Dr. Perumal Madan Kumar

Scientist,

Assistant Professor (AcSIR),

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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 experience

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

Project title: Molecular basis of Cholesterol metabolism

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)

Project title: Understanding the molecular mechanisms of activation of hepatic stellate cells (HSCs) and the inhibition of their activation by morin.

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)

Thesis title: Molecular mechanism of attenuation of hepatic stellate cell (HSC) activation by the bioflavonoid morin through suppression of NF-κB and Wnt signaling - In vivo and In vitro studies.

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

Faculty Academic Appointments

03/2018 - Present Assistant Professor (AcSIR) in the Faculty of Biological Sciences, Department of Biochemistry, CSIR-CFTRI, Mysuru.

01/2018 - Present Scientist, Department of Biochemistry, CSIR-CFTRI, Mysuru.

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

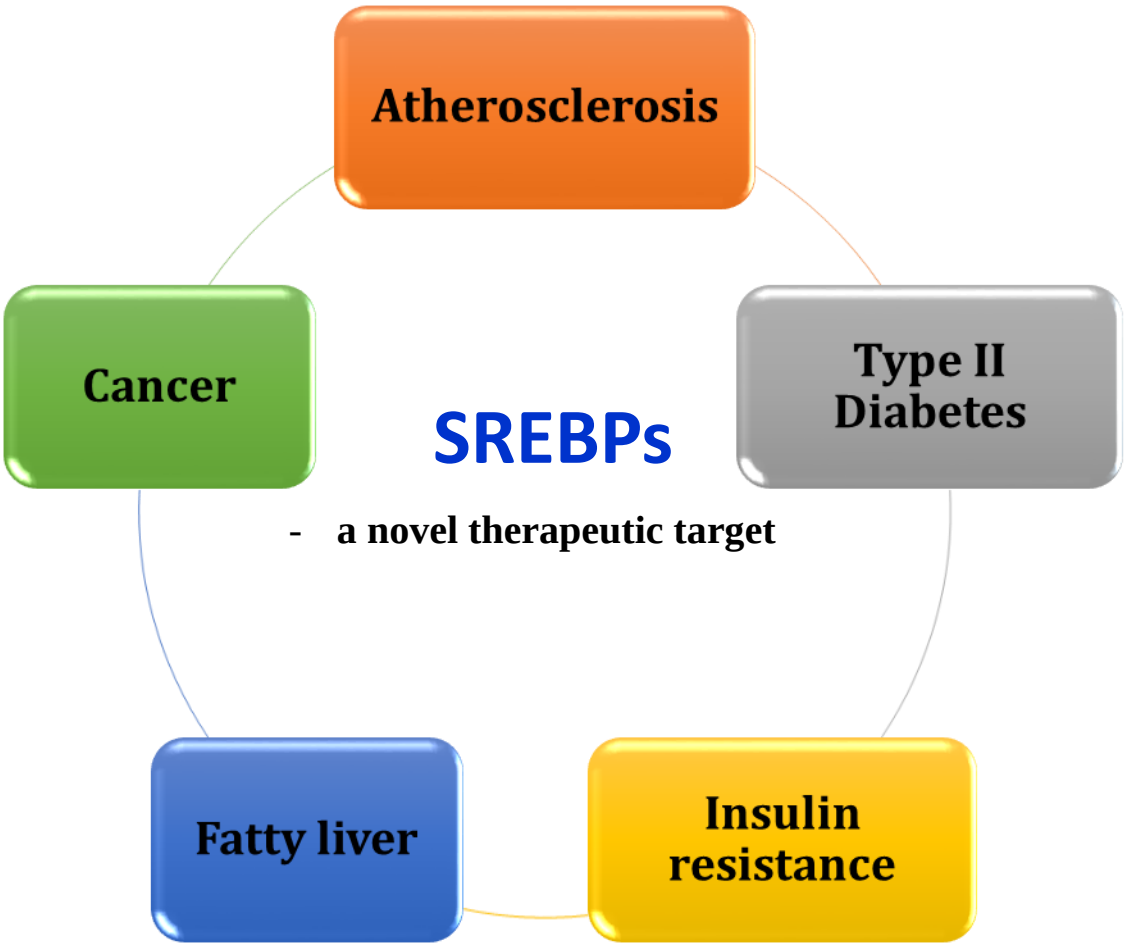
GAP Project(s)

Ongoing: **MLP 0207 - Development and evaluation of functional efficacy of cereal and spice based formulation in management of diabetes. (Role: Member)**

Number of current Ph.D student(s)	**1**
Number of completed Project trainee(s)	**1**

Research areas of interest

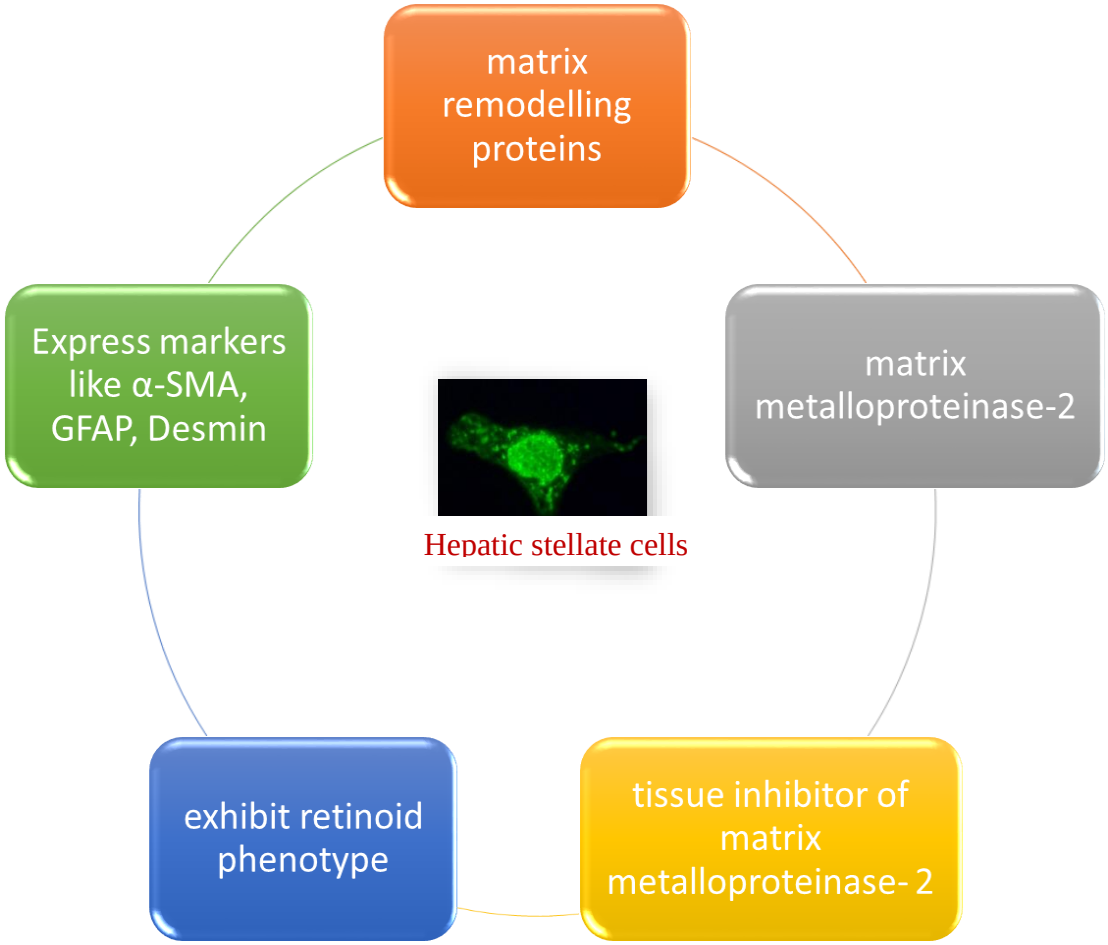
1. Sterol regulatory element-binding proteins in human diseases.



Sterol regulatory element-binding proteins (SREBPs) are family of transcription factors that control the expression of genes important for the uptake and synthesis of cholesterol, fatty acids and phospholipids. There are two SREBP genes in mammals, SREBP-1 and -2. SREBP-1 gene transcribes two isoforms SREBP-1a and -1c encoded from different promoters, which are demonstrated to mainly regulate genes that control fatty acid synthesis. SREBP-2 is shown to regulate genes involved in cholesterol synthesis. Inhibition of SREBP pathway can reduce lipid biosynthesis, which will lower the risk of metabolic diseases such as type II diabetes, insulin resistance, fatty liver, cancer and atherosclerosis.

2. Stellate cell biology.

In a normal healthy liver, stellate cells (SCs) represent approximately 8% of the total number of liver cells. These cells are localized in the Space of Disse and are in close proximity to hepatocytes and hepatic sinusoidal endothelial cells. SCs function as the principal storage site of retinoids in normal liver. Of all dietary retinol, 90% is stored in the liver and 75% of which is confined within SCs.



SCs, following liver injury undergo a process known as activation, which is a transition from quiescent vitamin A-rich cell to one which is proliferative, fibrogenic, and contractile, with reduced vitamin A content. The activation of HSCs has been implicated in the pathogenesis of liver fibrosis and hence inhibition of HSC activation offers a promising target for the development of anti-fibrotic agents. The fate of activated HSCs after the resolution of liver injury is under scrutiny.

Reviewer of Scientific Journals

- Cytokine
- Chemico-Biological Interactions
- Journal of Ethnopharmacology
- Advances in Microbiology

Invited talks

- Delivered Guest lecture on *'Cholesterol metabolism and Probiotics: a Friend or Foe?'* at Sri Sankara Arts and Science College, Kanchipuram (Chennai) on 20th September 2018.

Research papers published

- Perumal N*, **Perumal M*,** Halagowder D, Sivasithamparam N. *Morin attenuates diethylnitrosamine-induced rat liver fibrosis and hepatic stellate cell activation by co-ordinated regulation of Hippo/Yap and TGF-β1/Smad signaling*. Biochimie 2017; 140, 10-19 (*Equal contribution).
- Perumal N, **Perumal M,** Kannan A, Subramani K, Halagowder D, Sivasithamparam N. *Morin impedes Yap nuclear translocation and fosters apoptosis through suppression of Wnt/β-catenin and NF-κB signaling in Mst1 overexpressed HepG2 cells*. Exp Cell Res. 2017; 355:124–141.
- **MadanKumar P,** NaveenKumar P, Devaraj H, NiranjaliDevaraj S. *Morin, a dietary flavonoid, exhibits anti-fibrotic effect and induces apoptosis of activated hepatic stellate cells by suppressing canonical NF-kappaB signaling*. Biochimie 2015; 110: 107–18.
- Gopalakrishnan N, Saravanakumar M, **Madankumar P,** Thiyagu M, Devaraj H. *Colocalization of β-catenin with Notch intracellular domain in colon cancer: a possible role of Notch1 signaling in activation of CyclinD1-mediated cell proliferation*. Molecular and Cellular Biochemistry 2014; 396: no. 1-2, 281–293.
- E. Sundaravadivela, S. Vedavallia, M. Kandaswamy, B. Varghese and **P. Madankumar.** *DNA/BSA binding, DNA cleavage and electrochemical properties of new multidentate copper (II) complexes*. RSC Advances 2014 (4), 40763-40775.
- **MadanKumar P,** NaveenKumar P, Manikandan S, Devaraj H, NiranjaliDevaraj S. Morin ameliorates chemically induced liverfibrosis in vivo and inhibits stellate cell proliferation in vitro by suppressing Wnt/b-catenin signaling, Toxicol. Appl. Pharmacol. 2014; 277 (2) 210e220.

Opportunities

- M.Sc students interested in joining this laboratory for internships or project dissertations shall write to the PI.
- M.Sc graduates holding National level fellowship interested in joining this laboratory for AcSIR Ph.D programme shall contact with their brief CV.
- Ph.D submitted or awarded candidates interested to pursue Postdoctoral research in this laboratory may contact with their detailed CV.

Contact Dr. P. Madan Kumar for more information:
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