Mahesh Sandakonda

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Professional Experience

Wayne State University Detroit, MI, USA

Postdoctoral Fellow April 2019-Present

Advisor: **Prof. Jin K. Cha**

Area of Research: Design research plans for total synthesis of structurally complex natural products. Develop new synthetic methods to improve and optimize the existing transformations.

Education

CSIR-Indian Institute of Chemical Technology (IICT, Osmania University), Hyderabad

Ph.D. Chemistry, UGC-Scholar June 2013-March 2019

Dept. of Organic Synthesis & Process Chemistry

Advisor: **Dr. G. Sudhakar**, Principal Scientist

Thesis title: "Development of Novel Cationic Electrocyclization Precursors Into the Synthesis of Indenes/Cyclopentene Derivatives."

Rayalaseema University Kurnool

M.Sc. Natural Products 2009-2011

(First class with distinction)

Osmania Degree College Kurnool

B.Sc. (Bio-Chemistry, Chemistry, Zoology) 2006-2009

(First class with distinction)

Personal Biodata

Date of Birth : October 13th, 1988

Nationality/Marital Status : Indian/ Married.

Awards/Fellowships

2016 **Organic Chemistry Frontiers** best poster presentation award in ICOS-2016 held at IIT-Bombay**.**

2013 Awarded junior and senior research fellowships from University Grants Commission (UGC)-Govt. of India.

2013 Qualified All India Graduate Aptitude Test for Engineering (GATE) in Chemical Sciences.

Research Publications

1. Nazarov Cyclization and Tandem [4+2]-Cycloaddition Reactions of Donor-Acceptor Cyclopropanes; **S. K. Mahesh**., S. Phani Babu Vemulapalli., Jagadeesh Babu Nanubolu., Gangarajula Sudhakar*. "*Organic Letters"*. **2017**, *19*, 4500-4503.
2. Stereoselective Access to the Core Structure of Macroline-type Indole Alkoloids: Total Synthesis of Macroline and Alstomicine; Vilas, D. Kadam., Sridhara Shanmukha Rao B., **S. K. Mahesh**., Mithun Chakraborty., S. Phani Babu Vemulapalli., Satyanarayana D., Gangarajula Sudhakar*. "*Organic Letters"*. **2018**, *20*, 4782-4786.
3. Tandem Addition/Electrocyclization/Benzylation of Alkyl Aryl-1,3-dienes and Aromatic Aldehydes: Access to Highly Substituted Indenes. **S. K. Mahesh**., Jagadeesh Babu Nanubolu., Gangarajula Sudhakar*. "*Journal of Organic Chemistry"*. **2019**, *84*, 7815-7828.
4. Nazarov Cyclization of Dienyl Oxiranes into the Synthesis of Indenes; Studies toward the total Synthesis of Taiwaniaquinone-D. **S. K. Mahesh.**, Gangarajula Sudhakar*. *(Manuscript under preparation).*

Skills and Expertise

Being a part of a synthetic research group working in different areas of organic chemistry, I could learn, work and interact with many researchers/colleagues and could develop many skills required for a synthetic organic chemist.

- Planning and execution of multi-step synthesis for desirable precursors to investigate new cascade reactions.
- Knowledge in Electrocyclization reactions; handled several Lewis/Protic/ BrØnsted acids and used Organolithium/Grignard reagents in high quantity for Gram scale synthesis of appropriate precursors.
- Handled light and air sensitive organometallic reagents/compounds.

- Well experienced handling of all instruments involved in an organic laboratory for solvent purification system especially CombiFlash purification system, Kugelrohr, Polarimeters.
- Gained expertise in scientific reporting, manuscript preparations and all characterization techniques involving NMR, IR, MS, HRMS etc.
- Identifying experimental problems and resolve them independently.
- Stereo selectivity issues were solved by proposing reasonable mechanism pathways in cascade reactions.
- Trained one Ph.D. student & one M.Sc. student, and two M.Pharma students during my Ph.D. course.
- Good communication skills, self-motivated, creative and a good team member with leadership qualities.

Research Experience

Research Fellow at CSIR-Indian Institute of Chemical Technology, Dr. G. Sudhakar Research Group

I worked in the area of developing new synthetic methods based on cationic electrocyclization reactions, and tandem reactions (one-pot multi-reaction processes) which are exploited in Nazarov cyclization. Total synthesis of bioactive natural products based on electrocyclization reactions & biosynthetic pathways.

- Nazarov Cyclization and Tandem [4+2]-Cycloaddition Reactions of Donor-Acceptor Cyclopropanes.
- Tandem Addition/Electrocyclization/Benzylation of Alkyl Aryl-1,3-dienes and Aromatic Aldehydes: Access to Highly Substituted Indenes.
- Nazarov Cyclization of Dienyl Oxiranes Into the Synthesis of Indenes; Studies toward the total synthesis of Taiwaniaquinone-D.
- Stereoselective Access to the Core Structure of Macroline-type Indole Alkoloids: Total Synthesis of Macroline and Alstomicine.

Postdoctoral Research:

- Studies directed toward the total synthesis of (–)-Sparteine.
- Model studies on cross-coupling (S_N2') reactions of cyclopropanols with novel electrophiles.

Research Interests

- Total Synthesis of Biologically Active Natural products.
- Development of New Synthetic Methodologies for Bioactive Molecules *via* Cascade Reactions & Asymmetric Synthesis.
- Metal-mediated One Pot Multi-Reaction Processes by using C-H activation for Synthesis of Pharmaceutically Important Heterocyclic Systems

Conferences and Symposia

- Participated at **21st CRSI National Symposium in Chemistry** held at CSIR-Indian Institute of Chemical Technology, Hyderabad, India, July-2017
- Poster presentation on "Development of Novel Nazarov Cyclization Precursors and Application in the Synthesis of Cyclopentadienes/Indenes" during **21st International Conference on Organic Synthesis (ICOS-2016),** held at IIT-Bombay, Mumbai, India.
- Participated in **International Conference on Frontiers at the Chemistry-Allied Sciences Interface (FCOSI-2016),** held at the University of Rajasthan, Jaipur, India, April-2016.
- Participated in **Inventions, Innovations and Regulations in Crop Sciences (IIRCS-2015)** held at CSIR-Indian Institute of Chemical Technology, Hyderabad, India, June-2015.
- Participated in **2nd International Conference on Emerging Trends in Chemical and Pharmaceutical Sciences (ICETCPS-2014)** organized by CSIR-Indian Institute of Chemical Technology, Hyderabad, and Science-Tech Foundation, Bengaluru, India, October-2014.

Professional References

1. Dr. G. Sudhakar

Principal Scientist, Dept. of Organic Synthesis & Process Chemistry

CSIR-Indian Institute of Chemical Technology (CSIR-IICT)

Tarnaka, Uppal road, Hyderabad, Telangana, India-500007

Email: gsudhakar@iict.res.in

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2. Dr. Jagadeesh Babu Nanubolu

Senior Scientist, Centre for X-ray Crystallography

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Tarnaka, Uppal road, Hyderabad, Telangana, India-500007

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3. Dr. Subhash Ghosh

Senior Principal Scientist, Dept. of Organic Synthesis & Process Chemistry

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