

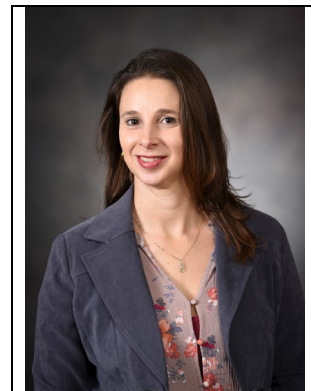
# *CURRICULUM VITAE ~ Marlene Elena Starr, PhD*

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# ***CURRICULUM VITAE***

**Marlene Elena Starr, PhD**  
**Associate Professor**  
**Department of Surgery - Division of General Surgery**  
**Department of Pharmacology and Nutritional Sciences**  
**College of Medicine**  
**University of Kentucky**



## **I. GENERAL INFORMATION**

**Office Address**      Healthy Kentucky Research Building  
760 Press Ave, Room 238  
Lexington, KY 40536

**Email**                      [marlene.starr@uky.edu](mailto:marlene.starr@uky.edu)

**Office**                        859-323-0471

**Cell**                         409-939-8027

## **II. EDUCATION**

08/1998-05/2003      **Texas A&M University**  
Galveston, Texas  
BS, Marine Biology

08/2007-05/2011      **University of Texas Medical Branch**  
Galveston, Texas  
PhD, Biochemistry and Molecular Biology  
Thesis title: The role of adipokines in age-related sensitivity to systemic inflammation – Mentor: Hiroshi Saito, PhD

05/2011-07/2014      **University of Kentucky**  
Lexington, Kentucky  
Postdoctoral Fellow, Aging and Critical Care Research Laboratory

### **III. PROFESSIONAL EXPERIENCES**

- 08/2000-08/2002      **University of Texas Medical Branch**  
Galveston, Texas  
Research Assistant, National Resource Center for Cephalopods, part-time
- 08/2002-05/2003      **National Marine Fisheries Service, National Oceanic and Atmospheric Administration (NOAA)**  
Galveston, Texas  
Biological Science Technician, Benthic Ecology Laboratory, part-time
- 05/2003-05/2004      **National Marine Fisheries Service, National Oceanic and Atmospheric Administration (NOAA)**  
Galveston, Texas  
Biological Science Technician, Platform Removal Program, full-time
- 05/2004-05/2005      **Moody Gardens Aquarium**  
Galveston, Texas  
Water Quality Specialist, Engineering Department, full-time
- 05/2005-08/2007      **University of Texas Medical Branch**  
Galveston, Texas  
Research Associate, Department of Surgery, full-time
- 08/2007-05/2011      **University of Texas Medical Branch**  
Galveston, Texas  
Doctoral Student, Biochemistry and Molecular Biology
- 05/2011-07/2014      **University of Kentucky**  
Lexington, Kentucky  
Post-doctoral Scholar, Department of Surgery

### **IV. ACADEMIC APPOINTMENTS**

**University of Kentucky**  
Lexington, Kentucky

- 07/2014 – 06/2020      Assistant Professor, Department of Surgery, Regular Title Series (tenure-track)
- 05/2018 – 06/2020      Assistant Professor, Department of Pharmacology and Nutritional Sciences, Joint Appointment
- 07/2020 – Present      Associate Professor with tenure, Department of Surgery
- 07/2020 – Present      Associate Professor with tenure, Department of Pharmacology and Nutritional Sciences, Joint Appointment
- 07/2020 - Present      Chief, Division of Research, Department of Surgery

## **V. HOSPITAL or CLINICAL APPOINTMENTS - N/A**

## **VI. CONSULTING ACTIVITIES - N/A**

## **VII. TEACHING ACTIVITIES**

### **Courses**

2019-2020	IBS608: Nutritional Modulation of Chronic Disease Lecture Title: Obesity and Diabetes
2019-2020	PHA 425G: Neuropharmacology: Treating Disorders of the Brain Lecture Title: Long-term Neurological Complications of Acute Critical Illness

### **Hands-on laboratory instruction**

#### **High School Students**

2011	Mizuki Saito	pursued BS in Biology at Wake Forest
2013	Michiko Minowa	pursued BS degree, Keio University, Japan
2014	Robert Wendroth	pursued BS in Biology, pre-med at UK

#### **Undergraduate Students**

2012	Mizuki Saito	went on to dental school, U of Louisville, current dental resident Miami Valley Hospital, Dayton, OH
2013	Heepke Wendroth	went on to medical school, current resident physician, Cincinnati Children's
2014	Beverly Balasuriya	received MS in Medical Science at UK, pursuing dental school currently
2015	Robert Wendroth	current medical student, UK
2019	Jonathan Ang	current BS student, Vanderbilt

#### **UK Medical Students - Summer Research Program**

2015	Nisha Nataraj	current Internal Medicine Resident, Stony Brook
2016	Dwight Harris	current 3 <sup>rd</sup> year med student, inducted to AOA National Honor Society
2016	Whitney Powell	current MS student, UK

2016	Damon Wallace	current 3 <sup>rd</sup> year med student, inducted to AOA National Honor Society, received a Medical Student Anesthesia Research Fellowship from the Foundation for Anesthesia Education and Research (FAER) to perform a summer research project at the University of Colorado, Denver Anschutz Medical Campus in 2017.
2017	David Turner	current 3 <sup>rd</sup> year med student
2017-2019	Franklyn Wallace	current 2 <sup>nd</sup> year med student, received a Clinical and Translational Science Professional Student Mentored Research Fellowship (PSMRF) to continue research in the Starr Lab through 2019.

#### UK Graduate Students

2015-2016	Grishma Trivedi	Medical Science Master's Program, current Medical Resident, University of Buffalo
2012-2017	Allison Steele	Physiology PhD Program, received F31 fellowship from NIH, current postdoc at Vanderbilt University
2019	Thomas Ujas	IBS Rotation Student
2019	Erick Lewis	Nutritional Science Master's Program, received Dean's Scholarship
2020	Sujata Mukherjee	Current PhD student

#### UK Post-doctoral Fellows

2018-2019	Allison Steele, PhD	current postdoc at Vanderbilt
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## **VIII. ADVISING ACTIVITIES**

### **Thesis & Dissertation**

**University of Kentucky**  
Lexington, Kentucky

2015-2017	Allison Steele, PhD Candidate, College of Medicine, Department of Physiology, graduated Dec 2017 [committee member]
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2015-2016	Grishma Trivedi, Masters Candidate, Medical Sciences, graduated May 2016 [committee member]
2019	Jazmyne Barney, PhD Candidate, College of Medicine, Department of Toxicology and Cancer Biology, graduated July 2019 [outside examiner]
2020 - Present	Sujata Mukherjee, PhD Candidate, College of Medicine, Department of Pharmacology and Nutritional Sciences [committee chair]

**UK-CCTS Professional Student Mentored Research Fellowship (PSMRF)**

2018-2020	Franklyn Wallace, medical student, PSMRF in Starr Lab (18 months)
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**Master’s Program Special Problems Advisor**

2019-2020	Erick Lewis, Master’s student, Research Assistant
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**IX. ADMINISTRATIVE ACTIVITIES & UNIVERSITY SERVICE**

**University of Kentucky**

2011-2017	Emergency Response Facilitator
2018-2019	CCTS Poster Judge
2019-2020	IBS Candidate Interviewer

**X. SPECIAL ASSIGNMENTS**

**XI. HONORS & AWARDS**

2007	Best Student Poster Award, Sealy Center on Aging 11 <sup>th</sup> Annual Forum on Aging, University of Texas Medical Branch (UTMB)  George Sacher Student Award, 60 <sup>th</sup> Annual Scientific Meeting, Gerontological Society of America (awarded to a single person)
2008	James E Beall II Memorial Scholarship  Best Student Poster Award, Sealy Center on Aging 12 <sup>th</sup> Annual Forum on Aging, University of Texas Medical Branch

- 2009 Best Poster Presentation in Immunology, National Student Research Forum (awarded to a single person)
- American Medical Association Foundation Award for Overall Excellence in Basic Research, National Student Research Forum (awarded to a single person)
- Stephen C Silverthorne Memorial Scholarship Award, UTMB
- Rose and Harry Walk Research Scholarship Award, UTMB
- George Sacher Student Award, 62nd Annual Scientific Meeting, Gerontological Society of America (awarded to a single person)
- 2010 American Foundation for Aging Research Graduate Fellowship
- 2010 Best Oral Presentation in Pathology – National Student Research Forum Travel Award, 33rd Annual Conference on Shock, The Shock Society
- Travel Award, 39th Annual Meeting of the American Aging Association
- Walter R. Nicolai Award for Meritorious Research by a Predoctoral Candidate in Biomedical Gerontology, American Aging Association
- Best Presentation at the “Student Data Blitz Competition,” American Aging Association (awarded to a single person)
- UTMB Sealy Center on Aging Scholarship Award
- James E Beall II Memorial Scholarship Award, UTMB
- 2011 Shock Society Diversity Enhancement Award
- Travel Award, 14<sup>th</sup> Congress of the International Association of Biomedical Gerontology
- Travel Award, 64<sup>th</sup> Annual Meeting of the Gerontological Society of America
- 2012 Barnstable Brown Obesity and Diabetes Research Day Outstanding Postdoctoral Research Presentation Award
- 2013 Travel Award, 36<sup>th</sup> Annual Conference on Shock, The Shock Society
- Emerging Scholar and Professional Organization Poster Award, 66<sup>th</sup> Annual Meeting of the Gerontological Society of America (awarded to a single person)
- 2014 Travel Award, 37<sup>th</sup> Annual Conference on Shock, The Shock Society
- 2015 Wethington Award for Research Excellency, University of Kentucky
- 2016 Wethington Award for Research Excellency, University of Kentucky
- Invited Speaker, 39<sup>th</sup> Annual Conference on Shock, The Shock Society

2017	Wethington Award for Research Excellency, University of Kentucky
2018	Jr Faculty Travel Award, 47 <sup>th</sup> Annual Meeting of the American Aging Association
	Wethington Award for Research Excellency, University of Kentucky
2019	Wethington Award for Research Excellency, University of Kentucky
2020	Wethington Award for Research Excellency, University of Kentucky

## **XII. PROFESSIONAL ACTIVITIES, PUBLIC SERVICE & PROFESSIONAL DEVELOPMENT**

### **Memberships**

2007-Present	The Gerontological Society of America (GSA)
2007-2015	Emerging Scholar and Professional Organization, GSA
2011-Present	The Shock Society
2011-Present	American Aging Association

### **Positions Held**

#### **Local**

	<b>University of Texas Medical Branch, Graduate School</b>
2007-2008	Member, Basic Biomedical Science Curriculum Representative to the Graduate Student Organization
2008	Member, Biochemistry and Molecular Biology Program Orientation Committee
2008-2009	Vice President, Graduate Student Organization

#### **National/International**

	<b>Gerontological Society of America</b>
2011-2103	Emerging Scholar and Professional Organization (ESPO) Representative to the Biological Sciences Executive Committee
2013	Chair, ESPO Biological Sciences Symposia Coordinator
2014-2015	Chair, ESPO Awards Committee
	<b>American Aging Association</b>
2019-2023	Board of Directors, Scientific Member
	<b>The Shock Society</b>
2019-2022	Laboratory Animals Committee



2020-2026                      **Surgery, Anesthesiology and Trauma Study Section, Center for  
Scientific Review, National Institutes of Health**  
Member

**Manuscript Peer-Reviewing**

2012-Present                      Journals of Gerontology: Biological Sciences  
2012-Present                      Critical Care Medicine  
2014                                      Microvascular Research  
2016                                      BBA Molecular Basis of Disease  
2016                                      Molecular Medicine  
2019                                      Aging Cell  
2019                                      PLOS One

**Grant Reviewing**

10/2017                              Pilot Project Reviewer, Center of Research in Obesity and Cardiovascular  
Disease – COBRE, University of Kentucky  
06/2018                              Early Career Reviewer, NIH Study Section, Surgery Anesthesiology and  
Trauma (SAT)  
10/2019                              Ad hoc reviewer, NIH Study Section, Surgery Anesthesiology and Trauma  
(SAT)  
10/2019                              American Heart Association Fellowship Reviewer  
06/2020                              Ad hoc reviewer, NIH Study Section, Surgery Anesthesiology and Trauma  
(SAT)  
07/2020 - Present                Member, NIH Study Section, Surgery Anesthesiology and Trauma (SAT)

**XIII. SPEAKING ENGAGEMENTS**

**Local**

**University of Kentucky**  
Lexington, Kentucky

09/2010                              Department of Surgery Research Colloquium: “The Role of Adipose  
Tissue in Age-associated Vulnerability to Sepsis”

10/2017                              Department of Pharmacology and Nutritional Sciences Seminar Series:  
“Aging and Adipose Tissue Inflammation: Journey from Acute to  
Chronic”

- 12/2018 Department of Surgery Research Colloquium: “The Role of Visceral Fat in Sepsis Severity : from bench to bedside and back again”
- 01/2019 Department of Microbiology, Immunology, and Molecular Genetics Seminar Series “Adipose Tissue Inflammation in Aging : Journey from Acute to Chronic”

**National/International**

**The Shock Society**

- 06/2016 Invited Speaker  
39<sup>th</sup> Annual Conference on Shock, San Antonio, Texas  
“Aging and Adipose Tissue in Critical Illness”

**National/International Podium Presentations**

- 04/2010 **Starr ME**, Takahashi H, Evers BM, Saito H. Vulnerability to sepsis in the aged is linked to reduced protein C pathway activation. National Student Research Forum Galveston, Texas. *This presentation received an award for Best Oral Presentation in Pathology.*
- 06/2013 **Starr ME**, Evers BM, and Saito H. Dietary restriction improves age-related intolerance to endotoxemia by reducing thrombosis. 36th Annual Conference on Shock, San Diego, CA. Shock 39 Suppl 2, Abstract 33. *This abstract received a travel award.*
- 06/2017 **Starr ME**, Steele AM, Wallace DK, Balasuriya BB, Okamura D, Saito H. Pathological role of visceral white adipose tissue in development of severe acute pancreatitis. 40th Annual Conference on Shock, Fort Lauderdale, FL. Shock 47 Suppl 1, Abstract 31.
- 06/2018 Powell WL, Steele AM, Balasuriya, BK, More SF, Cohen, DA, **Starr ME**. An Age-dependent expansion of gamma delta T cells in visceral adipose tissue promotes inflammation. 47th Annual Meeting of the American Aging Association, Philadelphia, PA. Abstract 64. *This abstract received a Jr Faculty Travel Award.*
- 06/2019 Balasuriya B , Zwischenberger BA, Harris DD, Nataraj N, Owen AM, Stromberg AJ, Chang PK, Neyra JA, Saito H, **Starr ME**. Increased expression of adipose-derived PAI-1 is associated with acute kidney injury in murine models and septic patients. 42nd Annual Conference on Shock, Coronado, CA. Shock 51 Suppl. 1: Abstract 65.

## **XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS**

### **A. PUBLICATIONS**

#### **Peer-Reviewed Original Research in Professional, Scientific or Educational Journals**

**<https://www.ncbi.nlm.nih.gov/pubmed/?term=marlene+e+starr>**

1. Zwischenberger BA, Balasuriya BK, Harris DD, Nataraj N, Owen AM, Bruno MEC, Mukherjee S, Ortiz-Soriano V, O'Connor W, Ke C, Stromberg AJ, Chang PK, Neyra JA, Saito H, **Starr ME**. Adipose-Derived Inflammatory and Coagulant Mediators in Patients with Sepsis. *Shock*. 2020, in press PMID: 32496420.
2. Owen AM, Patel SP, Smith JD, Balasuriya BK, Mori SF, Hawk GS, Stromberg AJ, Kuriyama N, Kaneki M, Rabchevsky AG, Butterfield TA, Esser KA, Peterson CA, **Starr ME**, and Saito H. Chronic muscle weakness and mitochondrial dysfunction in the absence of sustained atrophy in a preclinical sepsis model. *eLife*. 2019; 8: e49920. PMID: PMC6890461.
3. Al-Attar A, Presnell SR, Clasey JL, Long DE, Walton RG, Sexton M, **Starr ME**, Kern PA, Peterson CA, Lutz, CT. Human body composition and immunity: Visceral adipose tissue produces IL-15 and muscle strength inversely correlates with NK cell function in elderly humans. *Frontiers in Immunology*. 2018; 9: 440.
4. Steele AM, **Starr ME**, Saito H. Late therapeutic intervention with antibiotics and fluid resuscitation allows for a prolonged disease course with high survival in a severe murine model of sepsis. *Shock*. 2017; 47(6):726-734. PMID: 27879561.
5. Li J, Song J, Zaytseva YY, Liu Y, Rychahou P, Jiang K, **Starr ME**, Kim JT, Harris JW, Yiannikouris FB, Katz WS, Nilsson PM, Orho-Melander M, Chen J, Zhu H, Fahrenholz T, Higashi RM, Gao T, Morris AJ, Cassis LA, Fan TW, Weiss HL, Dobner PR, Melander O, Jia J, Evers BM. An obligatory role for neurotensin in high-fat diet-induced obesity. *Nature*. 2016; 533(7603):411-5. PMID: 27193687.
6. **Starr ME**, Steele AM, Cohen DA, Saito, H. Short-term dietary restriction rescues mice from lethal abdominal sepsis and endotoxemia, and reduces the inflammatory/coagulant potential of adipose tissue. *Critical Care Medicine* 2016; 44(7):e509-19. PMID: 26646465.
7. **Starr ME**, Saito M, Evers BM, Saito H. Age-associated increase in cytokine production during systemic inflammation-II: The role of IL-1 $\beta$  in age-dependent IL-6 upregulation in adipose tissue. *J Gerontol A Biol Sci Med Sci*. 2015; 70(12):1508-1515. PMID: 25344820.
8. **Starr ME**, Takahashi H, Okamura D, Zwischenberger BA, Mrazek AA, Ueda J, Stromberg AJ, Evers BM, Esmon CT, Saito H. Increased coagulation and suppressed generation of

- activated protein C in aged mice during intra-abdominal sepsis. *Am J Physiol Heart Circ Physiol*. 2015; 308(2):H83-91. PMID: PMC4338937.
9. **Starr ME**, Steele AM, Saito M, Hacker BJ, Evers BM, Saito H. A new cecal slurry preparation protocol with improved long-term reproducibility for animal models of sepsis. *PLoS One*. 2014; 9(12):e115705. PMID: PMC4274114.
  10. Shinozaki S, Chang K, Sakai M, Shimizu N, Yamada M, Tanaka T, Nakazawa H, Ichinose F, Yamada Y, Ishigami A, Ito H, Ouchi Y, **Starr ME**, Saito H, Shimokado K, Stamler JS, Kaneki M. Inflammatory stimuli induce inhibitory S-nitrosylation of the deacetylase SIRT1 to increase acetylation and activation of p53 and p65. *Science Signal*. 2014; 7(351):ra106. PMID:25389371.
  11. **Starr ME** and Saito H. Sepsis in old age: review of human and animal studies. *Aging and Disease* 2014; 5 (2): 126-136. PMID: 24729938.
  12. Mustain WC, **Starr ME**, Valentino JD, Cohen DA, Okamura D, Wang C, Evers BM, Saito H. Inflammatory cytokine gene expression in mesenteric adipose tissue during acute colitis. *PLoS ONE* 2013; 8 (12):e83693. PMID: 24386254.
  13. **Starr ME**, Hu Y, Stromberg AJ, Carmical JR, Wood TG, Evers BM, Saito H. Gene expression profile of mouse white adipose tissue during inflammatory stress: age-dependent upregulation of major procoagulant factors. *Aging Cell* 2013; 12(2):194-206. PMID: 23279636.
  14. Li J, Song J, Cassidy MG, Rychahou P, **Starr ME**, Liu J, Li X, Epperly G, Weiss HL, Townsend CM Jr, Gao T, Evers BM. PI3K p110 $\alpha$ /Akt signaling negatively regulates secretion of the intestinal peptide neurotensin through interference of granule transport. *Mol Endocrinol* 2012; 26(8):1380-93. PMID: 22700584.
  15. Okamura D, **Starr ME**, Lee EY, Stromberg AJ, Evers BM, Saito H. Age-dependent vulnerability to experimental acute pancreatitis is associated with increased systemic inflammation and thrombosis. *Aging Cell* 2012; 11(5):760-9. PMID: 22672542.
  16. **Starr ME**, Saito H. Age-related increase in food spilling by laboratory mice may lead to significant overestimation of actual food consumption: implications for studies on dietary restriction, metabolism, and dose calculations. *J Gerontol A Biol Sci Med Sci* 2012; 67 (10):1043-8. PMID: 22451471.
  17. Takahashi H, Okamura D, **Starr ME**, Saito H, Evers BM. Age-dependent reduction of the PI3K regulatory subunit p85 $\alpha$  suppresses pancreatic acinar cell proliferation. *Aging Cell* 2012; (2):305-14. PMID: 22212451.

18. **Starr ME**, Ueda J, Yamamoto S, Evers BM, Saito H. The effects of aging on pulmonary oxidative damage, protein nitration and extracellular superoxide dismutase down-regulation during systemic inflammation. *Free Radic Biol Med* 2011; 50 (2):371-80. PMID: 21092756.
19. **Starr ME**, Ueda J, Takahashi H, Weiler H, Esmon CT, Evers BM, Saito H. Age-dependent vulnerability to endotoxemia is associated with reduction of anti-coagulant factors APC and thrombomodulin. *Blood* 2010; 115 (23): 4886-4893. PMID: 20348393.
20. **Starr ME**, Evers BM, Saito H. Age-associated increase in cytokine production during systemic inflammation: Adipose tissue as a major source of IL-6. *J Gerontol A Biol Sci Med Sci* 2009; 64A:723-730. PMID: 19377014.
21. Ueda J, **Starr ME**, Takahashi H, Chang LY, Du J, Crapo JD, Evers BM, Saito, H. Decreased pulmonary extracellular superoxide dismutase during systemic inflammation. *Free Radic Biol Med* 2008; 45:897-904. PMID: 18640266.

### **Manuscripts under revision**

22. McIlwrath SL, **Starr ME**, High AE, Saito H, Westlund KN. Brain Microglial Response to Recurrent Caerulein Pancreatitis. *Frontiers in Physiology* 2020, *under revision*.

## **B. ABSTRACT PRESENTATIONS (partial list)**

### **Local/State/Regional Meetings**

1. October 2005. Ueda J, Yamamoto S, Mizutani A, **Alexander ME**, Du J, Evers BM Saito H. Age-associated loss of EC-SOD: Therapeutic effects of an SOD-mimetic molecule for sepsis in the elderly. Sealy Center on Aging Poster Forum, University of Texas Medical Branch (UTMB), Galveston, Texas. Poster (Ueda).
2. October 2006. **Alexander ME**, Ueda J, Falls BA, Evers BM and Saito H. Age-associated increase in thrombosis during systemic inflammation. Sealy Center on Aging Poster Forum, UTMB, Galveston, Texas. Poster (Starr).
3. October 2007. Mrazek AA, Edge D, Takahashi H, **Starr ME**, Evers BM, Saito H. Age-associated increase in coagulation during sepsis: role of thrombomodulin. Sealy Center on Aging Poster Forum, UTMB, Galveston, Texas. Poster (Mrazek).
4. October 2007. **Starr ME**, Evers BM, Saito H. Vulnerability to sepsis in old age is associated with increased IL-6 production by adipose tissue. Sealy Center on Aging Poster Forum, UTMB, Galveston, Texas. Poster (Starr). *This presentation received the **Best Student Poster Award**.*
5. November 2008. **Starr ME**, Evers BM, Saito H. Altered adipokine expression in old age

increases sensitivity to systemic inflammation. Sealy Center on Aging Poster Forum, UTMB, Galveston, Texas. Poster (Starr). *This presentation received the **Best Student Poster Award**.*

6. May 2012. **Starr ME**, Evers BM, Saito H. Dietary restriction and surgical removal of adipose tissue reduce age-dependent intolerance to inflammatory stress. 2<sup>nd</sup> Annual Barnstable Brown Obesity and Diabetes Research Day, Lexington, Kentucky. **Podium presentation (Starr)**. *This presentation received the **Outstanding Postdoctoral Research Presentation Award**.*
7. May 2012. **Starr, ME**, Hu Y, Stromberg A, Carmical, J, Wood TG, Evers BM, Saito H. Aged-associated changes in gene expression from mouse white adipose tissue during endotoxemia and sepsis. 2<sup>nd</sup> Annual Barnstable Brown Obesity and Diabetes Research Day, Lexington, Kentucky. Poster (Starr).
8. March 2014. **Starr ME**, Zwischenberger BA, Evers BM, Chang PK, Saito H. Increased inflammatory and thrombotic gene expression in visceral adipose tissue of patients with sepsis. 9<sup>th</sup> Annual CCTS Spring Conference, Lexington KY. Poster (Starr).
9. March 2015. **Starr ME**, Zwischenberger BA, Stromberg AJ, Chang PK, Saito H. Analysis of inflammatory and pro-coagulant factor expression in visceral adipose tissue of patients with intra-abdominal sepsis: adipose tissue as a major source of systemic PAI-1 which correlates with sepsis severity. 10<sup>th</sup> Annual CCTS Spring Conference, Lexington, KY. Poster (Starr).
10. March 2015. Steele AM, **Starr ME**, England J, Riley L, Esser KA, Saito H. Middle-aged mice rescued from lethal sepsis by a new late-intervention protocol exhibit long-term muscle dysfunction. 10<sup>th</sup> Annual CCTS Spring Conference, Lexington, KY. Poster (Steele).
11. March 2017. Wallace DK, Balasuriya BK, Steele, AM, Okamura D, **Starr ME**, Saito H. Pathological role of visceral white adipose tissue in development of severe acute pancreatitis. 12<sup>th</sup> Annual CCTS Spring Conference, Lexington, KY. Poster (Wallace).
12. March 2017. Powell WL, Balasuriya BK, Steele AM, Cohen DA, **Starr ME**. Age-dependent expansion of gamma delta T cells in visceral adipose tissue. 12<sup>th</sup> Annual CCTS Spring Conference, Lexington, KY. Poster (Powell).
13. March 2017. Harris DD, Zwischenberger BA, Balasuriya BB, Steele AM, Stromberg AJ, Chang PK, Saito H, **Starr ME**. Adipose-derived PAI-1 correlates with systemic levels, kidney injury, and severity of intra-abdominal sepsis. 12<sup>th</sup> Annual CCTS Spring Conference, Lexington, KY. Poster (Harris).
14. May 2017. Balasuriya B, Steele AM, Cohen, DA, **Starr ME**. Age-dependent expansion of gamma delta ( $\gamma\delta$ )-T cells in visceral adipose tissue. Barnstable Brown Obesity and Diabetes Research Day, Lexington, Kentucky. Poster (Starr).
15. April 2018. Wallace F, Steele AM, Saito H, **Starr ME**. Role of visceral adipose tissue in the development of sepsis. 13<sup>th</sup> Annual CCTS Spring Conference, Lexington, KY. Poster

(Wallace).

16. May 2018. Powell WL, Steele AM, Balasuriya BK, Mori SF, Cohen DA, **Starr ME**. Expansion of Gamma Delta T Cells in Visceral Adipose Tissue with Aging Promotes Chronic Inflammation. Barnstable Brown Obesity and Diabetes Research Day, Lexington, Kentucky. Poster (Powell)

### **National/International Meetings**

1. June 2006. Ueda J, **Alexander ME**, Crapo JD, Evers BM, Saito H. Age-associated increase in oxidative damage and down-regulation of extracellular superoxide dismutase (EC-SOD) in endotoxin-mediated acute lung injury. 29<sup>th</sup> Annual Conference on Shock, Broomfield, CO. *Shock* 25 Suppl.1: p.68-69. Poster (Ueda).
2. November 2006. Saito H, **Alexander ME**, Evers BM, Ueda J. Increased thrombosis and decreased expression of an anti-coagulation factor in aged mice during acute inflammatory stress. 59<sup>th</sup> Annual Scientific Meeting of the Gerontological Society of America, Dallas, TX. *The Gerontologist* 46: Special Issue, p.108. Poster (Saito).
3. June 2007. **Alexander ME**, Ueda J, Takahashi H, Evers BM, Weiler H, Saito H. Age-associated increase in thrombosis and down-regulation of thrombomodulin during sepsis and endotoxemia. 30<sup>th</sup> Annual Conference on Shock, Baltimore, MD. *Shock* 27: Supple.1, P160. Poster (Saito).
4. November 2007. **Starr ME**, Evers BM, Saito H. Age-associated increase in IL-6 expression by adipose tissue and its role in vulnerability to sepsis in old age. 60<sup>th</sup> Annual Scientific Meeting of the Gerontological Society of America, San Francisco, CA. *The Gerontologist* 46:Special Issue, p.287. Poster (Starr). *This presentation received the **George Sacher Student Award**.*
5. June 2008. Takahashi H, **Starr ME**, Mrazek AA, Weiler H, Evers BM, Saito H. Age-associated decrease in anticoagulation factors results in increased coagulation and mortality during sepsis. 6<sup>th</sup> Congress of the International Federation of Shock Societies and 31st Annual Conference on Shock, Cologne, Germany. *Shock* 29: Suppl.1, P341. Poster (Saito).
6. June 2008. **Starr ME**, Evers ME, Saito H. Altered adipokine expression in old age increases sensitivity to systemic inflammation. 6<sup>th</sup> Congress of the International Federation of Shock Societies and 31st Annual Conference on Shock, Cologne, Germany. *Shock* 29: Supple.1, P339. Poster (Saito).
7. April 2009. **Starr ME**, Evers BM, Saito H. Adipose tissue is a major source of IL-6 production and contributes to age-associated mortality during sepsis. National Student Research Forum Galveston, Texas. Poster (Starr). *This presentation received the **AMA Foundation Award for Overall Excellence in Basic Research and the Best Poster Presentation in Immunology**.*
8. June 2009. **Starr ME**, Evers BM, Saito H. Proteomics approach identifies proteins with age-

- related increases in nitration during systemic inflammation. 32nd Annual Conference on Shock, San, Antonio, TX. *Shock* 31: Suppl.1, P146. Poster (Starr).
9. November 2009. **Starr ME**, Evers BM, and Saito H. IL-1 $\beta$  mediates age-associated over-production of IL-6 in the adipose tissue. 62<sup>th</sup> Annual Scientific Meeting of the Gerontological Society of America, Atlanta, GA. *The Gerontologist* 49: Suppl 2; 183. Poster (Starr). *This presentation received the **George Sacher Student Award**.*
  10. April 2010. **Starr ME**, Takahashi H, Evers BM, Saito H. Vulnerability to sepsis in the aged is linked to reduced protein C pathway activation. National Student Research Forum Galveston, Texas. **Podium presentation (Starr)**. *This presentation received an award for **Best Oral Presentation in Pathology**.*
  11. June 2010. **Starr ME**, Evers BM, Saito H. Aging alters inflammation- and coagulation-related gene expression in white adipose tissue during inflammatory stress. 39<sup>th</sup> Annual Meeting of the American Aging Association, *Portland, OR*. Poster (Starr). *This presentation received the **Walter R. Nicolai Award for Meritorious Research by a Predoctoral Candidate in Biomedical Gerontology**.*
  12. June 2010. **Starr ME**, Takahashi H, Weiler H, Esmon CT, Evers BM, Saito H. Vulnerability to sepsis in the aged is linked to reduced protein C pathway activation. 33rd Annual Conference on Shock, Portland, OR. *Shock* 33: Suppl.1, P59. Poster (Starr). *Received a **Travel Award**.*
  13. November 2010. **Starr ME** and Saito H. Loss of table manners in aged mice leads to food consumption paradox. 63<sup>th</sup> Annual Scientific Meeting of the Gerontological Society of America, New Orleans, LA. *The Gerontologist* 50: Suppl 1; 184. Poster (Starr).
  14. November 2010. **Starr ME**, Hu Y, Stromberg, AJ, Carmical J, Evers BM, Saito H. Age-associated changes in gene expression from mouse white adipose tissue during systemic inflammation. 63<sup>th</sup> Annual Scientific Meeting of the Gerontological Society of America, New Orleans, LA. Late Breaker Poster Session. Poster (Starr).
  15. June 2011. **Starr ME**, Evers BM, Saito H. Dietary restriction and surgical removal of adipose tissue reduce age-associated intolerance to inflammatory stress. 40<sup>th</sup> Annual Meeting of the American Aging Association, Raleigh, NC. Poster (Starr).
  16. June 2011. **Starr ME**, Evers BM, Saito H. Age-associated changes in gene expression from mouse white adipose tissue during endotoxemia and sepsis. 34<sup>th</sup> Annual Conference on Shock, Norfolk, VA. *Shock* 35: Suppl.1, P135. Poster (Starr). *This abstract received the **Diversity Enhancement Award**.*
  17. June 2011. Ienaga J, Takahashi H, Okamura D, **Starr ME**, Evers BM, Saito H. Impact of protein c expression in the pancreas on plasma protein c levels during sepsis in mice. 34<sup>th</sup> Annual Conference on Shock, Norfolk, VA. *Shock* 35: Suppl.1. Poster (Ienaga).



18. June 2011. Okamura D, Ienaga J, **Starr ME**, Evers BM, Saito H. Age-associated multiple organ dysfunction during acute pancreatitis is linked to reduced pancreatic protein C. 34th Annual Conference on Shock, Norfolk, VA. *Shock* 35: Suppl.1, P162. Poster (Okamura).
19. July 2011. **Starr ME**, Evers BM, Saito H. The role of adipose tissue in age-related sensitivity to acute inflammatory stress and the therapeutic potential of short-term dietary restriction. 14<sup>th</sup> Congress of the International Association of Biomedical Gerontology, Brighton, United Kingdom. Poster (Starr). *This abstract received an NIH-sponsored Travel Award.*
20. November 2011. **Starr ME**, Evers BM, Saito H. Proteomic Analysis Identifies Age-Associated Release of Histone H4 during Acute Inflammatory Stress. 64<sup>th</sup> Annual Scientific Meeting of the Gerontological Society of America, Boston, MA. Late Breaker Poster Session. Poster (Starr). *This abstract received an NIH-sponsored Travel Award.*
21. June 2012. **Starr ME**, Evers BM, Saito H. Age-dependent upregulation of cytokines and coagulation factors in resident stromal cells of adipose tissue during systemic inflammation. 35<sup>th</sup> Annual Conference on Shock, Miami, FL. *Shock* 37 Suppl 1. Poster (Saito).
22. June 2012. Okamura D, **Starr ME**, Takahashi H, Evers BM, Saito H. Mechanisms for age-dependent coagulation after CLP-induced sepsis in mice. 35<sup>th</sup> Annual Conference on Shock, Miami, FL. *Shock* 37 Suppl 1. Poster (Okamura).
23. June 2012. Okamura D, **Starr ME**, Ienaga J, Evers BM, Saito H. Inhibition of JNK After Caerulein-Induced Acute Pancreatitis Ameliorated Systemic Thrombosis in Old Mice. Digestive Disease Week. *Gastroenterology* 142 (5), S-318. Poster (Okamura).
24. June 2012. Mustain WC, **Starr ME**, Okamura D, Evers BM, Saito H. (2012) Intra-Abdominal Adipose Tissue as a Major Source of IL-6 During Acute Experimental Colitis. Digestive Disease Week. *Gastroenterology* 142 (5), S-1086. Poster (Mustain).
25. November 2012. Saito H, **Starr ME**. Age-dependent induction of pro-inflammatory and pro-thrombotic genes in adipose tissue by inflammatory stress. 65<sup>th</sup> Annual Scientific Meeting of the Gerontological Society of America, San Diego, CA. *The Gerontologist* 52 Suppl 1. Poster (Starr).
26. March 2013. Okamura D, **Starr ME**, Evers BM, Saito H. (2012) Plasma KC and IL-6 are Early Predictive Markers of Severe Acute Pancreatitis. *Pancreas* 41 (8), 1393. Poster (Okamura).
27. July 2013. Campbell KE, Song J, **Starr ME**, Saito H, Li J, Evers BM. Defective mTORC1/4E-BP1 signaling contributes to the age-associated reduction of p85 alpha expression in pancreatic acinar cells. *Journal of the American College of Surgeons* 217 Suppl 3. Poster (Campbell).
28. June 2013. **Starr ME**, Evers BM, and Saito H. Dietary restriction improves age-related intolerance to endotoxemia by reducing thrombosis. 36<sup>th</sup> Annual Conference on Shock, San Diego, CA. *Shock* 39 Suppl 2, Abstract 33. **Podium presentation (Starr)**. *This abstract*

*received a travel award.*

29. June 2013. Okamura D, **Starr ME**, Evers BM, Saito H. Plasma IL-6 and KC levels during the early phase of acute pancreatitis can predict later progression to a severe condition with multiple organ dysfunction syndrome. 36<sup>th</sup> Annual Conference on Shock, San Diego, CA. *Shock* 39 Suppl 2, Abstract P133. Poster (Okamura).
30. November 2013. **Starr ME** and Saito H. Csprs is a novel adipose-specific biomarker of aging. 66<sup>th</sup> Annual Scientific Meeting of the Gerontological Society of America, New Orleans, LA, *The Gerontologist* 53: Suppl 1. Poster (Starr).
31. June 2014. **Starr ME**, Zwischenberger BA, Harris JW, Evers BM, Chang PK, Saito H. Exaggerated inflammatory and thrombotic gene expression in visceral adipose tissue of patients with intra-abdominal sepsis. 37<sup>th</sup> Annual Conference on Shock, Charlotte, NC. *Shock* 41 Suppl 2, Abstract P49. Poster (Starr). *This abstract received a travel award.*
32. November 2014. **Starr ME**, Takahashi H, Okamura D, Mrazek A, Evers BM, Saito H. Increased coagulation and suppressed generation of activated protein C in aged mice during intra-abdominal sepsis. 67<sup>th</sup> Annual Scientific Meeting of the Gerontological Society of America, Washington DC. *The Gerontologist* 54: Suppl 2. Poster (Starr).
33. June 2015. **Starr ME**, Zwischenberger B, Stromberg AJ, Chang PK, Saito H. Analysis of inflammatory and pro-coagulant factor gene expression in visceral adipose tissue of patients with intra-abdominal sepsis: adipose tissue is a major source of systemic PAI-1 which correlates with sepsis severity. 38<sup>th</sup> Annual Conference on Shock, Denver, CO. *Shock* 43 Suppl 1, Abstract P139. Poster (Starr).
34. June 2015. Steele AM, **Starr ME**, Saito H. Late intervention with repeated antibiotic and fluid resuscitation rescues mice from lethal cecal slurry-induced sepsis. 38<sup>th</sup> Annual Conference on Shock, Denver, CO. *Shock* 43 Suppl 1, Abstract P129. Poster (Steele). *This abstract received a travel award.*
35. November 2015. **Starr ME**, Okamura D, Steele AM, Saito H. IL-6 levels during early acute pancreatitis predict progression to severe conditions in aged animals. 68<sup>th</sup> Annual Meeting of the Gerontological Society of America, Orlando, FL. *The Gerontologist* 55: Suppl 2. Poster (Starr).
36. June 2016. Steele AM, **Starr ME**, Smith JD, Esser K, Saito H. Mice rescued from lethal sepsis using an ICU-like resuscitation protocol exhibit prolonged muscle dysfunction. 39<sup>th</sup> Annual Conference on Shock, Austin, TX. *Shock* 45 Suppl 1, Abstract P83. Poster (Steele). *This abstract received a travel award.*
37. November 2016. **Starr ME**, Steele AM, Cohen DA, Saito H. Short-term dietary restriction rescues mice from sepsis and reduces inflammation in adipose tissue. 69<sup>th</sup> Annual Scientific

Meeting of the Gerontological Society of America. New Orleans, LA. *The Gerontologist* 56: Suppl 3. Poster (Starr).

38. June 2017. **Starr ME**, Steele AM, Wallace DK, Balasuriya BB, Okamura D, Saito H. Pathological role of visceral white adipose tissue in development of severe acute pancreatitis. 40<sup>th</sup> Annual Conference on Shock, Fort Lauderdale, FL. *Shock* 47 Suppl 1, Abstract 31. **Podium presentation (Starr).**
39. June 2017. Steele AM, **Starr ME**, Patel SP, Smith JD, Kaneki M, Esser K, Rabchevsky AG, Peterson CA, Saito H. Mitochondrial damage and dysfunction in skeletal muscle of middle-aged murine sepsis survivors. 40<sup>th</sup> Annual Conference on Shock, Fort Lauderdale, FL. *Shock* 47 Suppl 1, Abstract 54. Podium (Steele). *This abstract received a travel award.*
40. July 2017. Steele, AM, **Starr ME**, Patel SP, Rabchevsky AG, Saito H. Impairment of mitochondrial function in murine sepsis survivors. 21st IAGG World Congress of Gerontology and Geriatrics, San Francisco, CA. *Innovation in Aging* 1 Suppl 1: 1391. Podium (Steele).
41. June 2018. Zwischenberger BA, Harris DD, Balasuriya, BK, Steele, AM, Stromberg AJ, Change PK, Saito H, **Starr ME**. A role for adipose-derived PAI-1 in sepsis-associated acute kidney injury. 41<sup>st</sup> Annual Conference on Shock, Scottsdale, AZ. *Shock* 49 Suppl 1, Abstract P230. Poster (Starr).
42. June 2018. Steele AM, **Starr ME**, Saito H. Chronic muscle weakness in murine sepsis survivors is accompanied by ongoing oxidative damage. 41st Annual Conference on Shock, Scottsdale AZ. *Shock* 49 Suppl. 1: P137. Poster (Steele).
43. June 2018. Powell WL, Steele AM, Balasuriya, BK, Cohen, DA, **Starr ME**. Age-associated expansion of gamma delta-T cells promotes visceral adipose tissue inflammation. National Idea Symposium of Biomedical Research Excellence. Washington, DC. Poster (Starr).
44. June 2018. Powell WL, Steele AM, Balasuriya, BK, More SF, Cohen, DA, **Starr ME**. An Age-dependent expansion of gamma delta T cells in visceral adipose tissue promotes inflammation. 47<sup>th</sup> Annual Meeting of the American Aging Association, Philadelphia, PA. Abstract 64. **Podium presentation (Starr).** *This abstract received a Jr Faculty Travel Award.*
45. November 2018. Powell WL, Steele AM, Balasuriya, BK, More SF, Cohen, DA, **Starr ME**. An Age-dependent expansion of gamma delta T cells in visceral adipose tissue promotes inflammation. Gerontological Society of America 2018 Annual Scientific Meeting, Boston, MA. Abstract 3. Poster (Starr).
46. November 2018. Steele AM, Mori SF, Balasuriya B, **Starr ME**, Saito H. Chronic Muscle Weakness Is Accompanied by Prolonged Oxidative Damage in Murine Sepsis Survivors. Gerontological Society of America 2018 Annual Scientific Meeting, Boston, MA. Abstract 31. Poster (Steele).

47. June 2019. Balasuriya B , Zwischenberger BA, Harris DD, Nataraj N, Owen AM, Stromberg AJ, Chang PK, Neyra JA, Saito H, **Starr ME**. Increased expression of adipose-derived PAI-1 is associated with acute kidney injury in murine models and septic patients. 42nd Annual Conference on Shock, Coronado, CA. *Shock 51 Suppl. 1*: Abstract 65. **Podium (Starr)**.

#### **XIV. RESEARCH & INTELLECTUAL CONTRIBUTIONS - *continued***

##### **C. SPONSORED RESEARCH PROJECTS, GRANT & CONTRACT ACTIVITIES**

###### **Active**

**Project Title:** Visceral fat gamma delta T cells in sepsis pathogenesis  
**Project Number:** R01 GM129532  
**Principal Investigator(s):** Marlene Starr, PhD  
**Role in Project:** **PI**  
**Effort:** 38 %  
**Institution/University:** University of Kentucky  
**Source of Funding:** NIGMS, NIH  
**Duration of Project:** 9/2018-5/2023  
**Total Award:** \$1,600,000

**Project Title:** The role of gamma delta T cells in age-associated adipose tissue inflammation  
**Project Number:** R56 AG061508  
**Principal Investigator(s):** Marlene Starr, PhD  
**Role in Project:** **PI**  
**Effort:** 25%  
**Institution/University:** University of Kentucky  
**Source of Funding:** NIA, NIH  
**Duration of Project:** 9/2019-8/2021  
**Total Award:** \$377,333

**Project Title:** Mechanisms mediating severity of acute pancreatitis in the aged  
**Project Number:** R01 AG055359  
**Principal Investigator(s):** Hiroshi Saito, PhD  
**Role in Project:** **Co-Investigator**  
**Effort:** 10 %  
**Institution/University:** University of Kentucky  
**Source of Funding:** NIA, NIH  
**Duration of Project:** 09/2017-5/2022  
**Total Award:** \$1,568,250

**Project Title:** Chronic muscle weakness in sepsis survivors  
**Project Number:** R01 GM126181  
**Principal Investigator(s):** Hiroshi Saito, PhD  
**Role in Project:** **Co-Investigator**  
**Effort:** 10 %  
**Institution/University:** University of Kentucky  
**Source of Funding:** NIGMS, NIH  
**Duration of Project:** 9/2017-8/2021  
**Total Award:** \$1,162,800

**Project Title:** Long-term immunomodulation from opioid exposure in septic shock  
**Principal Investigator(s):** Brittany Bissell, PharmD, PhD; Jamie Sturgill, PhD; Marlene Starr, PhD  
**Role in Project:** **Co-PI**  
**Effort:** no paid effort  
**Institution/University:** University of Kentucky  
**Source of Funding:** UK Igniting Research Collaborations (IRC)  
**Duration of Project:** 7/2019-12/2020  
**Total Award:** \$25,000

**Project Title:** Effect of aging on gingival gamma-delta T cells  
**Principal Investigator(s):** Octavio Gonzalez, DDS, PhD; Marlene Starr, PhD  
**Role in Project:** **Co-PI**  
**Effort:** no paid effort  
**Institution/University:** University of Kentucky  
**Source of Funding:** COBRE Extension Pilot Project  
**Duration of Project:** 11/2019-12/2020  
**Total Award:** \$20,000

### Pending

**Project Title:** The role of gamma delta T cells in age-associated adipose tissue inflammation  
**Project Number:** 1 R01 AG061508  
**Principal Investigator(s):** Marlene Starr, PhD  
**Role in Project:** **PI**  
**Effort:** 40%  
**Institution/University:** University of Kentucky  
**Source of Funding:** NIA, NIH  
**Duration of Project:** 9/2018-8/2023  
**Total Award:** \$1,250,000  
*Impact Score: 34, Percentile: 19*

## Recently Completed

**Project Title:** Adipose tissue gamma delta T cells in aging and obesity  
**Project Number:** COBRE-COCVD Junior Investigator (5P20GM103527)  
**Principal Investigator(s):** Marlene E Starr, PhD  
**Role in Project:** **PI**  
**Effort:** 50 % (Year 1), 40% (Year 2)  
**Institution/University:** University of Kentucky  
**Source of Funding:** NIGMS  
**Duration of Project:** 8/2017-7/2019  
**Total Award:** \$164,832

**Project Title:** Adipose tissue gamma delta T cells in aging and obesity  
**Project Number:** COBRE-COCVD Pilot Project  
**Principal Investigator(s):** Marlene E Starr, PhD  
**Role in Project:** **PI**  
**Effort:** 20 %  
**Institution/University:** University of Kentucky  
**Source of Funding:** NIGMS  
**Duration of Project:** 2/2017-1/2018  
**Total Award:** \$50,000

**Project Title:** The role of adipose tissue in age-dependent sensitivity to critical illness  
**Project Number:** 1RO1 AG039732  
**Principal Investigator(s):** Hiroshi Saito, PhD  
**Role in Project:** **Co-Investigator**  
**Effort:** 50 %  
**Institution/University:** University of Kentucky  
**Source of Funding:** NIA, NIH  
**Duration of Project:** 8/2011-5/2017  
**Total Award:** \$1,522,125

**Project Title:** The role of visceral adipose tissue in sepsis  
**Project Number:** UK-CCTS Small Grant Program  
**Principal Investigator(s):** Hiroshi Saito, PhD and Phillip Chang, MD  
**Role in Project:** **Co-Investigator**  
**Effort:** no salary support  
**Institution/University:** University of Kentucky  
**Source of Funding:** NIH, CTSA (UL1TR001998)  
**Duration of Project:** 05/2014-12/2014  
**Total Award:** \$5,000

**Project Title:** The role of adipokines in age-related sensitivity to systemic inflammation

**Project Number:** 1R36 AG038547  
**Principal Investigator(s):** Marlene E Starr, PhD  
**Role in Project:** **PI**  
**Effort:** 50 %  
**Institution/University:** University of Kentucky  
**Source of Funding:** NIA, NIH  
**Duration of Project:** 2/2011-5/2011 (*terminated early due to PI's graduation with PhD*)  
**Total Award:** \$39,074

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