

Sathish Kumar Natarajan

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**RESEARCH AREAS**

- Studying the mechanism of liver failure and the role of 3-hydroxy fatty acids in causing placenta and liver lipotoxicity during acute fatty liver of pregnancy
- Determine the mechanism of palmitoleate protection against Zika Virus-induced endoplasmic reticulum stress and apoptosis in placental trophoblasts
- Determine the lipotoxic role of saturated free fatty acids to placental trophoblast during maternal obesity

EDUCATION TRAINING

INSTITUTION AND LOCATION	DEGREE	COMPLETION DATE	FIELD OF STUDY
University of Madras, Chennai, Tamilnadu (TN), India	BS	05/1999	Biochemistry
University of Madras, Chennai, TN, India	MS	05/2001	Biochemistry
Dr. MGR Medical University, Chennai, TN, India	PhD	10/2008	Biomedical Sciences
University of Nebraska-Lincoln, Lincoln, NE	Postdoc	07/2012	Proline and pipercolate metabolism
University of Nebraska Medical Center, Omaha, NE	Postdoc	07/2015	Mechanism of cholangiocyte lipoapoptosis

Positions and Employment

2008 - 2012 Postdoctoral Research Associate, University of Nebraska, Lincoln, NE
 2012 - 2014 Postdoctoral Research Associate, University of Nebraska Medical Center, Omaha, NE
 2014 - 2015 Instructor, University of Nebraska Medical Center, Omaha, NE
 2016 - Assistant Professor, University of Nebraska-Lincoln, Lincoln, NE
 2018- Graduate Committee Member, Department of Nutrition & Health Sciences, University of Nebraska-Lincoln, NE

Other Experience and Professional Memberships

2014 - Member, American Association for the Study of Liver Disease
 2014 - Member, American Association for the Advancement of Science
 2014 - ad hoc reviewer, Well-Being Women Foundation, London, UK
 2016 - ad hoc reviewer, NSF Graduate Research Fellowship Program
 2016 - ad hoc reviewer, National Defense Society for Engineering Graduate Fellowship Evaluation Panel and Department of Defense
 2016 - Member, Nebraska Center for Prevention of Obesity Diseases
 2016 - Member, Redox Biology Center, UNL
 2016 - Member, American Society for Nutrition
 2016 - Member, Society for the Study of Reproduction

- 2017 - Editor-in-Charge, Journal 'Diabetes'
2018- Member, Nebraska Center for Virology, UNL
2019 - Member, Child Health Research Institute, UNMC

Honors

- 2004 Shakuntala Amir Chand Prize, Indian Council of Medical Research, Government of India
2006 Young Scientist Travel Award, 20th IUBMB Conference
2015 Travel Award to attend American Association for the Study of Liver Disease (AASLD) and Industry Colloquium, Novel Targets and Therapies in Liver Disease
2016 Thematic Best Poster Award, American Society for Biochemistry and Molecular Biology (ASBMB)

GRANT SUPPORT

Current Research Support

Natreon Inc, Industry Funding, 08/01/2020-09/01/2023

- The Effects of PrimaVie Shilajit on Biomarkers of Collagen Degradation and Synthesis as well as the Time Course of Muscle Strength and Soreness Recovery
- Total Dollars: \$79,500, Role: Co-Principal Investigator (PI: Terry Housh)

University of Nebraska- Research Collaboration Initiative Seed grant, 06/01/19-05/31/21

- Grant Title: Understanding cancer cachexia as the transcriptional and metabolic reprogramming of adipose tissue by activin A
- Total Dollars: \$150,000, Role: Co-Investigator (PI: So-Youn, Kim, UNMC)

NIH P20 COBRE (NIGMS 1P20GM104320 and **2P20GM104320**), 08/01/2017-08/16/2020

- **Grant Title:** Palmitoleate prevents 3-hydroxy fatty acid-induced lipotoxicity to placental trophoblasts and hepatocytes
- Total Dollars: \$450,000, Role: Project Leader (PI: Zemleni, J)

Funded and Completed Research Support

Nebraska Center for the Prevention of Obesity Diseases (NPOD) Seed Grant Funding, 2019.

- **Grant Title:** Impact of obesity on omega-3 fatty acid-derived proresolving mediators in maternal-infant health
- Total Dollars: \$32,000, Role: Co-I (PI: Anderson Berry)

University of Nebraska Food for Health Collaboration Initiative Planning Grant, 2018

- **Grant Title:** Simulation evaluation of simulation-based training in healthcare education and its impact on the delivery and quality of health care
- Total Dollars: \$10,000, Role: Co-I (PI: Mukherjee, M)

University of Nebraska Food for Health Collaboration Initiative Seed Grant, 2017

- **Grant Title:** Betaine protects diet-induced liver disease progression model
- Total Dollars: \$150,000, Role: Co-I (PI: Kharbanda)

Layman Seed Grant, University of Nebraska-Lincoln, 2017

- **Grant Title:** Palmitoleate protects 3-hydroxy fatty acid-induced oxidative stress in primary human trophoblast cells'
- Total Dollars: \$10,000, Role: Principal investigator

University of Nebraska Food for Health Collaboration Initiative Seed Grant, 2017

- **Grant Title:** Maternal obesity-dependent mechanism that increase offspring predisposition for metabolic dysfunction
- Total Dollars: \$150,000, Role: Co-I (PI: Wood, J)

Nebraska Center for Preventive for Obesity Diseases (NPOD) Seed Grant Funding Jan 2016 to May 31, 2016.

- **Grant Title:** Mechanism of 3-hydroxy-fatty acid-induced placental trophoblast and hepatocyte lipoapoptosis
- Total Dollars: \$42,000, Role: Principal investigator

Pending Support

USDA/AFRI-NIFA, (Natarajan, PI) 04/01/2019 – 03/31/2023 1.20 calendar
Food and Human Health, A1343

Grant Title: Palmitoleate protects against saturated free fatty acid-induced placental trophoblast lipotoxicity
Total Dollars: \$500,000
Role: Principal Investigator

1R21-NICHD (Natarajan SK), 04/01/2021 – 03/31/2023 1.25 calendar
DHHS/NIH/NICHD

Grant Title: Palmitoleate prevents Zika virus-induced ER stress and apoptosis in placental trophoblasts
Total Dollars: \$ 275,000
Role: Principal investigator

Submitted, but not Funded and/or to be Submitted

1R01 NICHD (Natarajan, PI), 04/01/2020 - 03/31/2025 3.00 calendar
DHHS/NIH/NICHD

Grant Title: 3-hydroxy fatty acids induces placenta and liver lipotoxicity in acute fatty liver of pregnancy
Total Dollars: \$1,277,435
Role: Principal investigator
Revised R01 proposal to be submitted in Nov 5 2020 as resubmission

1R01 NICHD (Wood J), 06/01/2019 - 11/30/2024 1.00 calendar
DHHS/NIH/NICHD

Grant Title: Maternal Obesity Dependent differences in mechanisms and transport of fatty acids from placenta to the maternal circulation.
Total Dollars: \$ 1,250,000
Role: Co-investigator
Revised R01 proposal to be submitted in Feb 2021 as new submission

1R01 NICHD (Hanson C), 04/01/2019 - 03/31/2024 2 Calendar

Grant Title: The role of omega-3 fatty acid-derived pro-resolving mediators in maternal-fetal health
Total Dollars: \$ 1,250,000
Role: Co-investigator

Revised R01 proposal to be submitted in March 2021

Three seed grants were submitted to Nebraska Center for Prevention of Obesity Diseases, Department of Pediatrics Seed Grant, UNMC and Idna Ittner Foundation. All of these three seed grants applications were funded to me and collaborators and will help increase our ability be competitive in this research area.

1R01 NIEHS, ES032248-01 (Natarajan SK, Anderson Berry A, Nordgren T), 2 Calendar
07/01/2020 - 06/31/2024, DHHS/NIH/NIEHS

Grant Title: Protective role of Omega-3 fatty acid-derived lipid mediators against particulate matter-induced maternal inflammation and adverse cardiovascular outcomes.

Total Dollars: \$ 1,500,000

Role: Principal Investigator (Contact PI)

Revised R01 proposal to be submitted in March 2021

RESEARCH EXPERIENCE

Assistant Professor

2016-present

University of Nebraska-Lincoln

- Elucidate the mechanism of 3-hydroxy-fatty acid- and free fatty acid-induced placental trophoblast necroptosis and hepatocyte lipoapoptosis
- Identify nutrient compounds that protects against Zika Virus-induced placental trophoblast apoptosis and neuronal cell apoptosis
- Determine whether palmitoleate, a nutrient mitigates the placental injury and dysfunction caused due to the increased circulating FFA during maternal obesity

Instructor

2014-2015

University of Nebraska Medical Center

- Research established that miR-34a targets anti-apoptotic proteins such as hepatocyte growth factor receptor (MET), Kruppel-Like Factor 4 (KLF4) and NAD-dependent deacetylase sirtuin1 for the induction of hepatocyte- and cholangiocyte lipoapoptosis

Post-Doctoral Research Associate

2012-2014

University of Nebraska Medical Center

- Established that saturated free fatty acids induce cholangiocyte lipoapoptosis via the activation of FoxO3 and its downstream target PUMA

Post-Doctoral Research Fellow

2008-2012

University of Nebraska-Lincoln

- Discovered the signaling mechanism of proline protection against H₂O₂-induced cell death is through complete activation of Akt/PKB (Protein Kinase B) by mammalian Target of Rapamycin Complex 2 (mTORC2). Complete activation of Akt phosphorylates FoxO3a, which results in the inactivation of FoxO3a and cell survival
- Reported that oxidative stress was evident in Methionine Sulfoxide Reductase 1 (Msr B1) and 15-kDa Selenoprotein (Sep 15) knockout mice

Graduate student

2001-2008

Wellcome Trust Research Laboratory, Department of Gastrointestinal Sciences, Christian Medical College, Vellore, India

- Investigated the effect of liver cirrhosis and biochemical alterations on liver, intestine and kidney using experimental models
- Established the role of oxidative stress in distant organ damage developed during liver cirrhosis

TEACHING EXPERIENCE

Course Instructor for NHS Seminar Series for graduate student in the Department of Nutrition & Health Sciences (NUTR990), UNL, taught in fall semesters of 2019 and 2020, 1 credit

Course Instructor for senior undergraduate students on Advanced Nutrition and Human Metabolism, NUTR455, 3 credits, spring semesters from 2017-2020 in the Department of Nutrition and Health Sciences, UNL. NUTR455 is a capstone course for Nutrition and Health Sciences and Food Science and Technology Department undergraduate students.

Course Instructor for graduate student Seminar for the Interdepartmental Nutrition Program (NUTR921), UNL, taught in fall 2016, 1 credit.

Guest Journal Club Coordinator for graduate students, Department of Biochemistry and Molecular Biology (BIOC970), UNMC, taught in fall 2014.

Course Lecturer for pharmacy graduate students on the following topics: Biochemical basis of human nutrition, biochemical nutrition, and metabolic regulations (BIOC514); January 2013-2015, University of Nebraska Medical Center.

Guest Lectured in the graduate level enzymology course on the following topics: xanthine oxidase, nitric oxide synthase and apoptosis-inducing factor; fall semester of 2010; 2011, in the Department of Biochemistry, University of Nebraska-Lincoln.

Guest Lectured in undergraduate biochemistry lab course (BIOC433) on the following topics: Plasmid isolation, polymerase chain reaction, genetic engineering, and gene cloning; January 2009-2012, in the Department of Biochemistry, University of Nebraska-Lincoln

INVITED TALKS (*reverse chronological order*)

Mechanism of Insulin Resistance, Glucose Transporters and Type 2 Diabetes, Virtual Presentation to **Life Science Discussion Forum of Botany4U**, an online platform for the students of life sciences. <https://botany4u.com/>. Presentations available here: <https://youtu.be/BmLVISyLwLU>

Palmitoleate protects against Zika virus-induced endoplasmic reticulum stress and apoptosis in placental trophoblasts, **Complex Biosystems Seminar Series, University of Nebraska-Lincoln**, Sept. 2020

Saturated Free Fatty Acid induce trophoblast lipoapoptosis, Department of Pediatrics, University of Colorado, Anschutz Medical Campus, October 2019

Palmitoleate protects against 3-hydroxy fatty acid-induced retinal pigment epithelial lipoapoptosis, **University of Missouri-Columbia, MO**, 2019

Mechanism of 3-hydroxy fatty acid-induced hepatocyte lipoapoptosis, **University of Missouri-Columbia, MO**, 2018

Cholangiocyte Lipoapoptosis in Non-alcoholic Fatty Liver Disease (NAFLD). **Redox Biology Center**, University of Nebraska-Lincoln, 2017

Mechanism of 3-hydroxy fatty acid-induced placental trophoblast and hepatocyte lipoapoptosis. **Department of Animal Science**, University of Nebraska-Lincoln, 2017

Preparations to become an assistant professor, **Postdoctoral Advisory Council workshop**, University of Nebraska-Lincoln, 2018

Role of Cholangiocyte Injury in Non-Alcoholic Fatty Liver Disease. Department of Biology, **University of Nebraska-Omaha**, 2014.

Tips for Succeeding in Academia: Preparations to become an assistant professor at the **Midwest Graduate Career Fair**, Nebraska Innovation Campus, Lincoln, NE, 2016

Cholangiocyte Lipoapoptosis in Non-alcoholic Fatty Liver Disease at the Sigma **XI** Scientific Club meeting, **University of Nebraska Medical Center**, Omaha, NE, 2016

CONFERENCE PRESENTATION (*reverse chronological order*)

Oral Presentation by Sathish Kumar Natarajan on “Omega-3 fatty acid-derived Resolvin D2 regulates placental trophoblast activities” in USDA-Multi state group (W-4122): Beneficial and Adverse Effects of natural chemical on human health and food safety annual meeting held on October 8-9, 2020

Oral Presentation by Philma Glora Muthuraj, Graduate student in Natarajan lab, **presented on** Zika virus infection induces placental trophoblast apoptosis, Gilbert Greenwald Symposium on Reproduction held at Kansas City, KS, 2018

Oral Presentation by Muthukrishnan E, Postdoc in Natarajan lab, **presented on** 3-hydroxy fatty acid-induced hepatocyte lipoapoptosis in Annual Redox Biology Symposium, held at Mahoney State Park, 2017

Oral presentation, Palmitoleate Protection Against Palmitate-induced Cholangiocyte Lipoapoptosis is Sensitive to Pertussis Toxin. **Experimental Biology**, San Diego, CA, 2016

Oral presentation, FoxO3 Increase miR-34a to Cause Palmitate-induced Cholangiocyte Lipoapoptosis. **American Association for the Study of Liver Disease (AASLD); Liver Meeting**, San Francisco, CA, 2015

Oral presentation, Palmitoleate prevents palmitate-induced cholangiocyte lipoapoptosis. **Digestive Disease Week (DDW)**, Orlando, FL, 2013

ACADEMIC AWARDS

Shakuntala Amir Chand Prize. This prize was awarded for my significant research contribution as a young scientist in biomedical sciences by Indian Council of Medical Research, Government of India, 2004 for the work on “Pathophysiological changes in Cirrhosis of Liver”

Young Scientist Travel Award to attend the young scientist program of 20th IUBMB, International Congress of Biochemistry and Molecular Biology and 11th FAOBMB congress, held at Kyoto, Japan, 2006

Senior Research Fellowship Award from the Indian Council of Medical Research, Government of India for pursuing the PhD program, 2005-2007

Best poster award on the poster entitled “Oxidative stress in Microvesicular Steatosis: Role of Mitochondria and Peroxisomes” at the fourth International Conference of Society of Free Radical Research, held at Bangalore, India 2005

Best poster award on the poster entitled “Liver injury in acute fatty liver of pregnancy: possible link to placental mitochondrial dysfunction and oxidative stress” at the 44th Annual Conference of The Indian Society of Gastroenterology held at Chennai, India 2003

Best poster award on the poster entitled “Pipercolate protects mammalian cells against H₂O₂-induced cell death” at the Redox Biology Center Annual Retreat held at Nebraska City, NE, USA, 2012

Best poster award on the poster entitled “Palmitoleate prevents palmitate-induced cholangiocyte lipoapoptosis” at the fifth NGN Annual Sprint Retreat held at Lincoln, NE, USA, 2013

Travel Award to attend American Association for the Study of Liver Disease (AASLD) and Industry Colloquium: Novel Targets and Therapies in Liver Disease, Durham, NC, 2015

The ASBMB 2016 Thematic Best Poster Award on the poster entitled “Palmitoleate protection against palmitate-induced cholangiocyte lipoapoptosis is sensitive to pertussis toxin” at the ASBMB Annual Meeting, Experimental Biology, San Diego, CA, USA, 2016

SERVICE

- 2016** Provided lab support to my colleague in the Department of Agriculture Leadership Education and Communication with his preparation and to host Future Farmers Association’s high school students and teacher visit to University of Nebraska-Lincoln, NE 2016
- 2017** American Society of Nutrition’s annual meeting Abstract reviewer and poster judge
- 2018** **USDA-NIFA** study section panelist for the Food Safety, Nutrition and Health, **Function and Efficacy of Nutrients program area** in Agriculture and Food Research Initiative Competitive grants program held in November 2018
- 2018-** Serving on Membership committee for the Society for the Study of Reproduction
- 2020** Abstract reviewer for the Annual meeting of the **Society for the Study of Reproduction**. Reviewed 96 abstract submitted in broad filed of ‘Placental physiology and trophoblast function’
- 2020** Ad hoc reviewer for hepatobiliary pathophysiology (**HBPP**) study section, National Institute of Digestive, Diabetes and Kidney Disease (**NIDDK**) in June 2020
- 2020** Judge for flash talk presentation in 2020 Virtual Greenwald Symposium held on October 8-9, 2020.

Ad hoc Reviewer to the following journals (n=42)

- Advances in Nutrition
- American Journal of Case Reports
- Antioxidant & Redox Signaling
- Antioxidants
- BioMed Research International
- Biomolecules
- Biomedicines
- British Journal of Nutrition
- BMC Cancer
- BMC Pregnancy and Childbirth
- Cancers
- Cancer Management and Research
- Cells
- Cell Health and Cytoskeleton
- Current Developments in Nutrition
- Current Molecular Pharmacology
- Diabetesity

- Diagnostics
- Digestive Diseases Sciences
- Discovery Phytomedicine
- Drug Design, Development and Therapy
- Drug-Healthcare and Patient Safety
- European Journal of Pharmacology
- Hepatic Medicine: Evidence and Research
- Inflammation and Colorectal Cancer
- International Journal of Biological Science
- International Journal of Pharmacology
- International Journal of Molecular Sciences
- Journal of Agricultural and Food Chemistry
- Journal of Hepatocellular Carcinoma
- Journal of Hepatology
- Journal of Cancer
- Journal of Cellular Biochemistry
- Journal of Cellular Physiology
- Journal of Clinical Medicine
- Journal of Inflammation Research
- Journal of Neuroscience Research
- Journal of Nutrition
- Journal of Nutrition Science
- Lipids in Health and Disease
- Mediators of Inflammation
- Molecules
- Molecular Cancer
- Molecular Biology Reports
- Molecular Therapy
- Nanomedicine: Nanotechnology, Biology, and Medicine
- Neuroscience
- Nutrients
- PLOS One, and
- Scientific Reports.

Editorial Boards

Consulting Editor to *Journal of Hepatic Medicine: Evidence and Research* 2015 - 2018

Editor-in-charge to *Journal Diabesity* 2017– present

Guest Editor for a special issue “Novel Therapeutic Nutrient Molecules”
in *Biomedicine* 2020

Post-doctoral Advisory Council

Treasurer for the Post-doctoral Advisory Council, University of Nebraska-Lincoln from July 2009 to Dec 2010

Vice-chair for the Post-doctoral Advisory Council, University of Nebraska-Lincoln from Jan 2011 to March 2011

Chair for the Post-doctoral Advisory Council, University of Nebraska-Lincoln from April 2011 to Dec 2011

Service to the Department

Volunteer, Take a Parent to Lunch	2016 - present
Poster Judge to NPOD's Spring retreat and Fall symposium	2016 - 2020
Graduate Committee Member for Nutrition and Health Sciences	2018 - present
Graduate Committee Member for Interdepartmental Nutrition Program	2018 -present
Faculty Convocations Committee Funding to bring Dr. Greg Gores, Mayo clinic to NHS seminar series	2019

Search Advisory Committee

- Search committee member for Biomedical Obesity Research Core director, 2018
- Search committee member for Clinical Coordinator, Food for health center, 2018
- Search committee member for Molecular Genetics faculty position, 2019

PUBLICATIONS (reverse chronological order):

n=39 including Hepatology, Free Radical Biology Medicine, Journal of Lipid Research, Journal of Biological Chemistry, and Journal of Virology; n=19 first author; and n=3 corresponding author. Impact Factor (IF). Natarajan lab members were underlined.

1. Muthuraj, P.G., **Natarajan, SK**. Fetal Programming in Maternal Obesity. *Diabetes* **2020**; 6(3): 36-39. DOI:10.15562/diabetes.2020.71 **Review**
2. Thoene M, Van Ormer M, Lyden E, Thompson M, Yuil-Valdes A, **Natarajan SK**, Mukherjee M, Nordgren TM, Furtado, Anderson-Berry A, Hanson C, Snowden J. Inflammatory Compounds and Fat-Soluble Nutrients in Mother-Infant Dyads at Time of Delivery. *Pediatr Res* (2020). *In Press*. **(IF: 2.88)**
3. Liu B, Lu Y, Chen X, Muthuraj PG, Li X, Pattabiraman M, Zempleni J, Kachman SD, **Natarajan SK**, Yu J. Protective Role of Shiitake Mushroom-Derived Exosome-Like Nanoparticles in D-Galactosamine and Lipopolysaccharide-Induced Acute Liver Injury in Mice. *Nutrients*. **2020** Feb 13;12(2):477. doi: 10.3390/nu12020477. PMID: 32069862. **(IF: 4.17)**
4. Thoene M, VanOrmer M, Yuil-Valdes AG, Bruett T, **Natarajan SK**, Mukherjee M, Thompson M, Nordgren TM, Lippevelde WV, Overby, NC, Adu-Bonsaffoh K, Anderson-Berry A, Hanson C. Fat-Soluble Nutrients and Omega-3 Fatty Acids as Modifiable Factors Influencing Preterm Birth Risk. *Placenta*. 2020 Sep 1;98:38-42. doi: 10.1016/j.placenta.2019.12.002. PMID: 33039030. **(IF: 2.63)**
5. Ulu A[#], Sahoo PK[#], Yuil-Valdes AG, Mukherjee M, VanOrmer M, Muthuraj PG, Thompson M, Anderson-Berry A, Hanson CK, **Natarajan SK***, Nordgren TM*. Omega-3 fatty acid-derived resolving D2 regulates human placental vascular smooth muscle and extravillous trophoblast activities. *Int. J. Mol. Sci.* 2019 Sep 7;20(18):4402. doi: 10.3390/ijms20184402. PMID: 31500240. ***Co-corresponding author. #Equal contributions. (IF: 4.13)**

6. Annamalai A, Pattnaik A, Sahoo B, Guinn, Z, Bullard B, Weaver E, Steffen D, **Natarajan SK**, Petro T, Pattnaik A. An Attenuated Zika Virus Encoding Non-Glycosylated Envelope (E) and Non-Structural Protein 1 (NS1) Confers Complete Protection against Lethal Challenge in a Mouse Model Vaccines (Basel). **2019** Sep 12;7(3):112. doi: 10.3390/vaccines7030112. PMID: 31547297. **(IF: 4.76)**
7. Kim Y, **Natarajan SK**, Chung S. Gamma-tocotrienol attenuates the hepatic inflammation and fibrosis by suppressing endoplasmic reticulum stress in mice. *Mol. Nutr. Food Res.* **2018** Nov; 62(21):e1800519. Doi: 10.1002/mnfr.201800519. PMID: 30183139. **(IF: 4.6)**
8. **Natarajan SK**, Ibdah JA, Role of 3-hydroxy fatty acid-induced hepatic lipotoxicity in acute fatty liver of pregnancy. *Int. J. Mol.Sci.* **2018**, 19, 322. PMID: 29361796. **(IF: 4.13). Invited Review**
9. Wehrkamp CJ, **Natarajan SK**, Mohr AM, Phillippi MA, Mott JL. miR-106b-responsive gene landscape identifies regulation of Kruppel-like factor family. *RNA Biology* **2018** Mar 4; 15(3): 391-403. PMID: 29286255. **(IF: 5.216)**
10. Annamalai A, Pattnaik A, Sahoo B, Muthukrishnan E, **Natarajan SK**, Steffen D, Vu H, Delhon G, Osorio F, Petro T, Xiang S, Pattnaik A. Zika Virus Encoding Non-Glycosylated Envelope Protein is Attenuated and Defective in Neuroinvasion. *J. Virol.* **2017**. Sep 20 pii: JVI.01348-17. doi: 10.1128/JVI.01348-17. PMID: 28931684. **(IF: 4.323)**
11. **Natarajan SK**, Muthukrishnan E, Khalimonchuk O, Mott JL, Becker DF. Evidence for Pipecolate Oxidase in mediating protection against hydrogen peroxide stress. *J. Cellular Biochem.* **2017** Jul; 118(7):1678-1688. PMID: 27922192. **(IF: 3.44)**
12. **Natarajan SK***, Stringham BA, Mohr AM, Wehrkamp CJ, Lu S, Phillippi MA, Harrison-Findik D, Mott JL. FoxO3 increases miR-34a to cause palmitate-induced cholangiocyte lipoapoptosis. *J. Lipid Res.* **2017** May; 58(5):866-875. PMID: 28250026. ***Corresponding author. (IF: 4.74)**
13. Kim J, Okla M, Erickson A, Carr T, **Natarajan SK**, Chung S. EPA potentiates brown thermogenesis through FFAR-4 dependent upregulation of miR-30b and miR-378. *J. Biol. Chem.* **2016** Sep 23; 291(39):20551-62. PMID: 27489163. **(IF: 4.1)**
14. **Natarajan SK**, Rasineni K, Ganesan M, Feng D, McVicker BL, McNiven MA, Osna NA, Mott JL, Casey CA, Kharbanda KK. Structure, function and metabolism of hepatic and adipose tissue lipid droplets: implications in alcoholic liver disease *Curr. Mol. Pharmacol.* **2017**; 10 (3):237-248. PMID: 26278390. **(IF: 2.48), Invited Review**
15. Amirtharaj GJ, **Natarajan SK**, Pulimood A, Balasubramanian KA, Venkatraman A, Ramachandran A. Role of oxygen free radicals, nitric oxide and mitochondria in mediating cardiac alterations during liver cirrhosis-induced by thioacetamide. *Cardiovasc. Toxicol.* **2017** Apr; 17(2):175-184. PMID: 27131982. **(IF: 2.63)**
16. Ganesan M, **Natarajan SK**, Zhang J, Mott JL, Poluektova LI, McVicker BL, Kharbanda KK, Tuma DJ, Osna NA. Role of apoptotic hepatocytes in HCV dissemination: Regulation by acetaldehyde. *Am J Physiol Gastrointest Liver Physiol.* **2016** June; 310(11):G930-40. PMID: 27056722. **(IF: 3.29)**
17. Rasineni K, Penrice DD, **Natarajan SK**, McNiven MA, McVicker BL, Kharbanda KK, Casey CA, Harris EN. Alcoholic vs non-alcoholic fatty liver in rats: distinct differences in endocytosis and vesicle trafficking despite similar pathology. *BMC Gastroenterology* **2016** Feb 16:27. PMID: 26924554 **(IF: 2.25)**

18. Lu S, **Natarajan SK**, Mott JL, Kharbanda KK, Harrison-Findik DD. Ceramide induces human hepcidin gene transcription through JAK/STAT3 pathway. *PLoS One*. **2016**; 11(1): e0147474. Doi:10.1371/journal.pone.017444. PMID: 26807955. **(IF: 2.77)**
19. **Natarajan SK***, Pachunka JM, Mott JL. Role of microRNAs in Alcohol-Induced Multi Organ Injury. *Biomolecules*. 2015; 5(4):3309-38. PMID: 26610589. ***Corresponding author. (IF: 4.69), Review article.**
20. **Natarajan SK**, Ingham SA, Mohr AM, Wehrkamp CJ, Ray A, Roy S, Phillippi MA, Mott JL. Saturated free fatty acids induce cholangiocyte lipoapoptosis. *Hepatology* **2014**; 60(6): 1942-56. PMID: 24753158. **(Highlighted in by the journal in an editorial commentary by Martinez AK, Glaser SK, 2014). (IF: 14.08)**
21. Wehrkamp CJ, Gutwein AR, **Natarajan SK**, Phillippi MA, Mott JL. XIAP antagonist embelin inhibited proliferation of cholangiocarcinoma cells. *PLoS One* **2014**; 9 (3):e90238. PMID: 24603802. **(IF: 2.77)**
22. **Natarajan SK**, Smith MA, Wehrkamp CJ, Mohr AM, Mott JL. MicroRNA function in human diseases. *Med. Epigenet.* **2013**; 1:106-115, **Invited Review.**
23. Liang X, Zhang L, **Natarajan SK**, Becker DF. Proline mechanisms of stress survival. *Antioxid. Redox Signal.* **2013**; 19(9): 998-1011. PMID: 23581681. **(IF: 5.83)**
24. **Natarajan SK**, Zhu W, Liang X, Zhang L, Demers AJ, Zimmerman MC, Simpson MA, Becker DF. Proline dehydrogenase is essential for proline protection against hydrogen peroxide-induced cell death. *Free Radic. Biol. Med.* **2012**; 53(5):1181-91. PMID: 22796327. **(IF: 5.74)**
25. **Natarajan SK**, Becker DF. Role of apoptosis-inducing factor, proline dehydrogenase, and NADPH oxidase in apoptosis and oxidative stress. *Cell Health Cytoskelet.* **2012**; 1; 2012(4): 11-27. PMID: 22593641. **Review article.**
26. Kasaikina MV, Fomenko DE, Labunskyy VM, Lachke SA, Qiu W, Moncaster JA, Zhang J, Wojnarowicz MW Jr, **Natarajan SK**, Malinouski M, Schweizer U, Tsuji PA, Carlson BA, Maas RL, Lou MF, Goldstein LE, Hatfield DL, Gladyshev VN. Roles of the 15-kDa selenoprotein (Sep15) in redox homeostasis and cataract development revealed by the analysis of Sep 15 knockout mice. *J Biol Chem.* **2011**; 286(38):33203-12. PMID: 21768092. **(IF: 4.1)**
27. **Natarajan SK**, Thangaraj KR, Goel A, Eapen CE, Balasubramanian KA, Ramachandran A. Acute fatty liver of pregnancy: an update on mechanisms. *Obstetric Medicine*, **2011**; 4:99-103. PMID: 27579101. **(IF: 0.347), Invited Review**
28. **Natarajan SK**, Thangaraj KR, Eapen CE, Ramachandran A, Mukhopadhyaya A, Mathai M, Seshadri L, Peedikayil A, Ramakrishna B, Balasubramanian KA. Liver injury in acute fatty liver of pregnancy: possible link to placental mitochondrial dysfunction and oxidative stress. *Hepatology.* **2010**; 51(1):191-200. PMID: 20034024. **(IF: 14.679)**
29. Sowmyanarayanan TV, **Natarajan SK**, Ramachandran A, Sarkar R, Moses PD, Simon A, Agarwal I, Christopher S, Kang G. Nitric oxide production in acute gastroenteritis in Indian children. *Trans R Soc. Trop. Med. Hyg.* **2009**; 103(8):849-51. PMID: 19552932. **(IF: 2.3)**
30. **Natarajan SK**, Amirtharaj GJ, Ramachandran A, Pulimood AB, Balasubramanian KA. Retinoid metabolism in the small intestine during development of liver cirrhosis. *J Gastroenterol. Hepatol.* **2009**; 24(5):821-9. PMID: 19226378. **(IF: 3.63)**

31. Fomenko DE, Novoselov SV, **Natarajan SK**, Lee BC, Koc A, Carlson BA, Lee TH, Kim HY, Hatfield DL, Gladyshev VN. MsrB1 (methionine-R-sulfoxide reductase 1) knockout mice: roles of MsrB1 in redox regulation and identification of a novel selenoprotein form. *J Biol Chem.* **2009**; 284(9):5986-93. PMID: 18990697. **(IF: 4.1)**
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Book Chapter

1. Mohr A, Sahoo PK, Muthuraj PG, Spriet MR, Mott JL, **Natarajan SK***. Epigenetics, Noncoding RNAs, and Gene Expression. **Comprehensive Foodomics, 2020** Chapter 00021. Elsevier Publications. ***Corresponding author.** Editor/Contributor: Alejandro Cifuentes, Epigenetics & Noncoding RNA Section Editor: Juan Cui

ADVISOR FOR GRADUATE STUDENTS/ CONSULTANT

Philma Glora Muthuraj, doctoral student, *Role: Primary Advisor* 2017- present
Philma is elucidating the protective role of palmitoleate against Zika Virus-induced placenta, and fetal brain damage using *in vitro* and *in vivo* approaches.

Prakash Kumar Sahoo, doctoral student, *Role: Primary Advisor* 2017- present
Prakash is determining the mechanism of 3-hydroxy fatty acid-induced placental trophoblast necroptosis and published a first authored manuscript in International Journal Medical Sciences.

Kyung Ho Park, *Role: Primary Advisor* 2019-Aug 20
Graduated with master's degree in August 2020.
Kyung Ho conducted research on the metabolic benefits of plant-based n-3 polyunsaturated fatty acids on brown thermogenesis in collaboration with Dr. Soonkyu Chung.

Mona Hadidi, *Role: Primary Advisor* 2018-Aug 19
Graduated with Master's degree in August 2019.
Mona conducted research on the lipotoxic role of 3-hydroxy fatty acids in retinal pigment epithelial cells. Mona is currently preparing two manuscript from her study for publications.

Kathryn J. Gray MD, PhD, *Role: Consultant* 2018-present
Kathryn J. Gray in Brigham & Women's Hospital was awarded K08 from National Institute of Health in her resubmission with my consultant support. Dr. Gray works on metabolic profile in early onset preclamptic patient's cohort at the Brigham & Women's Hospital at the Harvard Medical School. Katie has discovered long chain fatty acids, long chain acyl carnitine and ketone bodies in the maternal systemic circulation in patients with early onset preeclampsia and that match our interest of studying long chain fatty acid lipotoxicity in maternal obesity.

MENTOR FOR POSTDOCTORAL FELLOWS

Ezhumalai Muthukrishnan Ph.D 2016- Mar 19
Ezhumalai helped to determine the mechanism of 3-hydroxy fatty acid-induced hepatocyte lipoapoptosis.

MENTOR FOR UNDERGRADUATE STUDENTS

Jenna Whitmore
Undergraduate student from NE Wesleyan University, studying the protective role of n-3 fatty acids against particulate matter-induced inflammation in placental trophoblasts

Jillian Power
Undergraduate student, working on pro-apoptotic function of Forkhead family of transcription factor, FoxO3 in saturated free fatty acid-induced placental trophoblast damage during maternal obesity. Jillian has been awarded UCARE assistantship from UNL for 2019-20 academic year and ARD undergraduate research award

Madison Kraus
Undergraduate student, working on Zika virus-induced apoptosis in retinal pigment epithelial cells. Madison is awarded with Undergraduate Creative Education and Research Experience (UCARE) assistantship from UNL for 2018-19 and 2019-20 academic years and Milton Mohr Scholarship from UNL

Taylor Heng
Taylor is now enrolled in professional program in veterinary medicine and will graduate in 2021 in the UNL-Iowa State University

Sarah Dutt

Sarah is now senior in Nutrition Sci. & Dietetics program, volunteered in my lab to learn cell culture and aseptic techniques in fall 2017 and she is working with Ken Nickerson at the School of Biological Sciences, UNL

Taylor Bruett

Taylor was funded by the UCARE program on 3-hydroxy fatty acid-induced trophoblast lipoapoptosis UNL to work in the lab during summer of 2016. Taylor joined my lab in April 2019 as lab technician.

Yihang Zhao

Visiting Undergraduate student from the Northwest Agriculture and Forestry University Scholars, Yangling, China. Yihang worked on elucidating the protective role of Betaine protection against palmitate-induced trophoblast lipoapoptosis.

Supervisory Committee Member for the following students in UNL/UNMC:

Baolong Liu	Department of Nutrition & Health Sciences, UNL
Matthew Moran	Department of Biochemistry, UNL
Youra Moeun	Department of Chemical & Biomolecular Engineering, UNL
Kimberly Stanke	Department of Chemical & Biomolecular Engineering, UNL
Michael Moeller	Department of Chemical & Biomolecular Engineering, UNL
Timothy A. Hackett	Department of Biochemistry, UNL
Ekta Pandey	Department of Biochemistry, UNL
Fatima Cabral	Department of Biochemistry, UNL
Matthew VanOrmer	Medical Science Interdepartmental Area, UNMC
Maranda Thompson <i>(MD/PhD student)</i>	Medical Science Interdepartmental Area, UNMC
Snigdha Guha	Department of Food Science & Technology, UNL
Joslyn Beard <i>(graduated in 2020)</i>	Department of Animal Sciences, UNL
Martônio Ponte Viana <i>(graduated in 2020)</i>	Department of Biochemistry, UNL
Jennifer McAtee	Department of Nutrition & Health Sciences, UNL (graduated in 2019)
Caitlin Cadaret <i>(graduated in 2019)</i>	Department of Animal Sciences, UNL
YongEun Kim	Department of Nutrition & Health Sciences, UNL (graduated in 2018)
Rong Fan <i>(graduated in 2018)</i>	Department of Nutrition & Health Sciences, UNL