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EDUCATIONAL PROFILE:

B. Sc. (1997 - 2000)

In **Chemistry, Industrial Chemistry and Mathematics** from Vidyabharati College, Sant Gadage Baba **Amaravati University**, Amaravati, Maharashtra, India

M. Sc. (2002 - 2004)

In **Inorganic Chemistry**, Department of Chemistry, T. C. College Baramati, **University of Pune**, Maharashtra, India

Ph. D. (2006 - 2012)

In **Inorganic Chemistry**, Department of Chemistry, **Indian Institute of Technology Bombay (IIT Bombay)**, Mumbai, India

Title: "*Studies on Novel Chalcogenone Compounds*"

Supervisor: Prof. H. B. Singh

Post-Doctoral Research Fellow

(Feb 2013 – April 2014)

In **Inorganic Chemistry**, Department of Chemistry, **Korea Advanced Institute of Science and Technology (KAIST)**, Daejeon, South Korea as **Institute for Basic Science Research Fellow**

Supervisor: Prof. David G. Churchill

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PROFESSIONAL EXPERIENCE:

- **Research Associate** since **Oct. 2011** to **Jan. 2013** - Department of Chemistry, **IIT Bombay**, Powai, Mumbai, India (Supervisor Prof. H. B. Singh).
- Teaching Assistant, Indian Institute of Technology Bombay, Mumbai. Tutor for undergraduate course CH-103 and CH-117L (2008).
- Worked as a Research Project Assistant in Physical and material Chemistry Division at **National Chemical Laboratory**, Pune, Maharashtra, India under **Dr. P. A. Joy** (Since **July 2005** - **January 2006**) on research project sponsored by IGCAR and BARC entitled “**Preparation and characterization of SYNROC ceramic oxide**”.
- **Certificate Course in Information Technology** conducted by Board of vocational Examination, Maharashtra.

PROFESSIONAL RECOGNITION AND AWARDS:

1. Post-doctoral Research Fellow from **Institute for Basic Science in Korea Advanced Institute of Science and Technology (KAIST)**, Daejeon, South Korea-2013.
2. Senior Research Fellowship, awarded by C.S.I.R., New Delhi, India - 2008.
3. Junior Research Fellowship, awarded by C.S.I.R., New Delhi, India - 2006.

Ph.D. STUDENTS GUIDED: 02

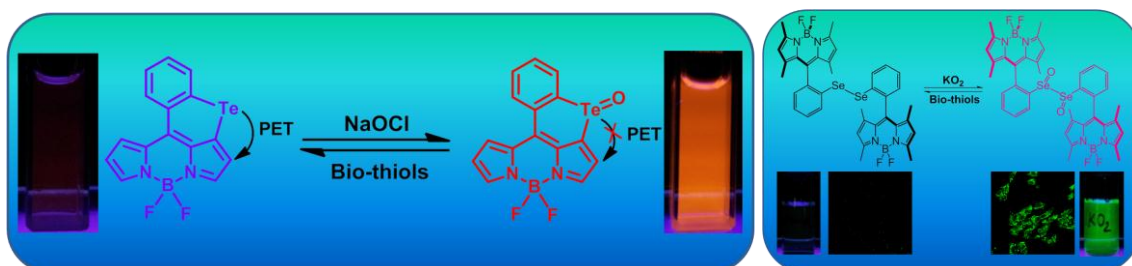
1. Ms. Pratiksha P. Deshmukh
2. Ms. Gauri S. Malankar

Ph.D. STUDENTS UNDER GUIDANCE: 03

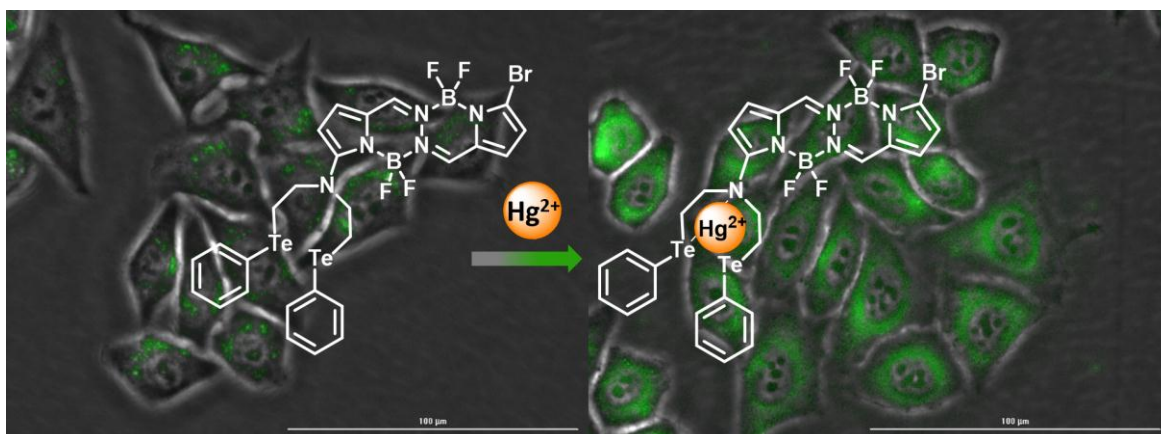
1. Mr. Kashinath S. Madibone
2. Mr. Srikrishna T. Salunke
3. Mr. Divyesh S. Shelar

RESEARCH INTEREST:

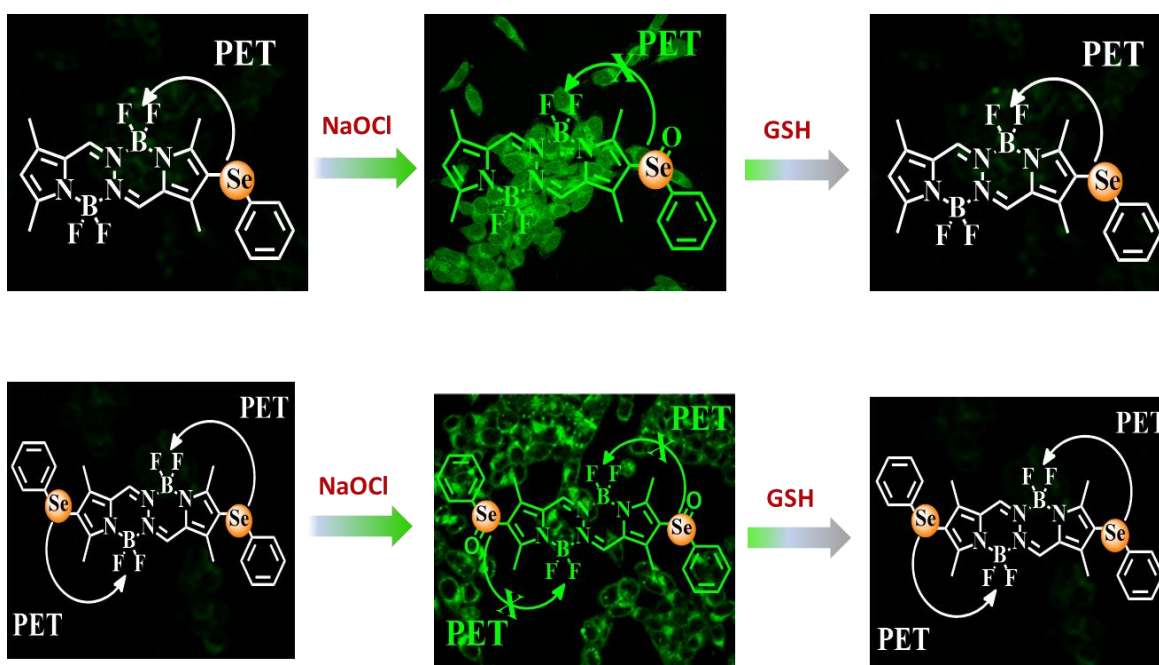
Synthesis and Bio-applications of Chalcogen-based Small Molecular Probes



Alzheimer's disease (AD) is the most common form of dementia. Till date there is no cure for the disease, which becomes more serious as it progresses, and will lead to death. People with AD experience difficulties communicating, learning, thinking and reasoning. According to recent studies the disease is suppose to be based three main hypothesis namely Amyloid cascade, Metal ions and Reactive Oxygen Species (ROS). As metal ions and ROS are among the causes of this disease it is very important to detect them selectively.

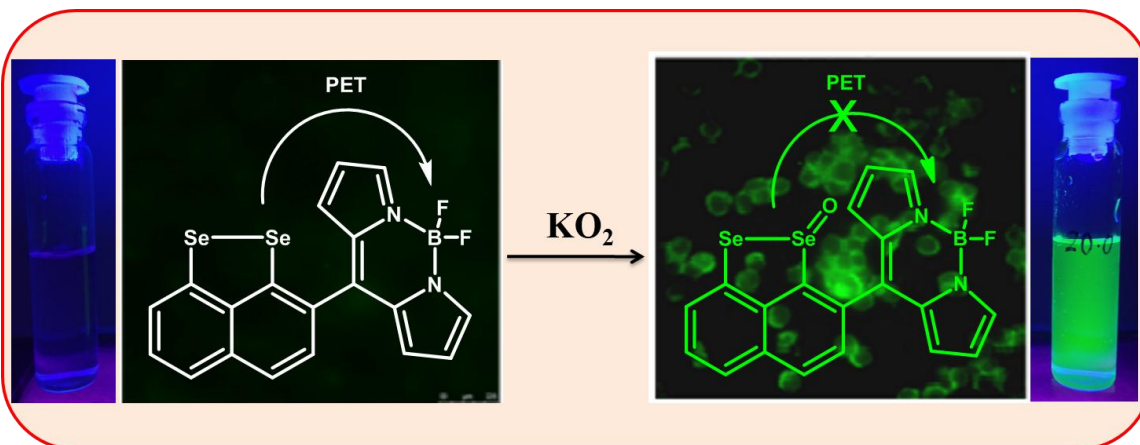


Dalton Trans., 2022, Accepted <https://doi.org/10.1039/D2DT01086K> (Impact Factor 4.390)



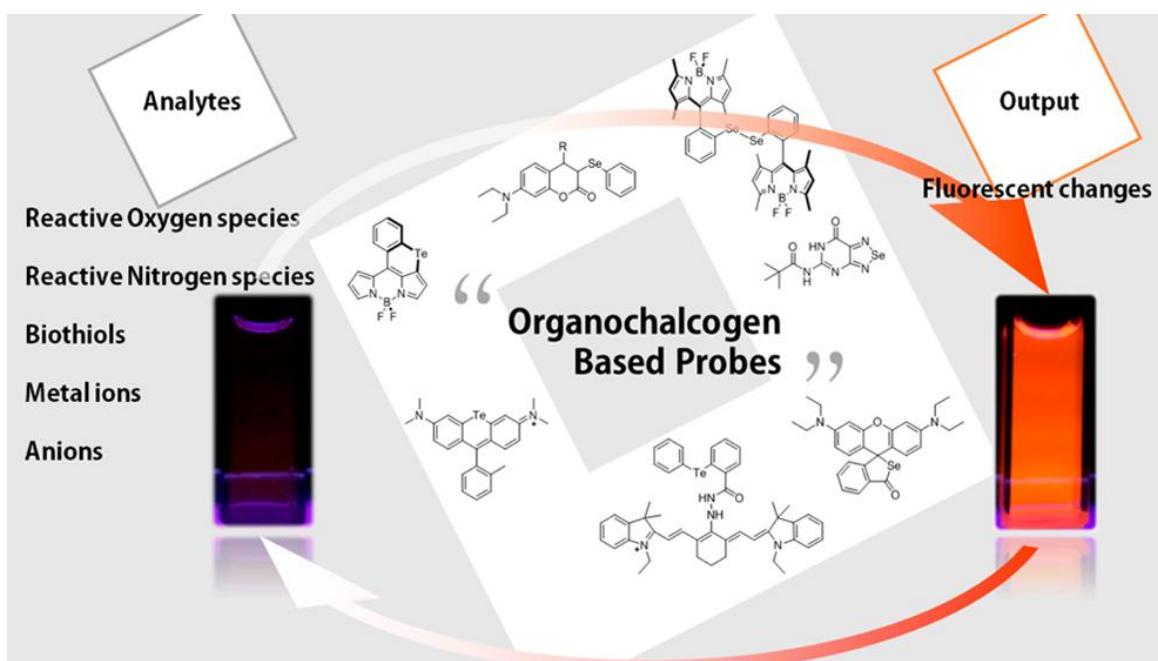
Analytica Chimica Acta 2021, 1150, 338205 (Impact Factor 6.558)

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ACS Omega 2020, 5, 14186–14193 (Impact Factor 3.512)

We are interested in designing and synthesis of molecular probes based-on common fluorophore (such as BODIPY, BOPHY, HBT, fluorescein, rhodamine, 1,8-naphthalamide, etc) and chalcogen atoms. Designing and synthesis of new chelating pockets with common fluorophore. These probes can be use for the selective and sensitive detection of various analytes (such as ROS, bio-thiols, amino acids, metal ions and anions) through fluorescence turn ‘ON’ or ‘OFF’.



RESEARCH SUMMARY:

Recently, we have started work on the synthesis and properties of fluorescence molecules: Reactive oxygen species (ROS) exist in, and are utilized by biology and neurobiology, yet they constitute so-called oxidative stress when present in unwanted excess. This may be a major contributing factor for diseases such as diabetes, cancer and molecular neurodegenerative disorders such as Alzheimer’s and Parkinson’s disease. Reactive oxygen species (ROS) are often mentioned in conjunction with nitrogen-based

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analogues (RNS), and include various species such as HOCl, OH[·], H₂O₂, NO, ONOO⁻, O₂^{·-}, tBuOOH and, tBuO[·]. Sensitive and selective detection of such species with fluorescence microscopy requires discrete synthetic molecular design and syntheses that are straight-forward and good yielding. A great number of novel heterocycles bearing single or multiple nitrogen, oxygen, sulphur, selenium or tellurium sites have been investigated over the years; many of these are heterocyclic pharmacophores bearing biological activity. One important challenge for organochalcogen chemists has been to synthesize novel heterocyclic systems and dichalcogen-based reversible probes. Thus, here we focused on the synthesis of novel annulated BODIPY chalcogenide (Se, Te) systems and diselenide-based BODIPY probes from their respective bis(*o*-formyl-phenyl)dichalcogenide intermediates. The annulated BODIPY selenide product was confirmed by X-ray diffraction. The red-shifted annulated BODIPY telluride version was found to be sensitive and selective for hypochlorite, reversible upon treatment with bio-thiols in water. Methyl-substituted BODIPY-based diselenide probe was found to be sensitive and selective for superoxide in giving [-Se(O)Se(O)-] oxidation. Probing was reversible through bio-thiols. Practical medicinal utility of BODIPY-based diselenide was demonstrated in MCF-7/ADR cancer cells for the detection of superoxide.

RESEARCH PROJECTS:

1) "START-UP RESEARCH GRANT (YOUNG SCIENTISTS)

Funding Agency : Science and Engineering Research Board (SERB), Department of Science and Technology (DST), Government of India.

Amount : Rs. 24.68 Lakhs

Period : 2015 – 2018

2) "START-UP GRANT FOR NEWLY RECRUITED FACULTY"

Funding Agency : University Grants Commission New Delhi

Amount : Rs. 6.00 Lakhs

Period : 2015 – 2017

3) Minor Research Project

Funding Agency : University of Mumbai

Amount : Rs. 40,000 /-

Period : 2016 – 2017

PATENT:

Korean Patent published on “Synthesis of Chalcogen based molecular probes” **Sudesh T. Manjare**, Youngsam Kim, David G. Churchill, Patent number: 10-1575150, Application number: 10-2014-0064649: Filing date: 28/05/2014: **Registration date: 01/12/2015**.

PUBLICATIONS: 28

28. Synthesis and Single Crystal X-ray Study of Phenylselenyl Embedded Coumarin-Based Sensors for Selective Detection of Superoxide, Gauri S. Malankar, Divyesh S. Shelar, R. J. Butcher and **Sudesh T. Manjare**, **Dalton Trans.**, **2022**, <https://doi.org/10.1039/D2DT01079H> (Impact Factor 4.390).

27. BOPHY based Fluorescent Probe for Hg²⁺ via an NTe₂ Chelation, Gauri S. Malankar, Divyesh S. Shelar, Manikandan M, Malay Patra, R. J. Butcher and **Sudesh T. Manjare** **Dalton Trans.**, **2022**, <https://doi.org/10.1039/D2DT01086K> (Impact Factor 4.390).

26. An efficient chemodosimeter for the detection of Hg(II) via diselenide oxidation, Pratiksha P. Deshmukh, Gauri S. Malankar, Arunima Sakunthala, Ambuja Navalkar, Samir K. Maji, Dhiraj P. Murale, Raju Saravanan and **Sudesh T. Manjare**, **Dalton Trans.**, **2022**, 51, 2269–2277 (Impact Factor 4.390).

25. A Ni-MOF based luminescent sensor for selective and rapid sensing of Fe(II) and Fe(III) ions, Ekta P. Asiwal, Divyesh S. Shelar, Chaturvedi S. Gujja, **Sudesh T. Manjare** and Suresh D. Pawar, **New J. Chem.**, **2022**, <https://doi.org/10.1039/D2NJ02263J> (Impact Factor 3.925).

24. Synthesis and study of organoselenium compound: DNA/Protein interactions, in vitro antibacterial, antioxidant, anti-inflammatory activities and anticancer activity against carcinoma cells, Divyesh S. Shelar, Pratik P. Dhavan, Pinky R. Singh, Bhaskar L. Jadhav, Shashikant P. Vaidya, **Sudesh T. Manjare**, **Journal of Molecular Structure**, **2021**, 1244, 130914 (Impact Factor 3.196).

23. Organoselenium-based BOPHY as a sensor for detection of hypochlorous acid in mammalian cells, Gauri S. Malankar, Arunima Sakunthala, Ambuja Navalkar, Samir K. Maji, Saravanan Raju, **Sudesh T. Manjare**, **Analytica Chimica Acta** **2021**, 1150, 338205 (Impact Factor 6.558).

22. Cyclic Organoselenide BODIPY-Based Probe: Targeting Superoxide in MCF-7 Cancer Cells, Kashinath S. Madibone, Pratiksha P. Deshmukh, Ambuja Navalkar, Samir K. Maji, Purav M. Badani, and **Sudesh T. Manjare**, **ACS Omega** **2020**, 5, 14186–14193 (Impact Factor 3.512).

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- 21.** Phenylselenenyl containing turn-on dibodipy probe for selective detection of superoxide in mammalian breast cancer cell line, Pratiksha P. Deshmukh, Ambuja Navalkar, Samir K. Maji, **Sudesh T. Manjare**, *Sensors & Actuators: B. Chemical*, **2019**, 281, 8–13 (Impact Factor 7.46).
- 20.** Novel intramolecular π – π -interaction in a BODIPY system by oxidation of a single selenium center: geometrical stamping and spectroscopic and spectrometric distinctions, Youngsam Kim, Taehong Jun, Sandip V. Mulay, **Sudesh T. Manjare**, Jinseong Kwak, Yunho Lee and David G. Churchill, *Dalton Trans.*, **2017**, **46**, 4111-4117 (Impact Factor 4.390).
- 19.** Transition metal mediated formation of dicationic diselenides stabilised by N-heterocyclic carbenes: designed synthesis, Sangeeta Yadav, **Sudesh T. Manjare**, Ray J. Butcher, Harkesh B. Singh, *Dalton Trans.* **2016**, 45, 12015-12027 (Impact Factor 4.390).
- 18.** Diselenide-based probe for the selective imaging of hypochlorite in living cancer cells, YoungSam Kim, Minsuk Choi, **Sudesh T. Manjare**, Sangyong Jon, David G. Churchill, *RSC Advances* **2016**, 6, 32013-32017 (Impact Factor 3.361).
- 17.** Solvent-controlled Novel Cu⁺ and Cu⁺²⁺ Fluorescent “Turn-ON” Probing, Yonghwang Ha, Dhiraj P. Murale, **Sudesh T. Manjare**, Minseong Kim, Jeong A Jeong, David G. Churchill, *Bull. Korean Chem. Soc.* **2016**, 37, 69-76 (Impact Factor 0.969).
- 16.** Bis(chalcogenones) as pincer ligands: isolation and Heck activity of the selone-ligated unsymmetrical C,C,Se-Pd pincer complex, Ninad Ghavale, **Sudesh T. Manjare**, Harkesh B. Singh, Ray J. Butcher, *Dalton Trans.* **2015**, 44, 11893-11900 (Impact Factor 4.390).
- 15.** H⁺-Assisted Fluorescent Differentiation of Cu⁺ and Cu²⁺: Effect of Al³⁺-induced acidity on chemical sensing and generation of two novel and independent logic gating pathways, Yonghwang Ha, Dhiraj P. Murale, Changsuk Yun, **Sudesh T. Manjare**, Hyungjun Kim, Juhyoun Kwak, Yoon Sup Lee, David G. Churchill, *Chem. Commun.*, **2015**, 51, 6357 (Impact Factor 6.222).
- 14.** Selenium- and Tellurium-Containing Fluorescent Molecular Probes for the Detection of Biologically Important Analytes, **Sudesh T. Manjare**, Youngsam Kim, David G. Churchill, *Acc. Chem. Res.* **2014**, 47, 2985–2998 (Impact Factor 22.384).
- 13.** A selective fluorescent probe for cysteine and its imaging in live cells, Youngsam Kim, Minsuk Choi, Seokjun Seo, **Sudesh T. Manjare**, Sangyong Jon David G. Churchill, *RSC Adv.*, **2014**, 4, 64183–64186 (Impact Factor 3.361).
- 12.** Crystal structure of (N¹-benzyl-N¹,N²,N²-trimethylethane-1,2-diamine-k²N,N²)dichloridomercury(II), **Sudesh T. Manjare**, Harkesh B. Singh, Ray J. Butcher *Acta Cryst.* **2014**, E70, 118-120 (Impact Factor 1.172).

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11. Selective and Sensitive Superoxide Detection with a New Diselenide Based Molecular Probe in Living Breast Cancer Cells, **Sudesh T. Manjare**, Sungsoo Kim, Won Do Heo, David G. Churchill *Org. Lett.* **2014**, *16*, 410–412 (Impact Factor 6.005).
10. Facile meso-BODIPY Annulation and Selective Sensing of Hypochlorite in Water, **Sudesh T. Manjare**, Jin Kim, Yunho Lee, David G. Churchill *Org. Lett.* **2014**, *16*, 520–523 (Impact Factor 6.005).
9. Fluorescence probing of the ferric Fenton reaction via novel chelation, Dhiraj P. Murale, **Sudesh T. Manjare**, Yoon-Sup Lee, David G. Churchill *Chem. Commun.*, **2014**, *50*, 359–361 (Impact Factor 6.222).
8. Novel selective and reversible Zn²⁺-assisted biological phosphate “turn-on” probing via attenuation of ligand hydrolysis through stable aryl-hydrazone salicylaldehyde conjugation, Olga G. Tsay, **Sudesh T. Manjare**, Hyungjun Kim, Kang Mun Lee, David G. Churchill *Inorg. Chem.* **2013**, *52*, 10052–10061 (Impact Factor 5.165).
7. Redox Reaction between Main-Group Elements (Te, Sn, Bi) and N-Heterocyclic-Carbene-Derived Selenium Halides: A Facile Method for the Preparation of Monomeric Halides, **Sudesh T. Manjare**, Sangeeta Yadav, Ray J. Butcher, Harkesh B. Singh, *Eur. J. Inorg. Chem.* **2013**, 5344–5357 (Impact Factor 2.524).
6. Oxidation of Carbene Derived Selenium Diiodide with Silver Tetrafluoroborate: Isolation of Iodonium Ion Complexes with Selenones, **Sudesh T. Manjare**, Ray J. Butcher, Harkesh B. Singh *Eur. J. Inorg. Chem.* **2013**, 2161–2166 (Impact Factor 2.524).
5. Synthesis and Glutathione Peroxidase-like activity of N-heterocyclic carbene derived cationic diselenides, **Sudesh T. Manjare**, Ray J. Butcher, Harkesh B. Singh *Tetrahedron* **2012**, *68*, 10561-10566 (Impact Factor 2.457).
4. Facile Synthesis of Benzazolin-2-chalcogenones: Nature of the Carbon-Chalcogen Bond, **Sudesh T. Manjare**, Sagar Sharma, Harkesh B. Singh, Ray J. Butcher *J. Organomet. Chem.* **2012**, *717*, 61-74 (Impact Factor 2.369).
3. N-[2-(2-Bromobenzylamino)phenyl]-N-Butylformamide, **Sudesh T. Manjare**, Ray J. Butcher, Harkesh B. Singh *Acta Cryst.* **2009**, *E65*, o2826 (Impact Factor 1.172).
2. 1-(2-Bromobenzyl)-3-isopropylbenzimidazol-2-one, **Sudesh T. Manjare**, Ray J. Butcher, Nidhi Goel, Udai P. Singh, Harkesh B. Singh *Acta Cryst.* **2009**, *E65*, o2836 (Impact Factor 1.172).
1. N-(2-Bromobenzyl)-N'-(2-pyridyl)-benzene-1,2-diamine, **Sudesh T. Manjare**, Harkesh B. Singh, Ray J. Butcher *Acta Cryst.* **2009**, *E65*, o2640 (Impact Factor 1.172).

PRESENTATIONS IN CONFERENCES:

1. **Invited talk at Main Group Chemistry Webinar** on Group 16 elements in Chemical Biology, Organized by Tokai University, Japan and Korea Advanced Institute of Science and Technology (KAIST), South Korea on 19th May **2022**.
2. **Invited talk at National Conference** on Green Technology for Sustainable Development on 14th February, **2020** at Arts, Science and Commerce College, Kolhar, Maharashtra.
3. **Invited talk at National Conference** on Advanced Perspectives in Chemical, Material and Life Sciences Organized by Eknath Sitaram Divekar College Varvand, Maharashtra on 18th January **2019**.
4. **Invited talk at National Conference** on Innovation and Sustainable Development made by Chemistry in 21st Century at Hutatma Rajguru Mahavidyalaya, Rajgurunagar, Maharashtra on 7th January **2019**.
5. **Invited talk at NET-SET Guidance workshop in Chemistry** on 19th January, **2018** at T. C. College, Baramati, Maharashtra.
6. **Invited talk at National Conference** on Research and Development in Synthetic Organic Chemistry on 29th December, **2017** at Dadasaheb Rupwate Science College Akole, Maharashtra.
7. **Invited talk at 54th Annual Convention of Chemists of Indian Chemical Society** on 25th December, **2017** at Uka Tarasadia University, Bardoli, Gujarat.
8. **Invited talk at National Conference** on Frontiers of Chemistry and Materials – 2015 on 14th February, **2015** at T. C. College, Baramati, Maharashtra.
9. Selective, Sensitive and Reversible Detection of ROS with a Novel *Chalcogen*-based Molecular Probes, **Sudesh T. Manjare**, David G. Churchill invitation for **Oral presentation** in the (Korean Chemical Society) KCS meeting, Korea (April 16~18, **2014**).
10. Selective, Sensitive and Reversible Superoxide Detection with a New Diselenide-based Molecular Probe: Clear Detection Capabilities in Living Breast Cancer Cells, **Sudesh T. Manjare**, Sungsoo Kim, Won Do Heo, David G. Churchill **poster presentation** at the “6th Korea Chemosensor Symposium” held at Seoul, South Korea (January **2014**) and received **best poster award**.
11. Oxidation of Elemental Tellurium with *N*-Heterocyclic Carbene Derived Selenium Halides, **Sudesh T. Manjare**, Harkesh B. Singh and Ray J. Butcher, **oral presentation** and poster presentation at HALCHEM-VI - Sixth International Meeting on Halogen Chemistry at **Indian Institute of Science, Bangalore**, India (Dec. 8-11, **2012**).

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12. Synthesis and Characterization of Monomeric Tellurium Tetrahalides Stabilized by Selenones, **Sudesh T. Manjare**, Harkesh B. Singh and Ray J. Butcher, poster presentation at the national symposium on the “*New Horizons in Chemistry*” held at **Department of Chemistry, IIT Bombay**, India (Oct. 3-4, **2011**).
13. Synthesis and Characterization of Monomeric Tellurium Tetrahalides Stabilized by Selenones, **Sudesh T. Manjare**, Harkesh B. Singh and Ray J. Butcher, poster presentation at *3rd Indo-German Symposium on “Frontiers of Chemistry”* held at **Department of Chemistry, IIT-Bombay**, India (Sep. 27-28, **2011**).
14. Synthesis and Characterization of Chalcogenone Compounds, **Sudesh T. Manjare**, Harkesh B. Singh and Ray J. Butcher, Presented a poster at the “*Royal Society of Chemistry (RSC) Symposium*” on the Chemical Sciences at the **Department of chemistry, IIT Bombay**, India (**2009**).

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