Curriculum Vitae: Dr Vikas Kumar

BIBLIOGRAPHYCAL SKETCH

PERSONAL INFORMATION			
Surname	Kumar	**Name**	Vikas
Title	Dr	**Gender**	Male
Date of Birth	03 Aug 1988	**Place of Birth**	Bina, India
Nationality	Indian	**Home language**	Hindi
Skype ID	https://join.skype.com/invite/n3jVAeU4E5Kd	**Web of Science Research citations**	226
ORCID	https://orcid.org/0000-0002-0506-6442	**i10-index**	14
Web of Science Researcher ID	https://publons.com/researcher/1718619/vikas-kumar/publications/	**h-index**	11

CURRENT EMPLOYMENT INFORMATION			
Organisation	Indian Institute of Science, Bangalore	**Department**	Organic Chemistry
Faculty Supervisor	Professor Tushar Kanti Chakraborty, Emeritus Professor, FNA, FNASc Department of Organic Chemistry, IISc (Former director of CDRI, Lucknow-UP)	**Position**	Dr. D. S. Kothari Postdoctoral Fellow
Email address	vikasnamdeo1389@gmail.com	**Alternative Email**	vknamdeo89@gmail.com

GENERAL INFORMATION
Language skills
English: Reading fluent, writing fluent, speaking fluent Hindi: Reading fluent, writing fluent, speaking fluent
Computer literacy
Microsoft Office, ChemDraw, ImageJ, PyMol, GraphPad-Prizm, YASARA Algorithm, Avogadro
Achievements and Awards
Claude Leon Postdoctoral Fellowship awarded by Claude Leon Foundation, South Africa
Exams qualified
CSIR-NET-LS June 2014, **AIR-40** (This test is compulsory to be qualified as minimum eligibility to apply for faculty positions in any Indian Institute)
CSIR-NET-LS June 2015, **AIR-51**(This test is compulsory to be qualified as minimum eligibility to apply for faculty positions in any Indian Institute)
Madhya Pradesh-State Eligibility Test 2017 (This test is compulsory to be qualified as minimum eligibility to apply for faculty positions in any institute of Madhya Pradesh-**An Indian Province**)

Curriculum Vitae: Dr Vikas Kumar

ACADEMIC QUALIFICATIONS

Degrees	Field of study	Higher education institution	Year	Division
10th	Science	Govt. Multipurpose Higher Secondary School No. 1, Bina, MP Secondary Board of Education	2004	First
12th	Science	Govt. Multipurpose Higher Secondary School No. 1, Bina, MP Secondary Board of Education	2006	First
BSc	Biological Sciences	Govt. Boys College Bina, Dr H. S. Gour University Sagar-MP, India	2008-2011	First
MSc	Chemistry	Dr Harisingh Gour Central University, Sagar-MP, India	2011-2013	First
PhD	Chemistry	Dr Harisingh Gour Central University, Sagar-MP, India	2013-2017	

Thesis Supervisor	Title of thesis	Date of submission	Date of Award
Dr Khashti Ballabh Joshi, Assistant Professor, Dept. of Chemistry DHSGSU, Sagar-MP	Synthesis and evolution of bioinspired novel chemical entities for advanced biological applications	09 June 2017	22 Dec 2017

EMPLOYMENT HISTORY AND EXPERIENCE DETAILS

Employer	Description of work	Period
University of Stellenbosch Department of Biochemistry Stellenbosch, South Africa	Post-doctoral Fellow, Sub-committee B, Stellenbosch University	01 April 2018 To 31 March 2019
University of Stellenbosch Department of Biochemistry Stellenbosch, South Africa	Claude Leon Postdoctoral Fellow	01 April 2019 To 31 March 2021
University of Stellenbosch Department of Biochemistry Stellenbosch, South Africa	Postdoctoral Fellow, funded by BIOPEP Research Fund to Professor Marina Rautenbach	01 April 2021 To 31 July 2021

MEMBERSHIP OF INSTITUTES/PROFESSIONAL SOCIETIES

Executive of Postdoctoral Society, Stellenbosch University (IT Portfolio), South Africa

RESEARCH OUTPUTS

PEER REVIEWED RESEARCH PUBLICATIONS

1. N. K. Mishra, **V. Kumar** and K. B. Joshi*, **"***Fabrication of gold nanoparticles on biotin-di-tryptophan scaffold for plausible medical applications*", *RSC Adv*., **2015**, *5*, 64387–64394. (Q1, ***Equally contributed,*** **IF-3.049, ISSN:2046-2069**)
2. N. K. Mishra, **V. Kumar** and K. B. Joshi*, "*Thermoplasmonic effect of silver nanoparticles modulates peptide*

amphiphile fiber into nanowreath-like assembly"**,** *Nanoscale*, **2015**, *7*, 20238–20248. (Q1, ***Equally contributed***, **IF- 6.970, ISSN: 2040-3372**)

3. **V. Kumar**, K. V. Krishna, S. Khanna and K.B. Joshi*, "*Aggregation propensity of amyloidogenic and elastomeric dipeptides constituents*", *Tetrahedron*, **2016**, *72*, 5369–5376. (Q2, **IF-2.651, ISSN: 0040-4020**)
4. **V. Kumar**, S. Gupta, A. Rathod, V. Vinayak and K. B. Joshi***,** "*Biomimetic fabrication of biotinylated peptide nanostructures upon diatom scaffold*", *RSC Adv*., **2016**, *6*, 73692–73698. (Q1, **IF-3.049, ISSN:2046-2069**)
5. S. Gautam, M. Kashyap, S. Gupta, **V. Kumar**, B. Schoefs, R. Gordon, C. Jeffryes, K. B. Joshi and V. Vinayak*, "*Metabolic engineering of TiO_2 nanoparticles in Nitzschia palea to form diatom nanotubes: an ingredient for solar cells to produce electricity and biofuel*", *RSC Adv*., **2016**, *6*, 97276–97284. (Q1, **IF-3.049, ISSN:2046-2069**)
6. **V. Kumar**, N. K. Mishra, S. Gupta and K. B. Joshi*, "*Short peptide amphiphile cage facilitate engineering of gold nanoparticles under the laser field*", *ChemistrySelect*, **2017**, *2*, 211–218. (Q2, **Wiley-VCH publishing group**, **IF-1.716, ISSN: 2365-6549**)
7. **V. Kumar**, S. Gupta, N. K. Mishra, S. K. Yadava, R. Singh and K. B. Joshi*, "*Laser-induced fabrication of gold nanoparticles on shellac-driven peptide nanostructures*" *Mater. Res. Exp.*, **2017**, *4* (3), 1–14. (Q2, **IOP publishing group**, **IF- 1.449, ISSN: 2053-1591**)
8. S. Gupta, **V. Kumar** and K. B. Joshi*, "*Solvent mediated photo-induced morphological transformation of AgNPs-peptide hybrids for plausible application*", *J. Mol. Liq*., **2017**, *236*, 266–277. (Q1, ***Equally contributed*** **IF-4.561, ISSN: 0167-7322**).
9. R. Singh, S. Gupta, **V. Kumar** and K. B. Joshi*, "*Hierarchical self-assembly of diproline peptide into dumbbells and copper ions-promoted robust disc*", *ChemNanoMat*, **2017**, *3*, 620–624. (Q1, **IF-3.379, ISSN: 2199-692X**)
10. S. Gupta, M. Kashyap, **V. Kumar**, P. Jain, V. Vinayak and K. B. Joshi*, *"Peptide mediated facile fabrication of silver nanoparticles over living diatom surface and its application*", *J. Mol. Liq*., **2018,** *249*, 600-608. **(Q1, IF-4.561, ISSN: 0167-7322**)
11. **V. Kumar**, R. Singh and K. B. Joshi***,** "*Biotin-avidin interaction triggers conversion of triskelion peptide nanotori into nanochains*", *New. J. Chem.*, **2018**, *42*, 3452-3458. (Q1, **IF- 3.069, ISSN: 1369-9261**)
12. **V. Kumar**, R. Singh, S. thakur, K. B. Joshi* and V. Vinayak*, "*Doping of magnetite nanoparticles facilitates clean harvesting of diatom oil as biofuel for sustainable energy*", *Mat. Res. Exp*., **2018,** *5*, 045503. (Q2, **IF- 1.449, ISSN: 2053-1591**)
13. R. Singh, N. K. Mishra, **V. Kumar**, V. Vinayak, K. B. Joshi, "*Transition metal ion–mediated tyrosine-based short-peptide amphiphile nanostructures inhibit bacterial growth*" *ChemBioChem*, **2018,** *19*,1630–1637. (Q1, **IF 2.593, ISSN: 1439-7633**)
14. **V. Kumar**, M. Kashyap, S. Gautam, P. Shukla, K. B. Joshi and V. Vinayak, "*Fast Fourier infrared spectroscopy to characterize 4 the biochemical composition in diatoms*" *J. Bioscience*, **2018**, 43(4), 717-729. (Q1, **IF-1.823, ISSN: 0250-5991)**
15. S. Gupta, R. Singh, **V. Kumar**, P. Shukla and K. B. Joshi, "*Ornamentation of triskelion peptide nanotori to produce AuNPs embedded peptide Nanobangles*", *Chem. Asian. J.*, **2018,** 13, 3285–3295. (Q1, **IF-3.698, ISSN: 1861-471X**)
16. M. J. Khan, N. Bawra, A. Verma, **V. Kumar**, K. B. Joshi, and V. Vinayak, *Cultivation of diatom Pinnularia saprophila for lipid production: A comparison of methods for harvesting the lipid from the cells*, *Bioresource Technology*, **2021,** 319, 124129 (**IF-7.539, ISSN-0960-8524**).
17. M. Rautenbach, **V. Kumar***, J. A. Vosloo, Y. Masoudi, R. J. van Wyk and M. A. Stander, "*Oligomerisation of tryptocidine C, a Trp-rich cyclodecapeptide from the antimicrobial tyrothricin complex*", *Biochimie*, **2021**, 181, 123-133. **(IF-3.413, ISSN-0300-9084)**

Conference Proceedings

18. V. Vinayak, **V. Kumar**, M. Kashyap, K. B. Joshi, R. Gordon and B. Schoefs, "*Fabrication of resonating microfluidic chamber for biofuel production in diatoms*", *ICEE-IEEE Xplore Digital Library*, INUP-IIT Bombay, 3rd International Conference on Emerging Electronics (ICEE), 27th-30th Dec 2016, Pages: 1-6.

Manuscripts Under Preparation

- **Vikas Kumar**, Carmen De Villiers, Ramesh Singh, Khashti Ballabh Joshi, Jackey L. Snoep, Hasko Henrick Paradies, Marina Rautenbach, *Microscopic aspects of nano-assemblies of tryptocidine C into oblate spheroids*".
- Marina Rautenbach, **Vikas Kumar**, J. Arnold Vosloo, "*Mass spectrometric determination of tyrocidine A, cyclodecapeptide from the antimicrobial tyrothricin complex*".
- **Vikas Kumar**, Carmen De Villiers, Hanso Henrick Paradies, Marina Rautenbach, "*Nanosilver labelled tryptocidine C, for enhanced antimicrobial applications*".

Curriculum Vitae: Dr Vikas Kumar

OTHER SCOLASTIC, RESEARCH-BASED CONTRIBUTIONS

PRESENTATIONS AT FORUMS, CONGRESSES AND CONFERENCES

1. Poster presentation, Thermoplasmonic Effect of Silver Nanoparticles Modulates Peptide Amphiphile Fiber into Nanowreath-like Assembly, in "18th ***Nation Symposium in Chemistry*** CRSI-2016" 5th - 7th Feb 2016, organized by Punjab University and institute of nano science and technology INST, Chandigarh-Punjab, India.
2. Poster presentation, Biotin-avidin interaction triggers conversion of triskelion peptide nanotori into nanochains, **SASBMB-FASBMB**, 8-11 July 2018, organized by Northwest University, Potchefstroom-Johannesburg, South Africa.
3. Oral Presentation**,** Multifaceted biomolecules for the advanced nanotechnological applications, **Postdoctoral Conference of Southern Africa**, 03rd-05th October 2018 in Stellenbosch University**,** South Africa.
4. Oral Presentation, Nanosilver Coated Cyclodecapeptide Assemblies for Antimicrobial Applications**, International Conference on Advanced Materials, Energy and Environmental Sustainability** (**ICAMEES-2018**), 14th-15th December 2018, University of Petroleum & Energy Studies, Dehradun-INDIA.
5. Oral presentation, Spectromicroscopy in Forensic Sciences, **National Webinar on Recent innovations in forensic science and their applications in forensic investigations**, 17 June 2020 - 20 June 2020 organized by Department of Forensic Science, Holkar College, Indore-MP, India.

CONFERENCES ATTENDED

1. Participated in ISCA-2014, 3rd - 7th Jan 2014, "***Indian Science Congress Association***, Mumbai-Maharashtra, India.
2. Participated in workshop on "***Nuclear magnetic resonance spectroscopy and its applications in physics, chemistry and biology***" 16 Feb 2014, organized jointly by Department of Physics and Department of Chemistry, Dr. Hari Singh Gour Central University, Sagar-MP, India.
3. Attended hands-on workshop on, "***Molecular modelling and drug design***", 16th - 17th December 2014, Department of Chemistry, Dr. Hari Singh Gour Central University, Sagar-MP, India.
4. Participated in the course "***Substance of Abuse: Pre and Postnatal Exposure: Pharmacological Effects and Analytical Methods of Detections***" GIAN Global Initiative of academic networks, 5th - 11th Sep 2016, organized by Department of Chemistry, Dr. Hari Singh Gour Central University, Sagar-MP, India.
5. Participated in the course "***Microalga as Renewable High Value Compounds***" GIAN Global Initiative of academic networks, 22th - 27th Nov 2016, organized by Department of Criminology and Forensic Sciences, Dr. Hari Singh Gour Central University, Sagar-MP, India.
6. Attended "***Workshop on Conceptual Quantum Chemistry***", 16th - 20th Jan 2017, Department of Chemistry, Dr. Hari Singh Gour Central University, Sagar-MP, India.

INVITED TALKS

1. *Spectroscopic and microscopic advancements to solve modern problems*, International Seminar on 3rd April 2021, organized by Eklavya University, Damoh, Madhya Pradesh, India.
2. *Novel Antimicrobial Cyclic Decapeptides as Repurposed Drugs and Biophysical Aspects of Their Self-assembly*, National Science Day Seminar on 3rd March 2021, Organized by Department of Chemistry, Dr. Harisingh Gour University, Sagar, India.
3. *Recent Research and Opportunities in Chemistry*, in National Seminar on 11 Jan 2021, organized by Atal Bihari Vajpayee Govt College Pandataraj, Chhattisgarh, India.
4. *Spectro-microscopy in Forensic sciences*, invited speaker at National Webinar on 18 June 2020, organized by Govt Holkar (Model, Autonomous) college, Indore, Madhya Pradesh, India.

Curriculum Vitae: Dr Vikas Kumar

TECHNICAL SKILLS

Research specialisation: Qualitative-structure-function analysis (QSAR), design, synthesis, natural production and purification of short peptides, peptide amphiphiles and peptide assisted photo-induced fabrication of silver and gold nanoparticles for antimicrobial applications. Targets include *Plasmodium falciparum*, *Trypanosoma brucei*, various pathogenic plant fungi and several Gram positive/negative bacteria.

Protein and peptide chemistry: Theoretical and practical background on short peptide synthesis and biophysical analysis methods such as circular dichroism, infrared spectroscopy, UV and fluorescence spectrophotometry, nuclear magnetic resonance, atomic force microscopy, electron microscopy, basic molecular modelling, protein bioinformatics, etc.

Mass spectrometry: Theoretical and practical background; development and/or optimisation of electrospray mass spectrometry and LC-MS analysis methods for peptides and cyclic peptides, polymers, application/optimisation GC-MS methods for small compounds.

Microscopic techniques- Operating skills of the Atomic Force Microscope and scanning electron microscope (with limited guidance). Theoretical and practical knowledge of SEM-energy dispersive spectroscopy and analysis of spectra for determination of elemental composition of nanomaterials. Sample preparation, imaging skills of Transmission electron microscopy for biomaterials and biological samples.

Software knowledge: experienced in computational study of peptide oligomerization by molecular docking and energy minimization. Study of their Cross collisional surface area (CCS analysis) by using **YASARA** software and **YASARA2** Force Field.

Future Research Plans

- Total synthesis of various analogous of a group of cyclic decapeptides known as tyrocidines produced by soil bacteria. 24 different structural variants can be possible but only few are known. Their synthesis, biophysical and biological properties are yet to be explored.
- Synthesis of bioinspired peptide based molecular containers for effective sequestration of CO2, and its photocatalytic conversion into more useful compounds such as amino acids.
- Preparation of peptide-nucleobase conjugates for the fabrication of hydrogels as antimicrobial scaffolds for tissue regeneration, dental pulp treatment and other plausible biological applications.

PERSONAL STATEMENT

Have a clear, logical mind with a practical approach to problem-solving and a drive to see things through to completion. Open-minded, patient, and supportive towards other people, especially towards those who suffer from disabilities. Possess excellent analytical and communications skills and a dedicated approach to working in a highly controlled working environment. I feel amazed to face new scientific problems and learning new techniques to solve them. During my postdoctoral work, I gained experience in point-to-point analysis of a scientific problem and new ways of detailed interpretation experimental data to extract more and more scientific information. Gained deep knowledge of molecular interactions leading to the self-assembly of biomolecules and formation of higher order nanostructures including the role of self-assembled structures in biological activity.

REFERENCES

Prof Marina Rautenbach
BIOPEP Peptide Research Group,
University of Stellenbosch
Department of Biochemistry
Tel: 021-8085878/62
Email: mra@sun.ac.za

Dr Khashti Ballabh Joshi
Department of Chemistry, School of Chemical Science and Technology,
Dr. Harisingh Gour Central University, Sagar-MP, India.
Phone No. +919425849877
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Dr Vandana Vinayak
Department of Criminology and Forensic Sciences, School of Applied Sciences, Dr. Harisingh Gour Central University, Sagar-MP, India.
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