

焦宁 (Ning Jiao)

Personal:

Born : May 13, 1976, Dongming, Shandong, China
Address : State Key Laboratory of Natural and Biomimetic Drugs
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Education:

- 2 2004-2006, Postdoctoral research, Chemical Biology, under Prof. Dr. Manfred T. Reetz in Max Planck Institute für Kohlenforschung (MPI) Mülheim an der Ruhr, Germany, Alexander von Humboldt Scholar
- 2 1999-2004, Ph. D., Organic Chemistry/Organometallic Chemistry, Shanghai Institute of Organic Chemistry (SIOC), Chinese Academy of Sciences (CAS), Shanghai, P. R. China, Advisor: Prof. Dr. Shengming Ma
- 2 1995-1999, B.S. Organic Chemistry, Shandong University, Ji'nan, P. R. China

Professional:

2007- Associate Professor of Chemistry (group leader), Peking University

Research Interests: Our research is focused on: 1) To develop some green and efficient synthetic methodologies for the synthesis of bioactive molecules through radical process, inert chemical bond activation, or tandem catalysis; 2) Directed evolution of enzymes and protein hybrid catalysts.

Publications:

Independent work (from 2007):

1. Chun Zhang, and **Ning Jiao***, Dioxygen Activation at Ambient Conditions: Cu-catalyzed Oxidative Amidation-Diketoneization of Terminal Alkynes Leading to α -Ketoamides. *J. Am. Chem. Soc.* **2010**, *132*, 28-29.

2. Shengtao Ding, Zhuangzhi Shi, and **Ning Jiao***, Pd(II)-Catalyzed Synthesis of Carbolines by Iminoannulation of Internal Alkynes via Direct C-H Bond Cleavage Using Dioxygen as Oxidant. *Org. Lett.* **2010**, accepted.
3. Wei Jia, and **Ning Jiao***, Cu-catalyzed Oxidative Amidation of Propiolic Acids Under Air via Decarboxylative Coupling. **2010**, submitted.
4. Delin Pan, and **Ning Jiao***, Palladium-Catalyzed Heck-Type Coupling of Allyl Esters: -H Vs -OAc Elimination. *Synlett.* 2010, submitted. (**Invited Contribution**).
5. Delin Pan, Miao Yu*, Wei Chen, and **Ning Jiao***, Pd(II)-Catalyzed Highly Selective Arylation of Allyl Esters via C-H Functionalization of Unactive Arenes with Retention of the Traditional Leaving Group. *Chem. Asian J.* **2010**, online. (**Invited Contribution**).
6. Miao Yu*, Delin Pan, Wei Chen, and **Ning Jiao***, Copper-catalyzed decarboxylative cross-coupling of propiolic acids and terminal alkynes. *Tetrahedron Lett.* **2010**, *51*, 1287-1290.
7. Zhuangzhi Shi, Shengtao Ding, Yuxin Cui, and **Ning Jiao***, Pd-catalyzed Oxidative Cycloaromatization of Biaryls with Alkynes Using Dioxygen as Oxidant. *Angew. Chem. Int. Ed.* **2009**, *48*, 7895-7898.
8. Shikai Xiang, Li-He Zhang, and **Ning Jiao***, Sp-sp³ C-C Bond Formation via Fe(OTf)₃/TfOH Cocatalyzed Coupling Reaction of Terminal Alkynes with Benzylic Alcohols. *Chem. Commun.* **2009**, 6487-6489.
9. Wang Zhou, Liangren Zhang, and **Ning Jiao***, Direct Transformation of Methyl Aromatics to Aryl Nitriles at Room Temperature. *Angew. Chem. Int. Ed.* **2009**, *48*, 7094-7097. (**Hot Paper of Angew. Chem.**) (**Highlighted by "Synform", and "Nature China"**).
10. Anjun Chen, Riyuan Lin, Qingjian Liu, and **Ning Jiao***, Fe-catalyzed Highly Selective Ring Expansion of Alkynylcyclopropyl Alkanols to Cyclobutanols. *Chem. Commun.* **2009**, 6842-6844.
11. Yijin Su and **Ning Jiao***, Control of Chemo-, Regio-, and Stereoselectivities in Ligand-Free Pd-Catalyzed Oxidative Heck Reactions of Arylboronic Acids or Alkenylboronate with Allyl Esters. *Org. Lett.* **2009**, *11*, 2980-2983. (**Highlighted by "Synfact"**).
12. Zhuangzhi Shi, Chun Zhang, Si Li, Delin Pan, Sengtao Ding, Yuxin Cui, and **Ning Jiao***, Indoles from Simple Anilines and Alkynes: Palladium-Catalyzed C-H Activation Using

Dioxygen as the Oxidant. *Angew. Chem. Int. Ed.* **2009**, *48*, 4572-4576. (**Hot Paper of Angew. Chem.**) (**Highlighted by “Synfact”, and “Nature China”**).

13. Wei Jia, Miao Yu*, Wei Chen, and **Ning Jiao***, AgNO₃ Catalyzed Cyclization of Propargyl Meldrum's Acids in Aqueous Solvent: Highly Selective Synthesis of Z- -Alkylidene Lactones. *Tetrahedron Lett.* **2009**, *50*, 5406-5408.
14. Delin Pan, Anjun Chen, Yijin Su, Wang Zhou, Si Li, Wei Jia, Juan Xiao, Qingjian Liu, Liangren Zhang, and **Ning Jiao***, Ligand Free Pd-Catalyzed Highly Selective Arylation of Allylic Esters with Retention of the Traditional Leaving Group. *Angew. Chem. Int. Ed.* **2008**, *47*, 4729-4732.
15. Wang Zhou, Liangren Zhang, and **Ning Jiao***, The Tandem Reaction Combining Radical and Ionic Processes: An Efficient Approach to Substituted 3,4-Dihydro- quinolin-2-ones. *Tetrahedron.* **2009**, *65*, 1982-1987.
16. Si Li, Wei Jia, and **Ning Jiao***, Copper/Iron Cocatalyzed Highly Selective Tandem Reactions: Efficient Approaches to Z- -Alkylidene Lactones. *Adv. Synth. Catal.* **2009**, *351*, 569-575.
17. **Ning Jiao** , Chapter 17 , *The Combination of Enzyme and Transition Metal Catalytic System*, Kuiling Ding, Qinghua Fan, Ed. *Asymmetric Catalysis: New Concepts and Methods*, Chemical Industry Press, **2009**.
18. Chinese Patent: **Ning Jiao**, Chun Zhang, application number: 200910241813.9.
19. Chinese Patent: **Ning Jiao**, Wang Zhou, Liangren Zhang, application number: 200910088860.4.
20. Chinese Patent: **Ning Jiao**, Zhuangzhi Shi, Chun Zhang, Si Li, Delin Pan, Shengtao Ding, and Yuxin Cui, Chinese Patent, application number: 200910082281.9.
21. Chinese Patent: **Ning Jiao**, Si Li, and Wei Jia, application number : 200810118384.1.

Before 2007:

Post-doctoral Work (abroad) :

1. Manfred T. Reetz* and **Ning Jiao**, Copper Phthalocyanine Conjugates of Serum Albumins as Enantioselective Catalysts in Diels-Alder Reactions. *Angew. Chem. Int. Ed.* **2006**, *45*, 2416-2419.
2. Fernandez, Layla; **Jiao, Ning**; Soni, Pankaj; Gumulya, Yosephine; Gonzagade Oliveira, Luciana; Reetz, Manfred T.* An efficient method for mutant library creation in *Pichia*

pastoris useful in directed evolution. *Biocatal. Biotransform.* **2010**, *28*, 122-129.

3. Manfred T. Reetz,* Martin Rentsch, Andreas Pletsch, Matthias Maywald, Peter Maiwald, Jérôme J.-P. Peyralans, Andrea Maichele, Yu Fu, **Ning Jiao** and Andreas Taglieber, Directed evolution of enantioselective hybrid catalysts: A novel concept in asymmetric catalysis. *Tetrahedron* **2007**, *63*, 6404-6414.

Ph. D. Work:

1. Shengming Ma* and **Ning Jiao**, Pd(0)-Catalyzed Three-Component Tandem Double Addition-Cyclization Reaction: Stereoselective Synthesis of *Cis*-Pyrrolidine Derivatives. *Angew. Chem. Int. Ed. Engl.* **2002**, *41*, 4737-4740.
2. Shengming Ma*, **Ning Jiao**, Shimin Zhao and Hairong Hou, Control of Regioselectivity in Pd(0)-Catalyzed Coupling-Cyclization Reaction of 2-(2',3'-Allenyl)Malonates with Organic Halides. *J. Org. Chem.* **2002**, *67*, 2837-2847.
3. Shengming Ma*, **Ning Jiao** and Longwu Ye, Palladium-Catalyzed Highly Regio- and Stereoselective Addition of Organoboronic Acids to Allenes in the Presence of AcOH. *Chem. Eur. J.* **2003**, *9*, 6049-6056.
4. Shengming Ma* **Ning Jiao**, Zilong Zheng, Zhichao Ma, Zhan Lu, Longwu Ye, Youqian Deng, and Guofei Chen, Cu and Pd-Catalyzed Asymmetric One-Pot Tandem Addition-Cyclization Reaction of 2-(2',3'-Alkadienyl)- α -keto Esters, Organic Halides, and Dibenzyl Azodicarboxylate: An Effective Protocol for The Enantioselective Synthesis of Pyrazolidine Derivatives. *Org. Lett.* **2004**, *6*, 2193-2196.
5. Shengming Ma* **Ning Jiao**, Qing yang, and Zilong Zheng, Highly Regio- and Stereoselective Synthesis of Polysubstituted Cyclopropane Compounds via Pd(0)-Catalyzed Coupling-Cyclization Reaction of 2-(2',3'-Allenyl)malonates with Organic Halides. *J. Org. Chem.* **2004**, *69*, 6463-6466.
6. Yin Shao-Hu, Ma Sheng-Ming*, **Jiao Ning** and Tao Feng-Gang, Dramatic Solvent Effect in the Reduction of 2,3-Allenic Acid Esters. A Simple Synthesis of 2,3-Allenols from 2,3-Allenates. *Chin. J. Chem.* **2002**, *20*, 707-710.
7. Dong, X., Xu, X., Hou, H., Wei, Q., Xu, D., **Jiao, N.**, Zhang, A., Zhao, S., Ma, S., Gas Chromatographic Enantiomeric Separation of Propargylic Alcohols and 2,3-Allenic Alcohols. *Chin. J. Org. Chem.* **2001**, *21*, 1142-1146.

8. **Jiao Ning**, Ye Long-wu, Ma Sheng-Ming*, Progress in Transition-metal-Catalyzed Addition Reaction of Organoboronic Acids to Unsaturated Bonds. *Chin. J. Org. Chem.*, **2004**, 472-484.
9. Shengming Ma* and **Ning Jiao**, Chinese Patent , application number : 02136129.0