

# GUANGBIN DONG

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## PROFESSIONAL PREPARATION/POSITIONS

- 2011 – present      Assistant Professor, CPRIT Scholar for Cancer Research, **University of Texas at Austin**, Austin, Texas
- 2009 – 2011        Camille and Henry Dreyfus Postdoctoral Fellow, **California Institute of Technology**, Pasadena, California  
Advisor: Professor Robert H. Grubbs
- 2004 – 2009        Ph.D. in Chemistry, **Stanford University**, Stanford, California  
Advisor: Professor Barry M. Trost  
Dissertation Title: “*Synthetic Efficiency: Using Atom-Economical and Chemoselective Approaches towards Total Syntheses of Agelas Alkaloids, Terpestacin and Bryostatins.*”
- 1999 – 2003        B.S. in Chemistry, **Peking University**, Beijing, China  
Advisors: Professor Zhen Yang and Professor Jiahua Chen

## SERVICE FOR COMMUNITY

- 2012 – present      **Grant referee** for ACS Petroleum Research Fund
- 2012 – present      **Award referee** for *Reaxys* PhD Prize
- 2012 – present      **Volume editor** for “*Topics in Current Chemistry*” on “C–C Bond Activation”
- 2012 – present      **Guest editor** for *ChemComm Web Theme* on “C–C Bond Activation”

## HONORS AND AWARDS

- Searle Scholar (2013)
- National Science Foundation CAREER Award (2013-2018)
- *Thieme Synlett/Synthesis Journal* Award (2012)
- *Chemistry and Molecularly Targeted Therapeutic Development* Award, Center for Targeted Therapy (CTT) & Texas Institute for Drug & Diagnostic Development (TI-3D) (2012-2014)
- *Ralph E. Powe* Junior Faculty Enhancement Awards (2012)
- *Welch* Grant for Chemical Research (2012-2015)
- ACS PRF Doctoral New Investigator grant (2013-2014)
- *Herman Frasch Foundation* Award in Chemical Research (2012-2017)
- *Rom Rhone* International Travel Award (2011)
- CPRIT Award for Recruitment First-Time Tenure-Track Faculty Member (2011-2015)
- *Reaxys* Travel Award (2011)
- *IUPAC* Prizes for Young Chemists, IUPAC (2010)
- *Reaxys* PhD Prize, Runners-up, Elsevier (2010)
- *Camille and Henry Dreyfus* Environmental Chemistry Fellow (2009)
- *Beckman* Postdoctoral Fellowship, Finalist (2009)
- *American Chemical Society* Travel Awards for Graduate Students, Division of Organic Chemistry (2009)
- *Chinese Government Award for Outstanding Self-Financed Students Abroad* (2008-2009)
- *Larry Yung* Stanford Graduate Fellowship in Science and Engineering, Stanford University (2006-2009)

- Samsung Fellowship, Peking University (2001-2002)
- Youlong Fellowship, Peking University (2000-2001)
- Dupont Fellowship, Peking University (1999-2000)

## PUBLICATIONS

1. Wang, Zhiqian; Reinus, Brandon J.; **Dong, Guangbin**\* “Catalytic Intermolecular  $\beta$ -C-H Alkenylation of  $\alpha$ -Enamino-Ketones with Simple Alkynes” *Chemical Communications*, **2014**, *in press* (invited contribution for the “Emerging Investigators 2014” themed issue).
2. Chen, Peng-hao; Savage, Nikolas A.; **Dong, Guangbin**\* “Concise Synthesis of Functionalized Benzocyclobutenones” submitted to *Tetrahedron* (invited contribution for honoring *Reisman Tetrahedron Young Investigator Award Symposium*).
3. Mo, Fanyang; Tabor, John, R.; **Dong, Guangbin**\* “Alcohols or Masked Alcohols as Directing Groups for C-H Bond Functionalization” *Chemistry Letters*, **2014**, accepted (invited review).
4. Dong, Zhe; **Dong, Guangbin**\* “*Ortho* vs *Ips*o: Site-Selective Pd and Norbornene-Catalyzed Arene C-H Amination Using Aryl Halides” *Journal of the American Chemical Society*, **2013**, *135*,18350-18353.
5. Mo, Fanyang; **Dong, Guangbin**\* “Sustainable and Regioselective Ketone  $\alpha$ -Alkylation via Dual Activation: Simple Olefins as Alkylating Agents”, *submitted to Science on Nov. 1<sup>st</sup> 2013*.
6. Xu, Tao; Savage, Nikolas A.; **Dong, Guangbin**\* “Rh<sup>I</sup>-Catalyzed Decarbonylative Coupling of Olefins and Benzocyclobutenones via C-C Activation: An Efficient Approach to Access Functionalized Spirocycles” *Angew. Chem. Int. Ed.* **2014**, *53*, *in press*.
7. Chen, Penghao; Xu, Tao; **Dong, Guangbin**\* “Divergent Syntheses of Fused  $\beta$ -Naphthol and Indene Scaffolds via Rhodium-Catalyzed Direct and Decarbonylative Alkyne-Benzocyclobutenone Couplings” *Angew. Chem. Int. Ed.*,**2014**, *53*, *in press (VIP paper)*.
8. Ko, Haye Min; **Dong, Guangbin**\* “Catalytic [4+2] Coupling of Cyclobutanones and Olefins via Cooperative Activation: A Saturated Analogue of Type II Intramolecular Diels-Alder Reaction” *submitted to Nature Chemistry*.
9. Pan, Ming; Gong, Jinlong; **Dong, Guangbin**; Mullins, C. Buddie\* "Model Studies with Gold: A Versatile Oxidation and Hydrogenation Catalyst" *Account for Chemical Research*, **2013**, *asap article*.
10. Huang, Zhongxing; **Dong, Guangbin**\*“Pd-Catalyzed Direct  $\beta$ -Arylation of Simple Ketones with Aryl Halides” *Journal of the American Chemical Society*, **2013**, *135*, 17747-17750.  
  
Highlighted by *Chemical and Engineering News* **2013**, 91, 28.
11. **Dong, Guangbin**\* “Ketone-Based Catalytic C-C and C-H Activation: Exploratory Studies” *Synlett*, **2013**, *24*, 1 (invited contribution *to highlight our own research* for SYNFACTS).
12. Mo, Fanyang; **Dong, Guangbin**\*; Zhang, Yan; Wang, Jianbo\* “Recent Applications of Arene Diazonium Salts in Organic Synthesis” *Org. Biomol. Chem.*, **2013**, 1582-2593 (invited review).
13. Dermenci, Alpay; **Dong, Gunagbin**\* “Decarbonylative C-C Bond Forming Reactions Mediated by Transition Metals” *Science China Chemistry*, **2013**, *56*, 685-701 (invited review for a special issue).
14. Dermenci, Alpay; Whittaker, Rachel E.; **Dong, Gunagbin**\* “Rh(I)-Catalyzed Decarbonylation of Diynones via C-C Activation: Orthogonal Synthesis of Conjugated-Diynes” *Organic Letters*, **2013**, *15*, 2242-2245.

15. Wang, Zhiqian; Reinus, Brandon J.; **Dong, Guangbin\*** “Catalytic Regioselective C-Alkylation of 1,2-Diketones Using simple olefins: A Traceless/Recyclable Directing Group Strategy” *Journal of the American Chemical Society*, **2012**, *134*, 13954–13957.
16. Xu, Tao; Ko, Haye Min; Savage, Nik; **Dong, Guangbin\*** “Highly Enantioselective Rh-Catalyzed Carboacylation of Olefins via C–C Activation of Benzocyclobutenones” *Journal of the American Chemical Society*, **2012**, *134*, 20005-20008.
17. Xu, Tao; **Dong, Guangbin\*** “Rh-Catalyzed Lewis Acid-Promoted Regioselective Carboacylation of Olefins: A C–C Activation Approach to Access Fused-Ring Systems” *Angew. Chem. Int. Ed.*, **2012**, *51*, 7567–7571.

Highlighted by *Chemical and Engineering News* **2012**, *90(27)* July 2nd.

18. Ren, Zhi; Mo, Fanyang; **Dong, Guangbin\*** “Catalytic Functionalization of Unactivated  $sp^3$  C–H Bonds via exo-Directing Group: Synthesis of Chemically Differentiated 1,2-Diols” *Journal of the American Chemical Society*, **2012**, *134*, 16991-16994.
19. Mo, Fanyang; Trzepakowski, Louis; **Dong, Guangbin\*** “Synthesis of ortho-Acylphenols via Pd-Catalyzed Ketone-Directed Hydroxylation of Arenes” *Angew. Chem. Int. Ed.*, **2012**, *51*, 13075-13079.
20. Pan, Ming; Brush, Adrian; **Dong, Guangbin**; Mullins, Charles\* “Tunable Ether Synthesis via Coupling of Aldehydes or Aldehyde/Alcohol over Hydrogen-Modified Gold at Low Temperatures” *Journal of Physical Chemistry Letters*, **2012**, *3*, 2512-2514.
21. Teo, Peili, Wickens, Zachary, K.; **Dong, Guangbin**; Grubbs, Robert H.\* “Efficient and highly aldehyde selective Wacker oxidation” *Organic Letters*, **2012**, *14*, 3237-3239.
22. Trost, Barry M.;\* Osipov, Maksim.; **Dong, Guangbin** "Palladium-Catalyzed Asymmetric Allylic Alkylation of Electron-Deficient Pyrroles with Meso Electrophiles" *Organic Letters*, **2012**, *14*, 2254-2257.
23. **Dong, Guangbin**; Teo, Peili; Wickens, Zachary, K.; Grubbs, Robert H.\* “Primary Alcohols from Terminal Olefins: Formal Anti-Markovnikov Hydration-like Process via Triple Relay Catalysis” *Science*, **2011**, *333*, 1609-1612.

Highlighted by *Chemical and Engineering News* (**2011**, *89(38)*, 29) and *Chem. Cat. Chem*, **2012**, *4*, 321-322.

24. Trost, Barry M.;\* **Dong, Guangbin** “Total Synthesis of Bryostatins 16 using a Pd-Catalyzed Diyne-coupling as Macrocyclization Method and Synthesis of C20-*epi*-Bryostatin 7 as a Potent Anticancer Agent” *Journal of the American Chemical Society*, **2010**, *132*, 16403–16416.
25. Trost, Barry M.;\* Ngai, Ming-Yu; **Dong, Guangbin** “Ligand-accelerated enantioselective propargylation of aldehydes via allenylzinc reagents” *Organic Letters*, **2011**, *13*, 1900-1903.
26. **Dong, Guangbin\*** “A Historical Story on the Synthesis of Agelastatin” *Pure and Applied Chemistry*, **2010**, *82*, 2231-2246 (2010 IUPAC Prize for Young Chemists, invited review).
27. Trost, Barry M.;\* Osipov, Maksim; **Dong, Guangbin** “Palladium-Catalyzed Dynamic Kinetic Asymmetric Transformations of Vinyl Aziridines with Nitrogen Heterocycles: Rapid Access to Biologically Active Pyrroles and Indoles” *Journal of the American Chemical Society*, **2010**, *132*, 15800–15807.
28. Trost, Barry M.;\* Frontier, Alison J.; Thiel, Oliver R.; Yang, Hanbiao; **Dong, Guangbin** “Total Syntheses of Bryostatins. Methods Developments: Atom-Economic and Stereoselective Synthesis of C-ring Subunit” *Chemistry - A European Journal*, **2011**, *17*, 9762-9776.
29. Trost, Barry M.;\* Yang, Hanbiao; Brindle, Cheyenne S.; **Dong, Guangbin** “Total Syntheses of Bryostatins. Methods Developments: Atom-Economic and Stereoselective Syntheses of A- and B-ring Subunits” *Chemistry - A European Journal*, **2011**, *17*, 9777-9788.

30. Trost, Barry M.;\* Yang, Hanbiao, **Dong, Guangbin** “Total Syntheses of Bryostatins. Syntheses of Two Ring-Expanded Bryostatins Analogues and Development of a New-Generation Strategy to Access the C7-C27 Fragment” *Chemistry - A European Journal*, **2011**, *16*, 9789-9805.
31. Trost, Barry M.;\* Osipov, Maksim; **Dong, Guangbin** “A Concise Enantioselective Synthesis of (–)-Ranirestat.” *Organic Letters*, **2010**, *12*, 1276-1279.
32. Trost, Barry M.;\* **Dong, Guangbin**; Vance, Jennifer A. “Cyclic 1,2-Diketones as Core Building Blocks: A Strategy for the Total Synthesis of (–)-Terpestacin.” *Chemistry - A European Journal*, **2010**, *16*, 6265-6277.
33. Trost, Barry M.;\* **Dong, Guangbin** “A Stereodivergent Strategy to Both Product Enantiomers from the Same Enantiomer of A Stereoinducing Catalyst: Agelastatin A.” *Chemistry - A European Journal*, **2009**, *15*, 6910-6919.
34. Trost, Barry M.;\* **Dong, Guangbin** “Total Synthesis of Bryostatin 16 Using Atom Economical and Chemoselective Approaches.” *Nature*, **2008**, *456*, 485-488.  
Highlighted by *Angewandte Chemie International Edition* (**2009**, *48*, 3221-3223), *Chemical and Engineering News* (**2008**, *8*, 11), *Chemistry World of Royal Chemical Society* (**2008**, 27 November) and *Nature* (**2008**, *456*, 451-453.)
35. **Dong, Guangbin**\* “Hosomi–Sakurai Reaction” Vol. 3, 139-180; *Modern Organic Reactions*, Hu, Yuefei; Lin, Guoqiang Eds, Chemical Industry Press: Beijing, 2008.
36. Trost, Barry M.;\* **Dong, Guangbin** “Asymmetric Annulation toward Pyrrolo-piperazinones. Concise Enantioselective Syntheses of Pyrrole Alkaloid Natural Products.” *Organic Letters*, **2007**, *9*, 2357-2359.
37. Trost, Barry M.;\* **Dong, Guangbin**; Vance, Jennifer A. “A Diosphenol-Based Strategy for the Total Synthesis of (–)-Terpestacin.” *Journal of the American Chemical Society*, **2007**, *129*, 4540-4541.
38. Trost, Barry M.;\* **Dong, Guangbin** “New Class of Nucleophiles for Palladium-Catalyzed Asymmetric Allylic Alkylation. Total Synthesis of Agelastatin A.” *Journal of the American Chemical Society*, **2006**, *128*, 6054-6055.
39. Tang, Yefeng; Deng, Lujiang; Zhang, Yandong; **Dong, Guangbin**; Chen, Jiahua;\* Yang, Zhen\* “Thioureas as Ligands in the Pd-Catalyzed Intramolecular Pauson-Khand Reaction.” *Organic Letters*, **2005**, *7*, 1657-1659.
40. Tang, Yefeng; Deng, Lujiang; Zhang, Yandong; **Dong, Guangbin**; Chen, Jiahua;\* Yang, Zhen\* “Tetramethyl Thiourea/Co<sub>2</sub>(CO)<sub>8</sub>-Catalyzed Pauson-Khand Reaction under Balloon Pressure of CO.” *Organic Letters*, **2005**, *7*, 593-595.
41. Dai, Mingji; Liang, Bo; Wang, Cuihua; You, Zejin; Xiang, Jing; **Dong, Guangbin**; Chen, Jiahua;\* Yang, Zhen\* “A Novel Thiourea Ligand Applied in the Pd-Catalyzed Heck, Suzuki and Suzuki Carbonylative Reactions.” *Advanced Synthesis & Catalysis* **2004**, *346*, 1669-1673.
42. Dai, Mingji; Wang, Cuihua; **Dong, Guangbin**; Xiang, Jing; Luo, Tuoping; Liang, Bo; Chen, Jiahua;\* Yang, Zhen\* “Development of Thiourea-based Ligands for the Pd-Catalyzed Bis(methoxycarbonylation) of Terminal Olefins.” *European Journal of Organic Chemistry*, **2003**, *22*, 4346-4348.

## PATENTS

1. Huang, Zhongxing; **Dong, Guangbin**\* “Direct  $\beta$ -Arylation of Carbonyl Compounds” Provisional Patent, Date Filed 11/8/2013, 6386 DON.
2. **Dong, Guangbin**; Grubbs, Robert H.\* “Direct Synthesis of Alcohols from Olefins: A Catalytic Anti-Markovnikov Hydration-like Process Using a Dual-Catalysis System” Provisional Patent, Date Filed 12/31/2010, CIT File No.: CIT-5769-P.

3. Teo, Peili; Dong, Guangbin; Grubbs, Robert H.\* “ $\delta$ -Metal Catalysts with olefin and *N*-Heterocyclic Carbene, Diimine or Phosphine Ligands for Anti-Markovnikov Olefin Hydration” Provisional Patent, Date Filed 2/16/2011, CIT File No.: CIT-5801-P.
4. Dong, Guangbin; Teo, Peili; Wickens, Zachary, K.; Grubbs, Robert H.\* “Direct Synthesis of Primary Alcohols from Non-activated Terminal Olefins: A Catalytic Formal Anti-Markovnikov Hydration Process using a Triple Relay Catalysis System” Provisional Patent, Date Filed 5/26/2011, CIT File No.: CIT-5769-P2.
5. Teo, Peili; Wickens, Zachary, K.; Dong, Guangbin; Grubbs, Robert H.\* “Pd(II) Catalyst System for Wacker Oxidation with High Aldehyde Selectivity and Efficiency” Provisional Patent, Date Filed 11/29/2011, CIT File No.: CIT-5801-P2.
6. Dong, Guangbin; Grubbs, Robert H.\*; Teo, Peili; Wickens, Zach K. “Catalytic anti-markovnikov oxidation and hydration of olefins” PCT Int. Appl. (2012), WO 2012092512 A2 20120705.

### CURRENT RESEARCH SUPPORT:

**Cancer Prevention and Research Institute of Texas** (ID: R11GD10) Dong (PI) 07/27/11-07/26/15  
*(Recruitment of First-Time, Tenure-Track Faculty Members)* Amount: \$500K/year  
**Title:** Changing from “Random Screen” to “Radar Screen”: Strategies for Efficient Anticancer Drug Discovery  
 The goal of this research is to harness the power of transition-metal catalysts to ease the discovery of new cancer therapeutics and ultimately address the pressing needs in the development of anti-cancer drug.

**Welch Foundation** Dong (PI) 06/01/12-06/01/15 Amount: \$60K/year  
**Title:** Site-Selective C-H Bond Functionalization  
 The goal of this research is to address a long-standing site-selectivity challenge—catalytic activation of C–H bonds distal to existing functional groups.

**Herman Frasch Foundation** Dong (PI) 07/01/12-06/30/17 Amount: \$50K/year  
**Title:** Economic and Divergent Syntheses of Aminophosphonate Herbicides via Catalytic C-H Bond Activation  
 The goal of this research is to enable a divergent and economic strategy to access the aminophosphonates and their analogues by developing palladium-catalyzed C–H bond functionalization methods.

**ACS PRF (DNI) Research Grant** Dong (PI) 08/31/13-08/31/15 Amount: \$50K/year  
**Title:** Direct Access of Chemically Differentiated 1,2-Diols from Oxime-Masked Mono-Alcohols  
 The goal of this research is to develop a Pd-catalyzed oxidation method for converting an inert  $sp^3$  C–H bond ( $\beta$  position of an alcohol moiety) to a C–O bond.

**NSF CAREER Program** Dong (PI) 07/1/13-06/30/18 Amount: \$130K/year  
**Title:** Ketone Alkylation Using Simple Olefins: A Sustainable Chemistry Approach  
 The goal of this research is to develop a direct and environmentally friendly ketone alkylation reaction using simple olefin as reagents via a C–H activation strategy.

**Center for Targeted Therapy (CTT) and TI-3D** Dong (Co-PI, 50%) 11/1/12-10/30/14 Amount: \$25K/year  
**Title:** Targeting TRAF2-clAP2 Interaction in Cancer  
 The goal of this research is to collaborate with Dr. Bryant G. Darnay from MD. Anderson Cancer Center and develop effective inhibitor for TRAF2-clAP2 Interaction.

**Searle Scholars Program** Dong (PI) 07/1/13-06/30/16 Amount: \$100K/year  
**Title:** Natural Product-Based Small-Molecule Libraries for Drug Discovery  
 The goal of this research is to develop novel synthetic methodologies and strategies for activation of inert chemical bonds (such as C–C and C–H bonds), and apply these chemistry tools in constructing natural product-based small-molecule libraries for biomedical research.

**NIH R01** Dong (PI) 10/1/13-9/30/18 Amount: \$286K/year  
**Title:** Catalytic C–C Activation: A ‘Cut and Sew’ Approach to Bridged and Fused Rings

The goal of this research is to develop new C–C Activation methodology and use these methods to streamline the synthesis of bridged and fused rings.

#### SELECTED INVITED PRESENTATIONS

- Dong, Guangbin “C–C and C–H Functionalization Based on Common Functional Groups” West Virginia University, West Virginia, Dec 11th, 2013.
- Dong, Guangbin “C–C and C–H Functionalization Based on Common Functional Groups” The 9th SINO - US Chemistry Professors Conference, Chengdu, China, July 14th, 2013.
- Dong, Guangbin “C–C and C–H Functionalization Based on Common Functional Groups” Gordon Research Conferences: Heterocyclic Compounds, Salve Regina University, RI, June 16-21, 2013.
- Dong, Guangbin “C–C and C–H Functionalization Based on Common Functional Groups” TexSyn-I, University of Texas at Austin, TX, May 17, 2013.
- Dong, Guangbin “C–C and C–H Functionalization Based on Common Functional Groups” Texas Christian University, Texas, February 28, 2013.
- Dong, Guangbin; Wickens, Zachary, Teo, Peili; Grubbs, Robert H. “Direct Synthesis of Primary Alcohols from Non-activated Terminal Olefins: A Catalytic Anti-Markovnikov Hydration-like Process Using a Triple Relay Catalysis System” Gordon Research Conferences: Natural Products, Bryant University, RI, July 24-29, 2011.
- Dong, Guangbin; Wickens, Zachary, Teo, Peili; Grubbs, Robert H. “Direct Synthesis of Primary Alcohols from Non-activated Terminal Olefins: A Catalytic Anti-Markovnikov Hydration-like Process Using a Triple Relay Catalysis System” 42<sup>th</sup> National Organic Symposium, Princeton, NJ, June 5-9, 2011.
- Dong, Guangbin; Trost, Barry M. “Synthetic Efficiency: Using Atom-Economical and Chemoselective Approaches towards Total Syntheses of *Agelas* Alkaloids, Terpestacin and Bryostatins.” Gordon Research Conferences: Natural Products, Tilton, NH, July 25-30, 2010.
- Dong, Guangbin; Trost, Barry M. “Total Synthesis of Bryostatin.” Division of Organic Chemistry, 238<sup>th</sup> American Chemical Society National Meeting, Washington, DC, August 16-20, 2009 (oral talk).
- Dong, Guangbin; Trost, Barry M. “Synthetic Efficiency: Using Atom-Economical and Chemoselective Approaches towards Total Syntheses of *Agelas* Alkaloids, Terpestacin and Bryostatins.” 41<sup>th</sup> National Organic Symposium, Boulder, CO, June 7-11, 2009.
- Dong, Guangbin; Trost, Barry M. “Palladium and Ruthenium Catalysis: Enantioselective Total Syntheses of Pyrrole Alkaloid Natural Products, (–)-Terpestacin, and Total Synthesis of Bryostatin 16” Division of Organic Chemistry, 236<sup>th</sup> American Chemical Society National Meeting, Philadelphia, PA, August 17-21, 2008.
- Dong, Guangbin; Trost, Barry M. Vance, Jennifer A. “A Diosphenol-Based Strategy for the Total Synthesis of (–)-Terpestacin.” Division of Organic Chemistry, 234<sup>th</sup> American Chemical Society National Meeting, Boston, MA, August 19-23, 2007 (oral talk).