

**CURRICULUM VITAE****Ashutosh Singh, PhD**

Institution: Assistant Professor, Department of Biochemistry, University of Lucknow, Lucknow, Uttar Pradesh, PO-226007, India.

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**Educational Qualification:****Dec-2013 – Apr 2016:** Postdoctoral Associate at Dept. of Microbiology, Life Sciences Building, Stony Brook University, New York, US.**2013 – Jan-Nov:** Senior Research Fellow at School of Life Sciences (DBT-India sponsored project), Jawaharlal Nehru University, New Delhi, INDIA.**2008 – 2012:** Ph.D. in Life Sciences from School of Life Sciences, Jawaharlal Nehru University, New Delhi, INDIA.**2007 – 2008:** Pre-Ph.D. coursework 8.50 C.G.P.A. (**1<sup>st</sup> Position**) from School of Life Sciences, Jawaharlal Nehru University, New Delhi, INDIA.**2005 – 2007:** M.Sc. Biochemistry with First Division (**1<sup>st</sup> Position**) from Dept. of Biochemistry, University of Lucknow, Lucknow, UP, INDIA.**2001 – 2005:** B.Sc. with First Division from University of Lucknow, Lucknow, UP, INDIA with subjects Zoology, Botany and Chemistry.**1999 – 2001:** Intermediate with First Division from New Way School, Lucknow, UP, INDIA.**1998 – 1999:** High School with First Division from Modern School, Lucknow, UP, INDIA.**Awards & Fellowships:**

1. **Professor P.S. Krishnan Gold Medal**, 1<sup>st</sup> Position, M.Sc. Biochemistry, 2007.
2. Qualified **GATE**, India 2008.
3. Qualified **CSIR-JRF** (Junior Research Fellowship) and Eligibility for Lectureship (**NET**), CSIR, India, 2008.
4. Awarded **ASM International Fellowship for Asia**, from ASM, USA, 2009.
5. Awarded **Corpus Fund Fellowship**, JNU, New Delhi, 2009.
6. Awarded **Trans-YTF grant**, FEBS, 2010.
7. Awarded **bursary from IMC9 Conference Secretariat**, IMA, 2010.
8. Awarded **travel grant from Council of Scientific and Industrial Research**, 2010.
9. Awarded **UGC-Plan Fellowship**, UGC, 2007.
10. Awarded **UGC-Meritorious Fellowship**, UGC, 2008.
11. Awarded **second prize in oral presentation**, BIOSPARKS- 2011, 2011.
12. Awarded **CSIR-SRF**, CSIR, India, 2011 – 2012.
13. Awarded **travel grant from Department of Science & Technology**, India, 2012.
14. Awarded **ASM Student travel grant**, ASM, USA, 2012.
15. Awarded **ASM Young Ambassador to India**, ASM, USA, 2013.

**Research Experience:****Department of Biochemistry, University of Lucknow, UP, India. April 2016 to Present**

*Trichophyton rubrum* is the major cause of onychomycosis (fungal nail infection) in humans, but can also invade the skin and hair, causing infection associated with substantial morbidity. Onychomycosis is quite common in the general adult population, probably 5-25% rate with an increasing incidence in elderly people. *T. rubrum* causes long term symptoms lasting from several months to years in humans. These include severe skin rash, nail fall, acute pain in the affected area and many more, resulting in a painful way of living in infected patients. *T. rubrum* hyphae are often interwoven with the nail plate, preventing effective antifungal drugs to reach its growth tip. Some patients

with compromised immune system also present with superficial white onychomycosis. The effective drug remedies against these infections are limited and becoming out dated. Drugs like terbinafine, itraconazole, griseofulvin and amphotericin B are not very affective, only about 80% effective for sensitive strains, after months of treatment. Resistant strains are almost impossible to treat. Additionally, these prolonged treatments result in high intracellular toxicity in patients. Therefore, there is an urgent need to search for the new and improved drug targets.

Sphingolipids are the unique components of fungal systems that present an ideal drug target, primarily because of the uniqueness in their chemical structure and differences in biosynthetic processes compared to humans. Additionally, in fungi these sphingolipids perform important functions like signaling, filamentation, maintaining membrane homeostasis as well as the virulence and pathogenicity traits. Interestingly, many pathogenic fungi share common structure of sphingolipid species, making them suitable targets for broad spectrum antifungals.

Presently I am working to characterize the biosynthesis of complex sphingolipids in a tropical human fungal pathogen *T. rubrum*. This study mainly focuses on the glucosylceramide synthase and its role in *T. rubrum* pathogenesis.

**Stony Brook University, Stony Brook, USA. December 2013 to April 2016.**

**Postdoctoral Associate:** My post-doctoral work is focused on a human pathogenic fungus *Cryptococcus neoformans*. Notwithstanding that there are effective drugs available against this fungus but so are the cases of resistance. Majority of these drugs are more often than not targeting the unique lipid components of this fungus. However, due to frequently encountered resistance cases among the available drugs, there is an urgent need to search for the new and improved drug targets. One of the unique key components of fungal system is the sphingolipids. Sphingolipids are not only involved in processes like signaling, filamentation, membrane homeostasis but also the virulence and pathogenicity traits. Therefore, my work was specifically focused to understand the detailed sphingolipid metabolism of *C. neoformans*; and look for a novel component which may be exploited as a candidate for drug targets. We employed mass spectrometry based analysis to quantify the major and minor sphingolipid classes including as well as the molecular species therein. Other lipid classes under study are sterols, sterol glycosides, fatty acids and phosphoglycerides. The projects under study were:

- Detailed characterization of sphingolipids, phospholipids, fatty acyls, sterols, diacyl glycerols and triacylglycerols of *C. neoformans*.
- Analysis of sphingolipid metabolism of *C. neoformans*, *C. gattii*, *Candida albicans*, *Aspergillus fumigates* and *Saccharomyces cerevisiae*.
- Analyses of lipid metabolism changes in mammalian cell lines and macrophages during fungal infection.
- Role of sterols in membrane homeostasis of sphingolipid biosynthesis mutants in pathogenic fungi.
- Characterization of sterol glycosides of *C. neoformans*.
- Characterization of Glucosyl Ceramide biosynthesis mutants of *A. nidulans*, *P. boydii* and *A. fumigatus*.
- LCMS based enzymatic activity assays of the lipid biosynthetic enzymes in pathogenic fungi.
- Stable isotope labeling for analyzing TCA cycle intermediates of pathogenic fungi and mammalian macrophages using GCMS.

**Membrane Biology Laboratory, School of Life Sciences (SLS), JNU New Delhi, INDIA. August 2007 to November 2013.**

**PhD:** In my Ph.D. project entitled “*Antifungal resistance: a lipidomics approach*”, I tried to elucidate the link between lipid composition and MDR in pathogenic *Candida*. *Candida* species have emerged as prevalent opportunistic pathogens in immuno-compromised patients. In *Candida*, lipid metabolism has been a prime target for strategies that kill these pathogenic organisms. However, increasing cases of multidrug resistance (MDR) against the known antifungal drugs demand better drug targets, and emphasis has been placed again on lipid metabolic enzymes as potential targets. One roadblock has been the identification of lipid biosynthetic pathways that might provide appropriate targets, partly because we have lacked the ability to analyze the functions of these pathways in a manner. Firstly, Using MS-based approaches, we developed a high-throughput platform to examine *Candida* lipids in greater depth. Next, to address whether changes in *Candida* lipidome correspond to high drug tolerance, we performed comparative lipidomics on several azole sensitive and resistant isogenic isolates of *C. albicans*. Further,

by lipid profiling of a sequential series of single isolate from an AIDS patient, we were able to provide an evidence of a cross-talk between mitochondrial lipid homeostasis, cell wall integrity and azole tolerance.

We could also implicate this lipidomics platform towards understanding the relationship between cellular iron, membrane lipid homeostasis and drug susceptibilities of *Candida*; identification of targets of known antifungals like curcumin, malachite green, etc. in the lipid metabolism of *Candida*; assigning the physiological traits to the uncharacterized drug transporters.

**Post PhD (DBT-SRF):** Post-PhD, I worked as a senior research fellow at Membrane Biology Laboratory, School of Life Sciences (SLS), JNU New Delhi, INDIA in a DBT India sponsored project. My project involved the investigation of regulation of lipid metabolism in human pathogenic *C. albicans*. By using a combination of mutant variants and lipidomics, I am working to dissect out the kinases and transcription factors that directly or indirectly regulate lipid metabolism in *Candida albicans*. The other major project involved the study of 'lipid rafts', their composition and role in membrane organization during azole resistance in *C. albicans*.

#### **Kansas Lipidomics Research Center, June to August 2009.**

ASM International Fellowship for Asia was awarded by the American Society of Microbiology from 1<sup>st</sup> June to 1<sup>st</sup> September, 2009, to work at KLRC, Division of Biology, KSU, Manhattan, KS 66506-4901, USA, on my project entitled "*Lipidomics of Candida albicans in antifungal resistance*". During my visit to this facility, I participated in a complete formal training in "*Mass spectrometry-based profiling of complex lipids*", offered by Dr Ruth Welti and the associated lab members, through the Kansas State University's Dept. of Continuing Education. My work here was focused on the development of quantitative, high-throughput, mass-spectrometry-based lipid profiling technology and the application of this technology to identify alterations in membrane and in lipid metabolism.

#### **National Botanical Research Institute, Lucknow, U.P. INDIA, June to August 2007 as summer trainee**

This summer training was focused on training of "*Different Molecular Biology Techniques in Relation to Plants*", under the supervision of Dr. Vidhu A. Sane, Scientist C, Plant Gene Expression Laboratory, NBRI Lucknow, UP, INDIA.

**Broad areas of expertise:** Lipid Biochemistry, Structural and Molecular biology.

#### **Projects:**

1. "*Lipidomics of Candida albicans in antifungal resistance*", USD 5500, funded by American Society of Microbiology, USA, June 1<sup>st</sup> – August 31<sup>st</sup>, 2009. STATUS: Completed.
2. "*Manipulation of lipid biosynthesis to treat Trichophyton rubrum mediated onychomycosis*" (ID: 2019-3147), 17.18 lakhs, funded by ICMR, 2019-22. STATUS: Ongoing.

#### **Publications: 36**

1. **Ashutosh Singh**, Tulika Prasad, Khyati Kapoor, Ajeet Mandal, Mary Roth, Ruth Welti and Rajendra Prasad. **Phospholipidome of *Candida*: Each species of *Candida* has distinctive phospholipid molecular species.** *OMICS*. 2010 Dec;14(6):665-77. (IF 2.370, ISSN Number: 15362310, e-ISSN Number: 15578100, UGC Journal No. 27363)
2. **Ashutosh Singh** and Rajendra Prasad. **Comparative lipidomics of azole sensitive and resistant clinical isolates of *Candida albicans* reveals unexpected diversity in molecular lipid imprint.** *PLoS One*. 2011 Apr 29;6(4):e19266. (IF 2.766, ISSN Number: 19326203, e-ISSN Number: 19326203, UGC Journal No. 37933)
3. Saif Hameed, Sanjiveeni Dhamgaye, **Ashutosh Singh**, Shyamal K. Goswami and Rajendra Prasad. **Calcineurin Signaling and Membrane Lipid Homeostasis Regulates Iron Mediated Drug Susceptibilities in *Candida albicans*.** *PLoS One*. 2011 Apr 12;6(4):e18684. (IF 2.766, ISSN Number: 19326203, e-ISSN Number: 19326203, UGC Journal No. 37933)
4. Tânia R Cabrito, Miguel C Teixeira, **Ashutosh Singh**, Rajendra Prasad and Isabel Sá-Correia. **The yeast ABC transporter Pdr18 (ORF YNR070w) controls plasma membrane sterol composition, playing a role in multidrug resistance.** *Biochem J*. 2011 Dec 1;440(2):195-202. (IF 3.857, ISSN Number: 02646021, e-ISSN Number: 14708728, UGC Journal No. 14560)

5. Monika Sharma, Sanjiveeni Dhamgaye, **Ashutosh Singh**, and Rajendra Prasad. **Lipidome analysis reveals antifungal polyphenol curcumin affects membrane lipid homeostasis.** *Front Biosci* (Elite Ed). 2012 Jan 1;4:1195-209. (IF 2.349, ISSN Number: 19450494, e-ISSN Number: 19450508, UGC Journal No. 17716)
6. Sanjiveeni Dhamgaye, Frederic Devaux, Raman Manoharlal, Patrick Vandeputte, Abdul Haseeb Shah, **Ashutosh Singh**, Corinne Blugeon, Dominique Sanglard and Rajendra Prasad. **The antifungal effect of Malachite Green on *Candida albicans* involves multiple cellular pathways and is regulated by transcription regulators UPC2 and STP2.** *Antimicrob Agents Chemother.* 2012 Jan;56(1):495-506. (IF 4.255, ISSN Number: 00664804, e-ISSN Number: 10986596, UGC Journal No. 15824)
7. **Ashutosh Singh**, Vipin Yadav, and Rajendra Prasad. **Comparative lipidomics in clinical isolates of *Candida albicans* reveal crosstalk between mitochondria, cell wall integrity and azole resistance.** *PLOS ONE.* 2012;7(6):e39812. doi: 10.1371/journal.pone.0039812. (IF 2.766, ISSN Number: 19326203, e-ISSN Number: 19326203, UGC Journal No. 37933)
8. Ajeet Mandal, Antresh Kumar, **Ashutosh Singh**, Andrew Lynn, Khyati Kapoor and Rajendra Prasad. **A key structural domain of the *Candida albicans* Mdr1 protein.** *Biochem J.* 2012 Aug 1;445(3):313-22. doi: 10.1042/BJ20120190. (IF 3.857, ISSN Number: 02646021, e-ISSN Number: 14708728, UGC Journal No. 14560)
9. **Ashutosh Singh**, Kaushal Kumar Mahto and Rajendra Prasad. **Lipidomics and *in vitro* azole resistance in *Candida albicans*.** *OMICS.* 2013 Feb;17(2):84-93, doi: 10.1089/omi.2012.0075. (IF 2.370, ISSN Number: 15362310, e-ISSN Number: 15578100, UGC Journal No. 27363)
10. Rajendra Prasad and **Ashutosh Singh**. **Lipids of *Candida albicans* and their role in multidrug resistance.** *Current Genetics,* 2013 Nov;59(4):243-50. doi: 10.1007/s00294-013-0402-1. (IF 3.574, ISSN Number: 01728083, e-ISSN Number: 14320983, UGC Journal No. 14220)
11. Awanish Kumar, Sanjiveeni Dhamgaye, Indresh Kumar Maurya, **Ashutosh Singh**, Monika Sharma and Rajendra Prasad. **Curcumin targets cell wall integrity via calcineurin mediated signaling in *Candida albicans*.** *Antimicrob Agents Chemother.* 2014 58(1):167-75. doi: 10.1128/AAC.01385-13. (IF 4.255, ISSN Number: 00664804, e-ISSN Number: 10986596, UGC Journal No. 15824)
12. Abdul Haseeb Shah, **Ashutosh Singh**, Sanjiveeni Dhamgaye, Korivi Jyothiraj Suneetha, Rupinder Kaur, Neeraj Chauhan, Pranab Mukherjee, Jyotsna Chandra, Mahmoud A. Ghannoum, Dominique Sanglard, Shyamal K. Goswami and Rajendra Prasad. **Novel Role of a Family of Major Facilitator Transporters in Biofilm Development and Virulence of *Candida albicans*.** *Biochemical Journal* 2014 460 (2), 223-235. (IF 3.857, ISSN Number: 02646021, e-ISSN Number: 14708728, UGC Journal No. 14560)
13. Reuel Bennett, Ahmed Grieballa, **Ashutosh Singh**, Dirk Tischler, Khosbayan Tulgaa, Laura Acevedo Ugarriza, Ednner Victoria, Moses Vurayai. **What are the opportunities and responsibilities of scientists to communicate their research at home and abroad?** *Cultures* 2014 1 (2), 52-59. (IF Not Applicable)
14. Amir M. Farnoud, Visesto Mor, **Ashutosh Singh**, Maurizio Del Poeta. **Inositol Phosphosphingolipid Phospholipase C1 Regulates Plasma Membrane ATPase (Pma1) Stability in *Cryptococcus neoformans*.** *FEBS Letters* 2014 558(21), 3932-3938. DOI: <http://dx.doi.org/10.1016/j.febslet.2014.09.005>. (IF 2.999, ISSN Number: 00145793, e-ISSN Number: 18733468, UGC Journal No. 29280)
15. Kaushal Kumar Mahto<sup>‡</sup>, **Ashutosh Singh**<sup>‡</sup>, Nitesh Kumar Khandelwal, Nitin Bhardwaj, Jaykar Jha and Rajendra Prasad. **An assessment of growth media enrichment on lipid metabolome and the concurrent phenotypic properties of *Candida albicans*.** *PLOS ONE* 9 (11: e113664), 2014. doi:10.1371/journal.pone.0113664. (<sup>‡</sup> equal authors) (IF 2.766, ISSN Number: 19326203, e-ISSN Number: 19326203, UGC Journal No. 37933)
16. Visesto Mor, Antonella Rella, Amir M. Farnoud, **Ashutosh Singh**, Mansa Munshi, Arielle Bryan, Shamoan Naseem, James Konopka, Iwao Ojima, Erika Bullesbach, Alan Ashbaugh, Michael J. Linke, Melanie Cushion, Hari Kristina Ananthula, Pankaj B. Desai, Nathan P. Wiederhold, Annette W. Fothergill, William R. Kirkpatrick, Thomas Patterson, Corey Nislow, Xuewen Pan, N. Rao Movva, Gabriele Vargas Cesar, Susana Frases, Kildare Miranda, Marcio L. Rodrigues, Chiara Luberto, Leonardo Nimrichter and Maurizio Del Poeta. **Identification of a new class of antifungals targeting the synthesis of fungal sphingolipids.** *MBio.* 2015 Jun 23;6(3):e00647. doi: 10.1128/mBio.00647-15. (IF 6.689, ISSN Number: 21507511, e-ISSN Number: 21507511, UGC Journal No. 4105)

17. Antonella Rella, Visesto Mor , Amir Farnoud, **Ashutosh Singh**, Achraf Shamseddine , Maria Teresa Montagna, Chiara Luberto, Nicholas Carpino, Elitza Ivanova and Maurizio Del Poeta. **Role of Sterylglucosidase 1 (Sgl1) on the pathogenicity of *Cryptococcus neoformans*: potential applications for vaccine development.** *Front. Microbiol.* 2015 6:836. doi: 10.3389/fmicb.2015.00836. (IF 4.019, ISSN Number: 1664302X, e-ISSN Number: 1664302X, UGC Journal No. 17739)
18. Nadia A. Rana, **Ashutosh Singh**, Maurizio Del Poeta, and Yusuf A. Hannun. **Qualitative and quantitative measurements of sphingolipids by mass spectrometry.** Book Chapter in *Bioactive Sphingolipids in Cancer Biology and Therapy (Springer Science)*. 2015. (IF Not Applicable, ISBN 978-3-319-20750-6)
19. Nitesh Kumar Khandelwal, Philipp Kaemmer, Toni M. Förster, **Ashutosh Singh**, Alix T. Coste, David R. Andes, Bernhard Hube, Dominique Sanglard, Neeraj Chauhan, Rupinder Kaur, Christophe d'Enfert , Alok kumar Mondal and Rajendra Prasad. **Pleiotropic effects of a vacuolar ABC transporter *MLT1* of *Candida albicans* on cell function and virulence.** *Biochemical J.* 2016. 473(11):1537-52. doi: 10.1042/BCJ20160024. (IF 3.857, ISSN Number: 02646021, e-ISSN Number: 14708728, UGC Journal No. 14560)
20. **Ashutosh Singh** and Maurizio Del Poeta. **Sphingolipidomics: an important mechanistic tool for studying fungal pathogens.** *Front. Microbiol.* 2016. 7:501, doi: 10.3389/fmicb.2016.00501. (IF 4.019, ISSN Number: 1664302X, e-ISSN Number: 1664302X, UGC Journal No. 17739)
21. Visesto Mor, Amir M. Farnoud, **Ashutosh Singh**, Antonella Rella, Keiko Ishii, Kazuyoshi Kawakami, Toshiya Sato and Maurizio Del Poeta. **Glucosylceramide Administration as a Vaccination Strategy in Mouse Models of Cryptococcosis.** *PLOS ONE* 2016 Apr 15;11(4):e0153853, doi:10.1371/journal.pone.0153853. (IF 2.766, ISSN Number: 19326203, e-ISSN Number: 19326203, UGC Journal No. 37933)
22. Patrícia Alves de Castro, Thaila Fernanda dos Reis, Stephen K. Dolan, Adriana Oliveira Manfiolli, Neil Andrew Brown, Sean Doyle, Diego M. Riaño Pachón, Fábio Márcio Squina, Camila Caldana, **Ashutosh Singh**, Maurizio Del Poeta, Daisuke Hagiwara and Gustavo H. Goldman. **The *Aspergillus fumigatus* SchA<sup>SCH9</sup> kinase modulates Saka<sup>HOG1</sup> MAP kinase activity and it is essential for virulence.** *Molecular Microbiology.* 2016 Nov;102(4):642-671. doi:10.1111/mmi.13484. (IF 3.816, ISSN Number: 0950382X, e-ISSN Number: 13652958, UGC Journal No. 31578)
23. CM Fernandes, PA de Castro, **A Singh**, FL Fonseca, MD Pereira, TVM Vila, GC Atella, S Rozental, Marcela Savoldi, M Del Poeta, Gustavo Henrique Goldman, E Kurtenbach. **Functional characterization of the *Aspergillus nidulans* glucosylceramide pathway reveals that LCB  $\Delta 8$ -desaturation and C9-methylation are relevant to filamentous growth, lipid raft localization and Psd1 defensin activity.** *Molecular Microbiology.* 2016. 102(3):488-505. doi:10.1111/mmi.13474. (IF 3.816, ISSN Number: 0950382X, e-ISSN Number: 13652958, UGC Journal No. 31578)
24. Rodrigo Pinheiro, **Ashutosh Singh**, Eliana Barreto Bergter, Maurizio Del Poeta. **Sphingolipids: the most recent target for fungal infections treatment.** *Future Medicinal Chemistry.* 2016. 8 (12), 1469-1484. (IF 3.969, ISSN Number: 17568919, e-ISSN Number: 17568927, UGC Journal No. 17876)
25. Rajendra Prasad, Sudhanshu Shukla and **Ashutosh Singh**. **Insights into *Candida* lipids.** Book Chapter in *Candida albicans: Cellular and Molecular Biology, Springer*. 2017. (IF Not Applicable, ISBN 978-3-319-50409-4)
26. JiHyun Kim, **Ashutosh Singh**, Maurizio Del Poeta, Deborah A. Brown, Erwin London. **The effect of sterol structure upon clathrin-mediated and clathrin-independent endocytosis.** *J of Cell Science.* 2017. 130, 2682-2695. pii: jcs.201731. doi: 10.1242/jcs.201731. (IF 4.517, ISSN Number: 00219533, e-ISSN Number: 14779137, UGC Journal No. 21798)
27. **Ashutosh Singh**, Andrew MacKenzie, Geoffrey Girnun and Maurizio Del Poeta. **Analysis of sphingolipids, sterols and phospholipids in human pathogenic *Cryptococcus* strains.** *Journal of Lipid Research.* 2017. 58:(10) 2017-2036. doi:10.1194/jlr.M078600. (IF 4.505, ISSN Number: 00222275, e-ISSN Number: 15397262, UGC Journal No. 24330)
28. Shriya Raj, Saeed Nazemidashtarjandi, JiHyun Kim, Luna Joffe, Xiaoxue Zhang, **Ashutosh Singh**, Visesto Mor, Desmarini Desmarini, Julianne Djordjevic, Daniel P Raleigh, Marcio L Rodrigues, Erwin London, Maurizio Del Poeta, Amir M. Farnoud. **Changes in Glucosylceramide Structure Affect Virulence and Membrane Biophysical Properties of *Cryptococcus neoformans*.** *BBA Biomembranes.* 2017. 1859: 2224–

2233. <https://doi.org/10.1016/j.bbamem.2017.08.017>. (IF 3.438, ISSN Number: 00052736, e-ISSN Number: 18792642, UGC Journal No. 14587)
29. **Ashutosh Singh**, Nitin Bhardwaj, Madri Kakoti and Taruni Lalchandani. **Comparison of TLC and GCMS techniques for steryl glucoside analysis.** *International Journal of Scientific Research Letters*. 2017. 1 (1), 17-20. (IF xx, e-ISSN Number: 2581-5466, UGC Journal No. xx)
  30. Nitesh Kumar Khandelwal, Neeraj Chauhan, Parijat Sarkar, Brooke D. Esquivel, Paola Coccetti, **Ashutosh Singh**, Alix T. Coste, Meghna Gupta, Dominique Sanglard, Theodore C. White, Christophe d'Enfert, Amitabha Chattopadhyay, Alok Kumar Mondal and Rajendra Prasad. **Azole resistance in a *Candida albicans* mutant lacking the ABC transporter CDR6/ROA1 depends on TOR signaling.** *Journal of Biological Chemistry*. 2018 Jan 12;293(2):412-432. doi: jbc. M117.807032. (IF 4.010, ISSN Number: 00219258, e-ISSN Number: 1083351X, UGC Journal No. 21606)
  31. Nitin Bhardwaj and **Ashutosh Singh**. **Paraquat treatment modulates Integrin associated Protein (CD47) and Basigin (CD147) expression and mitochondrial potential on erythroid cells in mice.** *Environmental Toxicology and Pharmacology*. 2018 Mar;58:37-44. doi.org/10.1016/j.etap.2017.12.007. (IF 2.776, ISSN Number: 13826689, e-ISSN Number: 18727077, UGC Journal No. 19854)
  32. Mansa A. Munshi, Justin M. Gardin, **Ashutosh Singh**, Chiara Luberto, Robert Reiger, Tejas Bouklas, Bettina Fries, and Maurizio Del Poeta. **The role of ceramide synthases in the pathogenicity of *Cryptococcus neoformans*.** *Cell Reports*. 2018. 22 (6), 1392-1400. (IF 8.032, ISSN Number: 22111247, e-ISSN Number: 22111247, UGC Journal No. 5255)
  33. **Ashutosh Singh**, Nitesh Kumar Khandelwal and Rajendra Prasad. **Lipidomics Approaches: Applied to the Study of Pathogenesis in *Candida* Species.** Book Chapter in *Yeasts in Biotechnology and Human Health. Progress in Molecular and Subcellular Biology, Springer Cham*. 2019. 58, 195-215. (IF Not Applicable, ISBN Number: 978-3-030-13034-3, e-ISBN Number: 978-3-030-13035-0, UGC Journal No. -)
  34. Rodrigo Rollin Pinheiro, Victor Pereira Rochetti, Mariana Ingrid Dutra da Silva Xisto, Livia Cristina Liporagi Lopes, Beatriz Bastos, Antonella Rella, **Ashutosh Singh**, Sonia Rozental, Maurizio Del Poeta, Eliana Barreto-Bergter. Sphingolipid Biosynthetic Pathway is Crucial for Growth, Biofilm Formation and Membrane Integrity of *Scedosporium boydii*. *Future Medicinal Chemistry*. <https://doi.org/10.4155/fmc-2019-0186>, September 2019. (IF 3.969, ISSN Number: 17568919, e-ISSN Number: 17568927, UGC Journal No. 17876)
  35. **Ashutosh Singh**, Nitin Bhardwaj and Rajendra Prasad. **Nanomaterial-Assisted Mass Spectrometry: An Evolving Cutting-Edge Technique.** In: Saxena S., Khurana S. (eds) *NanoBioMedicine*. Springer, Singapore. 2020. 453-464. [https://doi.org/10.1007/978-981-32-9898-9\\_19](https://doi.org/10.1007/978-981-32-9898-9_19). (IF-, ISBN Number: 978-981-32-9897-2, e-ISBN Number: 978-981-32-9898-9, UGC Journal No. -)
  36. Nitin Bhardwaj and **Ashutosh Singh**. **Splenectomy modulates the erythrocyte turnover and Basigin (CD147) expression in mice.** *Indian Journal of Hematology and Blood Transfusion*. Accepted MS, <https://doi.org/10.1007/s12288-020-01272-1>, 2020. (IF 0.869, ISSN Number: 0971-4502, e-ISSN Number: 0974-0449, UGC Journal No. -)

**Submitted manuscripts: 03**

1. Nitin Bhardwaj and **Ashutosh Singh**. Modulation of stress erythropoiesis in splenectomized condition in response to the herbicide paraquat. *PLoS One*. MS under revision (PONE-D-19-27902), 2020. (IF 2.766, ISSN Number: 19326203, e-ISSN Number: 19326203, UGC Journal No. 37933)
2. **Ashutosh Singh**, Sana Akhtar Usmani, Khushboo Arya and Nitin Bhardwaj. **Analysis of sterols by gas chromatography mass spectrometry.** In 'Analysis of membrane lipids', Springer Nature, Switzerland AG. In Press. 2020. Order No. 86989371.
3. Rajendra Prasad, Atanu Banerjee and **Ashutosh Singh**. **Background of membrane lipids.** In 'Analysis of membrane lipids', Springer Nature, Switzerland AG. In Press. 2020. Order No. 86989371.

**Review Editor/ Invited Reviewer**

**Acta Biochimica Polonica:** The Journal of the Polish Biochemical Society and of the Committee of Biochemistry and Biophysics Polish Academy of Sciences

**Scientific Reports:** Nature Research Group

**RSC Advances:** Royal Society of Chemistry

**Aquaculture:** An Elsevier Journal

**Frontiers in Microbiology:** Frontiers Journal

**Frontiers in Plant Science:** Frontiers Journal

**3Biotech:** Springer Journal

**Conferences/Poster Presentations/Meetings/Workshops: 30 Abstracts Published.**

1. Symposium on "Current Advances in Molecular Biochemistry: Applications in Health, Environment and Agriculture" organized by Dept. of Biochemistry, University of Lucknow, Lucknow, UP, India, attended, 28-30<sup>th</sup> December, 2007.
2. 2<sup>nd</sup> International Conference on "Trends in Cellular and Molecular Biology" organized by School of Life Sciences, Jawaharlal Nehru University, New Delhi, India, attended, 5-7<sup>th</sup> January, 2008.
3. Workshop on "Basic Fundamentals of GC-2010, GC Solution, GCMS QP2010, GCMS Solution Software and Maintenance" held at CSC, Mumbai, Shimadzu Analytical (India) Pvt. Ltd., attended, 29<sup>th</sup> September to 1<sup>st</sup> October, 2008.
4. National Workshop on "Advanced Analytical Instrumentation and Application" organized by AIF-USIC, Jawaharlal Nehru University, New Delhi, India, attended, 5-7<sup>th</sup> January, 2009.
5. International Conference "9<sup>th</sup> Yeast Lipid Conference" held at Humboldt and Technische Universität, Berlin, Germany, attended and made a poster presentation 21-23<sup>rd</sup> May, 2009.
6. 78<sup>th</sup> Annual Meeting of "Society of Biological Chemists (India)" organized by National Center of Cell Science and University of Delhi, Pune-411007, India, attended and made a poster presentation, 30<sup>th</sup> October to 1<sup>st</sup> November, 2009.
7. International Conference "FEBS Workshop on Microbial Lipids, From Genomics to Lipidomics" held at Vienna, Austria, attended and made a poster presentation, 13-15<sup>th</sup> May 2010.
8. International Conference "IMC9: The Biology of Fungi" organized by IMC9 Conference Secretariat, Isevier Ltd, The Boulevard, Langford Lane, Kidlington, Oxford, OX5 1GB, UK, at Edinburg, UK, and attended and made an oral presentation, 1 - 6<sup>th</sup> August, 2010.
9. International Conference "28<sup>th</sup> SMYTE" organized by Jawaharlal Nehru University, New Delhi, India, attended and made a poster presentation, 23<sup>rd</sup> to 27<sup>th</sup> September, 2010.
10. "BIOSPARKS-2011" organized by School of Life Sciences, Jawaharlal Nehru University, New Delhi, India, attended and made an oral presentation, 11<sup>th</sup> to 12<sup>th</sup> March, 2011.
11. "IPCON-2011: The Indian Proteomics Conference" annual meeting organized by The Proteomics Society (India) in collaboration with Advanced Instrumentation Research Facility, Jawaharlal Nehru Univeristy, New Delhi, India, attended and made a poster presentation, 3<sup>rd</sup> to 5<sup>th</sup> April, 2011.
12. 80<sup>th</sup> Annual Meeting of the "Society of Biological Chemists (India)" organized by CSIR-CIMAP, Lucknow, India, attended and made a poster presentation, 12<sup>th</sup>-15<sup>th</sup> November, 2011.
13. "ICYB 2011: 7th International Conference on Yeast Biology" organized by IIT Bombay, India, attended and made a poster presentation, 10<sup>th</sup>-13<sup>th</sup> December, 2011.
14. "11<sup>th</sup> ASM Conference on *Candida* and Candidiasis" held at San Francisco, CA, USA, 29<sup>th</sup> March – 2<sup>nd</sup> April, 2012.
15. "Workshop on GCMS" held at Advanced Instrumentation Research Facility, Jawaharlal Nehru University, New Delhi, India, 13 – 14<sup>th</sup> August, 2012.
16. Workshop on 'Scientific Writing and Bioethics' held at School of Life Sciences, Jawaharlal Nehru University, New Delhi, India, 20<sup>th</sup> - 21<sup>st</sup> September, 2012.
17. "113<sup>th</sup> ASM General Meeting" held at Denver, Colorado, USA, 18<sup>th</sup> – 21<sup>st</sup> May, 2013.
18. "114<sup>th</sup> ASM General Meeting" held at Boston, Massachusetts, USA, 17<sup>th</sup> – 20<sup>th</sup> May, 2014.

19. "9<sup>th</sup> ICB&DD Symposium" held at Stony Brook University, Stony Brook, USA, 8<sup>th</sup> October, 2015.
20. "National Seminar on: Paradigm Shifts in Biochemistry: Emerging Trends and New Vistas" held at University of Lucknow, Lucknow, UP, India, 10<sup>th</sup> September, 2016.
21. "57<sup>th</sup> Annual Conference & International Symposium of Association of Microbiologists of India" held at Gauhati University, Guwahati, India, 24<sup>th</sup> – 27<sup>th</sup> November, 2016.
22. National Conference "Lipids in forefront: A lot more to discover" held at Amity University, Panchgaon, Manesar, Gurgaon-122 413 (Haryana), India, 14<sup>th</sup> – 15<sup>th</sup> December, 2016.
23. 6<sup>th</sup> National Conference on "Nanomaterials and Nanotechnology (NATCON NAMTECH VI)" held at Department of Physics, University of Lucknow, Lucknow, Uttar Pradesh, India, 11<sup>th</sup> – 13<sup>th</sup> February, 2017.
24. "127<sup>th</sup> Orientation Program" (UGC, Govt. of India sponsored) held at Human Resource Development Center, University of Lucknow, Lucknow, Uttar Pradesh, India, 1<sup>st</sup> – 29<sup>th</sup> November, 2017.
25. International Conference on "Conference on Functional Biology and Molecular Interactions (FBMI-2017)" held at University of Lucknow, Lucknow, Uttar Pradesh, India, 20<sup>th</sup> – 22<sup>nd</sup> December, 2017.
26. 10<sup>th</sup> Conference on Yeast Biology jointly organized by Jawaharlal Nehru University and Amity University, Gurgaon, held at JNU, New Delhi, India, 8<sup>th</sup> – 11<sup>th</sup> February, 2018.
27. National workshop on "Building National STI Policy System and Governance for Effective R&D" organized by DST-Centre for Policy Research, BBA University, Lucknow, 5<sup>th</sup> March, 2019.
28. National Seminar on Recent Advances in Applied Biochemistry and Biotechnology (RAABB 2019) organized by Department of Biochemistry, Lucknow University, Lucknow, 9<sup>th</sup> March, 2019.
29. Refresher Course in Chemistry & Bio-Chemistry held at Human Resource Development Center, University of Lucknow, Lucknow, Uttar Pradesh, India, August 17-31, 2019
30. "DST Inspire Camp" organized by S.R.M.S.C.E.T. Unnao, on September 2<sup>nd</sup>, 2019.
31. "2<sup>nd</sup> Lipids in the Forefront: Lot more to discover" organized by Amity University, Gurgaon, from 12<sup>th</sup> – 13<sup>th</sup> December, 2019
32. "Two-day Workshop on finalization of Teaching Learning Resources for Life-science Teachers", at NIEPA, New Delhi, on 16-17 Jan, 2020.

#### Oral Presentations/Invited Lectures:

1. IMC9: The Biology of Fungi, Edinburg, UK, 1 - 6<sup>th</sup> August, 2010.
2. BIOSPARKS- 2011, SLS, Jawaharlal Nehru University, New Delhi, 11 – 12<sup>th</sup> March, 2011.
3. BIOSPARKS- 2012, SLS, Jawaharlal Nehru University, New Delhi, India, 14 – 15<sup>th</sup> March, 2012.
4. 11<sup>th</sup> ASM Conference on *Candida* and Candidiasis, San Francisco, USA, 29<sup>th</sup> March – 2<sup>nd</sup> April, 2012.
5. GCMS workshop, AIRF, Jawaharlal Nehru University, New Delhi, India, 13 – 14<sup>th</sup> August, 2012.
6. SBU Postdoc Spotlight Talk, Stony Brook University, New York, USA, September 18, 2014.
7. "Lipids in forefront: A lot more to discover" Amity University, Haryana, India, 14<sup>th</sup> – 15<sup>th</sup> December, 2016.
8. "NATCON NAMTECH VI" University of Lucknow, Uttar Pradesh, India, 11<sup>th</sup> – 13<sup>th</sup> February, 2017.
9. 10<sup>th</sup> CYB, Jawaharlal Nehru University, New Delhi, India, 8<sup>th</sup> – 11<sup>th</sup> February, 2018.
10. "Fundamentals of mass spectrometry and applications in structure determination and quantification of lipids", Amity University, Gurgaon Haryana, India, 26<sup>th</sup> June, 2018.
11. "Building National STI Policy System and Governance for Effective R&D" DST-CPR, BBA University, Lucknow, 5<sup>th</sup> March, 2019.
12. "DST Inspire Camp" organized by S.R.M.S.C.E.T. Unnao, on September 2<sup>nd</sup>, 2019.
13. "2<sup>nd</sup> Lipids in the Forefront: Lot more to discover" organized by Amity University, Gurgaon, from 12<sup>th</sup> – 13<sup>th</sup> December, 2019

#### Organization of Meetings/Conferences:

1. Volunteered for the organization of 'VIJYOSHI CAMP 2009' held at Jawaharlal Nehru University, New Delhi, India, 13 – 15<sup>th</sup> October, 2009.
2. Member of the organizing committee of a national level conference 'BIOSPARKS- 2010' held at School of Life Sciences, Jawaharlal Nehru University, New Delhi, India, 11 – 12<sup>th</sup> March, 2010.



3. Member of the organizing committee of 'Meet the Speaker' lecture series organized on a regular basis by the students of School of Life Sciences, Jawaharlal Nehru University, New Delhi, India, 2011.
4. ASM workshop on 'Culture of Responsibility and Bioethics' held at Jawaharlal Nehru University, New Delhi, India, 3<sup>rd</sup> September, 2013.
5. ASM Coordinator for Live Streaming of ICAAC 2013 at the School of Life Sciences, Jawaharlal Nehru University, New Delhi, India, 10<sup>th</sup> September, 2013.
6. Organized SBU Postdoc Spotlight Talk, Stony Brook University, New York, USA, September 18, 2014.
7. Organized SBU Postdoc Spotlight Talk, Stony Brook University, New York, USA, September 17, 2015.
8. Organized National Seminar on 'Paradigm Shifts in Biochemistry: Emerging Trends and New Vistas', University of Lucknow, Lucknow, UP, India, 10<sup>th</sup> September, 2016.
9. Organized International Conference on "Conference on Functional Biology and Molecular Interactions (FBMI-2017)" held at University of Lucknow, Lucknow, Uttar Pradesh, India, 20th – 22nd December, 2017.

#### **Academic/Teaching experience:**

1. BC-101 Biophysical chemistry and techniques (M.Sc. Biochemistry Semester I), since July 2016.
2. BC-302 Immunology I (M.Sc. Biochemistry Semester III), since July 2016.
3. BC-205 Practical II Biophysical Techniques (M.Sc. Biochemistry Semester II), since January 2017.
4. BC-402 Immunology II (M.Sc. Biochemistry Semester IV), since January 2017.
5. BC-404 Biostatistics, Bioinformatics and IPR (M.Sc. Biochemistry Semester IV), since January 2017.
6. BT-201 Molecular Cell Biology (M.Sc. Biotechnology Semester II), since January 2017.
7. BC-211 Techniques in Biochemistry (Elective: M.Sc. students from other departments), since January 2017.
8. Assisted Professor Rajendra Prasad in laboratory experimentation related to study of various aspects of lipid extraction and analyses, in MSc Life Sciences, for **4 years** during 2009-2012, at School of Life Sciences, Jawaharlal Nehru University, New Delhi-110067, India. Have trained 3 M.Sc. students in their dissertation, 2011.

#### **Administrative/Additional Responsibilities:**

1. Assistant Proctor, University of Lucknow.
2. President, Table Tennis Club, University of Lucknow.

#### **Memberships:**

- Member of Meritorious Student's Association, University of Lucknow, U.P., India, 2006 - 2007.
- Member of Alumni Association of Department of Biochemistry, University of Lucknow, U.P., India, since 2005. (15/12/2005)
- Member of American Society of Microbiology (ASM), since 2008. (28/2/2008)
- Member of International Society for the Study of Fatty acids and Lipids (ISSFAL), 2009. (6/1/2010)
- Member of Student-Faculty committee, School of Life Sciences, Jawaharlal Nehru University, New Delhi, India, 2009 - 2010.
- Member of Society of Biological Chemists (SBC), India, since 2010. (30/3/2010)
- Member of Alumni Association, Jawaharlal Nehru University, New Delhi, India, since 2012. (5/2/2017)
- Member of International Society for Infectious Diseases (ISID), Brookline, MA 02446, United States, since 2012. (13/9/2012)
- Member of World Society for Interdisciplinary Anti-Aging Medicine (WOSIAM), 2012 – 2013. (1/1/2012)
- Member of Postdoctoral Advisory Committee, Stony Brook University, Stony Brook, USA, 2014 - 2016.

#### **Key Skills: *Small and complex molecules mass spectrometry.***

- On hand experience on analyses of small metabolites on GC and GCMS. Instruments: Shimadzu Corp, Japan; Agilent Tech. CA, US.
- On hand experience on analyses of lipids on LC-MSMS. Instruments: TSQ Quantum MS, Thermo Finnigan; 6400 Series Triple Quadrupole, Agilent Tech. CA, US; 4000 QTRAP, Applied Biosystems.

- Well acquainted to analyses software platforms: GC and GCMS solutions (Schimadzu); Analyst; Lipid View; XCalibur; LCQuan; Mass Hunter.
- Well acquainted to handling of large datasets and statistical analyses (PCA, DA) software: XLSTAT; SYSTAT; PRISM.

#### Techniques:

- Matrix assisted laser desorption ionization – time of flight spectrometry (MALDI-TOF)
- Thin-layer chromatography (TLC) and High performance - thin-layer chromatography (HP-TLC)
- Flow-cytometry (FACS) and Confocal microscopy
- UV and Fluorescence spectroscopy
- Media culture, Drug susceptibility assays including MIC, spot assays, bacterial and yeast transformation
- Electrophoresis, Isoelectric focusing and Potentiometry
- Immunodiffusion methods and Enzyme kinetics
- Cloning, DNA and RNA isolation, purification and estimation, PCR
- Site directed mutagenesis, Protein isolation, purification, estimation and Fractionation techniques
- Western and Southern hybridization
- Various aspects of lipid extraction and analysis
- Computational and statistical analysis tools.

#### Referees:

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Mother's Name: Dr. Santosh Singh  
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Gender: Male  
Marital Status: Married  
Nationality: Indian  
**Place:** Lucknow, UP, India.