Proforma for information to be provided by the Teaching/ Academic/ Research Staff

1. **Name :** Ram Sagar Misra

2. **Designation:** Associate Professor

3. **Academic Qualifications:**

Sr.	Degree	Institution	Year
1	B.Sc.	University of Lucknow, Lucknow	1998
2	M.Sc.	University of Lucknow, Lucknow	2001
3	Ph.D.	Central Drug Research Institute, Lucknow (Dr. BRA Univ. Agra)	2006

Employment History:

Banaras Hindu University (BHU), Varanasi, India Feb2018-Present
(Associate Professor)
Shiv Nadar University, Gr Noida, India Aug 2012-Jan 2018
(Assistant Professor)
University of Oxford, United Kingdom 2008-2012
(Senior Postdoctoral Research Scientist, Lab manager)
Seoul National University, South Korea 2007-2008
(Postdoctoral Research Scientist, Mentor to Master students)
Indian Institute of Technology Kanpur, India 2006-2007
(CSIR Research Associate)

4. **Area of Specialization:** (brief write up, 200 words)

Carbohydrates and proteins: The biological roles of carbohydrates have until relatively recently been viewed as simple ones: as sources of energy, e.g., glucose, or as polymeric building materials, e.g., chitin in crab shells, cellulose in wood. However, it is becoming increasingly clear that oligosaccharides (carbohydrates in small clusters) and alterations in proteins (modifications) are examples of chemically complex biological markers that can act in important recognition processes such as microbial infection, cancer metastasis and cellular adhesion in inflammation, in addition to many intracellular communication events. Their remarkable structural diversity means that they can often mediate highly specific and therefore complex processes. We work to design and develop tools to understand such systems on a fundamental level leads to the design, synthesis and modification of potential therapeutic and biotechnologically applicable systems.

Diversity Oriented Synthesis, Medicinal Chemistry and Chemical Biology: A collection of "natural-product-like" small molecules that specifically perturb the individual functions of gene products are facilitating the exploration of biological pathways. Therefore, we works on the development of an efficient route for the

synthesis of drug-like small molecules that specifically perturb the individual function of gene products. We apply Diversity-oriented synthesis (DOS), which aims to populate the chemical space with skeletally and stereochemically diverse small molecules with high appending potentials, approach for diverse library preparation having molecules with different 3D chemical space. These diverse library leads to the discovery of bioactive small molecules. We further aim to look specific interactions of these molecules with biopolymers and develop microarrays methods to understand many complex processes in the biological system (e.g. plant and animals) and utilised the knowledge thus obtained for the benefit of mankind.

Asymmetric Synthesis and Methodology: Carbohydrates are an unrivalled source of contiguous, stereogenic centres - chirality that grows on trees. But surprisingly use of carbohydrates to induce asymmetry in molecules has been more limited than the use of other sources. We undertake to change this by developing ligands and organocatalysts based on sugar scaffolds and by exploring the role of sugars in prebiotic emergence of chirality.

5. Contact Information:

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6. Projects Undertaken as PI/ Co PI:

Project title: *"Towards chemical synthesis of linear Poly(ADP-ribose) for bio-application"*

Funding Agency: SERB-EMR Grant of Rs 43.51 Lakh (3 year), Start date: 5th Jan 2016

7. Awards/ Recognitions if any:

- **2008-2012**: BBSRC UK postdoctoral fellowship, University of Oxford, Oxford, United Kingdom.
- **2007-2008**: Brain Korea-21 postdoctoral fellowship, Seoul National University, Seoul, South Korea.
- **2006-2007**: Awarded Senior Research Fellow (SRF) by Council of Scientific and Industrial Research (CSIR), New Delhi, India.
- **2005** : Best paper presentation awards in 9th International conferences of Indian Society of Chemist and Biologist
- **2001-2005**: Awarded Junior Research Fellow (JRF) by Central Drug Research Institute (CDRI), Lucknow, India.
- **2002**: Qualified UPSLET (state level lectureship test) of University Grants Commission (UGC) New Delhi, India.

8. List of 10 major Publications: (in order of importance)

1. Chemical intervention in plant sugar signalling increases yield and resilience. Cara A. Griffiths,* **Ram Sagar**,* Yiqun Geng,* Lucia F. Primavesi, Mitul K. Patel, Melissa K. Passarelli, Ian S. Gilmore, Rory T. Steven, Josephine Bunch, Matthew J. Paul, and Benjamin G. Davis *Nature*, **2016,** *540*, 574-578. [IF 38.14]
   [* These are joint first authors]

2. Glycal Derived δ-Hydroxy α,β-unsaturated aldehydes (Perlin aldehydes): A Versatile Building Block in Organic Synthesis. L. V. R. Reddy, Vikas Kumar, **Ram Sagar**, and Arun K. Shaw *Chem. Rev.* **2013**, *113*, 3605-3631. [IF 40.12]

3. Conformational Effects in Sugar Ions: Spectroscopic Investigations in the Gas Phase and in Solution. **Ram Sagar**, Svemir Rudic, et al John P Simons and Benjamin G. Davis. *Chem Sci.* **2012**, 3, 2307-2313.[IF 9.14]

4. Regioselective Synthesis of Chirally Enriched Tetrahydrocarbazolones and Tetrahydrocarbazoles. Chintam Narayana, Priti Kumari, and **Ram Sagar*** *Org. Lett.* **2018**, *20*, 4240–4244. [IF 6.58].

5. C-3 Alkyl/Arylalkyl-2,3-dideoxy Hex-2-enopyranosides as Antitubercular Agents: Synthesis, Biological Evaluation, and QSAR Study. Mohammad Saquib, Manish K. Gupta, **Ram Sagar**, Yenamandra S. Prabhakar, Arun K. Shaw et al. *J. Med. Chem.* **2007,** *50*, 2942-2950. [IF 6.25]

6. Diastereoselective Synthesis of Polycyclic Acetal-Fused Pyrano[3,2-*c*]pyran-5(2*H*)-one derivatives. **Ram Sagar** , Jongmin Park, Minseob Koh and Seung Bum Park. *J. Org. Chem.* **2009**, *74*, 2171-2174. [IF 4.84]

7. Facile and efficient synthesis of carbohybrids as stereodivergent drug like small molecules. **Ram Sagar** and Seung Bum Park. *J. Org. Chem.* **2008**, *73*, 3270-3273. [IF 4.84]

8. Stereoselective synthesis of natural product inspired carbohydrate fused pyrano[3,2-*c*]quinolones as antiproliferative agents. Priti Kumari, Chintam Narayana, Shraddha Dubey, Ashish Gupta and **Ram Sagar*** *Org. Biomol. Chem.*, **2018**, *16*, 2049-2059. [3.56]
9. Stereoselective synthesis of carbohydrate fused pyrano[3,2-c]pyranones as anticancer agents. Priti Kumari, Sonal Gupta, Chintam Narayana, Shakeel Ahmad, Shailja Singh* and **Ram Sagar*** *New J. Chem.*, **2018**, *42*, 13985-13997. [IF 3.27]

10. Design and synthesis of *N*–acetylglucosamine derived 5a-carbasugar analogues as glycosidase inhibitors.Chintam Narayana, Priti Kumari, Daisuke Ide, Nasako Hoshino, Atsushi Kato and **Ram Sagar*** *Tetrahedron* **2018,** *74*, 1957-1964. [IF 2.65]

9. Additional Information/ Achievements:

Organization of National/ International Conferences:

i) Organized one day **RSC sponsored** workshop for students on ***"Recent Advances in Chemistry and Biology"*** with GCNC, Delhi University, on 15th December 2016 at Shiv Nadar University.
ii) Organized an one day symposium on ***"Emerging Trends in Translational research in India"*** on 09th Apr 2016. The sponsorship for this event was raised from LabIndia and Srico.
iii) Co-organized two days **RSC sponsored** international symposium ***"Chemistry for tomorrow word"*** with Delhi University, Manav Rachana University, during 2nd-3rd December 2015 at hotel Maiden New Delhi.
iv) Organized an one day symposium on ***"Current Trends in Drug Discovery research in India"*** on 11th Apr 2015. The sponsorship for this event was raised from Bruker and Inkarp.
v) Organized an one day symposium on ***"Emerging trends in translational research in India"*** on 12th Apr 2014. The sponsorship for this event was raised from Agilent and Neobiolabs.

Professional Membership of Societies:

- Life member of Association of Carbohydrate Chemists and Technologists (India) (from 2016)
- Life member of Indian society of chemist and biologist CDRI Lucknow (from 2001).
- Member of Royal Society of Chemistry (MRSC, 2009)

10. Full List of Publications:

1. Regioselective Synthesis of Chirally Enriched Tetrahydrocarbazolones and Tetrahydrocarbazoles. Chintam Narayana, Priti Kumari, and **Ram Sagar*** *Org. Lett.* **2018**, *20*, 4240–4244. [IF 6.58].
2. Stereoselective synthesis of carbohydrate fused pyrano[3,2-c]pyranones as anticancer agents. Priti Kumari, Sonal Gupta, Chintam Narayana, Shakeel Ahmad, Shailja Singh* and **Ram Sagar*** *New J. Chem.*, **2018**, *42*, 13985-13997. [IF 3.27]
3. Stereoselective synthesis of natural product inspired carbohydrate fused pyrano[3,2-*c*]quinolones as antiproliferative agents. Priti Kumari, Chintam Narayana, Shraddha Dubey, Ashish Gupta and **Ram Sagar*** *Org. Biomol. Chem.*, **2018**, *16*, 2049-2059. [3.56]
4. Design and synthesis of *N*–acetylglucosamine derived 5a-carbasugar analogues as glycosidase inhibitors.Chintam Narayana, Priti Kumari, Daisuke Ide, Nasako Hoshino, Atsushi Kato and **Ram Sagar*** *Tetrahedron* **2018,** *74*, 1957-1964. [IF 2.65]
5. A versatile carbohydrate based gelator for the oil water separation, nanoparticles synthesis and Dye removal. Chintam Narayana, Ravi K. Upadhyay, Raman Chaturvedi and **Ram Sagar**,* *New J. Chem.*, **2017**, *41*, 2261-2267. [IF 3.27]

6. One-Pot Two-step Facile Synthesis of 2,3,4,5-Tetra Substituted dihydrooxazoles and their Antimicrobial activity Shailendra Tiwari, Poonam Pathak, Kamal Pratap Singh and **Ram Sagar** *Bioorg & Med Chem Lett*, **2017**, *27*, 3802-3805. [IF 2.92]
7. Chemical intervention in plant sugar signalling increases yield and resilience. Cara A. Griffiths,* **Ram Sagar**,* Yiqun Geng,* Lucia F. Primavesi, Mitul K. Patel, Melissa K. Passarelli, Ian S. Gilmore, Rory T. Steven, Josephine Bunch, Matthew J. Paul, and Benjamin G. Davis *Nature*, **2016,** *540*, 574-578. [IF 38.14]
   [* These are joint first authors]

8. Efficient synthesis of new 2,3-dihydrooxazole-spirooxindoles hybrids as antimicrobial agents. Shailendra Tiwari, Poonam Pathak, **Ram Sagar** *Bioorg & Med Chem Lett*, **2016**, 26, 2513-2516. [IF 2.92]
9. Conformationally restricted glycoside derivatives as mechanistic probes and/or inhibitors of sugar processing enzymes and receptors, Carine Maaliki, Charles Gauthier, Olivier Massinon, **Ram Sagar**, Stéphane P. Vincent and Yves Blériot, Carbohydrate Chemistry **2014**, *40*, 418-444.
10. Glycal Derived δ-Hydroxy α,β-unsaturated aldehydes (Perlin aldehydes): A Versatile Building Block in Organic Synthesis. L. V. R. Reddy, Vikas Kumar, **Ram Sagar**, and Arun K. Shaw *Chem. Rev.* **2013**, *113*, 3605-3631. [IF 40.12]
11. Inhibition of SnRK1 by metabolites: Tissue-dependent effects and cooperative inhibition by glucose 1-phosphate in combination with trehalose 6-phosphate. C. Nunes, Lucia F. Primavesi, Mitul K. Patel, E. Martinez-Barajas, S. J. Powers, **Ram Sagar,** P. S. Fevereiro, Benjamin G. Davis, Matthew J. Paul *Plant Physiol. Biochem.* **2013**, *63*, 89-98. [IF 2.84]
12. Conformational Effects in Sugar Ions: Spectroscopic Investigations in the Gas Phase and in Solution. **Ram Sagar**, Svemir Rudic, et al John P Simons and Benjamin G. Davis. *Chem Sci.* **2012**, 3, 2307-2313.[IF 9.14]
13. Diastereoselective Synthesis of Polycyclic Acetal-Fused Pyrano[3,2-*c*]pyran-5(2*H*)-one derivatives. **Ram Sagar** , Jongmin Park, Minseob Koh and Seung Bum Park. *J. Org. Chem.* **2009**, *74*, 2171-2174. [IF 4.84]
14. An Improved Synthesis of Pyrimidine- and Pyrazole-based Acyclo-*C*-nucleosides as Carbohybrids. **Ram Sagar**, Moon-Ju Kim and Seung Bum Park, *Tetrahedron Lett.* **2008**, *49*, 5080-5083. [IF 2.61]
15. Stereoselective synthesis of safingol and its natural stereoisomer from D-glycals. Hariprasad Kokatala, **Ram Sagar** and Yashvant D. Vankar, *Tetrahedron Lett.* **2008**, *49*, 4728-4730. [IF 2.61]
16. Facile and efficient synthesis of carbohybrids as stereodivergent drug like small molecules. **Ram Sagar** and Seung Bum Park. *J. Org. Chem.* **2008**, *73*, 3270-3273. [IF 4.84]
17. C-3 Alkyl/Arylalkyl-2,3-dideoxy Hex-2-enopyranosides as Antitubercular Agents: Synthesis, Biological Evaluation, and QSAR Study. Mohammad Saquib, Manish K. Gupta, **Ram Sagar**, Yenamandra S. Prabhakar, Arun K. Shaw et al. *J. Med. Chem.* **2007,** *50*, 2942-2950. [IF 6.25]
18. A consecutive approach towards the stereoselective synthesis of trisubstituted THF domains. **Ram Sagar,** L.Vijaya Raghava Reddy, Mohammad Saquib, Brijesh Kumar and Arun K. Shaw, *Tetrahedron: Asymmetry* **2006**, *17*, 3294-3299.[IF 2.48]

19. Studies on epoxidation of enantiomerically pure 2,3-dideoxy hex-2-enitols: A convenient access to highly functionalized enantiomerically pure tetrahydrofuran derivatives. **Ram Sagar,** L.Vijaya Raghava Reddy and Arun K. Shaw, *Tetrahedron: Asymmetry* **2006**, *17*, 1189-1198. [IF 2.48]
20. An efficient synthesis of 2,3-dideoxy-α,β-unsaturated carbohydrate enals by mixed lewis acid ($HfCl_4$ and ZnI_2) catalyzed hydration of glycals. Mohammad Saquib, **Ram Sagar** and Arun K. Shaw, *Carbohydr. Res.* **2006**, *341*, 1052-1056. [IF 1.89]
21. Reductive opening of glycal derived highly functionalized 2,3-epoxy-1-iodides with zinc dust: An efficient method for the synthesis of acyclic long chain polyhydroxylated terminal alkenic alcohols. L.Vijaya Raghava Reddy, **Ram Sagar** and Arun K. Shaw, *Tetrahedron Lett.* **2006**, *47*, 1753-1756. [IF 2.61]
22. Diastereoselective annulation of 4-hydroxypyran-2*H*-ones with enantiopure 2,3-dideoxy-α,β-unsaturated sugar aldehydes derived from respective glycals. **Ram Sagar**, Pushpa Singh, Rishi Kumar, Prakas R. Maulik and Arun K. Shaw, *Carbohydr. Res.* **2005**, *340*, 1287-1300. [IF 1.89]
23. Neridienone A, a pregnane from the roots of *Nerium oleander*. Rishi Kumar, **Ram Sagar**, Arun K. Shaw and Prakas R. Maulik, *Acta. cryst.* **2005**, *E61*, o3905-o3907. [IF 0.41]
24. CP-MLR directed QSAR studies on the antimycobacterial activity of functionalized alkenols-topological descriptors in modeling the activity. Manish K. Gupta, **Ram Sagar**, Arun K. Shaw and Yenamandra S. Prabhakar, *Bioorg. Med. Chem.* **2005**, *13*, 343-351. [IF 2.97]
25. A Substrate controlled, very high diastereoselective Mortia-Baylis-Hillman reaction: a remote activation on the diastereofacial selectivity in synthesis of C-3-branched deoxysugars. **Ram Sagar**, C. S. Pant and R. Pathak and Arun K. Shaw, *Tetrahedron* **2004**, *60*, 11399-11406. [IF 2.98]
26. Reinvestigation of the mercuration-demercuration reaction on alkylated glycals: an improved method for the preparation of 2,3-dideoxy-α,β-unsaturated carbohydrate enals. **Ram Sagar**, Rashmi Pathak and Arun K. Shaw, *Carbohydr. Res.* **2004,** *339*, 2031-2035. [IF 1.89]
27. A convenient approach towards separation and identification of triterpenes of Δ^{12} lupane series. **Ram Sagar**, N. D. Dhoke, A. K Shaw, *Indian J. Chem. Sec B.* **2004**, *43B*, 2446-2451.[IF 0.56]

PATENTS:

1. Glycoside based anti-toxin for Epsilon intoxification and preparation method thereof. Chintam Narayana, Abhishek Shivappagowdar, **Ram Sagar**, Soumya Pati, Shailja Singh *Indian Patent* **2018** (No. 201811034958).

2. Modification of trehalose-6-phosphate level in plants. **Ram Sagar**, Lucia F. Primevessi, Matthew J. Paul and Benjamin G. Davis. *US Patent* **2013 (92340-891096-003200US).**

3. Modification of trehalose-6-phosphate in plants. **Ram Sagar**, Lucia F. Primevessi, Matthew J. Paul and Benjamin G. Davis. *PCT Patent* **2012 (PCT/GB12/050891)**.

4. Metabolic Intervention in plant T6P Metabolism. **Ram Sagar**, Lucia F. Primevessi, Matthew J. Paul, Mitul K. Patel, Conor S. Barry and Benjamin G. Davis. *UK Patent* **2011 (No. 01107031.5) 26.04.2011.**

5. C-3-alkyl and arylalkyl substituted 2,3-dideoxy glucopyranosides as potential anti-tubercular agents and a process for preparation thereof. **Ram Sagar**, Mohd Saquib, Arun K. Shaw, Anil N. Gaikwad, Sudhir K Sinha, Anil Srivastava, Vinita Chaturvedi, Manju Y. K. Ranjana Srivastava and B. S. Srivastava. *Indian Patent* **2006 (No. 0533DEL2006) 28.02.2006** (Ref. No. 0210NF2005).

Date: 05.09.2018 Signature

Place: Varanasi