RUNJHUN SARAN NARAYAN

Co-Founder, MOLwise

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HIGHLIGHTS

- Highly skilled researcher in Bio-Nanotechnology, Bioengineering, Biosensors, and applied Artificial Intelligence.
- Developed & established a *Research Program in AI-guided Biochemistry for Healthcare and Global Sustainability*, at ICASSSD, Canada.
- >10 years of experience in independent experimental design, execution, & problem-solving, as well as collaborative multidisciplinary research: published 18+ high impact research articles: Google Scholar.
- Strong experience of industry-academia collaboration.
- Strong experience of undergraduate (UG) and graduate research mentorship.
- Interacted with more than 1200 UG students as a Teaching Assistant, and as a Course Instructor

TECHNICAL SKILLS AND CERTIFICATIONS

Biosensors	DNA Nanotechnology	Biophysics	Python coding (Certified)
Biotechnology	Bioenginnering	Cheminformatics	Machine Learning (Certified 1, 2)
Biochemistry	Analytical Chemistry	Scientific Writing	University Teaching (Certified 1, 2)

EDUCATION

Doctor of Philosophy (Nanotechnology) 2014 - 2019
University of Waterloo, Waterloo, Ontario, Canada
DNA Nanotech | Biotech | Combinatorial Selection | Biochemistry | Scientific Writing

Master's of Technology (Biotechnology) 2009 - 2011
Anna University, Chennai, India
Biotechnology | Biochemistry | Molecular Biology | Microbiology | Protein Chemistry | Scientific Writing

Bachelor's of Technology (Biotechnology) 2005 - 2009
Amity University, Noida, India
Biotechnology

WORK EXPERIENCE

Co-Founder, MOLwise (Stealth mode Biotech) Feb 2023 - Present
AI-powered Bio-Nanotechnology for Environmental Sustainability & Healthcare

Scientific Advisor Jan 2023 - Present
International Center for Applied Systems Science for Sustainable Development, Cambridge, ON Canada
Bio-Nanotechnology | applied Machine Learning | Scientific Writing | Grant Writing | Research Mentor | Project Management

Parental Career Break May 2020 - Dec 2022

Postdoctoral Researcher, Department of Chemistry Sept 2019 - Apr 2020
Sessional Instructor, Department of Chemistry
Scientific Coordinator, Medical Physics and Data Analytics Cluster
The University of British Columbia, Kelowna, British Columbia, Canada
DNA Nanotech | Biotech | Analytical Chemistry | Biophysics | Biochemistry |Biosensors | Scientific Writing | Grant Writing | Research Mentor | University Teaching | Project Management

Research Assistant Feb 2014 - Jul 2014
University of Waterloo, Waterloo, Ontario, Canada
Biochemistry | Nucleic Acid Science | Biotechnology | Structure-function Chemistry | Scientific Writing

Research Fellow (CSIR / GATE) Jun 2011 - Dec 2013
Indian Institute of Science Education and Research Bhopal, M.P., India
Biochemistry | Molecular Biology | Microbiology | Biotechnology | Scientific Writing

PUBLICATIONS

Research Articles - Machine Learning | Bio-Nanotechnology:

1. Chharia A., **Saran R.** and Narayan A.; IEEE International Joint Conference on Neural Networks 2023, Gold Coast, Australia 18-23; June 2023 | cAPTured: Neural Reflex Arc-Inspired Fuzzy Continual Learning for Capturing in Silico Aptamer-Target Protein Interactions (Accepted).
2. Javier P T., Po-Jung J H., Yuzhe D., **Narayan R S.**, Narayan A. and Juewen L.; ACS Synthetic Biology; Jan 3, 2023 | Machine Learning Directed Aptamer Search from Conserved Primary Sequences and Secondary Structures.

Research Articles - Bio-Nanotechnology:

1. **Saran R.**, Piccolo K. A., He Y., Kang Y., Huang P. J. J., Wei C., Chen D., Dieckmann T. and Liu J.; Canadian Journal of Chemistry 99 (11), 860-866; Sep 16, 2021 | Thioflavin T fluorescence and NMR spectroscopy suggesting a non-G-quadruplex structure for a sodium binding aptamer embedded in DNAzymes.
2. Gu L., **Saran R.**, Yan W., Huang P J J., Wang S., Lyu M., Liu J.; ACS omega 3 (11), 15174-15181; Nov 9, 2018 · Reselection Yielding a Smaller and More Active Silver-Specific DNAzyme.
3. **Saran R.**, Lu Y., Hoang P. and Liu J.; Biochimie 145, 145-150; Jul 12, 2017 | Folding of the silver aptamer in a DNAzyme probed by 2-aminopurine fluorescence.
4. Zhou W., **Saran R.**, Ding J., Liu J.; ChemBioChem 18 (18), 1828-1835; Jun28, 2017 | Two Completely Different Mechanisms for Highly Specific Na+ Recognition by DNAzymes.
5. **Saran R.**, Kleinke K., Zhou W., Yu T. and Liu J.; Biochemistry 56 (14), 1955-1962; Mar 27, 2017 | A Silver-Specific DNAzyme with a New Silver Aptamer and Salt-Promoted Activity.
6. Zhou W., **Saran R.**, Huang P J J., Ding J., Liu J.; ChemBioChem 18 (6), 518-522; Jan 14, 2017 | An Exceptionally Selective DNA Cooperatively Binding Two Ca2+ Ions.
7. Kleinke K., **Saran R.**, Liu J.; Sensors 16 (9), 1370; Aug 26, 2016 | Label-Free Ag+ Detection by Enhancing DNA Sensitized Tb3+ Luminescence.
8. Chandra M., **Saran R.**, Datta S.; Biochemical and biophysical research communications 473 (1), 8-16; Apr 22, 2016 | Deciphering the role of Atg5 in nucleotide dependent interaction of Rab33B with the dimeric complex, Atg5-Atg16L1.
9. **Saran R.,** Liu J.; Analytical Chemistry 88 (7), 4014-4020; Mar 15, 2016 | A Silver DNAzyme.
10. **Saran R.,** Liu J.; Inorganic Chemistry Frontiers 3 (4), 494-501; Jan 11th, 2016 | A comparison of two classic Pb2+-dependent RNA-cleaving DNAzymes.
11. Zhou W., **Saran R.**, Chen Q., Ding J., Liu J.; ChemBioChem 17 (2), 159-163; Nov 19th, 2015 | A New Na+-Dependent RNA-Cleaving DNAzyme with over 1000-fold Rate Acceleration by Ethanol.
12. **Saran R.**, Chen Q., Liu J.; Journal of molecular evolution 81, 235-244; Oct 12, 2015 | Searching for a DNAzyme Version of the Leadzyme.
13. Wang F., **Saran R.**, Liu J.; Bioorganic & medicinal chemistry letters 25 (7), 1460-1463; Apr 1, 2015 | Tandem DNAzymes for mRNA cleavage: Choice of enzyme, metal ions and the antisense effect.

Reviews - Bio-Nanotechnology:

1. **Saran R.**, Huang Z. and Liu J.; Coordination Chemistry Reviews 428, 213624 · Feb 1, 2021 | Phosphorothioate nucleic acids for probing metal binding, biosensing and nanotechnology.
2. **Saran R.**, Wang Y. and Li I. T. S.; Sensors 2020, 20 (24), 7019 · Dec 29, 2020 | Mechanical Flexibility of DNA: A Quintessential Tool for DNA Nanotechnology.
3. Zhou W., **Saran R**. and Liu J.; Chemical Reviews 117 (12), 8272-8325 · Jun 9, 2017 | Metal Sensing by DNA.

STUDENT SUPERVISION

Student Name	Project Level	Research Topic	Duration	Resulting Publication	University
Raj Tulluri	Masters	Generative AI for Aptamer Discovery	Jan 2024 - Present	Under Preparation	International Centre for Applied Systems Science and Sustainable Development (ICASSSD), ON, Canada & University of Western Ontario, Canada
Daya Kumar	PhD	Generative AI for Aptamer Discovery	Sept 2023 - Present	Under Preparation	
Colin Dai	Master's	Toward designing highly tunable DNAzyme-based molecular rolling motors.	Sept 2019 – Dec 2020	Master's Thesis	University of British Columbia, British Columbia, Canada
Omkar Kulkarni	PhD	DNA based probes for cellular receptors at a molecular level	Sept 2019 – Dec 2020	Master's Thesis	
Brandon Magnus	UG	ELISA-based profiling of mouse-serum samples to identify early biomarkers for radiation-induced pulmonary fibrosis.	Sept. 2019 – Dec. 2019	Undergraduate 4th Year Research Project	
Mathias Labonte	UG	Development of a method for determining fibrotic area in murine lung Samples.	Sept. 2019 – Dec. 2019	Undergraduate 4th Year Research Project	
Sydney Neumeier	UG	Electrophoresis-induced shearing and unzipping of double stranded DNA.	May 2019 - August 2019	Undergraduate 4th Year Research Project	
Lide Gu	Master's	Reselection based on a silver specific RNA-cleaving DNAzyme	Aug. 2017 – Dec. 2018	Research Article	University of Waterloo, Ontario, Canada
Peter Hoang	UG	Folding of the silver aptamer in Ag10c (Ag+ dependent RNA cleaving DNAzyme) by FRET	May 2017 – Aug 2017	Research Article	
Austin Jabari	UG	Detecting gold ions using a DNAzyme	May 2017 – Aug 2017	Undergraduate Research Project	
Lu Yao	UG	Folding of the silver aptamer in Ag10c (Ag+ dependent RNA cleaving DNAzyme) probed by 2-aminopurine fluorescence.	Jan. 2017 – Apr. 2017	Research Article	
Kim Kleinke	UG	Label-Free Ag+ Detection by Enhancing DNA Sensitized Tb3+ Luminescence.	Jan. 2016 – Apr. 2016	Research Article	

GUEST LECTURES / INVITED TALKS

Title	Date	Event and Organization
Functional Nucleic Acids for Sustainable Environment and Healthcare	Mar 22, 2024	Department of Chemistry and Biochemistry, Wilfrid Laurier University, Waterloo, ON, Canada
'Introduction to Research & Research Process' (Online)	Mar 27, 2024	Second Research School on Sustainable Solutions, International Centre for Applied Systems Science for Sustainable Development (ICASSSD), Cambridge, ON, Canada
'Introduction to Research & Research Process' (Online)	Feb 24, 2023	First Research School on Sustainable Solutions, International Centre for Applied Systems Science for Sustainable Development (ICASSSD), Cambridge, ON, Canada
'Catalysis and applications of RNA-cleaving DNAzymes'	Nov 10, 2019	Quantum & Nano Computing Systems Applications (QANSAS 2019 @50) Conference November 10-12, 2019, Dayalbagh Educational Institute, Agra, India
'Nanotechnology and DNAzyme-based Biosensors'	Oct 30, 2019	Department of Biology and the Department of Chemistry, University of British Columbia, BC, Canada
'DNA-based Biosensors'	Oct 26, 2018	Department of Biology and the Department of Chemistry, University of British Columbia, BC, Canada
'DNA-based Biosensors'	Apr 29, 2018	3rd Indo-Canadian Research Colloquium 'UW and DEI: Education and Research in Dialogue', University of Waterloo, Canada
'Nanotechnology and DNA-based Biosensors'	Sept 27, 2017	Department of Biomedical Engineering, University of Waterloo, ON, Canada
'Can DNA contribute towards green environment?'	Jun 2, 2017	2nd Indo-Canadian Research Colloquium 'UW and DEI: Education and Research in Dialogue', University of Waterloo, Canada
'DNA and Nanotechnology' (Online)	Mar 3, 2017	Mount Allison University, Sackville, New Brunswick, Canada
'DNAzyme based Ag+ Biosensors'	Apr 21, 2016	1st Indo-Canadian Research Colloquium 'UW and DEI: Education and Research in Dialogue', University of Waterloo, Canada
'DNA and Nanotechnology'	Feb 2, 2016	Department of Chemistry, University of Waterloo, ON, Canada
'Isolation of a DNA sequence that can selectively detect silver ions'	Nov 24, 2015	WIN Graduate Seminar Series, Waterloo Institute of Nanotechnology, University of Waterloo, Waterloo, ON, Canada
'Regulation, Crosstalk and Mimicry of the Small GTP-binding Proteins'	Jan 31, 2013	State-of-the-Art Seminar Series, Indian Institute of Science Education and Research, Bhopal, MP India

TEACHING EXPERIENCE

Capacity	Course Name	Course Level	Duration	University	Activity
Course Instructor	BIOC410 Nucleic Acid Structure and Function (Online)	4th Year UG	Fall 2020	Dept. of Chem., University of British Columbia (UBC), Canada	Course design, Teaching & Grade evaluation
	PHY 305 Cellular Biophysics (Introduction to Biophysics)	3rd Year UG	Winter 2020	Dept. of Computer Science, Mathematics, Physics and Statistics, UBC, Canada	

Teaching Assistant	NE469 Special Topics in Micro and Nano-Instrumentation	4th year UG	Winter 2017	Waterloo Institute of Nanotechnology, University of Waterloo, Canada	Teaching & Grade Evaluation
	Chemical Reactions, Equilibria, and kinetics	1st year UG	Winter 2015 Winter 2014	Dept. of Chemistry, University of Waterloo, Canada	
Teaching Assistant	Introductory Biochemistry Laboratory	2nd year UG	Winter 2017 Winter 2016	Dept. of Biology, University of Waterloo, Canada	Teaching, Experimental Demonstration & Grade Evaluation
	Chemical Reaction Laboratory	1st year UG	Fall 2017 Fall 2016 Fall 2015 Fall 2014	Dept. of Chemistry, University of Waterloo, Canada	

SCHOLARSHIPS, HONORS, AND AWARDS

HONORS / AWARDS / SCHOLARSHIPS	YEAR	AMOUNT
Nominated at the National level by The University of British Columbia, Canada for the highly prestigious '***Banting Post-Doctoral Fellowship***'	2019-2020	--
Nominated at the National level by The University of British Columbia, Canada for the highly prestigious '***Killam Post-Doctoral Fellowship***'	2018-2019	--
WIN Nanofellowship, Waterloo Institute for Nanotechnology, University of Waterloo, Waterloo, ON Canada	Sep 2017	CAD$ 1,000
WIN Nanofellowship, Waterloo Institute for Nanotechnology, University of Waterloo, Waterloo, ON Canada	Sep 2016	CAD$ 1,000
Graduate Student Association, University of Waterloo, **Travel Grant**	2016	CAD$ 500
University of Waterloo Graduate Student Scholarship, Fall 2015	Fall 2015	CAD$ 2,000
Provost Doctoral Entrance Award for Women, University of Waterloo, Waterloo, ON Canada	Sep 2014	CAD$ 5,000
Senior Research Fellowship, Council of Scientific and Industrial Research (CSIR), India	July 2013	INR 1,32,000
Junior Research Fellowship, Indian Institute of Technology (GATE), India	July 2011	INR 4,32,000
Combined Biotechnology Entrance Exam Award, Department of Biotechnology, Govt. of India	July 2009	INR 1,92,000