

P. Pavan Kumar, M.Sc., Ph.D.

Scientist (Translational and Biomaterial research)

Institute of Basic Sciences and Translational Research,
Asian Healthcare Foundation & AIG Hospitals,
MindSpace Road, Gachibowli Hyderabad, India- 500032.
Mobile: +91-9491 474098, Email: pavan.islets@gmail.com.

EDUCATION

- **Ph.D in Biochemistry (Inter Disciplinary):** Awarded in **2015** by Dr.NTR University of Health sciences, Vijayawada.
- **Master of Science (Microbiology)** - 2004, Ponnaiah Ramajayam College, Bharathidasan University, Thanjavur, Tamilnadu, India.
- **Bachelor of Science-2002, in Biochemistry, Chemistry and Microbiology,** Acharya Nagarjuna University, Guntur, Andhra Pradesh, India.

RESEARCH/TEACHING EXPERIENCE

- **Post-Doctoral Fellow (2015 to 2017)**
November 2015 to October 2017, Department of Translational and Biomaterial research, Asian Healthcare Foundation (AHF), Asian Institute of Gastroenterology (AIG), Hyderabad, Telangana, India
- **Senior Research Fellow (June 2012 to 2015)**
Department of Basic Science and Translational Research, Hyderabad, Telangana, India.
- **Junior Research Fellow (July 2010 to 2012)**
Department of Basic Science and Translational Research, AHF and AIG, Hyderabad, Telangana, India.
- **Project Assistant (May 2008 to June 2010)**
Department of Biochemistry, AHF and AIG, Hyderabad, Telangana, India.
- **Research Fellow (June 2006 to May 2008)**
Invitro Biology in Avesthagen Ltd, Bangalore, India.
- **Assistant Professor (May 2004 to April 2006)**
Department of Biochemistry, Bapatla College of Arts & Sciences, Bapatla, Guntur, Andhra Pradesh, India.
- **Research Trainee (December 2003 to May 2004)**
Microbiologist in Sarath Industries Nellore, India

FELLOWSHIP/ AWARDS

- **Recipient of Junior Research Fellowship** by Department of Biotechnology (DBT), Government of India, New Delhi, India.
- **Best Poster Award** from “ISGCON 2010, at HSCC Hyderabad”, India. 51st Annual Conference of the Indian Society of Gastroenterology on “Translational Research in Gastroenterology - "Lab to Clinic”, organized by Asian Institute of Gastroenterology Somajiguda, Hyderabad, India, November-2010.

RESEARCH FOCUS:

1. **Cell Therapy studies:**
 - i) Developed clinical grade Islet cell protocols in India.
 - a. Initiated autologous islet transplantation studies for chronic pancreatitis patients in India and published as corresponding author for the First case series from India (GV Rao et al 2018)
 - b. First time Demonstration of long term functions of encapsulated islets in non-human primates by Coordinating a collaborative study of islet transplantation using immunoisulatory device to

avoid immunosuppression and develop a minimally invasive technique for islet transplantation (funded by Dept of Biotechnology, Govt of India).

- c. Our team in collaboration with Indian Institute of Technology, Hyderabad is the only one in India working towards development of a biocompatible device for encapsulating islets and for transplantation under IMPRINT scheme of Government of India. This enables utilization of cadaver Pancreata in India which is as on date is not utilized.
 - d. To understand architectural reformed islets in chronic pancreatitis to select functional islets for transplantation.
 - e. To develop Bio mimetic Natural Proteinaceous Device for Effective Islet cell Transplantation to Treat Patients with Diabetes.
- ii) Stem cells and Regenerative medicine:
- a. Involved in Autologous hematopoietic stem cell transplantation studies for bridging the gap between chronic liver failure and liver transplantation (Sharma M et al 2015)
 - b. Autologous Bone Marrow Derived Mesenchymal Stem Cell Transplantation in Poorly Controlled Pancreatic Diabetes.
2. Cellular, molecular and functional basis of understanding type3c diabetes.

PUBLICATIONS

Islet Biology Publications:

1. Rao GV, Pradeep R, Sasikala M, **Pavan Kumar P**, Krishna VV, Mahesh Shetty G, Talukdar R, Manu Tandan, Jagadeesh R, Nageshwar Reddy D, Distal pancreatectomy with autologous islet transplantation in chronic pancreatitis patients: First case series from India, *IndianJGastroenterol*, 2018, 37 (5) 452-456.
2. M. Sasikala*, Ravikanth VV, Murali Manohar K, Neha Deshpande, Sandhya Singh, **Pavan Kumar P**, R. Talukdar, Sudip Ghosh, Mohsin Aslam, GV. Rao, R. Pradeep, D. Nageshwar Reddy. Bach2 repression mediates Th17 cell induced inflammation and associates with clinical features of advanced disease in chronic pancreatitis. *United European Gastroenterology Journal*: 2018; 6(2), 272–282.
3. Rupjyoti Talukdar, Sasikala Mitnala*, **Pavan Kumar Pondugala**, Venkata Rao Guduru, Pradeep Rebala, Nageshwar Reddy Duvvuru, T-helper cell mediated islet inflammation contributes to β -cell dysfunction in chronic pancreatitis. *Pancreas*. 2016; 45(3):434-442.
4. Murali Manohar K, Sasikala M, **Pavan Kumar P**, Rao GV, Nageshwar Reddy D. Dysregulated miRNA associated with transcription factors of insulin gene expression in chronic pancreatitis. *Journal of Endocrine and Metabolic Diseases*, 2016;6:205-227.
5. **P. Pavan Kumar**, M. Sasikala*, K. Mamatha, GV Rao, R. Pradeep, R. Talukdar, D. Nageshwar Reddy. Characterization of Islets from chronic calcific pancreatitis patients of tropical region with distinct phenotype. *Advances in Bioscience and Biotechnology* 2016; 7:1-10.
6. **P. Pavan Kumar**, G. Radhika, G.V. Rao, D. N. Reddy, M. Sasikala*. Differentiation of pancreatic ductal epithelial cells into insulin like cell clusters in chronic pancreatitis. *Journal of Endocrine and Metabolic Diseases*, 2015; 5:177-183.
7. **Pavan Kumar P**, M. Sasikala*, GV Rao, R Pradeep, D. Nageshwar Reddy. Interferon γ decreases nuclear localization of Pdx-1 and triggers β -cell dysfunction in chronic pancreatitis. *J Interferon Cytokine Res*. 2015;35:523-29.
8. Mitnala Sasikala*, Guduru Venkat Rao, Venkateshan Vijayalakshmi, Rebala Pradeep, Suresh Pothani, **Pondugala Pavan Kumar**, Radhika Gaddipati, Ganneru Sirisha, Ramji Cheemalakonda, Chivukula Subramanyam, Seshadri Vasudevan, D. Nageshwar Reddy. Long-term functions of encapsulated islets grafted in nonhuman primates without immunosuppression. *Transplantation*. 2013; 15; 96(7):624-632.
9. **P. Pavan Kumar**, G. Radhika, and GV. Rao Interferon γ and glycemic status in diabetes associated with chronic pancreatitis. *Pancreatolgy*. 2012.12: 65 -70.

10. M.Sasikala, T.Rupjyoti, P.PavanKumar β -Cell Dysfunction in Chronic Pancreatitis. *Digestive Diseases and Sciences* 2012. 57:1764-1772.
11. SasikalaMitnala, **Pavan Kumar Pondugala**, Venkat Rao Guduru, PradeepRabella, JayashreeThiyyari, SubramanyamChivukula, SadasivuduBoddupalli, Nageshwar Reddy Duvvuru: Reduced Expression of pdx-1 is Associated with Decreased Beta Cell Function in Chronic Pancreatitis. *Pancreas*. 2010; 39(6):856-862.

Other Publications:

12. Mithun Sharma, **Pavan Kumar Pondugala**, ShashidharJaggaihgari, Sasikala Mitnala, et al., "Safety assessment of autologous stem cell combination therapy in patients with decompensated liver cirrhosis: a pilot study". *Clinical and Experimental hepatology*: <http://doi.org/1016.jceh.2021.03.010>
13. Mithun Sharma, Anand Kulkarni, Mitnala Sasikala, Pramod Kumar,Shasidhar Jaggaihgari, **Kumar Pondugala**, et.al., (2020) "Long-term Outcome of Autologous Hematopoietic Stem Cell Infusion in Cirrhosis: Waning Effect over Time". *Journal of Clinical and Translational Hepatology* 2020 vol. 8 | 385–390
14. Y. Poorna Chandra Rao, **P. Pavan Kumar** & B. R. Lokesh, Molecular Mechanisms for the Modulation of Selected Inflammatory Markers by Dietary Rice Bran Oil in Rats Fed Partially Hydrogenated Vegetable Fat, *Lipids* 51, 2016; 51(4) 451-67
15. Sasikala M*, Surya P, Radhika G, **Pavan Kumar P**, R.M. Mukherjee, Rao P.N. Rao, Nageshwar Reddy D. Identification of circulating CD90+ CD73 +cells in cirrhosis of liver. *World Journal of stem cells*. 2011;3(7):63-69.

Communicated

1. Gokula Nathan Nathan Kasinathan, **Pavan Kumar P**, Sasikala Mitnala, Aakanksha Ruhela, Chandra Shekhar Sharma, Subha Narayan Rath, Modulating hydrophilic cellulose acetate and polyethersulfone to hydrophobic: effective immunoisolation devices device for allogeneic islet cell transplantation. *Bioengineering & Translational Medicine*
2. Satish Kumar Vemuri; Rajkiran Reddy Banala; Susheel Kumar Nethi; Shagufta Haque; **Pavan Kumar.P**; Vijaya Madhuri Devraj, Inorganic Nanorods Directs Neuronal Differentiation of Bone Marrow derived Mesenchymal Stem Cells *Journal: Materials Science & Engineering*.

Under preparation

1. **P. Pavan Kumar**, M. Sasikala, Altered arrangement of islets in chronic pancreatitis can be used to select functional islets for transplantation.?
2. **P. Pavan Kumar**, M. Sasikala. Cancellous bone as a scaffold for islet cell transplantation - An approach in chronic pancreatitis.
3. **P. Pavan Kumar**, M. Sasikala. An improvised method for better characterization and quality assessment isolated pancreatic islets. Placental mesenchymal stromal cell derived secretome confers a better hepatoprotective effect in liver injury.

RESEARCH GRANTS:

1. Science and Engineering Research Board Ministry of Science and Technology, Government of India: Development of Bio mimetic Natural Proteinaceous Device for Effective Islet cell Transplantation to Treat Patients with Diabetes.2022-2025.Principal Investigator - Reference No.: 182021010445

PRESENTATIONS AND SCIENTIFIC MEETINGS

Oral

- **P. Pavan kumar**, M. Sasikala, J. Shashidhar, V.v. krishna,Ch.prema vani, G. V. Rao, D. Nageshwar reddy. Placental mesenchymal stromal cell-derived secretome confers abetter

hepatoprotective effect in liver injury models. P.56. International seminar on recent advances in translational medicine (isratm - 2021). School of life sciences, marudupandiyar college, Thanjavur.

- J.shashidhar, **P.pavan kumar**, M. Sasikala, B.Papa rao , Shruti bhadra V.v. krishna, C.G. Prema vani, G. V. Rao, D. Nageshwar reddy. Suitability of bone marrow derived mesenchymal stem cells from cld patients expanded in human platelet lysate for clinical applications p.58. International seminar on recent advances in translational medicine (isratm - 2021). School of life sciences, marudupandiyar college, Thanjavur
- **P. Pavan kumar**, Sasikala.M “Reduced expression of Pdx-1 is associated with Decreased beta cell function in chronic pancreatitis” in “51st Annual Conference of Indian Society of Gastroenterology “in ISGCON 2010 Hyderabad, Telangana, India, on 20-25th, November, 2010.

Posters

- Gokula Nathan Nathan Kasinathan P, **Pavan Kumar**, Sasikala Mitnala, Aakanksha Ruhela,Chandra Shekhar Sharma, Subha Narayan Rath “Modulating hydrophilic cellulose acetate and polyethersulfone to hydrophobic: effective immunoisolation devices device for allogeneic islet cell transplantation 2020.
- Mithun Sharma, Sasikala Mitnala, Padaki N. Rao, **Pavan Kumar.P**, Shashidhar Jaggaiahgari, Rajesh Gupta, Pramod Da, Annand Kulkarni, Nitin Jagtap, Jagdeesh Rampal Singh, Duvurr N. Reddy, P0613 - Long Term Data on Effect of Mobilized Peripheral Blood Autologous CD34+ Cell Infusion in Patients With Non- Viral Decompensated Cirrhosis. ACG 2019 Annual Scientific Meeting and Postgraduate Course. October 25-30, San Antonio, Texas
- **P. Pavan Kumar**. Participated in the second conference on Next Generation Sequencing [NGS-2017] Jointly organized by Bioserve Biotechnology (India) Private Limited, Hyderabad& CSIR- Canter for Cellular and Molecular Biology, Hyderabad, India, on 22^{ed} & 24th February 2017
- **P. Pavan Kumar**. Participated in International seminar on “G.I. Immunology and Inflammation 2017” organised by All India Institute of Medical Sciences, New Delhi (NCR), India, on 14th & 15th January 2017
- **P. Pavan Kumar**. M. Sasikala. Participated in International seminar on “Inflammatory Bowel Disease” conducted by Asian Institute of Gastroenterology, Hyderabad, India, on 22^{ed} & 24th April 2016
- R.Talukdar and **P. Pavan Kumar** Participated in International association of Pancreatology on “Pancreatic stellate cells and β -cell dysfunction in chronic pancreatitis” conducted by Seoul Korea, on 2013.
- R.Talukdar and **P. Pavan Kumar**. Participated in International symposium on “Immunoisulatory device protects islets allograft functions without immunosuppression in non-human primates” conducted by Journal of Neuroendocrine Tumors and Pancreatic Disease and Sciences in Hagerstown, 2012.
- **P. Pavan Kumar**. Presented a poster on “Influence of cytokines on Islet cell functions and pdx1 expression in chronic pancreatitis” in 33rd All India cell biology conference & International workshop organized by University of Hyderabad, India 2009.
- **P. Pavan Kumar**. Presented a paper entitled “Studies on biochemical composition of major carp Catla Catla (Ham) infected by V. Parahemolyticus” conducted by International Symposium on Fresh Water Aquaculture held on 12th to 30th sep2003.
- **P. Pavan Kumar**. Presented a paper entitled “Screening of antibacterial activity basal oil Ocimum Basilicum” UGC National Seminar on Superficial Mycoses-causes prevention cure with plant medicines” conducted by Kandaswami kandar’s college, Vellore, India 2003.

- **P. Pavan Kumar.** Participated one-day intercollegiate student seminar entitled on “Forests and their relationship with the environment” at centre for research and P.G Dept of Botany, Thyagarajar college, Madurai held on 2003.
- **P. Pavan Kumar.** Participated and obtained training in the “self-employment oriented training program on Medicinal Plants” at department of botany and microbiology AVVM Sri Pushpam College (Autonomous), Poondi 2003
- **P. Pavan Kumar.** Participated International seminar on “Recent advances in Biotechnology” at P.R.C College, Tanjavur, Tamil Nadu, India. 2003.
- **P. Pavan Kumar.** Participated in workshop on Fermentation Technology in Alcohol Industry held at Tiruchirappalli, Tamil Nadu, India. 2003.

RESEARCH EXPERIENCE

- **Ph. D: Brief summary (January, 2009- 2015)**

Characterization of the islet cells and pancreatic progenitors in patients with Chronic Pancreatitis

Chronic pancreatitis (CP) is a progressive inflammatory disorder characterized by replacement of parenchymal tissue with fibrosis leading to malnutrition, exocrine and endocrine deficiency culminating in clinical diabetes. Several studies have been conducted to know morphometric and immunohistochemical to understand etiopathology of CP but the information of cellular changes during progression of CP is lacking so we conducted this study and earlier studies have also shown that Pancreatic necroinflammation is upregulation of proinflammatory cytokines and islet apoptosis, loss of beta cell mass that contribute to endocrine insufficiency but specific cytokines contributing to beta cell dysfunction in CP is not studied. so we focused on profiling inflammatory cytokines in pancreatic tissue of CP patients with and without diabetes and identifying specific cytokine contributing to beta cell dysfunction in CP then we looked after Molecular events leading to beta cell dysfunction in chronic pancreatitis. And finally examine pancreatic progenitors (Nestin/Ductal epithelial cells) in chronic pancreatitis. These studies bear clinical importance in the treatment of diabetes secondary to chronic pancreatitis. Developing therapeutic strategies targeting inflammation in general and IFN- γ in particular may be beneficial in the management of secondary diabetes in chronic pancreatitis.

RESEARCH EXPERIENCE IN VARIOUS PROJECTS (2010 to 2013)

- **Long-term functions of encapsulated islets grafted in non-human primates without immunosuppression.**

This project was funded by DBT and research was conducted by collaborating with National Institute of Nutrition (NIN), NCLAS, Hyderabad and NCCS Pune. The aim of this study was to assess and evaluate the long-term efficacy, survival and functions of encapsulated islet grafts without immunosuppression. We used a device called TheraCyte, made up of polytetrafluoroethylene to maintain the function of islets without immunosuppression and we first time reported the feasibility of using this device suitable for islet cell transplantation in non-human primates. We performed Islet cell transplantations in partially pancreatectomized autologous (two) and allogenic (four) NHPs without immunosuppression. Results indicated that the subcutaneous implantation of microencapsulated islets is minimally invasive and has potential for transplantation without immunosuppression.

- **Functional and gene expression studies in islets during progression of chronic pancreatitis (2015 to 2017)**

This project was funded by ICMR. The main aim of the present study was to assess β cell dysfunction in progressive chronic pancreatitis. In this study, patients with chronic pancreatitis at different stages of the disease (mild, moderate, advanced), i e., during progression of the disease were recruited and studied the functional and gene expression studies in human Islets

of Langerhans to understand the mechanism of loss of β cell function i.e. insulin secretion in chronic pancreatitis.

Results from this study demonstrated for the first time that the functional loss of β -cells precedes β -cell apoptosis and clinical manifestation of secondary diabetes (type 3c) during the progression of chronic pancreatitis. Such a finding emanated from experiments (glucose stimulated insulin release and flow cytometric analysis of apoptotic events) conducted with islets isolated from chronic pancreatitis patients diagnosed with and without diabetes. Therefore the results of this study may be of use in treatment of CP patients with β cell dysfunction.

Membership in scientific bodies

1. European Pancreatic Club (E.P.C) - Life member
2. International Society For Infectious Disease (ISID) - Life member
3. Stem cell Research Forum of India - Student Member.

Training imparted:

1. Imparting training to Biotechnology Consortium of India Limited students under Biotechnology Industry Training Programme, Dept of Biotechnology, Government of India (Trained 14 students)

Board of studies (BOS)member

Mahatma Gandhi university Nalgonda Telengana India

Patents:

Electrospun Macroencapsulation Device For islet cell Transplantation In the Treatment of Diabetes Mellitus. Application No:202141039638/2021.