

Ratnasekhar Ch, Ph.D

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09- 2020 Scientist, CSIR-CIMAP, Lucknow, India
to present

Research experience

- 2019-2020 Project Investigator, Queen's University Belfast, United Kingdom
2018-2019 Research Fellow, Queen's University Belfast, United Kingdom
Project: Fingerprinting using metabolomics approach
2016-2018 Research Associate, UCL-Institute of Neurology, London, United Kingdom
Project: Studied non-transcriptional-translational Metabolic oscillations in mice, Drosophila and U2OS cells
2015-2017 Research associate, University of Cambridge, United Kingdom
Project: Investigated metabolic mechanisms regulate red-ox oscillations in Human red blood cells- Metabolic clock, using metabolomics approach
Jan-Apr 2015 Associate Scientist, ITC- Life Sciences, Bangalore, India

Education

- 2010-2015 Ph.D. (Metabolomics), CSIR-IITR, ACSIR, India
Thesis title: Metabolic investigation of effect of xenobiotics on human & model organisms
2005-2007 M. Sc. Analytical Chemistry, Andhra University, India
2002-2005 B. Sc. Chemistry, Andhra University, India

Visiting Scientist

- 01-02, 2020 Institute for Metabolomics, University of Vienna, Austria
2016-2018 The Francis Crick Institute, London, United Kingdom

Pre-doctoral research experience

- 2009-2010 National Institute of Pharmaceutical education & research, Mohali, India
2008-2009 Analytical chemist, Aptuit Laurus Pharmaceutical Pvt Ltd, India
Analytical method development

Grants/Fellowships Awarded

- 2015-2018 MRC-Wellcome Trust post-doctoral fellowship, University of Cambridge, University college London (UCL), United Kingdom
2012-2015 Senior Research Fellowship, CSIR-NET (Chemical Sciences), India
2010-2012 Junior Research Fellowship, CSIR-NET (Chemical Sciences), India
2009-2010 Junior Research Fellowship, UGC-NET (Chemical Sciences), India.

Professional memberships

- MRSC Royal Society of Chemistry, United Kingdom (ID: 667961)
MRSB Royal Society of Biology, United Kingdom (ID: P0136871)

Member International Metabolomics Society (ID: 112059437)
Member Cambridge Metabolic Network
Member Indian Society for Mass Spectrometry

Teaching experience

2018-2019 Visiting fellow for International postgraduate students, Queen's University Belfast, United Kingdom. **Courses:** Metabolomics, Analytical chemistry, Mass Spectrometry, Chromatography, Spectroscopy, Chemometrics, advanced analytical techniques

Skills set

- Metabolomics (Untargeted & targeted), Fluxomics, lipidomics, expertise in LC-MS/MS (Thermo Orbitrap Q-Excactive, Agilent QTOF), GC-MS/MS (Thermo QXLS, Agilent MSD), Metallomics, ICP-MS/MS (Agilent), Cell culture, Western blot, Proteomics, Biochemical assays, Omics data analysis, chemometric analysis, **Model organisms worked with** mice, *Drosophila melanogaster*, *C.elegans*, human, Cyanobacteria.

Editorial & Peer reviewer

- Academic Editor- PLOS ONE (ISSN: 1932-6203),
- Reviewer-PLOS Biology (ISSN: 1545-7885), Nature Scientific Reports (Nature publishing Group, ISSN: 2045-2322), Electrophoresis (ISSN: 0173-0835), Critical reviews in Toxicology (1547-6898)

List of Publications (Total **24**; first author **12**, co-author **12**; *Corresponding author; # equal first author; I.F = 5 year impact factor; Total citations = 552, h-index = 15; i10-index=19)

1. **Ratnasekhar Ch***, Guillaume Rey*, Sandipan Ray, Utham Valekunja, Paul C. Driscoll, Radoslaw Lach, Pawan Kumar Jha, Mariana Silva Dos Santos, James Ellis, James I. MacRae and Akhilesh B. “Rhythmic glucose metabolism regulates red-ox oscillations in human red blood cells for time keeping and energy balance”. **Nature communications 2020** (Accepted). (I.F 12.12)
2. **Ratnasekhar Ch***, Olivier Chevallier, Christopher Elliott. Metabolomics reveal Circadian control of Cellular metabolism. **Trends in Analytical Chemistry. 2020, 115986.** (I.F 9.8)
3. Guillaume Rey, Nikollay B Millev Utham Velekunja, **Ratnasekhar Ch**, Sandipan Ray, Maraiana Silva Dos Santos, Andras D Nagy, Robin Antrobus, James I Macrae, Akhilesh B Reddy. “Metabolic oscillations on the circadian time scale in Drosophila cells lacking clock genes”. **Molecular Systems Biology, 2018, 14(8), E8376. Cover page article.** (I.F 9.9)
4. **Ratnasekhar Ch**, Amit Kumar Singh, Manoj Pathak, Amarnath S, Chandrasekharan N Kesavachandran, Vipin Bihari, Mohana Krishna Reddy Mudiam. “Saliva and Urine metabolic profiling reveals altered amino acid and energy metabolism for complex pesticide exposure in human”. **Chemosphere, 2019, 226, 636.** (I.F 5.7)

5. **Ratnasekhar Ch#**, Shukla AK, Pragma P, Chauhan HS, Patel DK, Chowdhuri DK, MMK Reddy. “Metabolomic analysis provides insights on paraquat induced Parkinson like symptoms in *Drosophila melanogaster*”. **Molecular Neurobiology** **2016**, **53(1)**, **253-269**. (I.F 5.1)
6. **Ratnasekhar Ch***, Olivier Chevallier, Philip McCarron, Terence F McGrath, Di Wu, Arun P Kapil, Mary McBride, Christopher Elliott. Metabolomic fingerprinting of volatile organic compounds for the geographical discrimination of rice samples from China, Vietnam and India. **Food Chemistry**. **2020**, **334**, **127553**. (I.F 6.3)
7. **Ratnasekhar Ch**, Sonane M, Satish A, Mohana Krishna Reddy Mudiam. “Metabolomics reveals the perturbation in the metabolome of *Caenorhabditis elegans* exposed to titanium dioxide nanoparticles”. **Nanotoxicology**, **2015**, **9(8)**, **994-1004**. (I.F 6.2)
8. **Ratnasekhar Ch**, Amit Kumar singh, Pathya Pandey, Saxena P.N, Mohana Krishna reddy mudiam. “Identifying metabolic perturbations in earthworm induced by cypermethrin using gas-chromatography mass spectrometry-based metabolomics approach”. **Nature Scientific Reports** **2015**, **5**, **15674**. (I.F 4.6)
9. Gati Krushna P, **Ratnasekhar Ch**, Mohana krishn mudiam, Vipin M V, Sheikh R, Mukul Das. “Activity guided chemo toxic profiling of *Cassia occidentalis*: Detection of toxic compounds in body fluids of CO exposed patients and experimental rats”. **ACS Chemical research in toxicology**. **2015**, **28**, **6**, **1120-1132**. (I.F 3.2)
10. Manoj Kumar Gutpa, Rajeev Jain, Pratibha Singh, **Ratnasekhar Ch**, Mohana Krishna mudiam. “Determination of urinary PAH metabolites using DLLME hyphenated to injector port silylation and GC-MS/MS. **Journal of Analytical Toxicology**. **2015**, **39(5)**, **365-373**. (I.F 2.9)
11. Snighda Misra, Ajay Kumar, **Ratnasekhar Ch**, Vandana Sharma, Mohana Krishna Reddy mudaim, Kristipati Ravi Ram. “Exposure to endosulfan influences sperm competition in *Drosophila melanogaster*” **Nature Scientific Reports**, **2014**, **4**, **7433**. (I.F 4.6)
12. Snighda Misra, Anshuman Singh, **Ratnasekhar Ch**, Vandana Sharma, Mohana Krishna Reddy mudiam, Kristipati Ravi Ram. “Identification of *Drosophila*-based endpoints for the assessment of xenobiotic-mediated male reproductive adversities”. **Toxicological Sciences**, **2014**, **141(1)**, **278-291**. (I.F 4.1)
13. Syed Faix M, Ashish Dwivedi, Neera Yadav, **Ratnasekhar Ch**, Hari Narayan K, Mohan KR Mudiam, Gajendra Singh, Ratan S Ray. “Superoxide mediated photo modification and DNA damage induced apoptosis by Benzo(a)anthracen via mitochondrial mediated pathway. **Journal of Photochemistry and Photobiology B: Biology**, **2015**, **142**, **92-102**. (I.F 4.0)
14. **Ratnasekhar Ch#**, Mohana Krishna reddy mudiam, Sacena P.N. “Gas chromatography-mass spectrometry-based metabolomics approach for the optimization and toxicity evaluation of the earthworm sub-lethal responses to carbofuran”. **PLOS ONE**. **2013**, **8**, **e81077**. (I.F 2.8)

15. **Ratnasekhar Ch#**, Mohana Krishna reddy mudiam. “Ultrasound assisted one step rapid derivatization and dispersive liquid-liquid microextraction followed by gas chromatography mass spectrometry determination of amino acids in complex matrices”. **Journal of Chromatography A**, 2013, 1291, 10-18. (I.F 3.9)
16. Rajeev Jain, Mohana Krishna Reddy Mudiam, Abhishek Chauhan, **Ratnasekhar Ch**, RC Murthy, Haider A Khan. “Simultaneous derivatization and preconcentration of parabens in food and other matrices by isobutyl chloroformate and dispersive liquid-liquid microextraction followed by gas chromatography-mass spectrometry”. **Food Chemistry**, 2013, 141, 436-443. (I.F 6.2)
17. Rajeev Jain Mohana Krishna Reddy Mudiam, Abhishek Chauhan, **Ratnasekhar Ch**, Haider A Khan, RC Murthy. “Ultrasound assisted dispersive liquid-liquid microextraction followed by injector port silylation: a novel method for rapid determination of quinine in urine by GC-MS”. **Bioanalysis**, 2013, 5(18), 2277-2286. (I.F 2.5)
18. Mohana Krishna reddy mudiam, Rajeev jain, Meenu Varshney, **Ratnasekhar Ch**, Abhishek Chauhan, Sudhir Kumar Goyal, Haider A Khan, RC Murthy. In matrix derivatization of trichloroethylene metabolites in human plasma with methyl chloroformate and their determination by solid-phase microextraction gas chromatography-mass spectrometry. **Journal of Chromatography B**, 2013, 925, 63-69. (I.F 2.8)
19. Mohana Krishna reddy mudiam, Abhishek Chauhan Krishna P singh, Shailendar K Gupta, Rajeev Jain, **Ratnasekhar Ch**, Murthy RC. “Determination of t,t-muconic acid in urine samples using a molecular imprinted polymer combined with simultaneous ethyl chloroformate derivatization and pre-concentration by dispersive liquid-liquid microextraction. **Analytical and Bioanalytical Chemistry**, 2013, 405(1), 341-349. (I.F 3.4)
20. **Ratnasekhar Ch#**, Mohana Krishna reddy mudiam, Rajeev Jain, P.N Saxena, Abhishek Chauhan, R.C. Murthy. “Rapid and simultaneous determination of twenty amino acids in complex biological and food samples by solid-phase micro extraction and gas chromatography mass spectrometry with the aid of experimental design after ethyl chloroformate derivatization”. **Journal of Chromatography B**, 2012, 907, 56-64 (I.F 2.8)
21. **Ratnasekhar Ch#**, Mohana Krishna reddy mudiam. “Optimization of UA-DLLME by experimental design methodologies for the simultaneous determination endosulfan and its metabolites in soil and urine samples by GC-MS”. **Analytical methods**, 2012, 4, 3855-3863. (I.F 2.2)
22. **Ratnasekhar Ch#**, Singh AK, Chaudhari BP, Singh D, Chattopadhyay BD. “Evaluating metabolic responses in mice to nanosized titanium dioxide particles using gas chromatography mass spectrometry”. **Austin journal of analytical and pharmaceutical chemistry**, 2017, 4(2), 1085. (I.F 2.0)

23. Smita Kumari, Raj Kumar Regar, Abhay Bajaj, **Ratnasekhar Ch**, Gubbala Naga Benkata Satyanarayana, Mohana Krishna Reddy Mudiam, Natesan Manickam. Simultaneous biodegradation of polyaromatic hydrocarbons by a *Stenotrophomonas* sp: Characterisation of nid Genes and Effect of Surfactants and Degradation. **Indian J Microbial** 2017, **57(1)**, 60-67. (I.F 1.9)
24. Mohana Krishna reddy mudaim, Abhishek Chauhan, Rajeev Jain, **Ratnasekhar Ch**, Ghizal Fatima, Ekta Malhotra, R C Murthy. Development, validation and comparison of two microextraction techniques for the rapid and sensitive determination of pregabalin in urine and pharmaceutical formulations after ethyl chloroformate derivatization followed by gas chromatography-mass spectrometry. **Journal of Pharmaceutical and Biomedical analysis**. 2012, **70**, 310-319. (I.F 3.1)
25. **Ratnasekhar Ch**, Mohit Tyagi, PR Patil, KPR Kartha. "DABCO: an efficient promoter for the acetylation of carbohydrates and other substances under solvent free conditions". **Tetrahedron Letters**, **52 (44)**, 5841-5846. (I.F 1.9)

Conference Organisation

Organised YIM (Young investigator Meeting) at University of Cambridge for the year 2015

List of Presentations and Conferences

- Daily regulated glucose metabolism regulates circadian clocks. 15th International annual conference of the metabolomics society, Metabolomics, The Hague, Netherlands, June 23-27, 2019
Ratnasekhar Ch*, Guillaume Rey*, Sandipan Ray, Utham Valekunja, Paul C. Driscoll, Radoslaw Lach, Pawan Kumar Jha, Mariana Silva Dos Santos, James Ellis, James I. MacRae and Akhilesh B.
- Metabolomics approach in human health risk assessment of pesticides
Ratnasekhar Ch, Mudiam MKRM, Keshav Chandran. 10th annual international conference of the metabolomic society, Japan 23-26 June, 2014
- Metabolomic study of *Caenorhabditis elegans* for the toxicity evaluation of sub-lethal responses to titanium dioxide nanoparticles using gas chromatography-mass spectrometry combined with pattern recognition approach and ingenuity pathway analysis.
Ratnasekhar Ch; Sonane M; Satish A; Mudiam MKRM. 9th annual international conference of the metabolomic society, Glasgow, UK, 1-4 July 2013
- Gas chromatography- Mass spectrometry based metabolomic approach for the optimization and toxicity evaluation of the earthworm sub-lethal responses to carbofuran. Mohana Krishna Reddy Mudiam, **Ratnasekhar Ch**, Saxena, P.N. International conference on Environmental impact on
- human health and therapeutic challenges, Sri Venkateswara University India, December 20-22, 2012)
- Gas chromatography- Mass spectrometry based metabolomic study of *Caenorhabditis elegans* for the toxicity evaluation of sub-lethal responses of titanium dioxide nanoparticles.

Ratnasekhar Ch, Mohana Krishna Reddy Mudiam, Saxena, P.N. 12th ISMAS triennial international conference on mass spectrometry, Goa, India, March 3-8, 2013

- Targeted metabolomic profiling of amino acids in human hair samples using gas chromatography-mass spectrometry as an indicator for pesticide exposure.

Ratnasekhar Ch Mohana Krishna Reddy Mudiam. International conference on Bio diversity and sustainable energy development. conducted by Omics group, Hyderabad, India. September 14-15, 2012)

- SPME-mass spectrometry based targeted amino acid profiling in human urine samples.

Ratnasekhar Ch, Mohana Krishna Reddy Mudiam. International symposium on “Recent advances on Green Chemistry and Chromatographic Sciences held on 12-14th January 2012 at Faridabad, India.