

## RAMA KRISHNA PEDDINTI, Ph.D.

*Associate Professor  
Department of Chemistry  
Indian Institute of Technology Roorkee  
Roorkee-247667, Uttarakhand, INDIA*

*Tel: (0)1332-285438*

*E-mail: [rkpedfcy@iitr.ernet.in](mailto:rkpedfcy@iitr.ernet.in), [ramakpeddinti@gmail.com](mailto:ramakpeddinti@gmail.com)*

## RESEARCH AREAS

- *Asymmetric Synthesis*
- *Domino Reactions*
- *Arene Functionalizations*
- *Green Protocols in Organic Synthesis*
- *Carbohydrate Research*
- *Antibacterial Activity Studies*

## RESEARCH HIGHLIGHTS

- The group has developed various asymmetric organocatalysts from naturally available proline and derivatives of camphor-10-sulfonic acid and glucosamines. The catalytic activity of these organocatalysts has been investigated in various asymmetric transformations.
- Novel sugar derivatives were synthesized.
- Developed green protocols for the synthesis of an array of heterocycles under solvent-free and catalyst-free conditions. Synthesized several vesicular acetylcholine transporter inhibitors.
- Highly unstable *o*-benzoquinone monoimines were chemically generated for the synthesis of hitherto unknown 1,4-benzoxazine derivatives.
- A plethora of halogenated bicyclo[2.2.2]octenones were synthesized.

## SELECTED PUBLICATIONS

### Recent papers

1. **G. Choudhary, R. K. Peddinti**  
An efficient solvent-tuning approach for the rapid synthesis of thiazolidinone derivatives and the selective synthesis of 2-amino-4*H*-1,3-thiazin-4-one and dimethyl 3,3'-thiodiacrylates.  
*Tetrahedron Lett.* **2012**, (In press).

2. **S. R. Surasani, S. K. R. Parumala, R. K. Peddinti**  
Diels-Alder reactions of 4-halo masked *o*-benzoquinones. Experimental and theoretical investigations.  
*Org. Biomol. Chem.* **2012**, (In press).
3. **J. Agarwal, R. K. Peddinti**  
Synthesis and characterization of monosaccharide derivatives and application of sugar-based prolinamides in asymmetric synthesis.  
*Eur. J. Org. Chem.* **2012**, (In press).
4. **N. Bodipati, R. K. Peddinti**  
Hypervalent iodine mediated synthesis of carbamate protected *p*-quinone monoimine ketals and *p*-benzoquinone monoketals.  
*Org. Biomol. Chem.* **2012**, *10*, 4549-4553.
5. **N. Bodipati, R. K. Peddinti**  
Chemical generation of *o*-quinone monoimines: Rapid construction of novel 1,4-benzoxazine derivatives.  
*Org. Biomol. Chem.* **2012**, *10*, 1958-1961.  
(One of the top ten most accessed papers)
6. **G. Choudhary, R. K. Peddinti**  
Introduction of a clean and promising protocol for the synthesis of Michael adducts and 1,4-benzoheterocycles: An emerging innovation.  
*Green Chem.* **2011**, *13*, 3290-3299.
7. **S. R. Surasani, R. K. Peddinti**  
Diels-Alder reactions of halogenated masked *o*-benzoquinones. Synthesis of halogen-substituted bicyclo[2.2.2]octenones.  
*Tetrahedron Lett.* **2011**, *52*, 4615-4618.
8. **J. Agarwal, R. K. Peddinti**  
Glucosamine-based primary amines as novel organocatalysts for the asymmetric aldol reaction.  
*J. Org. Chem.* **2011**, *76*, 3502-3505.
9. **G. Choudhary, R. K. Peddinti**  
Towards absolute green protocol: An expeditious, highly efficient, catalyst-free and solvent-free synthesis of nitroamines and nitrosulfides by Michael addition.  
*Green Chem.* **2011**, *13*, 276-282.
10. **J. Agarwal, R. K. Peddinti**  
Study of asymmetric Michael addition catalysed by sugar-based prolinamides in solvent free conditions.  
*Tetrahedron Lett.* **2011**, *52*, 117-121.
11. **R. Rani, R. K. Peddinti**  
Michael reaction of ketones and  $\beta$ -nitrostyrenes catalyzed by camphor-10-sulfonamide-based prolinamide  
*Tetrahedron Asymm.* **2010**, *21*, 2487-2492.
12. **J. Agarwal, R. K. Peddinti**  
Sugar-based novel organocatalysts: Enantioselective aldol reactions of cycloalkanones with aromatic aldehydes.  
*Tetrahedron Asymm.* **2010**, *21*, 1906-1909.
13. **R. Rani, R. K. Peddinti**

- Camphor-based novel organocatalysts: Enantioselective aldol reactions of cycloalkanones with aromatic aldehydes.  
*Tetrahedron Asymm.* **2010**, *21*, 775-779.
14. **J. Agarwal, A. Duley, R. Rani, R. K. Peddinti**  
Aminolysis of epoxides using iridium trichloride as an efficient catalyst.  
*Synthesis* **2009**, 2790-2796.
  15. **S. R. Surasani, V. S. Rajora, N. Bodipati, R. K. Peddinti**  
Diels-Alder reactions of halogenated masked *o*-benzoquinones. Synthesis of halogen-substituted bicyclo[2.2.2]octenones.  
*Tetrahedron Lett.* **2009**, *50*, 773-775.
  16. **M. C. Singh, R. K. Peddinti**  
Antimony(III) chloride-catalyzed ring opening of epoxides with anilines.  
*Tetrahedron Lett.* **2007**, *48*, 7354-7357.
  17. **C.-C. Liao, R. K. Peddinti**  
Chapter 4 (1,2-Naphthoquinones including 1,5-, 1,7-, 2,3-, 2,6-naphthoquinones) in *Science of Synthesis: Houben-Weyl Methods of Molecular Transformations*, Volume 28 (Quinones and Heteroatom Analogs), **2006**.

## PROJECTS COMPLETED

1. Asymmetric Organocatalysis with L-Proline and its Derivatives.  
Nov. 2005 – Feb. 2009, DST.
2. Novel  $\alpha,\alpha$ -Diarylprolinol-derived Chiral Ligands for Catalytic Asymmetric Synthesis.  
CSIR, Apr. 2006 – Sept. 2009.
3. Dearomatization of 3-Methoxy-2-naphthol: Synthesis of Benzannulated Bicyclo[2.2.2]octenone Frameworks.  
MHRD, Apr. 2007 – March 2008.

## ONGOING PROJECTS

1. Novel Methodologies for the Generation of *o*-Benzoquinone Monoimides: Synthesis of 1,4-Benzoxazine Derivatives.  
CSIR, Oct 2009 – Mar. 2013.
2. Microwave Heating Technology: A Green Chemistry Approach for Functionalization of Arenes.  
MHRD, May 2010 – Apr. 2013.
3. Domino Reactions and Asymmetric Organocatalytic Reactions.  
DST, May 2012 – Apr. 2015.

## GROUP MEMBERS (Ph.D.)

1. Rashmi Rani (2006-11)
2. Garima (2006-11)
3. Jyoti Agarwal (2006-11)
4. Seshi Reddy Surasani (2007-11)
5. Naganjaneyulu Bodipati (2007-12)
6. Ram Tilak Naganaboina (2009-)
7. Jyoti Singh Tomar (2010-)
8. Santosh Kr. Reddy Parumala (2011-)
9. Arun Sharma (2011-)
10. Ujjawal Kumar Bhagat (2011-)
11. Shivangi Sharma (2011-)
12. Pallavi Singh (2012-)

## PROJECT FELLOWS

1. S. R. Palla (Antibacterial Activity Studies)
2. Balakrishna Aegurula (Asymmetric Synthesis)

## M.Tech.

1. Ankita Singh (2011-)

## PREVIOUS GROUP MEMBERS (M.Sc. & M.Tech.)

M.Sc.	Year of Graduation	M.Tech.	Year of Graduation
Anjali Jha	2005	Virendra Singh Rajora	2006
Sudarshana Mukherjee	2005	Mahesh Chander Singh	2007
Sujata Kashyap	2005	Deepika Kanwar	2008
Garima Singh	2006	Bhaskara Rao Pasumarti	2010
Jissy A. K.	2006	Monika Das	2011
Anju Duley	2007		
Shankha Pattanayak	2007		
Dipankar Sahoo	2008		
Farhana Shehla	2008		
Sunil Kumar Bonagani	2009		
Nithish Kumar Verma	2012		
Oishika Panda	2012		

## RESEARCH FACILITIES

The research group is well equipped with basic facilities to perform reactions for organic synthesis/ asymmetric synthesis. Laboratory has facilities to carry out reactions under inert atmosphere and at low temperatures up to  $-90^{\circ}\text{C}$ . It also procured HPLC instrument along with chiral columns.

In addition, instruments such as FT-IR, UV-Vis, GC, GC-MS, HRMS, CHN analyzer, *etc.*, are available in the Department and 500 MHz NMR and XRD instruments are available in the Institute Instrumentation Centre.

## FURTHER DETAILS OF THE GROUP

For further details of the group, visit the following sites

<http://people.iitr.ernet.in/facultywebsite/rkpedfcy/Website/>

[http://www.iitr.ernet.in/departments/CY/pages/Research+Facilities+Labs+Asymmetric\\_Synthesis\\_Lab.html](http://www.iitr.ernet.in/departments/CY/pages/Research+Facilities+Labs+Asymmetric_Synthesis_Lab.html)