Dr. Monoranjan Ghosh: Curriculum-Vitae

Personal Information:

Date of Birth: 04th October, 1987
Nationality: Indian
Marital Status: Married

Present Address: Shree Krishna Apartment, Banga Laxmi Abasan, Dashadrone, Rajarhat Gopalpur (M), Block D, N 24 PGS, West Bengal, Kol: 700136

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Current Position

Designation: Senior Research Scientist

Department: Chemistry

Location: TCG Lifesciences Pvt. Ltd, Saltlake, Sector V, West Bengal, Kolkata-700091

Duration: May, 2016- Till date

Research Background:

Area of Specialization: Synthetic Organic Chemistry

Title of Thesis: "***Investigation of Some Selective Reactions for the Synthesis of Chemical Entities with Biological Importance***"

Supervisor: Dr. Alakananda Hajra
Assistant Professor, Department of Chemistry
Visva-Bharati, Santiniketan-731235

Duration: Jan, 2011-April, 2016

Academic Achievements:

Qualification	Board/University	Year	(%) Marks	Status
Madhyamik Examination	W.B.B.S.E.	2003	75.8	1st Division
Higher Secondary Examination	W.B.C.H.S.E.	2005	74.8	1st Division
B.Sc. (Chemistry Hons.)	The University of Burdwan	2008	64.75	1st Class
M.Sc. (Organic Chemistry)	The University of Burdwan	2010	68.66	1st Class
Ph.D. (Synthetic Organic Chemistry)	Visva-Bharati	2011-2016	-----	Awarded (April, 2016)

Professional Achievements:

Organization	Designation	Duration
TCG Lifesciences Pvt. Ltd	Research Scientist	May, 2016- March, 2019
TCG Lifesciences Pvt. Ltd	Senior Research Scientist	April, 2019-till date

Summary of Research Work:

The main object of my present work is to synthesize some biologically and pharmacologically active molecules through an atom-efficient and environmentally benign manner employing cheap and commercially available reagents. My research work mainly based on copper and palladium catalysts for the development of novel strategies towards the synthesis and functionalization of

various useful and structurally diverse organic heterocyclic molecules (mainly polysubstituted furans and imidazopyridines). My research work has been divided in two parts.

In the first part I have synthesized oxygen containing heterocycle i.e., multi-substituted furan derivatives. 1,3-binucleophilic reagent such as nitrostyrenes and unsaturated carboxylic acids have been used as the coupling partner with the reaction of various substrates (enol derivatives) such as phenol derivatives, ketones and as well as diketones. Naphthols, phenols, hudroxycoumarins, hydroxyquinolones and simple ketones are well effective for synthesizing diversely functionalized furan derivatives with good yields.

In next part my focus is to synthesize and functionalization of another important nitrogen containing heterocycles such as Imidazopyridines. In this part I have developed a method for α-selective alkenylation of imidazopyridines through aerobic cross-dehydrogenative coupling reaction which follows Heck type mechanism. Furthermore, diaryl alkynes are also employed as a coupling partner for dehydrogenative annulation of imidazopyridines.

Apart from these, I have also experienced synthesizing and functionalization of some other biologically active heterocycles likes indoles, imidazobenzothiazoles, 2-aminobenzothiazoles etc.

During my research period I have published some articles based on Ph.D. research work as listed

1. "DABCO-promoted one-pot facile synthesis of angularly fused furoquinolinones and furocoumarins." **Monoranjan Ghosh**, Alakananda Hajra, *Eur. J. Org. Chem*., **2015,** 7836.
2. "Diversified synthesis of furans by coupling between enols/1,3-dicarbonyl compounds with nitroolefins: Direct access towards dioxa[5]helicenes." **Monoranjan Ghosh**, Sougata Santra, Pallab Mondal, Dhiman Kundu, Alakananda Hajra, *Chem. -Asian J*., **2015**, *10*, 2225.
3. "Regioselective synthesis of multisubstituted furans *via* copper-mediated coupling between ketones and β-nitrostyrenes." **Monoranjan Ghosh**, Subhajit Mishra, Alakananda Hajra, *J. Org. Chem*., **2015**, *80*, 5364.
4. "Copper-catalyzed regioselective synthesis of furan *via* tandem cycloaddition of ketone with an unsaturated carboxylic acid under air." **Monoranjan Ghosh**, Subhajit Mishra, Kamarul Monir, Alakananda Hajra, *Org. Biomol. Chem*., **2015**, *13*, 309.
5. "Palladium-catalyzed dehydrogenative annulation of imidazo[1,2-*a*]pyridines with diarylalkynes." **Monoranjan Ghosh**, Aswini Naskar, Subhajit Mishra, Alakananda Hajra, *Tetrahedron Lett.*, **2015**, *56*, 4101.
6. "Palladium-catalyzed α-selective alkenylation of imidazo[1,2-*a*]pyridines through aerobic cross-dehydrogenative coupling reaction." **Monoranjan Ghosh**, Aswini Naskar, Shubhanjan Mitra, Alakananda Hajra, *Eur. J. Org. Chem*., **2015**, 715.
7. "Copper-catalyzed C−H ethoxycarbonyldifluoromethylation of Imidazoheterocycles." Subhajit Mishra, Pallab Mondal, **Monoranjan Ghosh**, Susmita Mondal, Alakananda Hajra, *Org. Biomol. Chem*., **2016,** *14*, 1432.

8. "Metal-free regioselective thiocyanation of imidazoheterocycles through visible light photoredox catalysis." Shubhanjan Mitra, **Monoranjan Ghosh**, Subhajit Mishra, Alakananda Hajra, *J. Org. Chem*., **2015**, *80*, 8275.
9. "Regioselective synthesis of nitrosoimidazoheterocyclyes using *tert*-butyl nitrite." Kamarul Monir, **Monoranjan Ghosh**, Sourav Jana, Pallab Mondal, Adinath Majee, Alakananda Hajra, *Org. Biomol. Chem*., **2015**, *13*, 8717.
10. "Regioselective oxidative trifluoromethylation of imidazoheterocycles *via* C(sp2)-H bond functionalization." Kamarul Monir, Avik Kumar Bagdi, **Monoranjan Ghosh**, Alakananda Hajra, *J. Org. Chem*., **2015**, *80*, 1332.
11. "Iodine-catalyzed regioselective thiolation of imidazo[1,2-*a*]pyridines using sulfonyl hydrazides as a thiol surrogate." Avik Kumar Bagdi, Shubhanjan Mitra, **Monoranjan Ghosh**, Alakananda Hajra, *Org. Biomol. Chem*., **2015**, *13*, 3314.
12. "Phenyliodine(III) diacetate (PIDA) mediated synthesis of aromatic azo compounds through oxidative dehydrogenative coupling of anilines: scope and mechanism." Kamarul Monir, **Monoranjan Ghosh**, Subhajit Mishra, Adinath Majee, Alakananda Hajra, *Eur. J. Org. Chem.,* **2014**, 1096.
13. "Zinc Iodide: a mild and efficient catalyst for one-pot synthesis of aminoindolizines via sequential A^3 coupling/cycloisomerization." Subhajit Mishra, Avik Kumar Bagdi, **Monoranjan Ghosh**, Subrata Sinha, Alakananda Hajra, *RSC. Adv*., **2014**, *4*, 6672.
14. "Organocatalysis by an aprotic imidazolium zwitterion: a dramatic anion-cation cooperative effect on azide-nitrile cycloaddition." Matiur Rahman, Anupam Roy, **Monoranjan Ghosh**, Shubhanjan Mitra, Adinath Majee, Alakananda Hajra, *RSC. Adv*., **2014**, *4*, 6116.
15. "Unprecedented catalytic activity of Fe(NO3)3·9H2O: regioselective synthesis of 2-nitroimidazopyridines via oxidative amination." Kamarul Monir, Avik Kumar Bagdi, **Monoranjan Ghosh**, Alakananda Hajra, *Org. Lett*., **2014**, *16*, 4630.
16. "Catalytic application of task specific ionic liquid on the synthesis of benzoquinazolinone derivatives by a multicomponent reaction." Matiur Rahman, Anirban Sarkar, **Monoranjan Ghosh**, Adinath Majee, Alakananda Hajra, *Tetrahedron Lett*., **2013**, *55*, 235.
17. "A simple and efficient approach for the sulfonylation of indoles catalyzed by CuI." Matiur Rahman, **Monoranjan Ghosh**, Alakananda Hajra, Adinath Majee, *J. Sulfur Chem*., **2013**, *34*, 342.

Awards/Fellowship:

- CSIR-UGC NET (UGC), New Delhi, India; 2010.

Conferences Attend:

- "**IX *J-NOST* Conference**, IISER Bhopal", December 2013 (*Oral presentation*).
- "16th **CRSI National Symposium in Chemistry** (NSC-16)" IIT Bombay, February 2014 (*Poster presentation*).

Technical Skills:

- Expertise in operating and troubleshooting FT-NMR instrument (BRUKER AVANCE 400 MHz). Particularly ^{1}H, ^{13}C, DEPT-135, ^{19}F, ^{31}P NMR, NOESY, COSY, HMQC and HMBC operations.
- Experience in operating FT-IR (SHIMADZU 8400S), HPLC (AGILENT DIAD HPLC: isocratic), Parr-Hydrogenation, Parr-autoclave**.**
- Expertise in handling and sampling the BRUKER SINGLE CRYSTAL X-RAY Machine.
- Experience in handling regular lab instruments like microwave (Biotage), column chromatography, Combi-Flash Column purification, Parr-shaker, Lyophilizer.
- Literature survey of raw materials, intermediates and new molecules by using Sci-finder and Journals (nationals as well as internationals).
- Experienced reaction in Parr Autoclave, Amar autoclave and as well as Parr Shaker reactor in high pressure and temperature reaction conditions.

Data Analysis:

- Experience in analysis of ^{1}H, ^{13}C, DEPT-135, ^{19}F and ^{31}P NMR spectra as well as NOE, NOESY, COSY, HMQC and HMBC of unknown organic molecules.
- Analysis of IR spectra of organic as well as metal linked organic frameworks.
- Interpretation of HRMS spectral data, LCMS, UPLC, GCMS data of organic molecules.
- Experienced in solving X-ray crystal structures (Smart Apex2) and data generation to obtain the .cif files.
- Familiar with Microsoft office, Chemdraw (professional), ISIS draw, Biovia, Origin-pro statistical analysis software and Sci-finder for structure/reaction search.

Professional Skills:

- Client requirement: 1. Search the literature, Sci-finder to prepare new project proposal/request. 2. Chemical quotation, ordering. 3. Weekly update for the bench-chemistry. 4. Bi-weekly TC (Communicating with client).

- Capable to lead a team size of 4-5 FTE (Bench chemist). Now supervising two FTE works in the bench level to run the project along with mine.

- Synthesis of target molecules using multi-step syntheses within the timeline in bench level chemistry as well as parallel synthesis (Amidation, Buchwald and also Suzuki reactions).

- Experienced in various types of metal catalysed reactions, e.g. Buchwald reaction, Oxo-Buchwald reaction, Suzuki reaction (using boronic acids, triflates as well as boronate ester), Heck reaction, Sonogashira reaction, Negeshi Reaction, Chan-Lam reaction, Pd/Cu-Decarboxylative cross coupling reaction.

- Expertise in oxidation and reduction reactions especially in Swern oxidation, Pinnick oxidation, Pd-H_2 reduction reaction, DIBAL-H reduction, LAH reduction.

- Experienced in LDA reaction (formation and generation), formylation reactions, reductive amination, Amidation reaction with acid-amine coupling (using EDC-HOBT, HATU, T3P, Mukaiyama reagent) or amine with acid chloride (with $(COCO)_2$, $SOCl_2$), Bromination reaction (using NBS/AIBN), sulphone preparation (using Oxone, *m*-CPBA), Methylation (using MeI/Me_2SO_4). Ring expansion (using Pd-C/H2, Parr autoclave reactor)

- Protection (O-TBDMS/O-TBDPS, O-TES, N-BOC, N-FMOC, PMB) as well as de-protection (O-*t*Bu, N-Ph_3, S-Ph_3, -THP, -Benzyl, PMB) reaction of various enols (-OH/-SH/-NH) and amine based molecules.

- Experienced with handling with some sensitive reagents, such as DMPU-HF, Py.HF, n-BuLi, NaH, LAH, DiBAL-H, hexabutylditin, Metal triflets, triphosgene, CDI, PIDA, mCPBA, Oxone, TMSCl.

Name and Addresses of Three Referees:

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I hereby declare that the information provided by me is true to the best of my knowledge and belief.

Place: Kolkata

Monoranjan Ghosh.

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