

Dr. PERUMAL MADAN KUMAR
Senior Scientist
Department of Biochemistry,
CSIR- Central Food Technological Research Institute,
Mysuru - 570 020.
E-mail: madanperumal@cftri.res.in

Education

- | | |
|------|----------------------------------------------------------------------|
| 2014 | Doctor of Philosophy in Biochemistry - University of Madras, India. |
| 2008 | Master of Philosophy in Biochemistry - University of Madras, India. |
| 2007 | Master of Science in Biochemistry - Thiruvalluvar University, India. |
| 2005 | Bachelor of Science in Biochemistry - University of Madras, India. |

Research training

❖ **Post-Doctoral Research** (October 2014- May 2017)

Mentor(s): Prof. Mike Brown & Prof. Joe Goldstein, Regental Professors, Department of Molecular Genetics, UT Southwestern Medical Centre, Dallas, Texas, USA.

❖ **Senior Research Fellow** (August 2010 to July 2012)

Mentor: Dr. S. Niranjali Devaraj, Professor and Head (Rtd.), Department of Biochemistry, University of Madras, Guindy Campus, Chennai.

❖ **Doctoral Research (Ph.D)** (January 2009 to February 2014)

Mentor: Dr. S. Niranjali Devaraj, Professor and Head (Rtd.), Department of Biochemistry, University of Madras, Guindy Campus, Chennai.

Faculty Academic Appointments

- | | |
|-------------------------|--------------------------------------------------------------------------------------------------------------|
| 17/01/2022 - Present | Senior Scientist, Department of Biochemistry, CSIR-CFTRI. |
| 03/2018 - Present | Assistant Professor (AcSIR) in the Faculty of Biological Sciences, Department of Biochemistry, CSIR-CFTRI |
| 17/01/2018 - 16/01/2022 | Scientist, Department of Biochemistry, CSIR-CFTRI. |

Awards, Certificates and Honors

- | | |
|------|-------------------------------------------------------------------------------------------------------------------------------|
| 2018 | Recognized by AcSIR as an Assistant Professor of the Academy in the Faculty of Biological Sciences. |
| 2014 | Postdoctoral Research Fellowship in Drs. Brown/Goldstein laboratory, UT Southwestern Medical Center, Dallas, TX, USA. |
| 2014 | Research Associate in a DBT funded project in University of Madras, Chennai during 2014 (not accepted). |
| 2012 | Travel Grant Award from Christian Medical College (CMC), Vellore for presenting a poster in the "Tenth CMC Winter symposium". |
| 2010 | Senior Research Scholarship (Science) by Lady Tata Memorial Trust, Mumbai, INDIA. |
| 2007 | Proficiency Awards for studies in M.Sc Biochemistry. |
| 2005 | Prof. S. Govindasamy Cash Prize Award for securing first mark in Biochemistry in B.Sc University Examinations. |

Laboratory profile

Research areas of interest:

- 🚦 Hepatic stellate cell biology - MASLD
- 🚦 Sterol regulatory element-binding proteins in human diseases
- 🚦 Space biology – Hypoxia, Microgravity & Liver metabolism
- 🚦 Ayurceuticals and Functional formulations as dietary intervention

Ongoing R&D Projects:

| | | |
|---------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GAP648 | PI | Targeting mitochondrial fission with dietary molecules inhibits hepatic stellate cell activation and progression of non-alcoholic fatty liver disease: Pre-clinical & safety validation |
| GAP637 | PI | Decoding the role of the transcription factor, Sterol Regulatory Element Binding Protein during hepatic stellate cell activation |
| GAP631 | Co-PI | A greener processed ayurvedic anti-cancer formulation for liver cancer management |
| GAP633 | Member | Post-biotics fermentate formulation for the management of diabetes, hyperlipidemia and gut health |
| CLP0017 | Co-PI | Validation of health beneficial effects of Coconut oil and virgin coconut oil using <i>in vivo</i> and <i>in vitro</i> and clinical trials |

Completed R&D Projects:

| | | |
|--------|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GAP606 | PI | Adipocyte derived extracellular vesicles activate hepatic stellate cells mediated by SREBP cleavage-activating protein |
| MLP277 | PI | SREBP inhibitors as novel therapeutics for non-alcoholic fatty liver disease: Insights on CRISPR-Cas9 inhibition of SREBPs targeting activated hepatic stellate cells |
| MLP270 | PI | A cleaner processed ayurvedic food formulation and assessment for immunomodulatory effect |
| MLP246 | Co-PI | Development and evaluation of functional foods for Phenylketonurics and gastritis patients |

| | |
|-------------------------------------------------------------|----|
| Number of Post-docs presently mentoring | 2 |
| Number of Post-doc mentored | 2 |
| Number of Ph.D students presently mentoring | 4 |
| Number of Project JRFs presently mentoring | 2 |
| Number of Project JRFs mentored | 1 |
| Number of Project Associate-I presently mentoring | 2 |
| Number of Project Associate-I mentored | 1 |
| Number of Project Dissertation students presently mentoring | 1 |
| Number of Project Dissertation students mentored | 21 |

Recent Publications from CFTRI

Research – SCI Journals

1. Vijayan N, **Perumal MK***. Cholesterol Depletion Activate Hepatic Stellate Cells Mediated Through SREBP-2 Signaling. *J Cell Physiol.* 2024 Nov 13. doi: 10.1002/jcp.31476
2. Vijay V., Panneerselvam A., Manjunatha J.R., **Perumal MK***. Morin/hydroxypropyl- β -cyclodextrin inclusion complex showed higher in vivo oral bioavailability and inhibition on LX-2 cell growth, *Food Bioscience.* 2024, <https://doi.org/10.1016/j.fbio.2024.104897>.
3. V P V, Rajamanikandan S, **Perumal MK***. Morin inhibits the activity of pancreatic lipase and adipogenesis. *Eur J Pharmacol.* 2024 Aug 15;977:176705. doi: 10.1016/j.ejphar.2024.176705.
4. Dasgupta D, Ahuja V, Singh R, More S, Mudliar S, **Kumar M.** Food-grade xylitol production from corncob biomass with acute oral toxicity studies. *World J Microbiol Biotechnol.* 2023 Feb 17;39(4):102. doi: 10.1007/s11274-023-03542-2.
5. Om P, Gopinath MS, **Madan Kumar P**, Muthu Kumar SP, Kudachikar VB. Ethanolic extract of *Pyrus pashia* buch ham ex. D. Don (Kainth): A bioaccessible source of polyphenols with anti-inflammatory activity in vitro and in vivo. *J Ethnopharmacol.* 2022 Jan 10;282:114628. doi: 10.1016/j.jep.2021.114628.
6. Shilpa S, Shwetha HJ, **Perumal MK**, Ambedkar R, Hanumanthappa M, Baskaran V, Lakshminarayana R. Turmeric, red pepper, and black pepper affect carotenoids solubilized micelles properties and bioaccessibility: Capsaicin/piperine improves and curcumin inhibits carotenoids uptake and transport in Caco-2 cells. *J Food Sci.* 2021 Nov;86(11):4877-4891. doi: 10.1111/1750-3841.15926.
7. Murugesan S, Kottekad S, Crasta I, Sreevathsan S, Usharani D, **Perumal MK**, Mudliar SN. Targeting COVID-19 (SARS-CoV-2) main protease through active phytochemicals of ayurvedic medicinal plants - *Emblica officinalis* (Amla), *Phyllanthus niruri* Linn. (Bhumi Amla) and *Tinospora cordifolia* (Giloy) - A molecular docking and simulation study. *Comput Biol Med.* 2021 Sep;136:104683. doi: 10.1016/j.compbiomed.2021.104683.
8. Janani R, Anitha RE, **Perumal MK**, Divya P, Baskaran V. Astaxanthin mediated regulation of VEGF through HIF1 α and XBP1 signaling pathway: An insight from ARPE-19 cell and streptozotocin mediated diabetic rat model. *Exp Eye Res.* 2021 May;206:108555. doi: 10.1016/j.exer.2021.108555.

Reviews

1. Sekar V, VP V, Vijay V, BR A, Vijayan N, **Perumal MK***. Inhibition of hepatic stellate cell activation by nutraceuticals: an emphasis on mechanisms of action. *J Food Sci Technol* (2024). <https://doi.org/10.1007/s13197-024-06002-3>
2. Venkatesh VP, Kannan A, **Perumal MK***. Role of adipocyte-derived extracellular vesicles during the progression of liver inflammation to hepatocellular carcinoma. *J Cell Physiol.* 2023 Mar 24. doi: 10.1002/jcp.31008.
3. Vijayan N, **Perumal MK***. A critical review on anti-fibrotic phytochemicals targeting activated hepatic stellate cells. *J Food Biochem.* 2022 Oct 9:e14438. doi: 10.1111/jfbc.14438.
4. Gandhi GR, Jothi G, Mohana T, Vasconcelos ABS, Montalvão MM, Hariharan G, Sridharan G, **Kumar PM**, Gurgel RQ, Li HB, Zhang J, Gan RY. Anti-inflammatory natural products as potential therapeutic agents of rheumatoid arthritis: A systematic review. *Phytomedicine.* 2021 Dec;93:153766. doi: 10.1016/j.phymed.2021.153766.
5. Rajasekar J, **Perumal MK**, Vallikannan B. A critical review on anti-angiogenic property of phytochemicals. *J Nutr Biochem.* 2019 Sep;71:1-15. doi:

Invited Book chapters

1. Annapoorna BR, **Madan Kumar P***. (2024). Bioactive Compounds of Bhoomi Amla (Phyllanthus niruri): Nutritional and Pharmacological Aspects. In: Chakraborty, R., Mathur, P., Roy, S. (eds) Food Production, Diversity, and Safety Under Climate Change. Advances in Science, Technology & Innovation. Springer, Cham. https://doi.org/10.1007/978-3-031-51647-4_9
2. Vasudevan S, Sachin T, Venkatesh VP, **Madan Kumar P***. (2024). Recent Insights on Zebrafish Larvae as Experimental Model for Studying Liver Diseases. In: Kim, S.-K. (Ed.) Marine Larvae – Developments and Applications (1st ed.). CRC Press. <https://doi.org/10.1201/9781003359388>
3. **Madan Kumar P**, Janani R, Priya S, Naveen J, Baskaran V. (2022). Pharmaceutical Applications of Major Marine Nutraceuticals - Astaxanthin, Fucoxanthin, Ulvan, and Polyphenols. In: Kim, S.-K. (Ed.) Marine Biochemistry: Isolations and Techniques (1st ed.). CRC Press. <https://doi.org/10.1201/9781003303909>
4. Annapoorna BR, Vasudevan S, Sindhu K, Vani V, Nivya V, Venkatesh VP, **Madan Kumar P*** (2022). Hepatoprotective Marine Phytochemicals. In: Kim, S.-K. (Ed.) Marine Biochemistry: Isolations and Techniques (1st ed.). CRC Press. <https://doi.org/10.1201/9781003303909>
5. Vijayan N, Venkatesh VP, Vijay V, Kannan A, Vallikannan B, **Perumal MK*** (2022). A CRISPR-Cas9-Based Therapeutics in Oxidative Stress-Induced Cancer. In: Chakraborti, S. (eds) Handbook of Oxidative Stress in Cancer: Therapeutic Aspects. Springer, Singapore. https://doi.org/10.1007/978-981-16-1247-3_148-1
6. Jayapala N, **Perumal MK**, Baskaran R, Vallikannan B. (2022). Pharmacological Importance of Bioactive Molecules of Seaweeds. In: Ranga Rao, A., Ravishankar, G.A. (eds) Sustainable Global Resources of Seaweeds Volume 2. Springer, Cham. https://doi.org/10.1007/978-3-030-92174-3_32
7. Perumal NK, Vijayan N, **Perumal MK**, Halagowder D, Sivasithamparam ND. (2022). Small Molecule Inhibitors That Target Signal Transduction Pathways Involved In Oxidative Stress-Induced Cancer. In: Chakraborti, S. (eds) Handbook of Oxidative Stress in Cancer: Therapeutic Aspects. Springer, Singapore. https://doi.org/10.1007/978-981-16-1247-3_36-1
8. Vijay V, Vijayan N, Venkatesh VP, Vallikannan B, **Perumal MK*** (2022). Proapoptotic Effects of Dietary Flavonoids In Oxidative Stress-Induced Cancer. In: Chakraborti, S. (eds) Handbook of Oxidative Stress in Cancer: Therapeutic Aspects. Springer, Singapore. https://doi.org/10.1007/978-981-16-1247-3_151-1
9. Venkatesh VP, Vani V, Nivya V, Baskaran V, **Madan Kumar P*** (2021). Chapter-2: Bioactives of Lactuca sativa: Nutritional and Clinical importance. Editor: Lowell T. Duncan, In: 'Advances in Health and Disease'. Nova Science Publishers, Inc. Volume 33; Pages 43-64.
10. Naveen J, **Madan Kumar P**, Revathy B and Baskaran V (2021). Chapter-4: Nutritional and anticancer effects of carotenoids from *Lactuca sativa*. Editor: Lowell T. Duncan, In: 'Advances in Health and Disease'. Nova Science Publishers, Inc. Volume 33; Pages 95-117.
11. Vani V, Venkatesh VP, Nivya V, Baskaran V, **Madan Kumar P*** (2021). Chapter-8: Nutritional and anticancer effects of carotenoids from *Lactuca sativa*. Editor: Lowell T. Duncan, In: 'Advances in Health and Disease'. Nova Science Publishers, Inc. Volume 33; Pages 177-194.
12. Venkatesh VP, Nivya V, Vani V, Baskaran V, **Madan Kumar P*** (2021). Functional Foods for the Management of Non-Alcoholic Fatty Liver Disease. Editor: Arshad MS, Ahmad MH. In: Functional Foods - Phytochemicals and Health Promoting Potential.

London: IntechOpen; doi: 10.5772/intechopen.96317

13. Venkatesh VP, Nivya V, Vani V, Baskaran V, **Madan Kumar P*** (2021). Chapter-3: Antiviral activity of medicinal plants: Current understanding, prospects and challenges. Editor: Azamal Husen, In: 'Traditional Herbal Therapy for the Human Immune System'. CRC Press.
14. Naveen J, **Madan Kumar P**, Janani R, Baskaran V (2021). Chapter-15: Plant molecules to treat eye mitochondria. Editor: Marcos Roberto de Oliveira, In: Mitochondrial Physiology and Vegetal Molecules, Academic Press; Pages 339-356.
15. **Madan Kumar P**, Naveen J, Janani R, Baskaran V (2021). Safety Assessment and Pharmaceutical effects of Astaxanthin: An Overview. 'Global Perspectives on Astaxanthin: From Industrial Production to Food, Health, and Pharmaceutical Applications'. Elsevier; Pages 569-591.
16. Naveen J, **Madan Kumar P**, Baskaran V (2019). Biological activities and safety aspects of Fucoxanthin. In: 'Handbook of Algal Technologies and Phytochemicals: Volume I Food, Health and Nutraceutical Applications', CRC Press, Pages 245-257.

*Corresponding author

Invited talks at scientific meetings – 24

Other Responsibilities

- ❖ Convener, EMS (ISO 14001:2015) (2019 – till date)
- ❖ Member, (QMS-ISO 9001:2008) (2019 – till date)
- ❖ Member of Advisory committee & Examiner - Diploma Course in Food Safety and Management (SSASC, Kanchipuram) (2019 – 2023)

OPPORTUNITIES

- ❖ M.Sc/B.Tech/M.Tech students for 6 months project dissertation research
- ❖ Ph.D submitted/awarded candidates for applying ICMR/DBT/CSIR Postdoctoral Fellowships

For more details write to madanperumal@cftri.res.in