DEEPTHA KUMARASWAMY

Laboratory Researcher IV
Hillsborough, NJ - Email me on: deeptha.k@outlook.com

- Research technician with over 3 years' experience in gene sequencing, gas chromatography/mass spectrometry, and molecular labs.
- Skilled in the recording, developing and optimization of protocols and procedures
- Expert in mouse work, cell culture and wet lab assays
- Able to work independently and as part of a team to obtain and present publishable results.

WORK EXPERIENCE:

Laboratory Researcher IV
Rutgers University - Full-time
Center for Lipid research
Center for Nutrition, Microbiome and Health
May 2018 – Present
New Brunswick, New Jersey

Research Assistant
Rutgers University - Part time
Institute for Food, Nutrition and Health
Jan 2018 – May 2018

Laboratory Assistant
Rutgers University - Volunteer
Institute for Food, Nutrition and Health
July 2017 – Dec 2017

RESEARCH EXPERIENCE:

Partial list of projects that I have played major lead or supervisory roles:

1. ***Regulation of lipid metabolism with a focus on the lipid modifying enzyme SCD and its impact on tissue and whole-body health***
   - Maintaining animal colonies, genotyping, dosing and harvesting tissues.
   - Lipid analysis in various tissues using thin layer chromatography (TLC) and GC/MS
   - qRT-PCR, ELISA and other wet lab analysis

2. ***Oxidative DNA damage and repair and implications to metabolic health***
   - Cell line maintenance, harvesting and extraction
   - DNA purification and quantification
   - Lipid analysis and performing TLC

3. ***Characterization of gut microbiota of patients with Type 2 diabetes using an in vitro system: A Pilot Study***

- Processing of the human fecal pellets for next generation sequencing (NGS) using the Ion GeneStudio S5 sequencing platform (Thermo Fisher Scientific) which includes sample QC, library prep and sequencing in a GLP/GMP setup.
- Short Chain Fatty Acids (SCFA) content analysis using gas chromatography/mass spectrometry (GC/MS) system (Agilent).
- Measurement of pH in human fecal samples at different time points.

4. ***Development of an in vitro System to characterize human gut microbiota composition, functions, metabolism and to study the direct interactions between gut bacteria and test agents, e.g. nutrients, polyphenols, botanical extracts and pharmaceutical agents.***
   - Genomic DNA extraction from human microbial culture in the BSL-2 certified GMP processing facility and further processing of isolated DNA (e.g. PCR, PCR product purification and dilution) for 16S rRNA gene V4 amplicon sequencing.
   - SCFA profiling of in vitro fermentation culture using GC/MS system.
5. ***Development of standard operating procedure (SOPs) for human gut microbiota research:*** To collect diverse fecal samples and optimize protocols for storage, processing of human fecal samples for microbiota composition characterization using next-generation sequencing, and preparation of encapsulated fecal microbiota (GMP standard) for fecal microbiota transplantation (FMT) clinical trial.
   - Genomic DNA extraction to check the yield and purity of the isolated DNA using different DNA extraction methods
   - Sample preparation for 16S rRNA gene, whole-genome and shotgun metagenomics sequencing.
6. ***Effects of flavone in gut microbiome; Effects of DNA repair protein in obesity***
   - Plasma and hepatic lipid extraction and performing TLC
   - Fatty acid content and composition analysis using GC-MS
7. ***Impact of vitamin A transport and storage on intestinal homeostasis and functions***
   - Short-chain fatty acids measurements by GC-MS analysis

SKILLS and PROFICIENCY

1. ***Animal handling skills and related techniques***
   - Maintenance of wildtype, knockout and transgenic laboratory rodents (mice and rat)
   - Routine animal identification (ear notching, tattooing), set up breeding pairs, performing plug checks, conducting weaning and collecting samples for genotyping and maintain colony records.
   - Perform tail and ear PCR genotyping, database collection and recording.
   - Proficiency in techniques which includes repeated and terminal blood collection from animals (tail vein, cardiac and retro-orbital sinus blood), dosing animals by oral gavage, IV and IP injections, nair/shaving, tumor measurement and sample collection (urine and feces).
   - Collection of soft tissues (liver, gall bladder, bile, lungs, intestine, colon, cecum, gonads, pancreas, spleen, brain), muscles (heart, diaphragm, soleus, gastroc, quadriceps), adipose fat depots (visceral and subcutaneous) and bones.
   - Body composition determinations using NMR (Echo MRI, Columbus)

- Skilled in setting up metabolic cages and collecting data using metabolic monitoring system (oxymax/CLAMS)

2. ***Molecular and Analytical skills:***

- Thin layer chromatography (TLC) for lipid profiling (free fatty acids, Phospholipids, cholesterol esters, di and tri acyl glycerols)
- Skilled in using Agilent technologies GC-MS for comprehensive analysis on each lipid components from various matrixes (insects, fish, plant and animal tissues, human and rodent feces, fermentation liquid, human and animal cell lines)
- Performed assays for detecting enzyme activity by absorbance, fluorescence, or chemiluminescence (UV/VIS spectroscopy)
- Used Thermofisher scientific NanoDrop spectrophotometers and Invitrogen Qubit Fluorometers for nucleic acid quantifications
- Agarose gel electrophoresis for DNA separation and identification
- Western blot analysis for DNA-protein interaction
- PCR for genotyping
- qRT-PCR for gene expression studies
- ELISA and for linearity-of-dilution experiments
- RNA extraction and cDNA synthesis from various tissue using column and traditional method
- DNA extraction and purification from various matrixes
- Measurement of isotope labelled samples by Scintillation counting (Beckman Coulter)

3. ***Computer and Software proficiency***

- Agilent Chemstation® software and Thermo Scientific Lab Execution System (LES) platforms
- Database and reporting tools such as Microsoft Word, Excel, Access, and PowerPoint.
- Adobe Photoshop and Illustrator
- EndNote, GraphPad Prism, SPSS

4. ***Lab management and mentoring skills***

- Performs GLP/GMP quality manufacturing of encapsulated fecal microbiota products, QC testing, validation studies, research experiments at BSL-2 certified GMP processing facility.
- Key person of lipidomic core facility [Institute for Food, Nutrition, and Health, IFNH] for lipid profiling and its interactions with proteins and metabolites.
- 3+ years of experience with GC/MS systems with proficiency in Agilent Chemstation® software and iLAB LES platforms
- 2+ years of experience as a lab manager, which includes **management** (ensured compliance with regulatory requirements), **maintaining** (equipment, lab cleanliness, initiating repair services, as required), **documentation** (collection of documents supporting safety and efficiency of GLP standard) and **operations** (monitoring inventory, ordering supplies, performs validation for

supplies, collects and analyzes Certificate of Analysis of reagents and supplies required for GLP, monitors supplies and reagents expiration)

- Contributing to grant preparation by principal investigator (PI), helping institute researchers to get the most out of various equipment (GC/MS and others as required), discussing their projects and strategies with postdocs and students for picking the right equipment, technical help, troubleshooting, training and answering questions.
- Mentored students and staffs for both wet and dry lab techniques

EDUCATION:

B.S in Biochemistry
Madurai Kamarajar University
2000-2002

M.S in Biochemistry
Annamalai University
2002-2004

PUBLICATIONS

- Sex-Dependent Effects of 7,8-Dihydroxyflavone on Metabolic Health Are Associated with Alterations in the Host Gut Microbiome. Sharma P, Wu G, Kumaraswamy D, Burchat N, Ye H, Gong Y, Zhao L, Lam YY, Sampath H. Nutrients. 2021 Feb 16;13(2). doi: 10.3390/nu13020637.
- The DNA Repair Protein OGG1 Protects Against Obesity by Altering Mitochondrial Energetics in White Adipose Tissue. Komakula SSB, Tumova J, Kumaraswamy D, Burchat N, Vartanian V, Ye H, Dobrzyn A, Lloyd RS, Sampath H. Sci Rep. 2018 Oct 5;8(1):14886. doi: 10.1038/s41598-018-33151-1.
- Resveratrol and its Derivatives for the Prevention and Treatment of Gastrointestinal Disorders: A Review. Nova Science Publishers Inc. Disorders of Gastrointestinal Systems and Clinical Manifestations 2016; Chapter 2: Page 13-24. (ISBN: 978-1-63485-366-8).
- Influence of dietary resveratrol on early and late molecular markers of 1,2-dimethylhydrazine-induced colon carcinogenesis. Sengottuvelan M, Deeptha K, Nalini N.Nutrition. 2009 Nov-Dec;25(11-12):1169-76. doi: 10.1016/j.nut.2009.03.009.
- Resveratrol attenuates 1,2-dimethylhydrazine (DMH) induced glycoconjugate abnormalities during various stages of colon carcinogenesis. Sengottuvelan M, Deeptha K, Nalini N. Phytother Res. 2009 Aug;23(8):1154-8. doi: 10.1002/ptr.2770.
- Potential Role of Polyphenols on Liver Health and Diseases. Nova Science Publishers Inc. Hepatotoxicity: Symptoms, Management and Health Implications, 2009, Chapter 2: Page 23-40. Sengottuvelan M, Deeptha K. (ISBN: 978-1-63482-650-1)
- Resveratrol ameliorates DNA damage, prooxidant and antioxidant imbalance in 1,2-dimethylhydrazine induced rat colon carcinogenesis. Chemico-Biological Interactions 2009; 2:193-201.
- Dose dependent inhibitory effect of dietary caraway on 1,2-dimethylhydrazine induced colonic aberrant crypt foci and bacterial enzyme activity in rats. Kumaraswami Deeptha, Muthaiyan Kamaleeswari, Murugan Sengottuvelan, Namasivayam Nalini. Invest New Drugs. 2006 Nov;24(6):479-88. doi: 10.1007/s10637-006-6801-0.
- Effect of dietary caraway (Carum carvi L.) on aberrant crypt foci development, fecal steroids, and intestinal alkaline phosphatase activities in 1,2-dimethylhydrazine-induced colon carcinogenesis. Kamaleeswari M, Deeptha K, Sengottuvelan M, Nalini N.Toxicol Appl Pharmacol. 2006 Aug 1;214(3):290-6. doi: 10.1016/j.taap.2006.01.001.