

# Tim Cernak

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## Education & Experience

**Scientific Advisory Board**, NSF Center in Selective C-H Functionalization (CCHF), Atlanta, GA. **2012-2018**  
**Merck Research Labs**, Discovery Chemistry, Rahway, NJ & Boston, MA. **2009-2018**  
**Post-Doctoral Fellow**, with Tristan Lambert, Columbia University, New York, NY. **2007-2009**  
**Doctor of Philosophy**, with Jim Gleason, McGill University, Montréal, QC. **2002-2007**  
**Bachelor of Science**, Chemistry, University of British Columbia Okanagan, Kelowna, BC. **1998-2002**

## Publications

- Nathan J. Gesmundo, Bérengère Sauvagnat, Patrick Curran, Matthew P. Richards, Christine L. Andrews, Peter J. Dandliker, **Tim Cernak\***. "Nanoscale Synthesis and Affinity Ranking", *Nature*, **2018**, *accepted*.
- Tim Cernak\***. "A Machine with Chemical Intuition", *Chem*, **2018**, *accepted*.
- Tim Cernak\***, Nathan Gesmundo, Kevin D. Dykstra, Yang, Yu, Zhicai Wu, Zhi-Cai Shi, Petr Vachal, Donald Sperbeck, Shuwen He, Beth Murphy, Lisa Sonatore, Steven Williams, Maria Madeira, Andreas Verras, Maud Reiter, Claire Lee, James Cuff, Edward Sherer, Jeffrey Kuethe, Stephen Goble, Nicholas Perrotto, Shirley Pinto, Dong-Ming Shen, Ravi Nargund, James Balkovec, Robert DeVita, Spencer Dreher. "Microscale High-Throughput Experimentation as an Enabling Technology in Drug Discovery: Application in the Discovery of (Piperidinyl)pyridinyl-1H-benzimidazole Diacylglycerol Acyltransferase 1 Inhibitors", *The Journal of Medicinal Chemistry*, **2017**, 60(9), 3594-3605. *Featured Article*.
- Tim Cernak\***. "Synthesis in the Chemical Space Age", *Chem*, **2016**, 1(1), 6-9.
- Peter S. Kutchukian, James F. Dropinski, Kevin D. Dykstra, Bing Li, Daniel A. DiRocco, Eric C. Streckfuss, Louis-Charles Campeau, **Tim Cernak**, Petr Vachal, Ian W. Davies, Shane W. Krska\* and Spencer D. Dreher\*. "Chemistry Informer Libraries: A Chemoinformatics Enabled Approach to Evaluate and Advance Synthetic Methods", *Chemical Science*, **2016**, 7, 2604-2613.
- Tim Cernak\***, Kevin D. Dykstra, Sriram Tyagarajan, Petr Vachal and Shane W. Krska. "The Medicinal Chemist's Toolbox for Late Stage Functionalization of Drug-Like Molecules", *Chemical Society Reviews*, **2016**, 45(3), 546-576.
- Alexander Buitrago Santanilla, Erik L. Regalado, Tony Pereira, Kevin Bateman, Louis-Charles Campeau, Simon Berritt, Yong Liu, Michael Shevlin, Zhi-Cai Shi, Jonathan Schneeweis, Christopher J. Welch, Roy Helmy, Petr Vachal, Ian Davies, **Tim Cernak\*** and Spencer Dreher\*. "Nanomolar-Scale High-Throughput Chemistry for the Synthesis of Complex Molecules", *Science*, **2015**, 347(6217), 49-53.
- Shuwen He,\* Qingmei Hong, Zhong Lai, David X. Yang, Pauline C. Ting, Jeffrey T. Kuethe, **Timothy A. Cernak**, Kevin D. Dykstra, Donald M. Sperbeck, Zhicai Wu, Yang Yu, Ginger X. Yang, Tianying Jian, Jian Liu, Deodial Guiadeen, Arto D. Krikorian, Lisa M. Sonatore, Judyann Wiltsie, Jinqi Liu, Judith N. Gorski, Christine C. Chung, Jack T. Gibson, JeanMarie Lisnock, Jianying Xiao, Michael Wolff, Sharon X. Tong, Maria Madeira, Bindhu V. Karanam, Dong-Ming Shen, James M. Balkovec, Shirley Pinto, Ravi P. Nargund, and Robert J. DeVita. "Discovery of a Potent and Selective DGAT1 Inhibitor with a Piperidinyl-oxy-cyclohexanecarboxylic Acid Moiety", *ACS Medicinal Chemistry Letters*, **2014**, 5(10), 1082-1087.

- Heike Schönherr and **Tim Cernak\***. "Profound Methyl Effects in Drug Discovery and a Call for New C-H Methylation Reactions", *Angewandte Chemie International Edition in English*, **2013**, 52(47), 12256-12267.
- **Timothy Cernak\***, Kevin Dykstra, Dorothy Levorse, Andreas Verras, James Balkovec, Ravi Nargund and Robert DeVita. "Synthesis of Oxaspiropiperidines as a Strategy for Lowering logD", *Tetrahedron Letters*, **2011**, 52(48), 6457-6459.
- Lisa A. Ambrosini, **Tim A. Cernak** and Tristan H. Lambert. "Total Synthesis of the Tylophora Alkaloids Rusplinone, 13 $\alpha$ -Secoantofine, and Antofine using a Multicatalytic Oxidative Aminochlorocarbonylation / Friedel-Crafts Reaction", *Tetrahedron*, **2010**, 66(26), 4882-4887.
- Lisa A. Ambrosini, **Tim A. Cernak** and Tristan H. Lambert. "Development of Oxidative Formylation and Ketonylation Reactions", *Synthesis*, **2010**, 41(28), 870-881.
- **Tim A. Cernak** and Tristan H. Lambert. "Multicatalytic Synthesis of  $\alpha$ -Pyrrolidiny Ketones via a Tandem Palladium(II)/Indium(III)-Catalyzed Aminochlorocarbonylation/Friedel-Crafts Acylation Reaction", *The Journal of the American Chemical Society*, **2009**, 131(9), 3124-3125.
- Jonathan Hudon, **Timothy A. Cernak**, James A. Ashenhurst and James L. Gleason. "Stable 5-Substituted Cyclopentadienes for the Diels-Alder Cycloaddition and Their Application to Palau'amine Synthesis", *Angewandte Chemie International Edition in English*, **2008**, 47, 8885-8888.
- **Timothy A. Cernak** and James L. Gleason. "DFT Guided Design of Exo-Selective Dehydroalanine Dienophiles for Application Towards Palau'amine", *Journal of Organic Chemistry*, **2008**, 73(1), 102-110.
- **Timothy A. Cernak** and James L. Gleason. "Synthesis of 5-Chloromethylene Hydantoins and Thiohydantoins", *Heterocycles*, **2007**, 71(1), 117-134.

## Patents

- Dong-Ming Shen, Melissa Egbertson, Richard Berger, Xiaoxia Qian, Yimin Qian, Bart Harper, Meng Yang, Zack Zhi Qiang Guo, Vanessa L. Rada, Deping Wang, **Timothy A. Cernak**, Christopher J. Sinz, Ming Wang, Jonathan E. Wilson, Shimin Xu. "Pyrimidonecarboxamide compounds as PDE2 inhibitors and their preparation", *PCT International Application*, **2015**, WO2015096651.
- Xiaoqing Han, Alan Whitehead, Subharekha Raghavan, **Timothy A. Cernak**, Spencer Dreher, Jonathan Groeper, Lian Guo, Yong Zhang. "Pyrrolopyrimidinone derivatives as soluble guanylate cyclase activators and their preparation", *PCT International Application*, **2015**, WO2015088886.
- **Timothy A. Cernak**, Kevin D. Dykstra, Dong-Ming Shen, Kun Liu, Andrew Stamford, John Qiang Tan. "Preparation of indazole derivatives as mineralocorticoid receptor antagonists for the treatment of aldosterone-mediated diseases", *PCT International Application*, **2014**, WO2014014794.
- Robert J. DeVita, Shuwen He, Jian Liu, **Timothy A. Cernak**, Arto D. Krikorian, Ginger Xuqiang Yang, Zhicai Wu; Yang Yu, Dong-Ming Shen, Zhong Lai, Qingmei Hong, Ravi P. Nargund. "Preparation of triazolopyridine derivatives and analogs for use as DGAT-1 inhibitors", *PCT International Application*, **2013**, WO201306093.
- **Timothy A. Cernak**, Robert J. DeVita, Yang Yu, Zhicai Wu, Kevin D. Dykstra, Andreas Verras, James M. Balkovec, Alan Whitehead. "Preparation of bicyclo[2.2.2]octane-1-carboxylic acid derivatives as DGAT1 inhibitors for treatment of diabetes and obesity", *PCT International Application*, **2013**, WO2013068328.
- Jian Liu, James M. Balkovec, Arto D. Krikorian, Deodiali Guiadeen, Ginger Yang, Tianying Jian, Zhicai Wu, Yang Yu, Ravi P. Nargund, Petr Vachal, Robert J. DeVita, Shuwen He, Zhong Lai, Radhika M. Blevis-Bal, **Timothy A. Cernak**, Donald M. Sperbeck, Qingmei Hong. "Preparation of imidazopyridinylphenylpyridinylpiperidinylacetic acid derivatives and analogs for use as DGAT1 inhibitors", *PCT International Application*, **2012**, WO2012096813.
- **Timothy A. Cernak**, James M. Balkovec, Ravi P. Nargund, Maud Reiter, Donald M. Sperbeck, Kevin D. Dykstra, Yang Yu, Spencer Dreher, Kevin M. Maloney, Zhicai Wu, Robert J. DeVita, Andreas Verras. "Spirocyclic Compounds for Treatment of Obesity and Diabetes", *PCT International Application*, **2012**, WO2012009217.

## Lectures

- National Institutes of Health (Bethesda, MD, October 2017)
- Boston College (Boston, MA, May 2017)
- Boston University (Boston, MA, April 2017)
- University of British Columbia Okanagan (Kelowna, BC, January 2017)
- Emory University (Atlanta, GA, December 2016)
- The Broad Institute High Throughput ADME Conference (Cambridge, MA, July 2016)
- King's College London (London, England, June 2016)
- AstraZeneca (Cambridge, England, June 2016)
- Cambridge Healthcare Institute – Mastering Medicinal Chemistry (Cambridge, MA, June 2016)
- International Symposium on C-H Activation (Montreal, QC, May 2016)
- University of Massachusetts Boston (Boston, MA, February 2016)
- Pacificchem (Honolulu, HI, December 2015)
- Center for Selective C-H Functionalization Satellite Symposium (Atlanta, GA, October 2015)
- High Throughput Experimentation Meeting of the Minds (Cambridge, MA, August 2015)
- Gordon Conference: High Throughput Chemistry & Chemical Biology (New London, NH, June 2015)
- Chemical Biology in the Bay Area at UCSF (San Francisco, CA, June 2015)
- Sigma Aldrich (Global Webinar, Milwaukee, WI, March 2015)
- University of Cambridge (Cambridge, England, March 2015)
- University of Nevada, Reno (Reno, NV, February 2015)
- Massachusetts Institute of Technology (Cambridge, MA, August 2014)
- Institut Català d'Investigació Química (Tarragona, Spain, July 2014)
- American Chemical Society 247<sup>th</sup> National Meeting (Dallas, TX, March 2014)
- Lehman College (New York, NY, October 2013)
- Seton Hall University (South Orange, NJ, November 2012)
- Columbia University (New York, NY, July 2012)
- Vanderbilt University (Nashville, TN, April 2012)
- University of Idaho (Moscow, ID, March 2012) *Terry D. Wilson Lecture*

## Awards

- 2016 Merck Green Chemistry Award
- 2014 Merck Rahway Innovation Award
- 2014 Merck Process Chemistry – Scientific Risk Taking Award
- 2013 Merck K15 Building Design Award
- 2013 Merck Medicinal Chemistry – Green Chemistry Award
- 2012 Terry D. Wilson Lectureship, University of Idaho
- 2010 Merck Excellence Award
- 2008-2009 FQRNT Postdoctoral Fellowship (Columbia University)
- 2007 McGill Interdisciplinary Graduate Student Research Symposium Presentation Award
- 2006-2007 McGill Graduate Studies Fellowship
- 2006-2007 FQRNT Predoctoral Fellowship (McGill University)
- 2006 Ocean Nutrition Canada Prize
- 2006 Robert Zamboni Award
- 2005 McGill Alma Mater Travel Grant
- 2004 McGill Alma Mater Travel Grant
- 2002 Okanagan University College Undergraduate Research Award
- 2001 Okanagan University College Dean's List
- 2001 NSERC Undergraduate Student Research Award

## Media Coverage

- <https://www.medchemnet.com/posts/17252-chemical-high-throughput-experimentation-shifting-into-high-gear-in-drug-discovery>
- "Embarking on a Chemical Space Odyssey", S. Y. Chow, A. Nelson, *J. Med. Chem.*, **2017**, *60*, 3591–3593
- <http://www.sigmaaldrich.com/catalog/papers/26507237>
- [http://www.merck.com/about/featured-stories/Tim\\_Cernak.html](http://www.merck.com/about/featured-stories/Tim_Cernak.html)
- <http://www.sigmaaldrich.com/life-science/learning-center/customer-education/chemistry-webinar.html>
- <http://www.nature.com/nature/journal/v515/n7528/full/515468d.html>
- <http://www.rsc.org/chemistryworld/2014/11/nanomolar-chemistry-enables-1500-experiments-single-day>
- <http://cen.acs.org/articles/92/i47/Arrays-Aid-ScaleDrug-Candidate-Syntheses.html>
- <http://www.bioanalysis-zone.com/2014/12/12/new-high-throughput-technique-for-rapid-experimentation/>
- [http://blogs.sciencemag.org/pipeline/archives/2014/11/25/try\\_some\\_reactions\\_actually\\_try\\_them\\_all](http://blogs.sciencemag.org/pipeline/archives/2014/11/25/try_some_reactions_actually_try_them_all)
- <http://openflask.blogspot.com/2014/03/magic-methyl-effect.html>
- [http://blogs.sciencemag.org/pipeline/archives/2013/10/30/more\\_magic\\_methyls\\_please](http://blogs.sciencemag.org/pipeline/archives/2013/10/30/more_magic_methyls_please)

## Peer Review

- Reviewed manuscripts for *Science*, *The Journal of the American Chemical Society*, *Accounts of Chemical Research*, *Organic Letters*, *Organic Process Research & Development*, *Angewandte Chemie International Edition*, *RSC Green Chemistry*, *Chemical Society Reviews*, *Tetrahedron*, *Tetrahedron Letters*, *The Journal of Medicinal Chemistry*, *Chem*, *RSC Advances* and commented on new publications for *Chemical & Engineering News*.