

# KISHORE GOPALAKRISHNAN Ph.D.

Research Scientist, Wayne State University

(586)430-6806 Kishore.gopalakrishnan@wayne.edu 5047 Gullen Mall, Detroit, MI, USA [Website](#)

## Summary/Objective

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Dynamic researcher with a strong foundation in microbial fermentation and bioengineering, specializing in the optimization of bioprocesses for sustainable production. Proven expertise in managing complex laboratory environments, leading cross-functional teams, and driving innovative research initiatives. Passionate about leveraging advanced techniques to address global energy challenges and contribute to impactful solutions in bioenergy and bioproduct development.

## Research Experience

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### Research Scientist

Department of Biological Sciences – Ecotoxicology Lab - Wayne State University, MI, USA (August 2020 - Present)

Advisor: Dr. Donna Kashian

#### Projects:

- Isolation, identification, and characterization of novel cyanotoxins (microcystin) produced by cyanobacteria that limit the spawning of quagga (Dreissenid) mussels – Phase II
- Identifying how aquatic pollutants microplastics influence cyanobacteria and evaluating their physiological and biochemical changes in cyanobacteria and green algae

### Postdoctoral researcher

Department of Biological Sciences – Ecotoxicology Lab - Wayne State University, MI, USA (November 2017 – July 2020)

Advisor: Dr. Donna Kashian

#### Projects:

- Isolation, identification, and characterization of novel cyanotoxins (microcystin) produced by cyanobacteria that limit the spawning of quagga (Dreissenid) mussels – Phase I
- Investigating the influence of calcium and temperature on quagga mussel's invasion

### Postdoctoral researcher

Civil and Environmental Engineering - Wayne State University, MI, USA (January 2016 – October 2017)

Advisor: Dr. Yongli Wager

#### Projects:

- Optimization of culture conditions for the synthesis of microalgal secondary metabolites, lipids, and fatty acids
- Conducted Spatial Life Cycle Assessment of Algal Bioenergy with Wastewater

### Undergraduate Researcher

SPIC Pharmaceuticals, India (October 2005 – March 2006)

Advisor: Dr. Ravichandran

#### Project:

- Optimization of sterilization time, media composition and precursor concentration for increased penicillin production by *Penicillium chrysogenum*

## Teaching Experience

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**Lecturer:** Fermentation Technology, Bioprocess Engineering

Department of Industrial Biotechnology, Rajalakshmi Engineering College, India (June 2008 – December 2010)

**Tutor:** Bioreactor Laboratories

Chemical and Process Engineering, University of Canterbury, New Zealand (January 2012 – December 2014)

## Editorial Experience

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**Guest Editor:** Biofuels and Alternative Fuels

A special issue of Energies (ISSN 1996-1073)

**Topic Coordinator:** The Concept of Microalgal Bio-refinery: From Sustainable Wastewater Treatment to Resources Recovery

A special issue of Frontiers in Bioengineering and Biotechnology (ISSN 2296-4185)

**Reviewer:**

Algal Research | 9 manuscripts | 2022 - present

Aquatic Toxicology | 11 manuscripts | 2021 – present

Environmental Toxicology and Chemistry | 6 manuscripts | 2021 - Present

Environmental Science and Technology | 1 manuscript | 2022 - present

Environmental Pollution | 5 manuscripts | 2020 – Present

Journal of Great Lakes Research | 2 manuscripts | 2020 – present

Science of the Total Environment | 2 manuscripts | 2020 - present

Food and Function | 3 manuscripts | 2021 – Present

Urban Water Journal | 1 manuscript | 2023 – present

Biomass and Bioconversion | 1 manuscript | 2019 – present

Chemical Engineering Journal | 2 manuscript | 2023 - present

## Conference Experience

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**Session Chair, ASLO 2022** (Association for the Sciences of Limnology and Oceanography)

- Facilitated and guided discussions during “Conservation of urban aquatic systems: Interdisciplinary solutions to complicated problems” at the ASLO 2022 conference
- Managed the presentation schedule, introduced speakers, and facilitated Q&A sessions.

## Education

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**DOCTOR OF PHILOSOPHY (Ph.D.) in Chemical and Process Engineering**

University of Canterbury | July 2015

Christchurch, New Zealand.

**MASTER OF TECHNOLOGY (MTech) in Industrial Biotechnology (CGPA 9.03/10)**

Annamalai University | May 2008

Tamilnadu, India.

**BACHELOR OF TECHNOLOGY (BTech) in Industrial Biotechnology (74%)**

Anna University | May 2006

Tamilnadu, India.

## Honors and Awards

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**Awarded Prestigious Doctoral Scholarship (2011 – 2014)**

University of Canterbury

**Early Career Travel Grant (December 2018)**

Association for the Science of Limnology and Oceanography 2019 – Aquatic meeting - Puerto Rico, USA

## Funding

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1. The One Health Pilot Project Initiative has granted approval and funding of \$30,000 for the One Health 2024 Pilot Project Award, with a funded duration spanning 2024-2025.
2. The proposal submitted to Anderson Engineering Ventures Institute on the title "High value pigment production from newly discovered algae *Ettlia* species from New Zealand" has been selected for final round of \$5000 funding (Sep 9, 2016).

## Publications

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1. **Gopalakrishnan K**, Zhang Y, 14. Co-cultivation of Microalgae and Bacteria for Optimal Bioenergy Feedstock Production in Wastewater by Using Response Surface Methodology. *Scientific reports*, 2024;**14**(1): 20703.
2. Zhang Y, Diehl A, Lewandowski A, **Gopalakrishnan K**, Baker T. *Removal efficiency of micro- and nanoplastics (180 nm–125 µm) during drinking water treatment. Science of Total Environment*, 2020; 720: 137383
3. **Gopalakrishnan, K. K.**, & Kashian, D. R. Complex interactions among temperature, microplastics and cyanobacteria may facilitate cyanobacteria proliferation and microplastic deposition. *Ecotoxicology and Environmental Safety*, **263** (2023): 115259.
4. **Gopalakrishnan, K. K.**, R. Sivakumar and D. Kashian (2023). "The Microplastics Cycle: An In-Depth Look at a Complex Topic." *Applied Sciences* **13**(19): 10999.
5. **Gopalakrishnan, K. K.**, & Kashian, D. R. Extracellular polymeric substances in green alga facilitate microplastic deposition. *Chemosphere* 286 (2022): 131814.
6. **Gopalakrishnan K K**, Kashian D R. Identification of optimal calcium and temperature conditions for quagga mussel filtration rates as a potential predictor of invasion. *Environmental toxicology and chemistry*, 2020, 39(2): 410-418
7. Pedersen A F, **Gopalakrishnan K**, Boegehold A G, Peraino N J, Westrick J A, Kashian D R. Microplastic ingestion by quagga mussels, *Dreissena bugensis*, and its effects on physiological processes. 2020; *Environmental Pollution*, 260: 113964
8. **Gopalakrishnan K**, Roostaei J, Zhang Y. Mixed culture of *Chlorella* sp. and wastewater wild algae for enhanced biomass and lipid accumulation in artificial wastewater medium. *Frontiers of Environmental Science & Engineering*. 2018;12(4):14.
9. Roostaei J, Zhang Y, **Gopalakrishnan K**, Ochocki AJ. Mixotrophic Microalgae Biofilm: A Novel Algae Cultivation Strategy for Improved Productivity and Cost-efficiency of Biofuel Feedstock Production. *Scientific reports*. 2018; 8(1):12528.
10. Mazumdar N, **Gopalakrishnan KK**, Visnovsky G, Novis PM. A novel alpine species of *Haematococcus* (Chlamydomonadales: Chlorophyta) from New Zealand. *New Zealand Journal of Botany*. 2018; 56(2):216-26
11. **Gopalakrishnan, K**, Novis, P, Visnovsky, G. Alpine Scenedesmaceae from New Zealand: new taxonomy. *New Zealand Journal of Botany*. 2014; 1-16.
12. Novis, P. M, Smissen, R, Buckley, T. R, **Gopalakrishnan, K**, Visnovsky, G. Inclusion of chloroplast genes that have undergone expansion misleads phylogenetic reconstruction in the Chlorophyta. *American journal of botany*. 2013; 100:2194-209.
13. **Gopalakrishnan, K. K.**, & Detchanamurthy, S. Effect of Media Sterilization Time on Penicillin G Production and Precursor Utilization in Batch Fermentation. *J Bioprocess Biotechniq*. 2011; 1:5.
14. Roostaei J, Wager YZ, Shi W, Dittrich T, Miller C, **Gopalakrishnan K**. IoT-based Edge Computing (IoTEC) for Improved Environmental Monitoring. *Sustainable computing: informatics and systems*. 2023; 38:100870.

## Conference/Seminar Publications

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1. **Gopalakrishnan, K.** Kashian, D. (2022) Microplastics can facilitate cyanobacterial blooms which can promote their deposition. Grand Rapids, Michigan, JASM 2022 (Conference contribution – Oral presentations)
2. Kashian, D. **Gopalakrishnan, K.** (2022) Increase in temperature trigger seasonal shifts in Quagga mussel spawning in the Detroit River. Grand Rapids, Michigan, JASM 2022 (Conference contribution – Oral presentations)
3. Dima Awad, Rucha Joshi, Zoha Siddiqua, **Kishore Gopalakrishnan**, Shawn P. McElmurry, Tracie R. Baker, David K. Pitts. Behavioral and Genomic Responses to Volatile Petroleum Products in *Daphnia pulex*. 20th annual College Research Day, Wayne State University, Michigan, USA, October 11, 2023 (poster presentation)
4. Rucha Joshi, Dima Awad, Zoha Siddiqua, Shawn McElmurry; Donna Kashian; **Kishore Gopalakrishnan**, Tracie R. Baker; David K. Pitts. Xylene Toxicity: Immobility and transcriptomic changes in *Daphnia pulex*. 20th annual College Research Day, Wayne State University, Michigan, USA, October 11, 2023 (poster presentation)
5. Kashian, D. Boegehold, A. **Gopalakrishnan, K.** Pedersen, A. (2019) Ingestion of microplastics can inhibit filtration rates in quagga mussels (*Dreissena bugensis*). Salt Lake City, Utah. Society of Freshwater Sciences, May 19-23, 2019. (Conference contribution – Oral presentations)
6. **Gopalakrishnan, K.** Pedersen, A, Kashian, D. (2019) Effect of temperature and calcium on Quagga Mussels' filtration rates. San Juan, Puerto Rico, ASLO 2019 Aquatic meeting, February 26, 2019 (Conference contribution – Oral Presentation)
7. Kashian, D. Boegehold, A. **Gopalakrishnan, K.** Johnson, N. (2019) Can harmful algal blooms inhibit quagga mussel reproduction? San Juan, Puerto Rico, ASLO 2019 Aquatic meeting, February 26, 2019 (Conference contribution – Oral Presentation)
8. Pedersen, A. Boegehold, A. **Gopalakrishnan, K.** Kashian, D. (2019) Sublethal effect in *Dreissena bugensis* following exposure to microplastics. San Juan, Puerto Rico, ASLO 2019 Aquatic meeting, February 26, 2019 (Conference contribution – Oral Presentation)
9. **Gopalakrishnan, K.** Kashian, D, Boegehold, A, Johnson, N (2019) Effect of cyanobacteria on quagga mussels (*Dreissena rostriformis bugensis*) reproduction. Cleveland, Ohio, Midwest fish and wildlife conference, January 29, 2019 (Conference contribution – Oral presentations)
10. Zhang, Y. Veltri, V. **Gopalakrishnan, K.** Roostaei, J. (2017) Occurrence and fate of chemicals of emerging concern (CECs) and their interactions with microbiota in urban water cycles. Philadelphia: NIEHS 2017 Superfund Research Program Annual Meeting, December 6, 2017 (Conference Contributions - Poster presentations)
11. **Gopalakrishnan, K.** Roostaei, J. and Zhang, Y. (2017) Optimization of wastewater treatment efficiency and biofuel productivity by chlorella species and mixed wastewater algae using response surface methodology (RSM). Ann Arbor, Michigan: AEESP Conference, June 22, 2017 (Conference Contributions - Poster presentations)
12. **Gopalakrishnan, K.** Roostaei, J. and Zhang, Y. (2017) Optimization of effective parameters for maximum production of biomass and lipids by chlorella and MWWA by Box-Behnken model developed using DoE-RSM. Ann Arbor, Michigan: Borchardt Conference, February 22, 2017 (Conference Contributions - Poster presentations)
13. **Gopalakrishnan, K.** and Visnovsky, G. (2014) Influence of light intensity on growth kinetics and PUFA's production of New Zealand alpine algae cultivated in airlift photobioreactors. Wellington, New Zealand: New Zealand Microbiological Society Conference 2014, November 18-20, 2014. (Conference Contributions - Poster presentations)
14. **Gopalakrishnan, K.**, Visnovsky, G. and Novis, K. (2012) *Pigments and lipids from NZ alpine algae*. Dunedin, New Zealand: Forum on Algal and Cyanobacterial Biomass, Bioenergy and Bioproducts, December 7, 2012. (Conference Contributions - Oral presentations)

## Media Coverage

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### **IAGLR Lakes Letter | Fall, 2023**

"Research unearths microplastics and algae nexus in Great Lakes"

### **Research Feature, The Detroit news, Front Page | March 14, 2022**

"Newspaper headline: Mussels threaten Great Lakes from within"

### **Research Feature, The Detroit news, Front Page | April 3, 2023**

"Newspaper headline: Algae, plastic bits a 'scary' Great Lakes mix, experts fear"

### **Michigan Radio, State Side | May 3, 2023**

"Exploring the Unique Threat Posed by the Combination of Microplastics and Algae in the Great Lakes"

### **Great Lakes HABs Collaborative newsletter | Spring, 2023**

"Microplastics and Harmful Algal blooms in the Great Lakes"

## Invited talks.

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### **The National Oceanic and Atmospheric Administration's Great Lakes Environmental Research Laboratory**

Title - Microplastics movement in the aquatic environment: Can algae play a role? | February 23, 2021

### **Wayne State University, MI, USA**

Title - Microplastics movement | January 25, 2021

### **The Oxford college of Engineering, India**

Title – Generations of Biofuels and Future Challenges | July 6, 2020

### **Kalasalingam Academy of Research and Education, India**

Title – Prospects in Plant and algal biotechnology | December 2019

## References

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### **Dr. Donna Kashian**

Professor,  
Department of Biological Sciences,  
Wayne State University,  
5047, Gullen Mall, Detroit, MI, U.S.A 48202  
Phone: +01 313-577-8052, Email: [dkashian@wayne.edu](mailto:dkashian@wayne.edu)

### **Dr. Yongli Wager**

Assistant professor,  
Department of Civil and Environmental Engineering  
Wayne State University  
5050 Anthony Wayne Dr. #2168, Detroit, MI, U.S.A 48202  
Phone: +01 313-577-9962, Email: [zhangyl@wayne.edu](mailto:zhangyl@wayne.edu)

### **Dr. Phil Novis**

Researcher – Phycologist  
Landcare Research Ltd.  
Lincoln 7640, New Zealand  
Phone: +64 3 321 9998 E-Mail: [NovisP@landcareresearch.co.nz](mailto:NovisP@landcareresearch.co.nz)

## Declaration

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I hereby declare that the information furnished above is true to the best of my knowledge. I am ready to furnish further details on request.

Date: Oct 06, 2024.  
Place: Detroit, USA

Kishore Gopalakrishnan