

ARUMUGAM SUYAVARAN Ph.D.

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Energetic and technically sound Biochemist and molecular biologist with broad laboratory experience in Animal surgical experiments, primary cell isolation (from Liver) and cell culture experimentation with expertise in immunological and molecular analyses. Motivated team player with leadership skills with eagerness to learn from fellow team members.

EXPERIENCE

Council of Scientific and Industrial Research – University Grants commission - Junior Research Fellow

Research work: *Neutrophil extracellular traps in acrolein promoted hepatic ischemia reperfusion injury: therapeutic potential of NOX2 and p38MAPK inhibitors*

Pondicherry University, Pondicherry, India. (October 2012 to February 2017)

Project Scope/Outcomes: The role of NOX2 and P38 MAPK in induction of neutrophil extracellular traps (NET) upon exposure of isolated neutrophils to acrolein (a lipid peroxidation product) was elucidated. The deteriorating effects of NET in HepG2 cells cocultured with neutrophils were assessed via analysis of TNF- α expression and citrullination of Histone-3. In rats subjected to acrolein followed by partial hepatic ischemia reperfusion, activation of P38 MAPK - ERK1/2 axis was observed along with elevation in inflammatory cytokine and chemokine reflex. Inhibition of NOX2 and P38 MAPK suppressed these changes along with reduction in hepatic damage through NETosis.

Indian Council of Medical Research - Senior Research Fellow (Ad-hoc project)

Project: *Role of Mitochondrial Glutathione in the Survival of Young and Aged Primary Rat Hepatocytes*

Pondicherry University, Pondicherry, India. (September-2011 to October 2012)

Project scope/Outcomes: Hepatocytes were isolated via collagenase perfusion from young and aged rats subjected to glutathione pretreatment and the outcome of cellular oxidative stress response upon subjecting to external oxidative stress was analyzed. Also, young and aged rats pretreated with glutathione were subjected to partial hepatic ischemia reperfusion and the variable outcomes post surgery was observed. Glutathione effectively suppressed TNF- α -Caspase-8 signalling and produced similar outcomes in both young and aged rats.

University Grants commission -Junior Research Fellow (ad-hoc project):

Project: Post-translational Lipid modification of Apyrase from Shigella to formulate a self-assembled monolayer and its application for Biosensors.

Anna University, Chennai, India. (May-2010 to September – 2011)

Project scope/Outcomes: Design and construction of Apyrase insertion sequence with His-tag into pLMGV, transformation and expression of constructed clone in GJ1158, purification via Cobalt affinity chromatography. Analysis of lipid modification in expressed Apyrase by Tricine SDS-PAGE, silver staining and Western blotting. Construction of self assembled monolayer on hydrophobic substratum and evaluation by Atomic force microscopy.

EDUCATION

Doctor of Philosophy Degree

Thesis topic: *Pretreatment strategies for suppression of hepatic ischemia reperfusion injury: Insights into molecular mechanisms of hepatic recovery.*

Pondicherry University, Pondicherry, India, India

Thesis submitted on Feb – 2017, Graduation expected by October – 2017.

Masters of Science (Biochemistry and Molecular Biology)

Pondicherry University, Pondicherry, PY, India

Graduated: June, 2009 (7.6 CGPA)

Bachelor of Science (Medical laboratory technology)

Jawaharlal institute of post graduate medical education & research (JIPMER), Pondicherry, India

Graduated: June, 2007 (72.06 %)

SKILLS AND TECHNIQUES

Animal Handling: Experience in handling: Rats – Wistar & Sprague-Dawley; Mice – Wistar & C57bl/6. Administration of drug via following routes: intraperitoneal, intramuscular, intravenous & subcutaneous. Isolation and culture of primary rat hepatocytes via collagenase perfusion. Various surgical procedures including ischemia reperfusion surgery and partial hepatectomy. Rat models for MCD diet induced non-alcoholic fatty liver in Sprague-Dawley rats and Diethylnitrosamine induced liver cancer in male Wistar rats.

Histology: Tissue gross sectioning, tissue processing, paraffin block preparation, microtomy, differential staining (Hematoxylin & Eosin, Van Gieson's, Masson's trichrome, Periodic acid Schiff, Silver staining, Congo red staining, etc.), Immunohistochemistry (IHC), Immunofluorescence, Light, interference/phase contrast, Confocal and Scanning electron Microscopy.

Immunology: ELISA/EIA, Immunocytochemistry, Immunodiffusion, Immunoelectrophoresis and Precipitation.

Animal Cell culture: Cell line maintenance, evaluation of drug efficacy/toxicity, transfection optimization and plasmid transfection.

Molecular Biology: Isolation of Chromosomal DNA, Plasmid DNA, Total RNA and mRNA, DNA and RNA estimation, Agarose gel electrophoresis, Gene cloning and expression, Transformation, quantitative Real time PCR (qPCR), construction of recombinant plasmids with EGFP, CFP, BFP markers.

Biophysical, Biochemical and Proteomic Techniques: UV-Visible Absorption Spectroscopy, Ammonium sulphate precipitation, SDS-PAGE, Western blotting. Protein purification: Ion exchange, hydrophobic and metal affinity Chromatography.

Basic Microbiological Techniques: Isolation of pure cultures using spreading, streaking and differential culture techniques, Microbial staining techniques, Maintenance of Bacterial cultures, Antibiotic sensitivity test.

Computer and Software skills: Basic software and hardware training, Basic Bioinformatics skills base search: Homology search from NCBI, EMBL, DDB., Sequence retrieval and Format conversions, Molecular sequence alignment, Phylogenetic tree construction using CLUSTAL W, MEGA, Homology search, Motif finding in DNA,

protein sequences and their structures using PDB., Chemdraw, Chems sketch, Autodock 4.1, Endnote X6, Image J, Photoshop CS4, Corel draw-11, SPSS and Origin.

Leadership: Better communication, organizational and mentoring skills.

Teaching: Taught cell biology and cancer biology classes for master's students at Pondicherry University. Conducted cell biology and plant biotechnology practical classes for Master's students. Guided, eight master's students (Pondicherry University) during for their post graduate project during Ph.D.

Language: Proficient in English (Medium of education, experience in scientific writing and Conference speeches), Tamil (mother tongue – prolific speech, reading and writing skills), Telugu (conversational), Hindi (Basic reading, writing and speaking).

RESEARCH THRUST AREAS

- Ischemia reperfusion injury
- Inflammatory signalling pathways
- Transplantation and cellular regeneration
- Cancer therapeutics
- Drug interaction studies

AWARDS AND GRANTS

- Department of Science and Technology (DST) - **international travel grant** to present a paper in International Liver congress, conducted held at Amsterdam, Netherlands (2017).
- **CSIR-UGC-JRF** by Govt. of India for pursuing Doctoral Research in India (2012-2017).
- **Awarded for** Research internship at Cleveland clinic, **USA** (2009)
- **Best Poster presentation award** (Second prize) in National seminar on “Drug discovery and cancer therapy”, held at Department of Biochemistry and Molecular Biology, **Pondicherry University** (February 25th, 2016)

SELECTED PUBLICATIONS

Publication in Research area:

- **Suyavaran A**, Girish KS, Kemparaju K, Thirunavukkarasu C. Neutrophil extracellular traps in acrolein promoted hepatic ischemia reperfusion injury: Therapeutic potential of NOX2 and p38MAPK inhibitors. *J Cell Physiol.* 2017 Sep 8. doi: 10.1002/jcp.26167 (**IF – 4.08**)
- Subastri A, **Suyavaran A**, Preedia Babu E, Nithyananthan S, Barathidasan R, Thirunavukkarasu C. Troxerutin with copper generates oxidative stress in cancer cells: Its possible chemotherapeutic mechanism against hepatocellular carcinoma. *J Cell Physiol.* 2017 Jun 19. doi: 10.1002/jcp.26061 (**IF-4.08**)
- **Suyavaran A** & Thirunavukkarasu C. Preconditioning methods in the management of hepatic ischemia reperfusion- induced injury: Update on molecular and future perspectives. *Hepatol Res* 2017;47, 31-48 (**IF – 2.7**) (A review article)
- **Suyavaran A**, Mareeswaran R, Ramamurthy C, Subastri A, Rao PL, et al. Non-alcoholic fatty liver disease – A brief insight into pathogenesis and review of recent reports on therapeutic targets. *J Liver Clin Res* 2015; 2(2): 1014. (A review article)

- Subastri A, Ramamurthy CH, **Suyavaran A**, Mareeswaran R, Lokeswara Rao P, Harikrishna M, Suresh Kumar M, Sujatha V, Thirunavukkarasu C. Spectroscopic and molecular docking studies on the interaction of troxerutin with DNA. *Int J Biol Macromol*. 2015;78:122-9. (IF-3.02)
- **Suyavaran A**, Ramamurthy C, Mareeswaran R, Subastri A, Lokeswara Rao P, Thirunavukkarasu C. TNF- α suppression by glutathione preconditioning attenuates hepatic ischemia reperfusion injury in young and aged rats. *Inflamm Res*. 2015;64(1):71-81. (IF-2.3)
- **Suyavaran A**, Ramamurthy C, Mareeswaran R, Shanthi YV, Selvakumar J, Mangalaraj S, Kumar MS, Ramanathan CR, Thirunavukkarasu C. Synthesis and biological evaluation of isoindoloisoquinolinone, pyroloisoquinolinone and benzoquinazolinone derivatives as poly(ADP-ribose) polymerase-1 inhibitors. *Bioorg Med Chem*. 2015;23(3):488-98. (IF-2.95)
- Rajamurugan R, **Suyavaran A**, Selvaganabathy N, Ramamurthy CH, Reddy GP, Sujatha V, Thirunavukkarasu C. Brassica nigra plays a remedy role in hepatic and renal damage. *Pharm Biol*. 2012;50(12):1488-97. (IF-1.3)

Other co-authored publications:

- Preedia Babu E, Subastri A, **Suyavaran A**, Premkumar K, Sujatha V, Aristatile B, Alshammari GM, Dharuman V, Thirunavukkarasu C. Size Dependent Uptake and Hemolytic Effect of Zinc Oxide Nanoparticles on Erythrocytes and Biomedical Potential of ZnO-Ferulic acid Conjugates. *Sci Rep*. 2017 Jun 23;7(1):4203. doi: 10.1038/s41598-017-04440-y. (IF-4.2)
- Ezhuthupurakkal PB, Polaki LR, **Suyavaran A**, Subastri A, Sujatha V, Thirunavukkarasu C. Selenium nanoparticles synthesized in aqueous extract of *Allium sativum* perturbs the structural integrity of Calf thymus DNA through intercalation and groove binding. *Mater Sci Eng C Mater Biol Appl*. 2017 May 1;74:597-608. (IF-4.164)
- Subastri A, Ramamurthy CH, **Suyavaran A**, Lokeswara Rao P, Preedia Babu E, Hari Krishna K, Suresh Kumar M, Thirunavukkarasu C. Probing the interaction of troxerutin with transfer RNA by spectroscopic and molecular modeling. *J Photochem Photobiol B*. 2015 Dec;153:137-44. (IF- 2.62)
- A.Subastri, CH. Ramamurthy, M. Priyanka, R. Sandeep, **A. Suyavaran**, C. Thirunavukkarasu (2015). Nutrient profile of porridge made from *eleusines coracana* (l.) Grains: effect of germination and fermentation. *Journal of Food Science and Technology* 15, 1713-17. (IF-2.02)
- Ramamurthy CH, Subastri A, **Suyavaran A**, Subbaiah KC, Valluru L, Thirunavukkarasu C. Solanum torvum Swartz. fruit attenuates cadmium-induced liver and kidney damage through modulation of oxidative stress and glycosylation. *Environ Sci Pollut Res Int*. 2016 Apr;23(8):7919-29. (IF-2.71)
- Ramamurthy CH, Padma M, samadanam ID, Mareeswaran R, **Suyavaran A**, Kumar MS, Premkumar K, Thirunavukkarasu C. Extracellular synthesis of gold and silver nanoparticles and their free radical scavenging and antibacterial properties. *Colloids Surf B Biointerfaces*. 2013;102:808-15. (IF-4.2)
- Ramamurthy CH, Kumar MS, **Suyavaran A**, Sujatha V, Mareeswaran R, Thirunavukkarasu C. Evaluation of antioxidant, radical scavenging activity and polyphenolics profile in Solanum torvum L. fruits. *J Food Sci*. 2012;77(8):C907-13. (IF-1.8)

CONFERENCE PAPERS/POSTERS (SELECTED)

- **Suyavaran. A.**, Ramamurthy.CH, Mareeswaran. R, Subastri. S, Lokeshwar Rao, Thirunavukkarasu. C. “Protective effect of glutathione preconditioning against warm ischemia/reperfusion injury in young and aged rats”, paper presented in 34th Annual conference of the Indian Association of Biomedical Scientists. Organized by Dr. ALM post graduate institute of basic sciences, University of Madras, Chennai, India, 27th - 29th December 2013.
- **Suyavaran. A.,** Thirunavukkarasu. C. “Inhibition of NOX2 and p38MAPK suppresses acrolein aggravated hepatic ischemia reperfusion injury through neutrophil extracellular traps”, Poster accepted for presentation in International liver congressTM, organized by The European association for study of liver (EASL), to be held at Amsterdam, Netherlands, during 19th to 23rd April, 2017.
(Published in supplementary edition of “Journal of Hepatology” - DOI: [http://dx.doi.org/10.1016/S0168-8278\(17\)30697-9](http://dx.doi.org/10.1016/S0168-8278(17)30697-9). (IF. 12.4)

Total publications: 15 (Arumugam Suyavaran [Author])

Original research: 13

Review article: 2

Conference Poster: 1

Google Scholar Citation indices: Total citations: 148; h-index: 6 and i10-index: 3

<https://scholar.google.co.in/citations?user=NINqf-kAAAAJ&hl=en>

Research gate link:

https://www.researchgate.net/profile/Arumugam_Suyavaran

Pubmed Link:

<https://www.ncbi.nlm.nih.gov/pubmed/?term=suyavaran>

REFERENCES

Guide & Supervisor:		
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