

Dr. PREMALATHA “Prema” BALACHANDRAN, Ph.D., MBA
Principal Scientist, National Center for Natural Products Research, School of Pharmacy,
Adjunct Instructor, School of Business and Center for Student Success
University of Mississippi,
MS 38677, USA.
Phone (Office): 662-915-3463
Phone (Mobile): 662-801-0559
Email: prembala@olemiss.edu
Website: [Prema's website](#)

Personal Mission Statements: I am committed to achieving goals and completing challenging tasks through efficient planning, self-motivation, and dedication. I enjoy teamwork and exercising respect, ethics, integrity, and trustworthiness.

My mission is to serve and apply ethical principles that improve the lives of others, positively impact the well-being of people, and extend their quality of life.

My professional life's purpose is to use my position to help others achieve their dreams and use my values of focused vision, good character and integrity, knowledge and wisdom, perseverance, and optimism to cultivate, inspire, encourage self-efficacy in everyone around me.

I am motivated to carry a life that leads to legacy, not merely to survive, but to thrive; and to do so with passion, compassion, humor, and style and thus, leave the world a better place than I found it.

Immigration Status: US citizen

Family and marital Status: Married to Karthikeyan Rathinavelu, MBA., and is the mother of two boys. Keerthin Karthikeyan, freshman at Ole Miss and Sagan Karthikeyan, 7th grader at Oxford Middle School.

Education and training: Ph.D. in medical biochemistry and 30+ years of experience in scientific research. MBA from the University of Mississippi, class of 2022 (More details are given in the attached CV).

Administration and Policy making: Serving as a Board of Director for United Way of Oxford and Lafayette and Oxford Chamber of Commerce. Serving as a Scholarship Manager/ Executive officer for UM staff Council since 2010. Actively involved in UM Policy making and administration by meeting with the UM Chancellor every month and as a part of Strategic Planning Council. Health and Committee Chair for Chicksa District, Boy Scout of America, Treasurer for Oxford High School PTO.

Leadership: Graduate of Leadership Lafayette (2021) and serving in its Steering Committee. Gallup Clifton strength finder 2.0 course completed.

Honors: 2022 Outstanding Academic Achievement Award from UM Business School, 2022 Algernon Sydney Sullivan award from the Division of Diversity and Community Engagement,

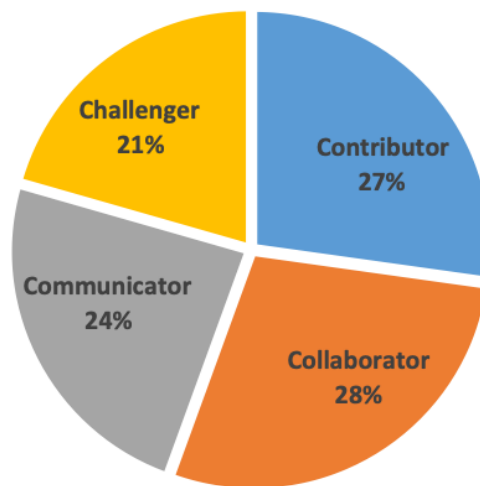
Women of Distinction recognition by Girls Scouts Heart of the South, 2015 Outstanding Staff Member Award from UM Staff Council.

Communication: Published more than 40+ research and review articles and book chapters. Serving as an editor for books, scientific journals, reviewer for grants and manuscripts and as an examiner for Ph.D. thesis.

Service leadership to the community: Honored to serve as a Poll Manager at Elections. Organizing and Chairing “Reading is Fundamental” program as part of DDES PTO. School of Pharmacy’s annual poster session chair. Judge for Speaker’s edge (UM). Serving on various job selection committees at UM. Serving as Co-chair and judge at Regeneron’s International Science and Engineering Fair (ISEF), Genius Olympiad International Science Fair, School District, Regional and State Science Fairs. Past president of Indian Association of North Mississippi. Judging at Regional Speech and Debate competitions. Other committees include Oxford School District’s Standard Based Learning committee, Oxford High School Parent Teacher Association and Boy Scouts of America Health and Committee chair, Yocona Area Council’s Nomination Committee Chair.

Clifton strengths Identified: Achiever, Responsibility, Consistency, Learner, Harmony.

Parker Team Player style:



Preferred Leadership style: Transformational leadership with individual consideration and inspirational motivation.

News Articles:

[UM Senior Scientist excels in Cancer Research](#)

[Cancer Discovery Project launch](#)

Research Summary & Accomplishments

As a **Principal Scientist**, I exhibited leadership and administrative skills and served key roles in the establishment, management and development of several long-standing, funded research programs at NCNPR School of Pharmacy. In 2010, in collaboration with UMMC-Cancer institute, I played an instrumental role in establishing **Cancer Drug Discovery Core research program** (News link: [Cancer Discovery Project launch](#)) at Oxford Campus, expanded the program into new directions, that led us to discover a new anticancer formulation (**patent pending**). This patented (pending) formulation has high potential for development and commercialization and the research on animal models have shown promising results.

For this drug discovery program, I developed a new innovative high throughput screening panel of cancer signaling pathways to discover new drugs from plant sources that are being translated into clinical research. I have screened thousands of plant extracts, biologically guided fractions, and screened more than 500 pure compounds including **cannabidiol and its analogs**.

I have performed clinical trials on Immulina (as PI on IRB proposals), a botanical supplement that is currently patented, and my results/publication have been used as a selling point for product promotion by licensed companies (ChromaDex) and federal funding. I have demonstrated the immune stimulating potency of Immulina and Echinacea in animal models.

In accordance with this, I perform isolation, biological standardization, characterization, and mechanistic studies. In addition to this *in vitro* research, I direct, plan, oversee and conduct animal research to evaluate *in vivo* efficacy. Also, I work closely with Scientists at UMMC - Cancer Center and Research Institute (CCRI) in Jackson, MS. I also oversee/supervise the research activities carried out by Postdoctoral Fellows and other research scientists. In addition to research communication as book chapters, manuscripts, review articles, I serve as an editor for journals and reviewer for manuscripts.

Areas of Expertise

- Supervise and oversee the activities of Post-Doctoral Fellows, Junior Research Scientists, support staff.
- New interdisciplinary STEM course development and teaching.
- Policy Development with HR, Staff Council.
- Coordination with other scientists and members of the university community.
- Community Outreach and Partnerships
- Leadership role and key personnel in Clinical studies on Immulina: PI on IRB protocols, planned and performed clinical trials.
- Leadership role and Key personnel in the development of animal models for cancer and immune stimulation, microbiome projects at NCNPR. (PI on protocol approvals, planning and organizing experiments.
- Developing assays and exploring into new area of research to screening natural products effective against Sars-Cov2.
- Developing 3D *in vitro* skin models to evaluate skin toxicity and penetration.

- Drug discovery research from natural products: Currently one product is under development. US Patent filed.
- High throughput screening using automated instruments: Developing and standardization of protocols, trouble shooting.
- Biologically guided fractionation using various Chromatographical techniques.
- Immune cells sorting, identification and quantification using flow cytometry.
- Cytotoxicity assays in high throughput screening format: Assay set up in automated instruments. Data analysis.

Education

Master of Business Administration, School of Business, University of Mississippi, USA (2022). GPA 4.0/4.0. Credentials: 2022 Outstanding Academic Achievement award.

Ph.D. in Medical Biochemistry, Department of Medical Biochemistry, University of Madras, India. (1999)

M.S. in Medical Biochemistry, Department of Medical Biochemistry, University of Madras, India (1993)

B.S. in Chemistry, Department of Chemistry, University of Madras, India (1991)

Professional Experience

Date	Employment details
August 2022- Current	Adjunct Instructor , -Biomedical Entrepreneurship- ENT-451 for School of Business -EDHE courses, Center for Student Success and First-year experience.
July 2022 – Current	Principal Scientist , National Center for Natural Products Research, Research Institute of Pharmaceutical sciences, School of Pharmacy, University of Mississippi, MS, USA.
July 2015 – June 2022	Senior Research Scientist, National Center for Natural Products Research, Research Institute of Pharmaceutical sciences, School of Pharmacy, University of Mississippi, MS, USA.
July 2009 - June 2015	Research Scientist, National Center for Natural Products Research,

	Research Institute of Pharmaceutical sciences, School of Pharmacy, University of Mississippi, MS, USA.
August 2005 - June 2009	Associate Research Scientist, National Center for Natural Products Research, Research Institute of Pharmaceutical sciences, School of Pharmacy, University of Mississippi, MS, USA.
August 2002 - July 2005	Post-doctoral Fellow, National Center for Natural Products Research, Research Institute of Pharmaceutical sciences, School of Pharmacy, University of Mississippi, MS, USA.
November 2000 - April 2002	Post-doctoral Fellow, Dept. of Biochemistry and Molecular Biology, University of Nebraska Medical Center, Omaha, Nebraska, USA.
March 1999 - September 2000	Senior Research Fellow, Department of Animal Biotechnology, Madras Veterinary College, Tamilnadu Veterinary and Animal Sciences University, Chennai, India.
February 1998 – December 1998	Research Associate, Department of Biotechnology (R&D), Tamilnad Hospital Academic Trust, Chennai (Affiliated to University of Madras), India.
April 1994 – December 1997	Junior Research Fellow (University Grants Commission, India) at Department of Medical Biochemistry, University of Madras, India.

Awards/ Honors/ Memberships

1. **2022 Outstanding Academic Achievement Award** from UM Business School
2. **2022 Algernon Sydney Sullivan** award from the Division of Diversity and Community Engagement.
3. Chancellor's Commission on the Status of Women Committee member (Since August 2022).
4. Phi Kappa Phi member (Since 2021- present)
5. Gillespie Business Plan competition finalist by Center for Innovation and Entrepreneurship, 2021.
6. Landshark Pitch Competition finalist 2021.
7. **Women of Distinction recognition** by Girl Scouts Heart of the South, 2019.
8. **University of Mississippi's Outstanding Staff Award 2015.**
9. University of Madras, India Valedictorian. 1991.
10. Merit certificate award from Royal Society of London. 1991.
11. UMMC Experimental Therapeutic Program Scientific Membership -Current.
12. "UM- Women in Leadership" – Current member.
13. American Association of Cancer Research (AACR) 2012, 2019.
14. American Society of Pharmacognosy – 2014.

Leadership Training and certification

1. Leadership Lafayette, Graduate of 2021 from Oxford Chamber of Commerce, Oxford, MS.

Credentials:

- Selected to serve in the Steering Committee for future Leadership Lafayette program
Project Manager for “LOVE our LOFT” community fundraising program
2. Leadership and Ethics course, MBA 601, GPA 4.0/4.0.
 3. NCDCA personal development conference at Houston, Texas in June 2019.
 4. Leadercast 2019 and 2021 (hosted by HR).
 5. Gallup strength course and identification of personal strengths and skills.

Patents pending

Patent Title: Anticancer Formulation

Number: PCT/US19/51354

US Filing date: 3/16/2021

PCT application: 09/16/2019.

Provisional Patent: September 2018.

Role: Inventor

Leadership and Administration

Administrative leadership services to the University of Mississippi:

- University of Mississippi 175th Anniversary Task Committee (2023).
- Chancellor’s commission for women member (August 2022-current). Women in Leadership sub-committee convener.
- Chancellor’s Strategic Planning Council Standing Committee (August 2022-current)- Member of Goal 6 sub-committee.
- Chancellor’s Building and Renovations standing committee (August 2022-Current).
- Diversity Grants Evaluator for the Division of Community Engagement.
- Algernon Sydney Sullivan award nominations reviewer (2023)
- **Policy Development-** Human Resources- “Professional Development Increase” committee member and reviewer (Since 2023)
- Human Resources Policy Review Committee (Since 2023)
- Judge, Speaker’s Edge 2022-current.

- Chair, Staff Council's Overall Staff member award and EEO award selection Committee (2020- Present).
- Chair, Executive Board Election committee
- Chair, Staff Council Election committee.
- Chancellor's Library council standing committee (until July 2022)
- Meet with Chancellor every month regarding UM administration and policies. (2010-till date)
- Chancellor's Student affairs standing committee: Served during 2011-2012
- Executive officer for University of Mississippi Staff Council (2010-till date).
- Scholarship Manager for University of Mississippi Staff Council (2010-till date)
- Elected member for University of Mississippi Staff Council (2009-till date).
- Director of Treasury and Finance: UM Dames Executive Board (2021- till date)
- Served in General Counsel and Chief Legal Officer Search Committee interviews (multiple rounds of search) 2021
- Member of Bylaws committee, Staff member of the month election committee, and Marketing and communications committee of Staff Council.
- Mentor for Lott Leadership Students program
- MASCO meeting with SC executive Board at MS University for Women at Columbus, MS- 2019
- Judging at UM Debate Competition, 2019
- Quiz Bowl competition Judge 2021

Professional Services to the Scientific community:

- Co-Chair for Regeneron's International Science and Engineering Fair (Biochemistry category), Atlanta, GA, May 2022.
- Chair, School of Pharmacy/NCNPR annual poster session since 2017.
- Regeneron Science Talent Search Evaluator 2021
- Guest editor for Complementary medicine.
- Selection committee member of various Research scientist track positions.
- External examiner for Ph.D. dissertation for various Universities all around the world.
- Grant reviewer for post-doctoral and graduate student grant fellowship proposals
- Reviewer for Scientific articles to Journal of Natural Products, Planta Medica, Life Sciences, Expert opinion on Therapeutic Targets, Indian Journal of Experimental Biology.
- ISEF (International Science and Engineering Fair) Grand award Judge 2021
- Genius Olympiad Science Competition Judge 2019.
- Science fair judge at International, State, Regional and district level science fairs.
- Merit badge counselor for Science related merit badges for Boy Scouts of America.
- Training Post-docs.

Community Partnerships and Outreach- Service leadership to Lafayette and Oxford Community:

United Way of Oxford-Lafayette:

- Board of Director for United Way (Lafayette, Oxford)
- Chair, UM Campaign Committee
- Grant reviewer, Health and Education committee

Lafayette Oxford Foundation for Tomorrow (LOFT)

- Project Manager for “Love of LOFT” fundraising program, supported the mission and goal of LOFT. Raised \$30,000 and awarded grants to 22 non-profits organizations.

Oxford Chamber of Commerce

- Board of Director
- Leadership Lafayette Program Steering Committee
- Junior Leadership Lafayette Program Steering Committee

Civic Duty:

- Poll Manager at President, State, City and County elections (2015 to current).

Oxford School District

- Visiting Speaker, Oxford High School Biology Courses on Biotechnology applications
- Treasurer, Oxford High School PTO (2022-23)
- Chair, Reading is Fundamental Program for Della Davidson Elementary School PTO. (2019-2021)
- Asst. Treasurer, Oxford High School PTO (2021)
- Standard based Learning Committee to determine the grading policy for Oxford School District (2020)

Boy Scouts of America Yocona Area Council

- Chair, Health and Safety Committee
- Chair, Nomination committee 2022.
- Board of Director for Chicksa District Committee (2021)
- Member for Chicksa Nominating Committee (2020, 2021)
- BSA Youth Protection Training Completed.
- Serving as a **Mentor** and “**Merit badge Counselor**” for Boy Scouts of America, Yocona Area Council.

Training

- UM Digital accessibility training September 2022
- Inclusive and Equitable hiring process: Faculty and Staff Searches September 2022
- UM info security training September 2022
- Feedback 360° by UM Human resources, August 2022
- UM Blackboard training -August 2022
- EDHE instructor training- July 2022
- Graduate instructor training 2021
- Leadercast workshop by UM Human Resources 2021
- “International Science and Educational Fair” (ISEF) Judge training and workshop, May 2021
- Computational Glycoscience Workshop January, 2021
- eGrove user training August 2020
- Leadership Training by NCDG Global Professional Development Conference, June, 2019 at Houston, TX.
- Clifton Strength finder 2.0 course completed.
- Adjudicating Speech and Debate training course from National Speech and Debate Association.
- Collaborative Institutional Training Initiative (CITI)- Social and Behavioral Responsible conduct of Research course 1 -2017 (Basic).
- Collaborative Institutional Training Initiative (CITI)- Group 2A SBR Faculty and Staff -2006 (Basic), 2009 (Refresher) and 2017 (Refresher)
- Radiation safety annual update – Every year.
- Biological Safety training – April 2006.
- Chemical Safety training –August 2002.
- Radiation Safety training - August 2002
- Animal Safety training – August 2002
- Post-doctoral training from November 2000 to July 2005.

List of Publications

1. Singh, S., Carlo F., Ibrahim, MM, Penfornis P, Mouton AJ, Tripathi S, Agarwal, A, Eastham L., Pasco DS., **Balachandran P.**† Claudio PP† . ‡Shared Last author. (2023). The Oligostilbene, Gnetin H Is a Novel Glycolysis Inhibitor That Regulates Thioredoxin Interacting Protein Expression and Synergizes with OXPPOS Inhibitor in Cancer Cells. *International Journal of Molecular Sciences* 24 (9),7741.
2. Łaska, G., Sieniawska, E., Maciejewska-Turska, M., Świątek, Ł., Pasco, D.S. and **Balachandran, P.** (2023). *Pulsatilla vulgaris* Inhibits Cancer Proliferation in Signaling Pathways of 12 Reporter Genes. *International Journal of Molecular Sciences*, 24(2), p.1139.

3. **Balachandran, P.** (2022). Ayurvedic Knowledge Inspired Approach to Modern Drug Discovery. In *Chemistry, Biological Activities and Therapeutic Applications of Medicinal Plants in Ayurveda* (pp. 325-373). Royal Society of Chemistry.
4. Kumarihamy M, Tripathi S, **Balachandran P**, Avula, B, Zhao J, Wang M, Bennett, MM, Zhang J, Carr, MA, Lovell MK, Wellington, OI, Marquart ME, Dhammika Nanayakkara, NP, Muhammad, I. (2022). Synthesis and Inhibitory Activity of Machaeridiol- based Novel anti-MRSA and anti-VRE Compounds and their Profiling for Cancer-Related Signaling Pathways. *Molecules* 27, 6604.
5. Abdelgawad, S.M., Hetta, M.H., Ibrahim, M.A., **Balachandran, P.**, Zhang, J., Wang, M., Eldehna, W.M., Fawzy, G.A., El-Askary, H.I. and Ross, S.A., 2022. Phytochemical Investigation of Egyptian Riverhemp: A Potential Source of Antileukemic Metabolites. *Journal of Chemistry*. <https://doi.org/10.1155/2022/8766625>
6. Abdelgawad, S.M., Hetta, M.H., Ibrahim, M.A., **Balachandran, P.**, Zhang, J., Wang, M., Fawzy, G.A., El-Askary, H.I. and Ross, S.A., 2022. Phytochemical Investigation of Egyptian Spinach Leaves, a Potential Source for Antileukemic Metabolites: In Vitro and In Silico Study. *Revista Brasileira de Farmacognosia*, pp.1-12.
7. Abdelgawad, S.M., Hetta, M.H., Ibrahim, M.A., Balachandran, P., Zhang, J., Wang, M., Ospanov, M., Fawzy, G.A., El-Askary, H.I. and Ross, S.A., 2021. Attenuation of Smad, Wnt and E2F Signaling by Egyptian Riverhemp Triterpenes in Leukemia Cells, *Journal of Chemistry*.
8. **Balachandran P**, Elsohly M, Hill KP (2021). Cannabidiol Interactions with Medications, Illicit Substances, and Alcohol: a Comprehensive Review. *J Gen Intern Med.* 36, 2074-2084.
9. **Balachandran, P**, Ibrahim, M.A.; Zhang, J.; Wang, M.; Pasco, D.S.; Muhammad, I (2021) Crosstalk of Cancer Signaling Pathways by Cyclic Hexapeptides and Anthraquinones from *Rubia cordifolia*. *Molecules*, 26, 735.
10. Łaska, G., Maciejewska-Turska, M., Sieniawska, E., Świątek, Ł., Pasco, D.S. and **Balachandran, P.** (2021). Extracts from *Pulsatilla patens* target cancer-related signaling pathways in HeLa cells. *Scientific reports*, 11, 1-16.
11. Stephanie A. Sheehan, Kelly L. Hamilton, Edward P. Retzbach, **Balachandran, P.**, Krishnan H., Leone P., and Goldberg, GS (2021). Evidence that *Maackia amurensis* seed lectin (MASL) exerts pleiotropic actions on oral squamous cells to inhibit SARS-CoV-2 infection and COVID-19 disease progression. *Experimental Cell Research*, 403, 112594.PMID:33106801
12. Hamilton KL, Sheehan SA, Retzbach EP, Timmerman CA, Gianneschi GB, Tempera PJ, **Balachandran P**, Goldberg GS (2021). Effects of *Maackia amurensis* seed lectin

(MASL) on oral squamous cell carcinoma (OSCC) gene expression and transcriptional signaling pathways. *J Cancer Res Clin Oncol.* 147, 445-457.

13. **Balachandran P.**, (2020) Role of Indian traditional systems of medicine in Integrative oncology, Book Chapter in the book entitled, *Cancer Integrative Oncology*, Spain, ISBN:978-18115-88-2. Mandala Ediciones Publications, 2020.
14. Ghanadian, M., Ali, Z., Khan, I.A., **Balachandran, P.**, Nikahd, M., Aghaei, M., Mirzaei, M. and Sajjadi, S.E. (2020). A new sesquiterpenoid from the shoots of Iranian *Daphne mucronata* Royle with selective inhibition of STAT3 and Smad3/4 cancer-related signaling pathways. *DARU Journal of Pharmaceutical Sciences*, 28, 253-262.
15. Labib, R.M., Zulfiqar, F., Ibrahim, M.A., **Balachandran, P.**, Zhang, J. and Ross, S.A., (2019). FOXO signal activating alkaloids isolated from *Ochrosia elliptica* leaf cultivated in Egypt. *Medicinal Chemistry Research*, 28(10), pp.1628-1632.
16. Eastham LL, Howard, CM., **Balachandran P.**, Pasco, DS., and Claudio PP. (2017) Eating Green: Shining Light on the Use of Dietary Phytochemicals as a Modern Approach in the Prevention and Treatment of Head and Neck Cancers. Invited review. *Current Topics in Medicinal Chemistry*, 17, 1-10.
17. Zaki, MA., **Balachandran, P.**, Khan, SI., Wang, M., Mohammed, R., Hetta, MH., Pasco, DS., and Muhammad I. (2013). Cytotoxicity and Modulation of Cancer-Related Signaling by (Z)- and 2 (E)-3,4,3',5'-Tetramethoxystilbene Isolated from *Eugenia rigida*. *J. Nat. Prod.*, 76, 679–684.
18. Nielsen, CH., **Balachandran, P.**, Christensen, O., Pugh, ND., Tamta, H., Sufka, KJ., , Wu, X., Walsted A., Schjørring-Thyssen, M., Enevold, C., and Pasco, DS. (2010). Enhancement of natural killer cell activity in healthy subjects by **Immulina**®, a *Spirulina* extract enriched for Braun-type lipoproteins. *Planta Med.*, 76, 1802-8.
19. Tamta H, Pugh, ND., **Balachandran, P.**, Moraes, R., Sumiyanto, J., Pasco, DS (2008). Variability in *in vitro* macrophage activation by commercially diverse bulk *Echinacea* plant material is due predominantly to bacterial lipoproteins and lipopolysaccharides. *J. Agri. Food Chem.*, 56, 10552-10556.
20. Pugh ND., Tamta H., **Balachandran P.**, Wu X., Howell J., Dayan FE., Pasco DS. (2008). The majority of *in vitro* macrophage activation exhibited by extracts of some immune enhancing botanicals is due to bacterial lipoproteins and lipopolysaccharides. *Int. Immunopharmacol.*, 8, 1023-1032.
21. **Balachandran, P** (2007). Advancements of Ayurveda in Cancer Management with Special Focus on Hepatocellular Carcinoma.- Solicited review in *Annals of Traditional Chinese medicine In: Alternative Treatment for Cancer*, Leung P.C., and Fong H (eds.), World Scientific Publishing Co., Singapore, Vol.3, pp 77-106.

22. **Balachandran, P** and Govindarajan R (2007). Ayurvedic Drug Discovery. Solicited review in *Expert Opinion on Drug Discovery*, 12, 1631-1652.
23. **Balachandran, P.**, Pugh ND, Ma, G. and Pasco, DS (2006). Toll-like receptor 2-dependent activation of monocytes by *Spirulina* polysaccharide and its immune enhancing action in mice. *Int. Immunopharmacol.*, 6, 1808-1814.
24. Pawar, R., **Balachandran, P.**, Pasco, DS and Khan, IA (2006). Cytotoxicity studies of triterpenoids from *Akebia trifoliata* and *Clematis ligustifolia*. *Acta Horticulturae*, 720, 171-178.
25. **Balachandran, P., Wei, F., Lin, R., Khan, IA., Pasco, DS. (2005).** Structure-activity relationships of aristolochic acid analogues. Toxicity in cultured renal epithelial cells. *Kidney International*, 67, 1797-1805.
26. **Balachandran P. and Govindarajan R. (2005).** Cancer –an ayurvedic perspective - review. *Pharmacological Research*, 51,19-30.
27. **Pugh N., Balachandran, P., Lata, H., Dayan, F., Joshi, V., Bedir, E., Makino, T., Mores, R., Khan I., Pasco, D., (2005).** Melanin: Dietary mucosal immune modulators from *Echinacea* and other botanical supplements. *International Immunopharmacol.*, 5, 637-647.
28. Rao, U.S., Baker, J.M. Pluznik, J.L. and **Balachandran, P.** (2004). Role of intracellular Ca^{2+} in the expression of amiloride-sensitive sodium channel. *Cell calcium*, 35, 21-28.
29. **Balachandran, P.** and Govindarajan, R., (2003). Hepatic disorders in *Scientific basis for Ayurvedic Therapies*, L.C. Mishra (Ed.) CRC Press LLC, Florida, 231-254.
30. Rao, U.S., Steimle, R., and **Balachandran, P.**, (2002). Activation of large conductance sodium channels upon expression of amiloride-sensitive sodium channel in Sf9 insect cells. *Journal of Biological Chemistry*, 277, 4900-4905.
31. **Premalatha, B.** and Sachdanandam, P. (2000) Potency of *Semecarpus anacardium* Linn. nut milk extract against aflatoxin B₁ induced hepatocarcinogenesis: reflection on hepatic microsomal biotransformation enzymes. *Pharmacological Research*, 42, 161 – 166.
32. **Premalatha, B.** and Sachdanandam, P. (2000). Stabilization of lysosomal membrane and glycoprotein content by *Semecarpus anacardium* nut extract in aflatoxin B₁ induced hepatocellular carcinoma. *Phytotherapy Research*, 14, 352 –355.
33. **Premalatha, B.** and Sachdanandam, P. (2000). Modulating role of *Semecarpus anacardium* Linn. nut milk extract on aflatoxin B₁ biotransformation. *Pharmacological Research*, 41,19-24.

34. **Premalatha, B.** (2000) *Semecarpus anacardium* Linn. nuts - a boon in alternative medicine – A review. *Indian Journal of Experimental Biology*, 38, 1177-1182.
35. **Premalatha, B.** and Sachdanandam, P. (1999). *Semecarpus anacardium* Linn. nut extract administration induces *in vivo* antioxidant defense system in aflatoxin B₁ mediated hepatocellular carcinoma. *Journal of Ethnopharmacology*, 66, 131-139.
36. Navis Paul Sriganth, I and **Premalatha, B.** (1999). Dietary curcumin with cisplatin administration modulates tumour marker enzymes indices in experimental fibrosarcoma. *Pharmacological Research*, 39, 175 – 179.
37. **Premalatha, B.** and Sachdanandam, P. (1999). Effect of *Semecarpus anacardium* Linn. nut extract against aflatoxin B₁ induced hepatocellular carcinoma. *Fitoterapia*, 70, 484-492.
38. **Premalatha, B.** and Sachdanandam, P., (1999). Effect of *Semecarpus anacardium* Linn. nut milk extract on rat serum Alpha-fetoprotein level in aflatoxin B₁ mediated hepatocellular carcinoma. *Fitoterapia*, 70, 279-283.
39. **Premalatha, B.** and Sachdanandam, P., (1999). Alteration in lipid metabolism during the development of aflatoxin B₁ induced experimental hepatocellular carcinoma. *Medical Science Research*, 27, 779-782.
40. **Premalatha, B.** (1999). Microsomal Membrane modulating efficacy of *Semecarpus anacardium* Linn. Nut. Milk extract in experimental hepatocellular carcinoma. *Indian Drugs*, 36, 714-719.
41. **Premalatha, B.**, Muthulakshmi, V., and Sachdanandam, P. (1999). Anticancer potency of the milk extract of *Semecarpus anacardium* Linn. nuts against aflatoxin B₁ mediated Hepatocellular carcinoma bearing Wistar rats with reference to tumour marker enzymes. *Phytotherapy Research*, 13, 183 – 187.
42. **Premalatha, B.** and Sachdanandam, P., (1998). Immunomodulatory activity of *Semecarpus anacardium* Linn. nut milk extract in aflatoxin B₁ induced hepatocellular carcinoma *Pharmacy and Pharmacology Communications*, 4, 507-510.
43. **Premalatha, B.** and Sachdanandam, P., (1998). Regulation of mineral status by *Semecarpus anacardium* Linn. nut milk extract in Aflatoxin B₁ induced hepatocellular carcinoma. *Journal of Clinical Biochemistry and Nutrition*, 25, 63 – 70.
44. **Premalatha, B.**, Muthulakshmi, V., Vijayalakshmi, T. and Sachdanandam, P. (1997). *Semecarpus anacardium* nut extract induced changes in Enzymic antioxidants studied in aflatoxin B₁ caused hepatocellular carcinoma bearing Wistar rats. *International Journal of Pharmacognosy*, 35, 1-6.

45. **Premalatha, B.**, Sujatha V. and Sachdanandam, P. (1997). Modulating effect of *Semecarpus anacardium* Linn. nut extract on glucose metabolizing enzymes in aflatoxin B₁ induced experimental hepatocellular carcinoma. *Pharmacological Research*, **36**, 187-192.
46. **Premalatha, B.**, Muthulakshmi, V., Vijayalakshmi T. and Sachdanandam, P., (1997). Protective role of *Serankottai Nei*, a Siddha preparation, on cell membranes, in aflatoxin B₁ induced hepatocellular carcinoma bearing rats. *Indian Drugs*, **34**, 385-389.
47. **Premalatha, B.**, Thangaraju, M. and Sachdanandam, P. (1995). Influence of cyclophosphamide and vitamin E administration on the rate of lipid peroxidation in experimental fibrosarcoma in rats. *Journal of Clinical Biochemistry and Nutrition*, **18**, 79-87.

Publications in review

1. **Balachandran P.**, Editor for the book “Chemistry, Biological Activity and Application of Essential Oils”, Published by Royal Society of Chemistry, London.
2. **Balachandran P.** Overview of natural products in nutraceutical industry. Book chapter in “Herbs, Spices and Their roles in Nutraceuticals and Functional Foods. Elsevier Publications.
3. Ilias, M., Ibrahim MM., Kumarihamy M., Lambert, JA., Zhang J., Mohammad MH., Khan, SI., Pasco. DS., **Balachandran, P.** Cannabinoid and Opioid Receptor Affinity and Modulation of Cancer-Related Signaling Pathways of Machaeriols and Machaeridiols from *Machaerium* Pers. Submitted to *Molecules*.

Conference Presentations (Guest speaker and poster)

1. **Premalatha Balachandran**, Ikhlas Khan, Targeting signaling pathways as an effective approach to evaluate the efficacy of natural products for the treatment of diabetic nephropathy. International Conference On the Science of Botanicals, April 2023 at Oxford, MS.
2. **Premalatha Balachandran**, Mallika Kumarihamy, Siddharth Tripathi, Bharathi Avula, Jianping Zhao, Mei Wang, Maria M. Bennett, Jin Zhang, N P Dhammika

- Nanayakkara, and Ilias Muhammad. Inhibitory Activity of Machaeridiol-Based Novel Anti-MRSA and Anti-VRE Compounds and Their Profiling for Cancer-Related Signaling Pathways. International Conference On the Science of Botanicals, April 2023 at Oxford, MS.
3. **Premalatha Balachandran**, Embracing Nature. Guest Speaker for Science on Screen, 20th Film Festival in Oxford, MS. March 5, 2023.
 4. **Premalatha Balachandran**, Mallika Kumarihamy, Siddharth Tripathi, Bharathi Avula, Jianping Zhao, Mei Wang, Maria M. Bennett, Jin Zhang, N P Dhammika Nanayakkara, and Ilias Muhammad. Inhibitory Activity of Machaeridiol-Based Novel Anti-MRSA and Anti-VRE Compounds and Their Profiling for Cancer-Related Signaling Pathways. Research Day, October 11, 2022, Oxford, MS
 5. Tyler J. Hellmig, Eamonn J. Brace, Kelly L. Hamilton, Clinton A. Timmerman, Edward P. Retzbach, Stephanie A. Sheehan, Katarzyna Jachimowska, **Premalatha Balachandran**, Alan J. Shienbaum, David I. Suster, Eugenio M. Capitle, Evelyne Kalyoussef, Dylan Roden, Soly Baredes, Mahnaz Fatahzadeh, Gary S. Goldberg. A novel approach to inhibit OSCC tumor progression. The 2022 Annual Retreat on Cancer Research in New Jersey, May 25, 2022
 6. Flavia D. Carlo, **Premalatha Balachandran**, Shivendra Singh, Mohamed Ali Ibrahim, David Pasco and Pier Paolo Claudio, Gnetin-H purified from Peonies Seeds Extracts as a Glycolysis Inhibitor and it is cytotoxic in combination with a PPP inhibitor in Human Cancer Cell Lines. 2022 Mississippi Academy of Sciences 86th Annual Meeting in the Cellular, Molecular and Developmental Division, March 21-April 1, 2022, Biloxi, MS.
 7. Tyler J. Hellmig, Eamonn J. Brace, Kelly L. Hamilton, Clinton A. Timmerman, Edward P. Retzbach, Stephanie A. Sheehan, Katarzyna Jachimowska, **Premalatha Balachandran**, Yukinari Kato, Alan J. Shienbaum, David I. Suster, Eugenio M. Capitle, Evelyne Kalyoussef, Dylan Roden, Soly Baredes, Mahnaz Fatahzadeh, Gary S. Goldberg. MASL targets the PDPN receptor on OSCC cells to inhibit tumor cell motility, viability and oncogenic transcriptional signaling pathways. Presented at Rutgers Cancer Institute-Princeton University Annual Cancer Research Symposium, Jan 11, 2022.
 8. **Premalatha Balachandran**, Jin Zhang, David S. Pasco. Assessment of Natural Products on cancer related signaling pathways. Poster presented at 11th AACR-JCA Joint conference in Breakthroughs in Cancer Research: Biology to Precision Medicine at Maui, HI. Feb 8th to 12th, 2019.
 9. **Premalatha Balachandran**, Jin Zhang, Mohamed Ali Ibrahim, Linda L. Eastham, Pier Paulo Claudio, David S. Pasco. Cancer Drug Discovery Core. School of Pharmacy Poster session at Oxford, MS. Oct 12th, 2018.
 10. Linda L. Eastham, **Premalatha Balachandran**, Claus yang, Bart Morris, Srinivasan Vijayakumar, David S. Pasco, Pier Paulo Claudio. Head and Neck Squamous

Carcinoma cells Pre-treated with BITC become sensitized to the effects of Chemoradiation. Research Day, University of Mississippi Medical Center, Jackson, MS, April 2018.

11. David S. Pasco, **Premalatha Balachandran**, Multi-target approach for natural product-based cancer prevention and treatment. Scientific Leadership Retreat, University of Mississippi Medical Center, Jackson, MS, June 25, 2018.
12. David S. Pasco, **Premalatha Balachandran**, NCNPR/UMMC - CI Cancer Drug Discovery Core. Scientific Leadership Retreat, University of Mississippi Medical Center, Jackson, MS, June 25, 2018.
13. **Premalatha Balachandran**, Jin Zhang, David S. Pasco. Assessment of Natural Products on cancer related signaling pathways. 11th AACR-JCA Joint conference in Breakthroughs in Cancer Research: Biology to Precision Medicine at Maui, HI. Feb 8th to 12th, 2019.
14. **Premalatha Balachandran**, Jin Zhang, Mohamed Ali Ibrahim, Linda L. Eastham, Pier Paolo Claudio, David S. Pasco. Cancer Drug Discovery Core. School of Pharmacy Poster session at Oxford, MS. Oct 12th , 2018.
15. **Premalatha Balachandran**, Jin Zhang, Agnes Rimando, Pier Paolo Claudio, David S. Pasco. Tumor/Patient Specific Action of Various Natural Products on Cancer Stem Cells and Bulk Tumor Cells. 16th Annual Oxford International Conference on the Science of Botanicals at Oxford, MS. April 11th to 14th, 2016.
16. Mohamed A Ibrahim, **Premalatha Balachandran**, Muhammad Ilias, David S Pasco. Modulation of Cancer-related Signaling by secondary metabolites from *Salvia officinalis* and *Zingiber officinale*. 16th Annual Oxford International Conference on the Science of Botanicals at Oxford, MS. April 11th to 14th, 2016.
17. Yuewen Sun, Mingchun Ou, Jin Zhang, **Premalatha Balachandran**, Hanchen Qiu, Gang Liang, David S Pasco. Anticancer saponin sepearated from *Schizocapsa Plantaginea*(Hance) 16th Annual Oxford International Conference on the Science of Botanicals at Oxford, MS. April 11th to 14th, 2016.
18. **Premalatha Balachandran**, Fazlul Sarkar, David S Pasco. Action of curcumin and its synthetic analog CDF on cancer related signaling pathways. *Planta Medica*, 2014, 80, IL 28. American society of Pharmacognosy/ICSB meeting at Oxford, MS. August 6-10, 2014.
19. David S. Pasco, Nirmal D. Pugh, **Premalatha Balachandran**, Colin Jackson, Immune enhancing bacterial endophytic components in Echinacea and other

botanicals *Planta Medica*, 2014, 80, PH 12. American society of Pharmacognosy/ICSB meeting at Oxford, MS. August 6-10, 2014.

20. **Premalatha Balachandran**, Jin Zhang, Mohamed A Ibrahim, Muhammad Ilias, David S Pasco. UMMC-Cancer Institute/ NCNPR Cancer Drug Discovery Core. Poster Submitted to School of Pharmacy/ NCNPR internal poster session on October 17, 2014.
21. **Premalatha Balachandran**, Fazlul Sarkar, David S Pasco. Action of Natural Products on cancer related signaling pathways. School of Pharmacy/ NCNPR internal poster session on October 17, 2014.
22. **Premalatha Balachandran**, Jin Zhang, Agnes Rimando, Pier Paolo Claudio, David S. Pasco. Tumor/Patient Specific Action of Various Natural Products on Cancer Stem Cells and Bulk Tumor Cells. 15th Annual Oxford International Conference on the Science of Botanicals at Oxford, MS. April 13th to 16th, 2015.
23. **Premalatha Balachandran**, Jin Zhang, Mohamed A Ibrahim, Muhammad Ilias, David S Pasco. UMMC-Cancer Institute/ NCNPR Cancer Drug Discovery Core. Poster Submitted to School of Pharmacy/ NCNPR poster session on October 2nd, 2015.
24. **Premalatha Balachandran**, Jin Zhang, Agnes Rimando, Pier Paolo Claudio, David S. Pasco. Tumor/Patient Specific Action of Various Natural Products on Cancer Stem Cells and Bulk Tumor Cells Poster Submitted to School of Pharmacy/ NCNPR internal poster session on October 2nd, 2015.
25. **Premalatha Balachandran**, Jin Zhang, Agnes Rimando, Pier Paolo Claudio, David S. Pasco. Tumor/Patient Specific Action of Various Natural Products on Cancer Stem Cells and Bulk Tumor Cells. Poster presented at Research day at UMMC, Jackson, MS on March 3rd, 2016.
26. Mohamed A. Zaki, Premalatha Balachandran, Mohamed A Ibrahim, Shabana Khan, Mei Wang, Rabab Mohammed, Mona H. Hetta, David Pasco and Ilias Muhammad(2013).
27. Cytotoxicity and Modulation of Cancer-Related Signaling by (Z)- and 2 (E)-3,4,3',5'-Tetramethoxystilbene Isolated from *Eugenia rigida*. Annual ASP meeting. July 13-17, 2013. St. Louis, MO.
28. Mohamed A. Zaki, **Premalatha Balachandran**, Shabana Khan, Mei Wang, Rabab Mohammed, Mona H. Hetta, David Pasco and Ilias Muhammad (2013). Cytotoxicity and Modulation of Cancer-Related Signaling by (Z)- and 2 (E)-3,4,3',5'-

- Tetramethoxystilbene Isolated from *Eugenia rigida*. 12th Annual Oxford Conference on Science of
29. Botanicals (ICSB) Sponsored by CFSAN/FDA, Shanghai Institute of Materia medica/CAS, China and the CSIR (Council of Scientific & Industrial Research) and the Society of Medicinal Plant Research. April 15- 18, 2013. Oxford, MS.
 30. **Premalatha Balachandran**, Mohamed A Ibrahim, Muhammad Ilias, David S Pasco. Assessment of *Rubia cordifolia* action on cancer related signaling pathways. School of Pharmacy/NCNPR poster session on November 8, 2013.
 31. David S Pasco, **Premalatha Balachandran**, Muhammad Ilias, Mohamed A Ibrahim, Majken Trolle Wadum, Shabana Khan. UMMC-Cancer Institute/NCNPR Cancer Drug Discovery Core. School of Pharmacy/NCNPR poster session on November 8, 2013.
 32. **Premalatha Balachandran**, Nirmal D. Pugh, Claus Henrik Nielsen, Ole Christensen, Hemlata Tamta, Kenneth J. Sufka, Xiangmei Wu, Anette Walste, Michelle Schjørring-Thyssen, Christian Enevold and David S. Pasco. Enhancement of natural killer cell activity in healthy subjects by Immulina®, a *Spirulina* extract enriched for Braun-type lipoproteins. Cancer Research Day, UMMC cancer institute on November 19, 2012.
 33. David S Pasco, **Premalatha Balachandran**, Muhammad Ilias, Mohamed A Ibrahim, Majken Trolle Wadum, Shabana Khan. UMMC-Cancer Institute/NCNPR Cancer Drug Discovery Core. School of Pharmacy/NCNPR poster session on November 8, 2012.
 34. Nirmal D. Pugh, **Premalatha Balachandran**, David S Pasco. Immune enhancing botanical research program: commercial products developed and potential opportunities. UMMC-Cancer Institute/NCNPR Cancer Drug Discovery Core. School of Pharmacy/NCNPR internal poster session on November 8, 2012.
 35. Mohamed A. Zaki, **Premalatha Balachandran**, Shabana Khan, Mei Wang, Rabab Mohammed, Mona H. Hetta, David Pasco and Ilias Muhammad (2013). Cytotoxicity and Modulation of Cancer-Related Signaling by (Z)- and 2 (E)-3,4,3',5'-Tetramethoxystilbene Isolated from *Eugenia rigida*. 12th Annual Oxford Conference on Science of Botanicals (ICSB) Sponsored by CFSAN/FDA, Shanghai Institute of Materia medica/CAS,China and the CSIR (Council of Scientific & Industrial Research) and the Society of Medicinal Plant Research. April 15- 18, 2013. Oxford, MS.
 36. **Premalatha Balachandran**, Nirmal Pugh, Hemlata Tamta, Kenneth J. Sufka, Xiangmei Wu, and David S. Pasco. Enhancement of natural killer cell activity in healthy subjects by Immulina®, a *Spirulina* extract enriched for Braun type lipoproteins. 8th Annual Oxford Conference on Science of Botanicals (ICSB) and American Society of Pharmacognosy Sponsored by CFSAN/FDA, Shanghai Institute of Materia medica/CAS, China and the CSIR (Council of Scientific & Industrial

- Research) and the Society of Medicinal Plant Research. April 6- 9, 2009. Oxford, MS.
37. Hemlata Tamta, Nirmal Pugh, **Premalatha Balachandran**, Rita Moraes, Sumiyanto, J, David Pasco, DS. Variability in *in vitro* macrophage activation by commercially diverse bulk *Echinacea* plant material is due predominantly to bacterial lipoproteins and lipopolysaccharides. 8th Annual Oxford Conference on Science of Botanicals (ICSB) and American Society of Pharmacognosy Sponsored by CFSAN/FDA, Shanghai Institute of Materia medica/CAS,China and the CSIR (Council of Scientific & Industrial Research) and the Society of Medicinal Plant Research. April 6- 9, 2009. Oxford, MS.
 38. **Premalatha Balachandran**, Kenneth Sufka and David Pasco. Enhancement of natural killer cell activity and phagocytosis by Immulina, *Spirulina* extract: A prospective pilot study on healthy subjects. 7th Oxford International Conference on Science of Botanicals (ICSB) and American Society of Pharmacognosy Sponsored by CFSAN/FDA, Shanghai Institute of Materia medica /CAS, China and the CSIR (Council of Scientific & Industrial Research) and the Society of Medicinal Plant Research. April 12- 16, 2008. Oxford, MS.
 39. **Premalatha Balachandran**, Ikhlas Khan and David Pasco. Evaluation of herbal toxicity- Choosing the right cell based *in vitro* assay. 6th Oxford International Conference on Science of Botanicals (ICSB) on "Critical approaches to Pre-clinical evaluation of botanicals Sponsored by CFSAN/FDA, Shanghai Institute of Materia medica/CAS, China and the CSIR (Council of Scientific & Industrial Research). April 30- May 3rd, 2007. Oxford, MS.
 40. **Premalatha Balachandran**, Rahul Pawar, Ikhlas Khan and David Pasco. Identification of cytotoxic constituents from *Menispermum dauricum*-a botanical under FDA alert. 5th Oxford International Conference on Science of Botanicals (ICSB) on "Quality, Safety and Processing of Botanical Products" Sponsored by CFSAN/FDA and the CSIR (Council of Scientific & Industrial Research). August 21-24, 2006. Oxford, MS.
 41. **Premalatha Balachandran**, Ikhlas Khan and David Pasco. Aristolochia Spp: Screening for cytotoxicity and apoptosis induction in vitro. Presented at International Conference on Quality and Safety Issues Related to Botanicals, Sponsored by CFSAN/FDA and the University of Mississippi. August 15-18th 2005, Oxford, MS.
 42. **Premalatha Balachandran**, Ikhlas Khan and David Pasco. Botanicals of FDA concern: Screening for cytotoxicity and apoptosis induction in vitro. Presented at International Conference on Quality and Safety Issues Related to Botanicals, Sponsored by CFSAN/FDA and the University of Mississippi. August 15-18th 2005, Oxford, MS.

Funding (Grants and contracts) received/ investigated

1. Anti-cancer formulation: Research activities related to preclinical studies: This project (Dr. Balachandran as PI) aims to do pharmacokinetic and toxicity studies on the anticancer formulation/lead compound that has been filed for PCT application.

Type: Agreement/Partnership

Role on the contract: Principal Investigator

Dates: July 2019-June 2021.

Amount awarded: \$80,000 (one year no cost extension until June 2021)

Granting Agency: UMMC Cancer Institute/MSDH.

Objectives:

- To evaluate pharmacokinetic effect of Gnetin H
- To determine maximum tolerated dose for Gnetin H.
- To identify an enzyme(s) responsible (biomarker) for Gnetin H glycolysis inhibitor effect.

2. Cancer drug discovery core

Title: NCNPR-UMMC cancer Drug discovery core

Institute: University of Mississippi Cancer center and Research Institute, Jackson, MS.

Type: Agreement/Partnership.

Role on the contract: Sr. Investigator

Dates: July 2010-June 2019 (Renewed annually).

Amount awarded: ~\$200,000-\$250,000/annum

Objectives: To identify, characterize, discover, develop, translate and foster commercialization of new anticancer drugs from plant extracts. Develop high throughput screening assays that target signal-transduction pathways known to be involved in the expression of cancers.

3. Echinacea bacterial endophytes

Title: Immune enhancing *Echinacea* bacterial endophytes.

Agency: NIH - National Center for Complementary and Alternative Medicine

Type: R01 AT007042

Amount: **\$1,035,336**

Period: 2012 – 2015 (no cost extension until 2016)

Role on the Grant: Sr. Investigator.

Objectives: To isolate and characterize bacterial endophytic components those are responsible for immune stimulating action.

4. Echinacea optimization

Title: New-Immuno-active compound for Optimizing *Echinacea*

Type: RO1 AT002360

Agency: NIH/NCCAM

Amount: \$846,498

Period: 9/15/ 2004 to 7/31/ 2007 and one year no cost extension to 07/30/2008

Role on the Grant: Investigator.

Objectives: To identify and characterize immune active compound(s) in *Echinacea*.

5. PharmAfrican Grant:

Title: Evaluation of *Gnetum africanum* extracts for anti-inflammatory activity and other African plants for anti-cancer, anti-malaria and immune enhancement.

Agency: Pharmaf African Inc.

Period: February 2, 2008- July 30, 2008

Role on the Grant: Investigator

Type: Phase I (\$18,553)

Objectives: To evaluate the *in vitro* anti-inflammatory potential of *Genetum africanum* plants and to identify active constituent(s) responsible for its anti-inflammatory activity. Evaluation of *G. africanum* extracts for anti-cancer, immune stimulatory activities.

6. Mannatech Grant:

Title: *In vitro* evaluation of immune stimulatory effects of polysaccharides.

Agency: Mannatech

Period: May 1, 2007- August 31, 2007

Role on the Grant: Investigator.

Type: Phase I, \$ 28,935

Objectives: To evaluate *in vitro* immune stimulatory effects of 8 polysaccharide preparations using monocytes/macrophage system.

7. Nordic Phytopharma:

Title: Immulina Mouse studies

Agency: Nordic Phytopharma

Period: February 1, 2004- January 31, 2005.

Role on the grant: Investigator

Amount: \$4,400.00

Objectives: To evaluate *in vivo* immune stimulatory effects of Immulina, an active preparation from *Spirulina platensis* in mouse models.

8. Echinacea (R21) Grant:

Title: New Immuno-active principles for optimizing Echinacea.

Agency: NIH/NCCAM

Type: R21 AT001207.

Period: May1, 2002 - April 30, 2004.

Role on the grant: Investigator

Amount: \$358,750.

Objectives: To identify and characterize immune principles in Echinacea.

Research proposals to IRB, IACUC and IBC

CLINICAL TRIALS AND RESEARCH INVOLVING HUMAN CELLS (IRB approvals)

1. Pilot Clinical Trials on Immulina:

Title: Pilot study to assess the immunostimulatory effects of Immulina supplementation on healthy individuals.

Sponsor for Immulina capsules: Scandinavian Clinical Nutrition Denmark

PI: Dr. Premalatha Balachandran.

Type: Pilot Clinical Study

Approval: Institutional Review Board

B. In Vitro Studies on human immune cells:

Title: Evaluation of immunostimulatory botanicals and their active components for biological activity using human blood products.

PI: Dr. Premalatha Balachandran (PI)

Type: In vitro evaluation of botanicals using human blood products.

Approval: Institutional Review Board

RESEARCH INVOLVING ANIMAL STUDIES (IACUC APPROVALS):

1. Title: Monitoring microbiome alterations after the administration of natural products in diabetic and non-diabetic mice.
Duration: July 2021-June 2024.
2. Title: Evaluating anti-cancer efficacy of novel agents in mice and determination of their pharmacokinetics in various organs
Duration October 2020 – October 2023.
3. Title: Development and use of an assay for detection of agents that influence mucosal and systemic immunity
Duration: October, 2017 – October 2020.
4. Title: Development and use of an assay for detection of agents that influence mucosal and systemic immunity
Duration: October, 2014 – October, 2017.
5. Title: Development and use of an assay for detection of agents that influence mucosal and systemic immunity
Duration: October, 2011 – October, 2014.

6. Title: Development and use of an assay for detection of agents that influence mucosal and systemic immunity
Duration: October, 2008 – October, 2011.

7. Title: Development and use of an assay for detection of agents that influence mucosal and systemic immunity
Duration: October, 2005 – October, 2008.

Research Experience

1. July 2022 to Present

Principal Scientist at National Center for Natural Products Research, School of Pharmacy, University of Mississippi, Mississippi – 38677.

2. July 2015 to June 2022

Senior Research Scientist at National Center for Natural Products Research, School of Pharmacy, University of Mississippi, Mississippi – 38677.

Key investigator of Cancer Drug Discovery core (In collaboration with Cancer Institute at UMMC, Jackson, MS).

3. July 2009 to June 2015

Research Scientist at National Center for Natural Products Research, School of Pharmacy, University of Mississippi, Mississippi – 38677.

Key investigator of Cancer Drug Discovery core (In collaboration with Cancer Institute at UMMC, Jackson, MS).

4. July 2005 to June 2009

Associate Research Scientist at National Center for Natural Products Research, School of Pharmacy, University of Mississippi, Mississippi – 38677.

5. August 2002 to June 2005

Post Doctoral Research Associate at National Center for Natural Products Research, School of Pharmacy, University of Mississippi, Mississippi – 38677.

6. November 2000 to April 2002

Post Doctoral Research Associate at Department of Biochemistry and Molecular Biology, University of Nebraska Medical Center, Omaha, Nebraska, USA.

7. February 1999 to October 2000

Senior Research Fellow at Department of Animal Biotechnology, Madras Veterinary College, Tamilnadu Veterinary and Animal Sciences University, Chennai, India.

8. February 1998 to January 1999

Research Associate, Department of Biotechnology (R&D), Tamilnad Hospital Academic Trust, Chennai (Affiliated to University of Madras), India.

9. April 1994 to December 1997

Junior Research Fellow (University Grants Commission, India) at Department of Biochemistry, University of Madras, India.

STEM Skills

Clinical Trials: Pilot study designing, Approval of proposals from IRB, Experimental study execution, side effects monitoring, blood processing and isolation of PBMC, human NK cell cytotoxicity assay, whole blood phagocytosis by flowcytometry.

Animal research (Mice and rats): Study design, Approval of proposals from IACUC, Tumor biology, dose and time response studies, administration of drugs by various routes, fine tissue removal (e.g. Peyer's patches), collection of body fluids including peritoneal fluid, bone marrow processing. Development of diabetic model in mice.

Skin 3D models for skin toxicity and penetration: New technique to evaluate dermal penetration of extracts/pure compounds. This assay is helpful for screening test agents for their permeation capabilities and also skin toxic effects.

Covid 19 inhibitor assay: Screening assay has been set up to identify Sars-CoV-2 inhibitors. Very useful tool in Covid-19 drug discovery research.

Diabetic nephropathy: Establishment of transcription factor/signaling pathway assay panel

Immunology: Flowcytometry, Cell sorting, ELISA, immunocytochemistry, isolation of immune cells from various tissues by enzymatic dissociation, PBMC isolation from human blood, immune cell identification by antibody staining, quantification, determination of cellular trafficking, Phagocytosis quantification, NK cell cytotoxicity assays.

Molecular biology: Isolation of DNA, RNA, cloning and mammalian cell transfection, protein expression in mammalian and insect cells, agarose gel electrophoresis, Western blotting, RT-PCR, RNase protection assay.

Chromatographic techniques: Protein purification by various chromatographical methods viz., size exclusion, ion-exchange, HPLC, affinity, PAGE, TLC

Cell culture techniques: High throughput screening assay, Mammalian and insect cell maintenance and transfection using various methods, cell based assays and multiplex assays for cytotoxicity and apoptosis, nuclear staining, gene reporter assays.

Biochemistry: General biochemical assays, enzyme assays, isolation of microsomes and assessment of microsomal enzymes activity.

Microbiology: Isolation of rare bacteria, maintenance, propagation.

Radiolabeling: Making DNA probes and RNase Protection assay.