

# Chyna Gray-Lovell, Ph.D., M.S.

NIH T32-NRSA/Post-Doctoral Fellow--Division of Surgical  
Research/ Department of Surgery  
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## **Primary Research Field**

Immunology, Immuno-modulators, lymphocytes: immune/organ injury in severe septic animal/patient

## **Education**

- 2023-present NIH T32-NRSA Post-doctoral Fellow, Brown University, Providence, RI
- 2017-2023 Ph.D. in MCB Graduate Program, Brown University, Providence, RI
- 2013-2017 B.A. in Biology & Chemistry, University of San Diego (USD), San Diego, CA

## **Professional Experience**

- Research Assistant to *Dr. Hugh Ellis* 2013-17
  - (Dept. Biology: USD)
- Laboratory Technician 2013-17
  - (Dept. Biology: USD)
- Research Assistant to *Dr. Lisa Baird* 2015
  - (Dept. Biology: USD)
- Research Assistant to *Dr. Joseph Provost* 2016-17
  - (Dept. Biochemistry: USD)
- Research Assistant to *Dr. Alfred Ayala* 2016
  - (Dept. of Surgery: Brown Univ.)
- Research Rotation Student 2017-18
  - (Dept. MCB: Brown Univ)
- Research Fellow under *Dr. Alfred Ayala* 2018-2023
  - (Dept. of Surgery, Dept. MCB: Brown Univ.)
- Co-chair 2019
  - (Respiratory Allergic Diseases: Soc. Leuko. Biology)
- Post-doctoral Fellow under *Drs. Craig Lefort & Alfred Ayala* 2023-present
  - (Dept. Surgery, Brown Univ)

## **Awards, Honors, Fellowships, Grants:**

- Pre-undergraduate Research Experience Fellowship USD 2013
- Summer Undergraduate Research Fellowship USD 2014

• Ronald E. McNair Scholar Research Award	USD	2015
• Dean's List: first honors	USD	2015, 2016
• Dean's List: second honors	USD	2016
• Leadership Alliance Research Fellowship	Brown Univ.	2016
• ABRCMS Poster Presentation Travel Grant Awardee	ABRCMS	2016
• Manes Research Award	USD	2017
• Initiative to Maximize Student Diversity (IMSD) Grant	Brown Univ.	2017
• Initiative to Maximize Student Diversity (IMSD) Grant	Brown Univ.	2018
• SLB's Mentoring Diversity Travel Award	SLB	2018
• SLB Conference Travel Award	SLB	2019
• 'Top 3' Poster presentation at 31 <sup>st</sup> MCB-GP Retreat	Brown Univ.	2019
• SHOCK Society Diversity Enhancement Award	SHOCK Society	2021
• 'Grad. Student Finalist' in the ' <u>SLB Presidential Scholars</u> ' competition		2022
• MCB-GP Barry Jay Rosen Award	Brown Univ.	2023

### **Publications:**

1. Fallon, E.A., Chun, T.T., Young, W.A., **Gray, C.C.**, Ayala, A.#, Heffernan, D.S.# 2017. Program cell death receptor-1-mediated invariant Natural Killer T-cell control of peritoneal macrophage modulates survival in neonatal sepsis. *Frontiers in Immunology*, 8:article 1469 (PMCID: PMC5701916) (#A.A. and D.S.H. contributed equally as senior authors to this work)
2. Wakeley, M.E., Shubin, N., Monaghan, S.F., **Gray, C.C.**, Ayala, A., Heffernan, D.S. 2019. Herpes Virus Entry Mediator (HVEM): A novel potential mediator of trauma induced immunosuppression. *J. Surg. Res.* 245:610-618.
3. Wakeley, M.E., **Gray, C.C.**, Monaghan, S.F., Heffernan, D.S., Ayala, A. 2020. Check point inhibitors and their role in immunosuppression in sepsis. *Crit. Care Clin.* 36:69-88 (Review).
4. **Gray, C.C.**, Biron-Girard, B., Wakeley, M.E., Chung, S-C., Chen, Y., Quiles-Ramirez, Y., Tolbert, J.D., Ayala, A. 2022. Negative Checkpoint Protein, VISTA, Regulates the CD4<sup>+</sup> T<sub>reg</sub> Population During Sepsis Progression to Promote Acute Sepsis Recovery and Survival. *Frontiers in Immunology* 13:861670.
5. Hensler, E., Petros, H.F., **Gray, C.C.**, Chung, C-S., Ayala, A.#, Fallon, E.A.# 2022. The neonatal innate immune response to sepsis: checkpoint proteins as novel mediators of this response and as possible therapeutic/diagnostic levers. *Frontiers in Immunology* 13:940930. (#E.A.F. and A.A. contributed equally as senior authors to this work).
6. **Gray, C.C.**, Chung, C-S., Armstead, B.E., Chen, Y., Ayala, A. 2023. Anti-inflammatory mechanisms in murine sepsis: VISTA<sup>+</sup> Tregs non-redundantly suppress CD69<sup>Low</sup>  $\gamma\delta$  T cell accumulation in the intestine while promoting systemic sCD40L release. *J. Leuko. Biol.* (in revision).

### **Abstracts (published):**

1. **Gray, C.**, Biron, B., Chen, Y., Chung, C-S., Ayala, A. 2018. CD4<sup>+</sup> T cells upregulate immune checkpoint VISTA surface expression in response to septic challenge. *J. Leuko. Biol.* (On-line Abst. Book: Abst.#22: pg 16-17).

2. **Gray, C.**, Wakeley, M., Biron, B., Chung, C-S., Chen, Y., Ayala, A. 2019. VISTA as an Enigma: Deciphering its Context Dependent Role in Sepsis. *Shock* 51:125 (Suppl. 1)
3. **Gray, C.**, Chen, Y., Quiles-Ramirez, Y., Ayala, A. 2019. Immune Checkpoint Regulator, VISTA, Improves Survival in Murine Sepsis By Enhancing T-cell Crosstalk and Minimizing Inflammatory Tissue Injury. *J. Leuko. Biol.* (On-line Abst. Book: Abst.#24).
4. **Gray, C.**, Chen, Y., Chung, C-S., Ayala, A. 2020. Negative checkpoint protein, VISTA, suppresses the infiltration of proinflammatory gamma-delta T cells during murine sepsis progression. *Shock* 53(S1):133. Gray, C., Biron-Gerard, B., Chen, Y., Quiles-Ramirez, Y., Ayala, A. 2021. Negative checkpoint regulator, VISTA, plays an indispensable and non-redundant role in Treg-mediated tissue protection and survival in murine sepsis. *J. Leuko. Biol.* (On-line Abst. Suppl.).
5. **Gray, C.**, Biron-Gerard, B., Chen, Y., Quiles-Ramirez, Y., Chung, C-S., Ayala, A. 2021. Negative checkpoint regulator, VISTA, suppresses the infiltration of proinflammatory gamma-delta T cells during murine sepsis progression. *Shock* 55:(in press).
6. **Gray, C.**, Biron-Gerard, B., Chen, Y., Quiles-Ramirez, Y., Ayala, A. 2021. Negative checkpoint regulator, VISTA, plays an indispensable and non-redundant role in Treg-mediated tissue protection and survival in murine sepsis. *J. Leuko. Biol.* (On-line Abst. Suppl.).
7. **Gray, C.**, Biron-Girard, B., Chung, C-S., Chen, Y., Ayala, A. 2022. Promoting tolerance: a compelling role for vista in CD4<sup>+</sup> Treg-mediated sepsis mortality. *Shock* 57:(in press).
8. **Gray, C.C.**, Chung, C-S., Armstead, B.E., Chen, Y., Ayala, A. 2022. Striking a delicate balance: VISTA regulates the Treg and  $\gamma\delta$  T cell population to promote sepsis survival. *J. Leuko. Biol.* (On-line Abst. Suppl.).

#### **Presentations (Oral & Poster):**

1. **Gray, C.**, Fallon, E.A., Ayala, A. The Role of invariant Natural Killer (iNK) T- cells in Neonatal Sepsis. Presented as a poster at the Brown University-Summer Research Symposium, Providence, RI, August 4, 2016.
2. **Gray, C.**, Fallon, E.A., Ayala, A. The Role of invariant Natural Killer (iNK) T- cells in Neonatal Sepsis. Presented as a poster at the Annual Biomedical Research Conference for Minority Students, Tampa, FL, November 4-7, 2016.
3. **Gray, C.**, Wakeley, M., Chung, C-S., Chen, Y., Ayala, A. Dynamic Immune Regulation in Sepsis: Differential expression of checkpoint protein, VISTA, on CD4<sup>+</sup> T cell subsets. Presented as a poster at the 30<sup>th</sup> annual Brown University- Dept. Mol., Cell. & Biochem. Grad. Prog. held in W. Greenwich, RI, August 28, 2018.
4. **Gray, C.**, Ayala, A. Is there a role of the “checkpoint” protein, V-domain Ig Suppressor of T Cell Activation (VISTA), in sepsis? Presented as an oral presentation at the 16<sup>th</sup> Annual “Advances in Inflammation Research” Symposium at RI Hospital/Brown Univ., Providence, RI, September 20, 2018.

5. **Gray, C.,** Biron, B., Chen, Y., Chung, C-S., Ayala, A. CD4<sup>+</sup> T cells upregulate immune checkpoint VISTA surface expression in response to septic challenge. Presented as a poster at the 2018 joint 50<sup>th</sup> Society of Leukocyte Biology (SLB)/ 14<sup>th</sup> Biennial Meeting of the International Endotoxin & Innate Immunity Society (IEIS) meeting, to be held in Phoenix, AZ, October 13-16, 2018.
6. **Gray, C.,** Ayala, A. The Role of Checkpoint Regulator, VISTA, in sepsis. Presented as an oral at the 2019 Rhode Island Hospital Division of Surgical Research Seminar. Providence, RI, February 19, 2019.
7. **Gray, C.,** Wakeley, M., Biron, B., Chung, C-S., Chen, Y., Ayala, A. VISTA as an Enigma: Deciphering its Context Dependent Role in Sepsis. Presented as a poster at the 2019 annual SHOCK Society Meeting held in San Diego, CA, June 5-8, 2019.
8. **Gray, C.,** Wakeley, M., Chung, C-S., Chen, Y., Ayala, A. VISTA as an Enigma: Deciphering its Context Dependent Role in Sepsis. Presented as a poster at the 31<sup>st</sup> annual Brown University-Dept. Mol., Cell. & Biochem. Grad. Prog. held in W. Greenwich, RI, August 30, 2019.
9. **Gray, C.,** Chen, Y., Quiles-Ramirez, Y., Ayala, A. Immune Checkpoint Regulator, VISTA, Improves Survival in Murine Sepsis By Enhancing T-cell Crosstalk and Minimizing Inflammatory Tissue Injury. Presented as a selected talk and a poster at the 2019 Society for Leukocyte Biology, held in Boston, MA, November 15-18, 2019.
10. **Gray, C.,** Ciambella, C., Wakeley, M., Biron, B., Chung, C-S., Chen, Y., Ayala, A. VISTA: Bridging the Gap Between Innate and Adaptive Immune Regulation in Sepsis. Presented as a selected talk at the MCB Department Seminar. Providence, RI, January 31<sup>st</sup>, 2020.
11. **Gray, C.,** Ciambella, C., Wakeley, M., Biron, B., Chung, C-S., Chen, Y., Ayala, A. VISTA Discriminates: Suppressing Effectors and Activating Suppressors in the Septic Immune Response. Presented as an oral at the 2020 Rhode Island Hospital Division of Surgical Research Seminar. Providence, RI, November 10<sup>th</sup>, 2020.
12. **Gray, C.,** Chung, C-S., Wakeley, M., Biron, B., Chen, Y., Ayala, A. VISTA Discriminates: Uncovering Nuances in the Septic Immune Response. Presented as a selected talk at the MCB Department Seminar. Providence, RI, April 16<sup>th</sup>, 2021.
13. **Gray, C.,** Biron, B., Chen, Y., Quiles-Ramirez, Y., Ayala, A. VISTA in Treg-mediated Tissue Protection and Survival in Murine Sepsis. Presented 'virtually' as a 'selected talk' at the 2021 (44<sup>th</sup>) Society for Leukocyte Biology meeting, held virtually. July 22<sup>nd</sup>, 2021.
14. **Gray, C.C.,** Chung, C-S., Chen, Y., Rickman, B., Armstead, B.E., Ayala, A. Negative Checkpoint Regulator, VISTA, Suppresses the Infiltration of Proinflammatory Gamma-Delta T cells During Murine Sepsis Progression. Poster presentation at the 2021 Shock Society Conference, held virtually. October 12<sup>th</sup>, 2021.
15. **Gray, C.,** Chung, C-S., Chen, Y., Rickman, B., Armstead, B.E., Ayala, A. Promoting tolerance: A compelling role for VISTA in CD4<sup>+</sup> Treg-mediated sepsis

mortality. Oral presentation at the 4<sup>th</sup> Annual Dr. Samuel M. Nabrit Conference for Early Career Scholars at Brown University. June 17<sup>th</sup>, 2022.

16. **Gray, C.C.**, Chung, C-S., Armstead, B.E., Chen, Y., Ayala, A. Striking a delicate balance: VISTA regulates the Treg and  $\gamma\delta$  T cell population to promote sepsis survival. Oral presentation as a part of the as a 'Graduate Student Finalist' in the 'SLB Presidential Scholars' competition at the 55th annual Society of Leukocyte Biology meeting, Waikoloa Village, HI, October 27, 2022.

### **Teaching Experience**

- Fall 2018: Teaching Assistant for Drs. Mark Johnson & Jody Hall. Genetics, Brown University, Providence, RI, Spring 2019.
- Brown Junior Researchers Afterschool Program (Program Coordinator/President).
- Co-Mentored for Leadership Alliance summer research experience students.
  - John Davies, summer 2021
  - Adriana Ramirez-Marrero, summer 2023

### **Associations:**

2018-present      Society of Leukocyte Biology  
2019-present      Shock Society  
2022-present      American Association of Immunologists

### **Support/Funding**

#### **Present:**

2023-present

Role: Post-doctoral Fellow

*NIH-NIGMS Lifespan-RI Hospital's (affiliated with Brown University); program entitled: "Trauma and Inflammation Research Training Program (TIRTP)"*

Grant No.: 2 T32 GM065085

Program Director: Alfred Ayala

Total Support = \$142,380 in total direct cost (for 2023-present).

#### **Past:**

2019-2020s

Role: Pre-doctoral Fellow

*NIH-NIGMS Administrative Supplement to Promote Diversity in Health-Related Research to MIRA-ESI; program entitled: "Mechanisms of Immune Dysfunction and Morbid Outcome in Response to Shock/Sepsis."*

Grant No.: 3 R35 GM118097-03S1

Principal Investigator: Alfred Ayala

Total Support = \$144,655 in total direct costs (for 2019-2020).

NOTE: Also chosen as a recipient of an American Association of Immunologist's (AAI) Pre-doctoral fellowship in July of 2022, but chose to turn it down for BRRTP support.

2022-2023

Role: Pre-doctoral Fellow

*NIH-NHLBI Brown University; program entitled: "Respiratory Research Training Program (BRRTP)."*

Grant No.: 2 T32 HL134625

Principal Investigator: Elizabeth Harrington  
Total Support = \$72,328 in total direct cost (for 2022-2023).

***Pending:***

2024-2029

Role: **Principal Investigator**

*NIH-Director's Early Investigator Independence Award (DEIIA), Lifespan-RI Hospital's (affiliated with Brown University); project entitled: "Predisposition to ALI/ARDS: A Novel Role for Checkpoint Proteins and Smoking."*

Grant No.:

Total Support = \$200,000 in total direct cost (for 2023-present).

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*Last updated: 9/22/2023*