Sagar S. Thorat, Ph.D.,

Department of Chemistry and Biochemistry
North Dakota State University, Fargo, ND-58105
Contact: +91-7350422251(India) / +1-7017297559(US)
E-mail: sagarthrt@gmail.com | sagar.thorat@ndsu.edu
Links: LinkedIn | Google Scholar | Website

Professional Summary:

- Experienced synthetic organic chemist with ~10 years of expertise in the field. hold a Ph.D. In organic chemistry, specializing in natural product total synthesis, drug molecule process development, and catalysis-enabled synthetic methodologies.
- Excellent communicator who has presented at several conferences, and the ability to work independently or in multidisciplinary teams.
- My proficiency extends to conducting chemical experiments on both small and large scales, utilizing advanced analytical techniques.

Skills:

- Well, trained in planning and execution of multi-step synthesis of natural products and related compounds.
- Experienced in carrying out various organic transformations on milligram to gram scale (~200 G) along with expertise in purification and handling of air/moisture sensitive reagents.
- Experienced in structural determination of natural product/unknown compounds using IR, 1D and 2D-NMR, mass spectroscopy.
- Gained valuable experience while working in medicinal chemistry projects with expertise in systematic planning and synthesis of structural analogues for biological activity
- Trained and experienced in handling instruments especially microwave synthesizers, combi flash purification system, mass spectrometer, kugelrohr and HPLC.
- I gained expertise in scientific reporting, manuscript preparations, grant writing and data analysis.
- As a part of work involved in training and guiding the undergraduate and graduate research trainees.

Professional/Research Experience:

- **Nov 2022 – Present: Postdoctoral Research Associate:** North Dakota State University | Fargo, USA. **Advisor:** Mukund Sibi (*Website*)
- **Feb 2022 – Oct 2022: Senior Project Associate:** CSIR-National Chemical Laboratory | Pune, India. **Advisor:** Dr. Ravindar Kontham (*Website*)
- **Sep 2020 – Mar 2021: Project Associate-II:** CSIR-National Chemical Laboratory | Pune, India. **Advisor:** Dr. Ravindar Kontham (*Website*)
- **Jun 2014**: **Master Thesis:** Punyashlok Ahilyadevi Holkar Solapur University | India

  Advisor: Dr. Raghunath B. Bhosale

  Research area: *Synthetic Utility of Oxoketene Dithioacetals in Multicomponent Reactions.*

Education:

- **2015 – 2021: Ph.D**. (*Chemical Sciences*): AcSIR, CSIR-National Chemical Laboratory | Pune, India. **Advisor:** Dr. Ravindar Kontham (*Website*)

  Thesis Title: *Stereoselective Total Synthesis of Yaoshanenolides, Pleurospiroketals, and Construction of Furopyranones through [3+2]-Annulation of Alkynols and α-Ketoesters*

- **2012 – 2014: Master's degree (MSc)** (*Organic Chemistry*): Punyashlok Ahilyadevi Holkar Solapur University, INDIA – 413255
- **2009 – 2012: Bachelor's degree (BSc)** (*Chemistry*): Punyashlok Ahilyadevi Holkar Solapur University | Maharashtra, India
- **2007 – 2009**: **HSC:** Krishna Mahavidyalaya, Rethare (BK), Satara, Maharashtra, India-415108
- **2006 – 2007**: **SSC-High School:** Shri Shivaji High School Chinchani (Ambak)

Awards and Fellowships:

- Post-Doctoral Fellowship from Department of Chemistry and Biochemistry, North Dakota State University, Fargo, USA. funded by the US Department of Defense - (November-**2022** to Till Date).
- Awarded Senior Research Fellowship (SRF) from the Council for Scientific and Industrial Research (CSIR), New Delhi, INDIA (three years, **2017-2020**).
- Awarded Junior Research Fellowship (JRF) from the Council for Scientific and Industrial Research (CSIR), New Delhi, INDIA (two years, **2015-2017**).
- Keshav Rajaram Joshi Gold Medal for securing the highest marks in M.Sc. Chemistry from Punyashlok Ahilyadevi Holkar Solapur University, INDIA (for the year-**2014**).
- Best poster award (*second prize*) in National Conference on Physics and Chemistry of Advanced Materials (NCPACAM) (**2013**).
- Eklavya Scholarship for postgraduate students (two years, **2012-2014**).

Key Words:

- Synthetic Organic Chemistry, Total synthesis, bioactive natural products, Drug synthesis, Catalysis (transition metal catalyzed cascade reactions), Asymmetric synthesis, Medicinal Chemistry, Process Chemistry and Biomass (Synthesis of Bio-based Monomers, including Furan and Vanillin-based Styrene, Amines, Aldehydes, and Epoxide Derivatives).

Publications:

1) Shimpi, S. P.; **Thorat, S. S**.; Kontham, R. Stereoselective Total Synthesis of Lycibarbarines A-C. (*To be submitted*)
2) Sadanande, M. V.; **Thorat, S. S.**; Sharma, H.; Vanka, K.; Gonnade, R. G.; Kontham, R. Studies on the Stereoselective Synthesis of Sacubitril via a Chiral Amine Transfer Approach. *Chem. Asian J.* **2025**, *20*, e202401223. (DOI)
3) Renner. A.; **Thorat, S. S**.; Sibi, M.P. Synthesis of biobased polyacetals: A review. *RSC Sustain.,* **2024**, 2, 3669-3703. (DOI)
4) Domnich, B.; Polunin, Y.; **Thorat, S. S.**; Sibi, M.P.; Voronov, A. Tough Bio-based Thermosets with Dual Curing Capability via Epoxy and Allylic Functionality. *Prog. Org. Coat.,* **2024**, *197*, 108844. (DOI)
5) Hevus, I.; Tiwari, S.; **Thorat S.S.;** Gibbon, L.R.; La Scala, J.J.; Ulven, C.A.; Sibi, M.P.; Webster, D.C. Vanillin-Derived Veratrole Reactive Diluents in Stereolithography. *ACS Appl.*

Polym. Mater. **2024**, *6*, 7705–7715. (DOI)

6) Moorthy, R.; Biosawe, W.; **Thorat, S. S.**; Sibi, M.P. Unveiling the Beauty of Cyclopropane Formation: A Comprehensive Survey of Enantioselective Michael Initiated Ring Closure (MIRC) Reactions. *Org. Chem. Front*. **2024**, 11, 4560-4601. (DOI) (*2024 Org. Chem. Front. HOT articles*) [*Cover Art*]
7) **Thorat, S. S**.; Sibi, M. P. Total Synthesis of Natural Products Containing the Tetralone Subunit. *Arkivoc* **2024**, *2024,* 202312053. (DOI)
8) **Thorat, S. S**.; Shimpi, S. P.; Sambherao, P. I.; Gamidi R. K.; Kontham, R. Regioselective Synthesis of Benzannulated [5,6]-Oxaspirolactones via Cu(II)-Catalyzed Cycloisomerization of 2-(5-Hydroxyalkynyl)benzoates. *J. Org. Chem.*, **2023**, *88*, 16915—16933. (DOI)
9) Polunin, Y.; Domnich, B.; Tiwari, S.; **Thorat, S. S.**; Sibi, M.P.; Voronov, A. Free Radical (Co)Polymerization of Aromatic Vinyl Monomers Derived from Vanillin. *Eur. Polym. J.* **2023**, *201*, 112546. (DOI)
10) Mankad, Y.; **Thorat, S. S.**; Das, P.; Gamidi, R.; Kontham, R.; Reddy, D.S. Ready Access to Benzannulated [5,5]-Oxaspirolactones using Au(III)-Catalyzed Cascade Cyclizations. *J. Org. Chem.*, **2022**, *87*, 3025–3041. (DOI)
11) Nakate A. K.; **Thorat, S. S.**; Jain, S.; Gamidi R. K.; Vanka, K.; Kontham, R. Silver-Catalyzed [3+3]-Annulation Cascade of Alkynyl Alcohols and α,β-Unsaturated Ketones for the Regioselective Assembly of Chromanes. *Org. Chem. Fornt*. **2022**, *9*, 802-809. (DOI)
12) **Thorat, S. S**.; Gamidi R. K.; Kontham, R. Stereoselective Total Synthesis of (±)-Pleurospiroketals A and B. *J. Org. Chem.* **2021**, *86*, 13572-13582. (DOI)
13) **Thorat, S. S**.; Kontham, R. Strategies for the synthesis of furo-pyranones and their application in the total synthesis of related natural products. *Org. Chem. Front*., **2021**, *8*, 2110-2162. (DOI)
14) **Thorat, S. S.**; Kontham, R. Recent advances in synthesis of oxaspirolactones and their application in the total synthesis of related natural products. *Org. Biomol. Chem*., **2019**, *17*, 7270-7292. (DOI)
15) **Thorat, S. S.**; Palange, M. N.; Kontham. R. Four-Step Total Synthesis of (+)-Yaoshanenolides A and B. *ACS Omega* **2018**, *3*, 7036-7045. (DOI)
16) **Thorat, S. S.**; Kataria. P.; Kontham, R. Synthesis of Furo[2,3-*b*]pyran-2-ones Through Ag(I) or Ag(I)-Au(I)-Catalyzed Cascade Annulation of Alkynols and *a*-Ketoesters. *Org. Lett*. **2018**, *20*, 872−875. (DOI)
17) Kambale, D. A.; **Thorat, S. S.**; Pratapure, M. S.; Gonnade, R. G.; Kontham, R. Lewis acid catalysed cascade annulation of alkynols with α-ketoesters: a facial access to γ-spiroketal- γ-lactones. *Chem. Commun.* **2017**, *53*, 6641−6644. DOI: (DOI)
18) Mahadik, S. A.; Pedraza, F.; Mahadik, S.S.; Relekar, B. P.; **Thorat, S. S**. Biocompatible superhydrophobic coating material for biomedical applications. *J. Sol-Gel Sci. Technol*. **2016**, *81*, 791-796. DOI: (DOI)
19) Mahadik, S. A..; Pedraza, F.; Relekar, B. P.; Parale, V. G.; Lohar, G. M. **Thorat, S. S**. Synthesis and characterization of superhydrophobic-superoleophilic surface. *J. Sol-Gel Sci. Technol*. **2016**, *78*, 475-481. (DOI)

Patents:

1) Kontham, R.; **Thorat, S. S**. Furo[2,3-*b*]Pyran-2-one Compounds, And Process for Preparation Thereof, US2020/0165263 (**2020**)/ WO2018/220647 A1; PCT/IN2018/050345 (**2018**)
2) Filed; Kontham, R.; Chavan, S. P.; **Thorat, S. S**.; Kadam**.** A Process for the Preparation of Sacubitril Intermediates, IN201911043858 (**2019**).

List of Conferences, Oral and Poster Presentations:

Attended approximately 20 National and International conferences and symposiums presented around 5 posters and delivered 1 oral presentation.

1) 2018: XIV J-NOST Conference for Research Scholars CSIR-Indian Institute of Chemical Technology, Hyderabad — 500007, Telangana, India (November 28-December 1, 2018). Title: "Furo[2,3-b]pyran-2-ones Through Ag(I) or Ag(I)-Au(I)- Catalyzed Cascade Annulation of Alkynols and α-Ketoesters." **Oral presentation**
2) 2018: National science day-2018, at CSIR-NCL. Title "Four-Step Total Synthesis of (+)-Yaoshanenolides A and B." **Poster Presentation**
3) 2017: National science day-2017, at CSIR-NCL. Title: "A New Entry in Catalytic Cascade Annulation of Alkynols and α-Ketoesters: Synthesis of Furo-pyranones via Dual Activation of Soft Nucleophiles and Hard Electrophiles." **Poster Presentation**
4) 2016: ***International Conference*** on Nature Inspired Initiatives in Chemical Trends Organic synthesis 2016 Participation.
5) 2013: National Conference on Physics and Chemistry of Advanced Materials (NCPACAM) (18th, 19th December 2013) **Poster presentation** (*second prize*).

References:

Dr. Ravindar Kontham
Principal Scientist
CSIR-National Chemical Laboratory,
Dr. Homi Bhabha Road,
Pune-411008, INDIA
Phone: +91-20-2590 2301
E-mail: *k.ravindar@ncl.res.in*

Dr. D. Srinivasa Reddy
Director,
CSIR-Indian Institute of Chemical Technology
Hyderabad – 500007, INDIA
Phone: +91-40-27193030
Email: *director@iict.res.in*

Prof. Mukund Sibi
University Distinguished Professor,
North Dakota State University
Sugihara Hall 436
1231 Albrecht Blvd.
Fargo, ND 58108-6050, USA
Phone: (701) 231-8251
E-mail: *mukund.sibi@ndsu.edu*