. "Diastereoselective Phenol para-Alkylation: Access to a Cross-Conjugated Cyclohexadienone en Route to Resiniferatoxin" *Org. Lett.* **2004**, *6*, 4371–4374.
03. T. Ritter, K. Stanek, I. Larrosa, E. M. Carreira. "Mild Cleavage of Aryl Mesylates: Methanesulfonate as Potent Protecting Group for Phenols" *Org. Lett.* **2004**, *6*, 1513–1514.

02. T. Ritter, E. M. Carreira. "The Diazonamides: The Plot Thickens" *Angew. Chem., Int. Ed.* **2002**, *41*, 2489–2495.
01. B. König, M. Pelka, H. Zieg, T. Ritter, H. Bouas-Laurent, R. Bonneau, J. P. Desvergne. "Photoinduced Electron Transfer in a Phenothiazine-Riboflavin Dyad Assembled by Zinc-Imide Coordination in Water" *J. Am. Chem. Soc.* **1999**, *121*, 1681–1687.

## AWARD LECTURES

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The 75<sup>th</sup> Yangtze Academic Forum, Wuhan University, China | October 2018

Susan P. & Barry M. Trost Lectureship, University of Pennsylvania, USA | March 2018

Erdtman Lecture, Stockholm, Sweden | October 2015

MacLean Lecture, McMaster University, Canada | May 2014

Aldrich Lecture, University of British Columbia, Canada | March 2014

RCS Fluorine Prize Lecture, London, UK | September 2013

BMS Lecture, MIT, USA | April 2013

20th Archer Lecturer, Rensselaer Polytechnic Institute, NY, USA | March 2013

9th Hirata Memorial Lecture, Nagoya University, Japan | January 2013

Klung-Wilhemly-Weberbank Lecture, Berlin, Germany | November 2012

Alphora Research Inc. Lecture, University of Toronto | May 2012

The Padwa Lecture, Columbia University | February 2012

BASF Catalysis Award, BASF, Germany | July 2011

Organic Synthesis Lecturer, University of California, Berkeley | April 2011

Mordecai and Rivka Rubin Lecture, Technion–Israel Institute of Technology | June 2010

Eli Lilly Young Investigator Lecture, University of Wisconsin–Madison | May 2010

Novartis Lecture, Boston University | February 2010

## OTHER INVITED LECTURES

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### 2020

Pacificchem 2020 Hawaii, USA, | ACS Editors Summit, Hawaii, USA | Fry Lecture, University of Arkansas, USA | 11th Asian-European Symposium on metal-Mediated Organic Synthesis, Haifa, Israel | ACS National Meeting, San Francisco, USA | Oxford Summer Synthesis Conference 2020, Oxford, UK | Webinar for Merck Darmstadt, Germany | EurJOC Virtual Symposium, European Journal of Organic Chemistry | SCI Conference - Applied late-stage functionalisation: where chemistry meets biology, Manchester, UK | GDCh Lecture, University of Leipzig, Germany | 2nd Alpine Winter conference on Synthetic and Medicinal Chemistry, St. Anton am Arlberg, Switzerland

**2019**

Mamma Forum, Klinik für Senologie & Evangelische Kliniken Gelsenkirchen, Germany | Novartis Institutes for BioMedical Research, Cambridge, USA | The Dr. Paul Janssen Invited Lecture series, Janssen Pharmaceutica N.V., Beerse Belgium | 27th International Society of Heterocyclic Chemistry Congress, Kyoto, Japan | Organic Chemistry seminar series, California Institute of Technology, Pasadena, USA | 26th International Symposium on Synthesis in Organic Chemistry, University of Cambridge, Cambridge, UK | GDCh Lecture, TU Dortmund university, Dortmund, Germany | Chem East Organic Symposium, University of East Anglia, Norwich, UK | 54th SCS Conference on Stereochemistry, Bürgenstock Conference, Brunnen, Switzerland | 17th Rencontres de Chimie Organique (RCO), Gif-sur-Yvette, France | Roche, Basel, Switzerland | Organic Chemistry Colloquium, ETH Zürich, Switzerland | 8th Grubbs Symposium, Southern University of Science and Technology, Shenzhen, China | Merck, Kenilworth, USA | GlaxoSmithKline, Collegeville, USA | Princeton Student Invited Lecture Series, Princeton University, New Jersey, USA | Bristol-Myers Squibb, New Brunswick, USA | GDCh Colloquium, Hannover, Germany

**2018**

Sapienza University of Rome, Italy | Università degli Studi di Milano, Milano, Italy | University of Barcelona, Spain | ICIQ Institut Català d'Investigació Química, Tarragona, Spain | University College London, UK | Sir Derek Barton Centenary Celebration, Imperial College, London, UK | 22th International Symposium on Fluorine Chemistry (ISFC), Oxford, UK | Talk at TUM, Technical University Munich, Garching, Germany | ICBMS, University of Lyon, France | Klinikum rechts der Isar, Munich, Germany | 9<sup>th</sup> Munster Symposium on Cooperative Effects in Chemistry, Muenster, Germany

**2017**

Meeting of the French Chemical Society, Toulouse, France | Annual meeting of AG Radiochemie, Starnberg, Germany | International Isotope Society Central European Division Workshop, Bad Soden, Germany | Bayer AG, Frankfurt, Germany | UCB Super Network Conference 2017, London, UK | EuCOMC-2017, Amsterdam, Netherlands | Pohang University of Science and Technology, Pohang South Korea | OMCOS-19, Jeju Island, South Korea | Tsinghua University, Beijing Shi, China | University of Nankai, Nankai Qu, China | University of Tianjin, Nankai Qu, China | Junior Faculty Professional Development Workshop, Mainz, Germany | Science Day at CARBOGEN AMCIS AG, Bubendorf, Switzerland | GDCh Lecture at the Technical University Braunschweig, Germany | 253rd ACS National Meeting and Exposition, San Francisco, USA | University of Cambridge, UK | International Symposium Imaging agents in Medicine, University medical Center Groningen, Netherlands | GDCH Ostverband Saar-Lecture, Universität des Saarlandes, Saarbrücken, Germany | Colloquium for Organic Chemistry and Chemical Biology, Phillips University of Marburg, Germany | 50th annual Sheffield Stereochemistry Meeting at the University of Sheffield, UK

**2016**

50th annual Sheffield Stereochemistry Meeting at the University of Sheffield, UK | Eli Lilly, Windlesham-Erl Wood, UK | Vertex Pharmaceuticals, Abingdon-Oxfordshire, UK | UCB - Late Stage Functionalization for Synthesis and Medicines, Oxford, UK | Pierre and Marie Curie University, Paris, France | 1st ISOTOPICS Project Meeting, Paris, France | Ernst Haage Symposium 2016, MPI CEC, Mülheim an der Ruhr, Germany | MedChem 2016, Annual One-Day Meeting on Medical Chemistry, Mont-Saint-Guilbert, Belgium | 25<sup>th</sup> International Isotope Society, (UK Group) Symposium University of Cambridge, UK | Institute of Chemistry, Karl-Franzens-Universität, Graz, Austria | Ludwig-Maximilian-University, Munich, Germany | University of Lund, Sweden | DTU, Technical University of Denmark, Lyngby, Denmark | Chemistry Department, University of Oslo, Sweden | David Geffen School of Medicine at UCLA, USA | Medicinal Chemistry Department at Boehringer Ingelheim Pharma GmbH & Co. KG, Biberach an der Riss, Germany | Sanofi-Aventis Deutschland GmbH R&D LGCR / Chemistry Frankfurt am Main, Germany | GSK External Lecture, GlaxoSmithKline Medicines Research Centre, Stevenage, UK, | EFMC-ISMIC 2016 XXIV EFMC, International Symposium on Medicinal Chemistry, Manchester, UK | 57th GECO Conference Basque, France | Institute of Organic Chemistry RWTH Aachen University, Aachen | ECHC 2016 - XXVII European Colloquium on Heterocyclic Chemistry, Amsterdam, Netherlands | Actelion Chemistry Lectures, Basel, Switzerland | 19. Steinheimer Gespräche des Fonds für den Hochschullehrernachwuchs, Bad Homburg, Germany | Organic Chemistry Colloquium in SS 2016 Kaiserslautern, Germany | Colloquium Summer Semester, GDCh Ostverband Köln-Leverkusen, Germany | Boehringer-Ingelheim, Ingelheim am Rhein, Germany | GDCh Lecture, University Duisburg-Essen, Germany | Max-Planck-Institute for Chemical Energy Conversion, Mülheim, Germany | Max-Planck-Institute Dortmund, Germany, | PAC Symposium, Leiden, Netherlands | 9<sup>th</sup> CaRLa Winter School 2016 Lecture, Heidelberg, Germany | Heterocyclic and Synthesis Group of the Royal Society of Chemistry at the Institute of Cancer Research, Chelsea, London, UK

## 2015

Pacificchem 2015, Honolulu, USA | The Autumn 2015 meeting of the French Chemical Society-Organic Chemistry division, Paris, France | IKCOC-13, Kyoto, Japan | GDCh Lecture, Bochum University, Bochum, Germany | 5th Annual Symposium of Organic Chemistry, Universidad Autónoma de Madrid "UAM" 2015, Madrid, Spain | Erdtman Lecture 2015, Stockholm, Sweden | BASF, Chicago, IL | UCSD, San Diego, CA | Northwestern University, Chicago, IL | University of Michigan | Wane State University, Detroit, MI | Argonne Labs, Argonne, IL | University of Colorado, Boulder, CO | Florida Heterocyclic Conference, Speaker, Gainesville, Florida, USA | ACS Winter Fluorine Conference, Presenter

**2014**

China/Europe| Nankai University, China | Peking University, China | SIOC | WuXi | Shanghai | Roche Pharmaceuticals, Basel Switzerland | Novartis, Basel Switzerland, | UCB, Brussels, Belgium | Firmenich, Geneva, Switzerland |Philadelphia organic Chemistry Club| ICOM 2015, Fukuoma, Sapporo, Hokkaido University, Japan | Gordon research Conference Speaker/Discussion Leader, Salve Regina University, USA | Brock University, St Catherines, Ontario, Canada| McMaster University, Hamilton, Ontario, Canada |University of Southern California | Brock University | University of Utah, Salt Lake City, UT | Swiss Chemical Society, Fribourg Switzerland | Syngenta, Switzerland | Brussels, Belgium | University of British Columbia

**2013**

Nagoya University, Japan | University of Tokyo, Japan | Rensselaer Polytechnic Institute, Troy, NY | University of Ottawa, Canada | MIT | ACS National Meeting, New Orleans | University of Texas Austin | University of Texas Southwestern Medical Center, Dallas | Stanford | Sloan Kettering, New York | 15th Brazilian Meeting on Organic Synthesis, Sao Paulo

**2012**

Yale University | University of Oregon | Columbia University, New York | University of California, San Francisco | The Padwa Lecture, Columbia University | Eli Lilly and Company, Indianapolis | ACS National Meeting, San Diego | National RSC Meeting, Warrick, UK | ANORCQ Conference, Caen, France | École Nationale Supérieure de Chimie de Paris, Paris, France | DuPont, Wilmington | GlaxoSmithKline, Research Triangle Park, North Carolina | University of Toronto | ISACS 7, Edinburgh, UK | Belgian Organic Synthesis | Symposium, Leuven, Belgium | Dreyfus Foundation, New York | Meyers Symposium, Colorado State University | Klung-Wilhemly-Weberbank Lecture, Berlin, Germany | Merck, Rahway

**2011**

Winter Fluorine Conference, St. Pete Beach | Dow Chemicals, Midland | Merck, Boston | Ludwig-Maximilians-Universität, Munich, Germany | Sanofi-Aventis, Frankfurt, Germany | Max Planck Institut für Kohlenforschung, Mülheim, Germany | University of Munster, Germany | Hoffman-La Roche, Nutley | University of North Carolina, Chapel Hill | University of Illinois at Urbana-Champaign | ACS National Meeting, Anaheim | Genentech, South San Francisco | Theravance, South San Francisco | University of California, Berkeley | RSC Organic Symposium, Queen Mary University of London, London, United Kingdom | Oxford University, Oxford, United Kingdom | University of Bristol, Bristol, United Kingdom | GlaxoSmithKline, Stevenage, United Kingdom | Syngenta, Bracknell, Berkshire | University of Minnesota | California Institute of Technology | Annual Graduate Student Symposium, University of Buffalo | High Throughput Chemistry & Chemical Biology Gordon Research Conference | Heterocycles Gordon Research Conference |

BASF Catalysis Award, BASF, Germany | Organic Reactions and Processes Gordon Research Conference | Natural Products Gordon Research Conference | Medicinal Chemistry Gordon Research Conference | University of California, Los Angeles, Crump Institute | ACS National Meeting, Denver | Dow Corning, Midland, Michigan | GlaxoSmithKline, Philadelphia | Princeton ACS Meeting, Princeton | Harvard University | Boston College | New Jersey Biotechnology Chemistry Consortium | Northeastern University, Boston | ETH Zürich, Switzerland

## 2010

University of California, Irvine | University of California, Los Angeles | Boston University, Novartis Lecture | Dartmouth University | Bristol Myers Squibb, Wallingford | Bayer AG, Berlin, Germany | Bayer AG, Wuppertal, Germany | Rheinisch-Westfaelische Technische Hochschule Aachen, Germany | ACS National Meeting, San Francisco | Johnson & Johnson, La Jolla | University of California, San Diego | The Scripps Research Institute | Amgen, San Francisco | University of Wisconsin–Madison, Eli Lilly Young Investigator Lecture | Merck, West Point | Merck, Rahway | Northeastern Regional Meeting, American Chemical Society | Weizmann Institute, Israel | Tel Aviv University | Technion – Israel Institute of Technology, Mordecai and Rivka Rubin Lecture | Pfizer, Groton | ICIQ Summer School, Tarragona | Gordon Research Conference, Stereochemistry | American Chemical Society, National Meeting, Boston | Bayer CropScience | ORGCHEM-Weimar | AstraZeneca, Waltham | University of California, Santa Barbara | Amgen, Thousand Oaks | McGill University, Canada | Pacificchem

## 2009

University of Puerto Rico | University of Massachusetts, Dartmouth | Sepracor | Bristol-Myers Squibb | NSF workshop on Organic Synthesis and Natural Products Chemistry | Rising Organic Chemists in Catalysis (ROCCAT) | Amgen, Cambridge | Eli Lilly and Company | Abbott Labs | University of Pennsylvania | Princeton University | ETH, Lausanne

## 2008

Gordon Research Conference: Heterocycles | Dana Farber/Harvard Cancer Center

## TEACHING EXPERIENCE

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**RWTH Aachen University** | Aachen, Germany

2017–present

CHEMISTRY – ORGANIC CHEMISTRY

**Harvard University** | Cambridge, MA, USA

2006–2010, 2013–2015

CHEMISTRY 30 – ORGANIC CHEMISTRY

Fundamental principles and advanced topics in organic chemistry. Carbonyl chemistry and pericyclic reactions are covered in detail. Students learn about strategies in multi-step organic synthesis and are given an introduction into organometallic chemistry. Laboratory: an introduction to organic chemistry laboratory techniques and experimental organic synthesis.

Committee for Undergraduate Education instructor ratings by students (out of 5.0): 4.5 (06-07), 4.8 (07-08), 4.5 (08-09), 4.9 (09-10) 4.3 (13-14).

#### 2010-2013 CHEMISTRY 153 – ORGANOMETALLIC CHEMISTRY

Fundamental principles and advanced topics in organometallic chemistry. Transition metal catalysis and principles thereof are covered in detail, with focus on the organometallic reactivity. Committee for Undergraduate Education instructor ratings by students (out of 5.0): 4.6 (10-11); 4.5 (11-12); 4.6 (12-13).

## PATENTS (ONLY ISSUED PATENTS)

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20. T. Ritter, J. Garber, K. Yamamoto "Direct palladium-catalyzed aromatic fluorination"  
*US 2019 / 0099748 A1*, Apr. 4, **2019**
19. T. Ritter, C. N. Neumann, M. H. Beyzavi, M. G. Strebl-Bantillo, D. Mandal "Process for deoxyfluorination of phenols"  
*EP 3 438 077 A1*, Feb. 6, **2019**
18. T. Ritter, F. Ye "Process for hydrocyanation of terminal alkynes"  
*WO 2018/210631 A1*, Nov. 22, **2018**
17. T. Ritter, F. Serpier, G. B. Boursalian "Process for preparing a substituted aromatic or heteroaromatic hydrocarbon and its use"  
*EP 3 243 816 A1*, Nov. 15, **2017**
16. T. Ritter, C. N. Neumann "Fluorination of organic compounds"  
*US 2016/0272593 A1*, Sep. 22, **2016**
15. T. Ritter, J. B. Raynaud, J. Yung Wu "Iron complexes and methods for polymerization"  
*US 9,290,591 B2*, Mar. 22, **2016**
14. T. Ritter, E. Lee "Nickel fluorinating complexes and uses thereof"  
*US 9,273,083 B2*, Mar. 1, **2016**
13. S. E. Parker, T. Ritter "Platinum metallacycles comprising n, p, or as ringatoms and their use as catalysts in 1,2-hydrosilylation reactions of dienes"  
*US 2016/0009747 A1*, Jan. 14, **2016**
12. T. Ritter, F. Sadojevich "Fluoroalkylation reagents and uses thereof"  
*WO 2015/168368 A1*, Nov. 5, **2015**
11. T. Ritter, P. Tang "Fluorination of organic compounds"  
*US 9,150,516 B2*, Oct. 6, **2015**

10. T. Ritter, T. Furuya, P. Tang "Fluorination of organic compounds"  
*US 9,024,093 B2*, May 5, **2015**
09. M.-Y. Ngai, G. B. Boursalian, E. A. McNeill, T. Ritter "Transition metal-catalyzed imidation of arenes"  
*WO 2015/031725 A1*, Mar. 5, **2015**
08. T. Furuya, D. Powers, T. Ritter "High-valent palladium fluoride complexes and uses thereof"  
*US 8,686,158 B2*, Apr. 1, **2014**
07. T. Ritter, T. Furuya, H. M. Kaiser "System for fluorinating organic compounds"  
*US 2014/0058106 A1*, Feb. 27, **2014**
06. T. Ritter "Fluorine containing compounds and methods of use thereof"  
*US 2012/0316120 A1*, Dec. 13, **2012**
05. T. Ritter, D. C. Powers, M. G. Cambell, J. B. Raynaud "Palladium nanowires and methods of preparation"  
*WO 2012/109389 A2*, Aug. 16, **2012**
04. T. Ritter, L. Brass, C. Keith, A. Watson, D. J. Greenblatt "Fluorine containing compounds and methods of use thereof"  
*US 2012/0149900 A1*, Jun. 14, **2012**
03. T. Ritter, C. Huang, T. Liang "Fluoroalkoxylation of organic compounds"  
*WO 2012/054782 A2*, Apr. 26, **2012**
02. T. Ritter, L. Brass, C. Keith, A. Watson, D. J. Greenblatt "Fluorine containing compounds and methods of use thereof"  
*US 2012/00952.17 A1*, Apr. 19, **2012**
01. E. Carreira, H. Hauser, L. Kvaerno, T. Ritter, M. Werder "Hypocholesterolemic compounds"  
*US 7,544,667 B2*, Jun. 9, **2009**