CAMILA FARIAS AMORIM, PH.D.

Immunology, Computational Biology and Statistical Inference
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CONTACT

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EDUCATION

2014-2017 **Doctor of Immunology, Ph.D., Health Sciences**
Federal University of Bahia, Salvador, Bahia, Brazil

2012-2013 **Master of Immunology, M.S., Health Sciences**
Federal University of Bahia, Salvador, Bahia, Brazil

2008-2011 **Bachelor of Biomedicine, Health Sciences**
Bahia School of Medicine and Public Health, Salvador, Bahia, Brazil

TRAINING AND RESEARCH EXPERIENCE

2023-current **Research Associate, Laboratory of Dr. Phillip Scott, University of Pennsylvania**
Multi-omic profiling of cutaneous leishmaniasis infections
Research focus: I have integrated a multi-omic dataset of patients infected with the parasite *Leishmania braziliensis* (RNA-seq, 16S-seq, bacterial WGS, qPCR, clinical metadata) using linear modeling computational workflows to identify factors contributing to the worse clinical outcome. I've discovered that the skin microbiome strongly contributes to the severity of the disease, and unrevealed IL-1β as a major inflammatory mediator behind this association (Farias Amorim *et al.* Sci Trans Med 2023). This study's results support targeted immunotherapies in the parasitic infection cutaneous leishmaniasis.

2017-2022 **Postdoctoral Researcher, Laboratory of Dr. Phillip Scott, University of Pennsylvania**
Transcriptional profiling of L. braziliensis skin lesions predicts failure of the treatment
Research focus: Most of the patients infected by *L. braziliensis* fail the therapy with an anti-parasitic drug, and there are no vaccines for this infection. My goal was to identify global genetic biomarkers that predict treatment failure. I developed a workflow focused on genes with a highly variable expression between subjects and discovered that the cytotoxic effector mechanism from skin CD8+ T cells and NK cells is the primary inflammatory pathway that affects the response to therapy and can be used as an early biomarker at the clinic. The blockade of this mechanism in experimental models impacted dramatically the control of the disease.

2017-2022 **Postdoctoral Researcher, Laboratory of Dr. Daniel Beiting, University of Pennsylvania**
Main role: NGS analyst and consultant in Health Sciences
Research focus: The CHMI is the Center for Host-Microbe Interactions at the University of Pennsylvania, a core center focused on supporting and collaborating with institutions' laboratories to sequence and investigate datasets from various health science contexts (cancer, auto-immune and infectious diseases). My role was to process RNA-seq files, analyze, develop scalable workflows, and report the findings with biological insights to collaborators.
https://hostmicrobe.org/

2017 **Ph.D. fellowship in Computational Biology, Laboratory of Dr. Phillip Scott and Dr. Daniel Beiting, University of Pennsylvania**
Transcriptional profiling of skin and blood of patients with cutaneous leishmaniasis
Using linear modeling and statistical inference, I sought to profile the transcriptome of patients with cutaneous leishmaniasis to reveal the gene expression patterns associated with clinical variables and outcomes. I identified the local (skin) and systemic (peripheral blood) whole transcriptome pathways activated and repressed by the infection by the parasite *L. braziliensis* (Farias Amorim *et al.* PLoS Negl Trop Dis 2021).

TEACHING

2017-current **Teaching Assistant, Center of Host-Microbiome Interactions (CHMI), University of Pennsylvania**
Course for Transcriptomics data analyses, data modeling and biological interpretation UPenn CAMB714
Course focus: to teach how to investigate bulk and single cell RNA-seq data analysis, using of lightweight and open-source software and the R/bioconductor environment.
DIYtranscriptomics.com

AWARDS AND ACHIEVEMENTS

2017 **Ph.D fellow scholarship award** to develop a scientific research project abroad - by Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES, Brazil)

2022 **WHIP 2022 Travel Award**, Woods Hole Immunoparasitology Group, Marine Biological Laboratory, University of Chicago

PUBLICATIONS

(⊥ indicates corresponding author. *Indicates equal contribution) Google Scholar Profile and Web of Science

First-author publications:

1. **C. Farias Amorim**, V. M. Lovins, T. P. Singh, F. O. Novais, J. C. Harris, A. S. Lago, L. P. Carvalho, E. M. Carvalho, D. P. Beiting, P. Scott⊥, E. A. Grice⊥. Multi-omic profiling of cutaneous leishmaniasis infections reveals microbiota-driven mechanisms underlying disease severity. medRxiv (2023), doi:10.1101/2023.02.02.23285247.
2. F. O. Novais*, **C. F. Amorim***, P. Scott⊥, Host-Directed Therapies for Cutaneous Leishmaniasis. Front. Immunol. 12, 660183 (2021).
3. **C. Farias Amorim**, F. O Novais, B. T. Nguyen, M. T. Nascimento, J. Lago, A. S. Lago, L. P. Carvalho, D. P. Beiting⊥, P. Scott⊥, Localized skin inflammation during cutaneous leishmaniasis drives a chronic, systemic IFN-γ signature. PLoS Negl. Trop. Dis. 15, e0009321 (2021).
4. A. S. F. Berry*, **C. Farias Amorim***, C. L. Berry, C. M. Syrett, E. D. English, D. P. Beiting⊥, An Open-Source Toolkit To Expand Bioinformatics Training in Infectious Diseases. MBio. 12, e0121421 (2021).
5. **C. F. Amorim***, F. O. Novais*, B. T. Nguyen, A. M. Misic, L. P. Carvalho, E. M. Carvalho, D. P. Beiting⊥, P. Scott⊥, Variable gene expression and parasite load predict treatment outcome in cutaneous leishmaniasis. Sci. Transl. Med. 11 (2019), doi:10.1126/scitranslmed.aax4204.
6. **C. F. Amorim**, N. B. Carvalho, J. A. Neto, S. B. Santos, M. F. R. Grassi, L. P. Carvalho, E. M. Carvalho⊥. The Role of NK Cells in the Control of Viral Infection in HTLV-1 Carriers. J. Immunol. Res. 2019, 6574828 (2019).
7. **C. F. Amorim**, L. Galina, N. B. Carvalho, N. D. M. Sperotto, K. Pissinate, P. Machado, M. M. Campos, L. A. Basso, V. S. Rodrigues-Junior, E. M. Carvalho, D. S. Santos⊥. Inhibitory activity of pentacyano(isoniazid)ferrate(II), IQG-607, against promastigotes and amastigotes forms of Leishmania braziliensis. PLoS ONE. 12, e0190294 (2017).
8. **C. F. Amorim**, A. S. Souza, A. G. Diniz, N. B. Carvalho, S. B. Santos, E. M. Carvalho⊥. Functional activity of monocytes and macrophages in HTLV-1 infected subjects. PLoS Negl. Trop. Dis. 8, e3399 (2014).

Collaborative peer-reviewed publications

9. O. A. Pilling, C. A. Grace, J. L. Reis-Cunha, A. S. Berry, M. W. Mitchell, J. A. Yu, C. Malekshahi, E. Krespan, C. K. Go, C. Lombana, Y. S. Song, **C. F. Amorim**, A. S. Lago, L. P. Carvalho, E. M. Carvalho, D. Brisson, P. Scott, D. C. Jeffares, D. P. Beiting⊥. Selective whole-genome amplification reveals population genetics of Leishmania braziliensis directly from patient skin biopsies. PloS Pathogens. In press, 2023.
10. M. T. Nascimento, M. Franca, A. M. Carvalho, **C. F. Amorim**, F. Peixoto, D. Beiting, P. Scott, E. M. Carvalho, L. P. Carvalho⊥. Inhibition of gamma-secretase activity without interfering in Notch signaling decreases inflammatory response in patients with cutaneous leishmaniasis. Emerg. Microbes Infect. 10, 1219–1226 (2021).
11. C. H. Fantecelle, L. P. Covre, R. Garcia de Moura, H. L. de M. Guedes, **C. F. Amorim**, P. Scott, D. Mosser, A. Falqueto, A. N. Akbar, D. C. O. Gomes⊥. Transcriptomic landscape of skin lesions in cutaneous leishmaniasis reveals a strong CD8+ T cell immunosenescence signature linked to immunopathology. Immunology. 164, 754–765 (2021).

12. A. S. F. Berry, K. Johnson, R. Martins, M. C. Sullivan, **C. Farias Amorim**, A. Putre, A. Scott, S. Wang, B. Lindsay, R. N. Baldassano, T. J. Nolan, D. P. Beiting[⊥]. Natural Infection with Giardia Is Associated with Altered Community Structure of the Human and Canine Gut Microbiome. mSphere. 5 (2020), doi:10.1128/mSphere.00670-20.
13. M. Guerra, T. Luna, A. Souza, **C. Amorim**, N. B. Carvalho, L. Carvalho, D. Tanajura, L. S. Cardoso, E. M. Carvalho, S. Santos[⊥]. Local and systemic production of proinflammatory chemokines in the pathogenesis of HAM/TSP. Cell. Immunol. 334, 70–77 (2018).
14. N. B. Carvalho, F. V. de Oliveira Prates, R. de C. da Silva, M. E. F. Dourado, **C. F. Amorim**, P. R. L. Machado, F. G. Pacheco, T. W. F. Corte, P. Machado, D. S. Santos, E. M. de Carvalho[⊥]. In Vitro Immunomodulatory Activity of a Transition-State Analog Inhibitor of Human Purine Nucleoside Phosphorylase in Cutaneous Leishmaniasis. J. Immunol. Res. 2017, 3062892 (2017).
15. A. M. Carvalho, **C. F. Amorim**, J. L. S. Barbosa, A. S. Lago, E. M. Carvalho[⊥]. Age modifies the immunologic response and clinical presentation of American tegumentary leishmaniasis. Am. J. Trop. Med. Hyg. 92, 1173–1177 (2015).
16. A. S. Souza, **C. F. Amorim**, N. Carvalho, S. B. Santos, E. M. Carvalho[⊥]. Impairment of humoral and cellular immune response to tetanus toxoid in HTLV-1 infected individuals. Retrovirology. 11, P66 (2014).

Manuscripts in preparation

17. Singh TP, **Farias Amorim C**, Lovins V, Bradley C, Carvalho LP, Carvalho EM, Grice EA[⊥], Scott P[⊥]. Foxp3+ regulatory T cells limit Staphylococcus aureus colonization and disease severity of cutaneous leishmaniasis. Anticipated publication: 2023.
18. Fowler EE, **Farias Amorim C**, Sacramento L, Yan A, Oliveira CI, Scott P, Novais FO[⊥]. Leishmania lesions license CD8 T cells to be pathogenic by upregulating Blimp-1 expression. Anticipated publication: 2024.
19. Sacramento L, **Farias Amorim C**, Scott P[⊥]. CCR5 mediates CD8+ T cells migration to lesions and can be targeted to improve the treatment of cutaneous leishmaniasis. Anticipated publication: 2024.

CODEOCEAN CAPSULES

2019	Variable gene expression and parasite load predict treatment outcome in cutaneous leishmaniasis. **Farias Amorim C**, Novais FO, Nguyen B, Misic AM, Carvalho LP, Carvalho EM, Beiting DP, Scott P. DOI: 10.244433/CO.5903311.v1
2019	DIYtranscriptomics. Berry ASF, **Farias Amorim C**, Berry CT, English ED, Beiting DP. DOI: 10.24433/CO.8082955.v1

PROFESSIONAL AND LEADERSHIP ROLES

Member of professional societies

2021-current American Society of Immunologists (AAI)

Reviewer

2021-current Frontiers in Cellular and Infection Microbiology (2022-), The Journal of Infectious Diseases (2022-), JID Innovations (2021-)

Leadership roles

2021-current Organizer, Department of Pathobiology Joint Lab Meetings, University of Pennsylvania

TALKS

2022	The skin microbiome enhances transcriptional inflammatory signatures and delays clinical resolution in cutaneous leishmaniasis. 25th Annual Woods Hole Immunoparasitology Conference. Woods Hole, MA, USA
2021	*Staphylococcus aureus* contributes to cutaneous leishmaniasis pathology by stimulating neutrophil skin infiltration and enhancing pro-inflammatory gene expression. 25th Annual Woods Hole Immunoparasitology Conference. Woods Hole, MA, USA
2019	Parasite load and host cytotoxicity-related gene expression are potential biomarkers for treatment outcome. American Society of Tropical Medicine and Hygiene (ASTMH) Meeting. Maryland, USA

2019	Predicting treatment failure in cutaneous leishmaniasis. Tropical Medicine Research Center (TMRC) Meeting. Salvador, Bahia, Brazil
2019	Predicting Treatment Failure in Cutaneous Leishmaniasis. 22nd and 23rd Annual Woods Hole Immunoparasitology Conference. Woods Hole, MA, USA
2016	NK cells cytotoxicity is impaired in HAM/TSP patients. XII International Symposium of HTLV in Brazil and IV Paulista Symposium of HTLV. São Paulo, Brazil
2014	The role of viral factors on monocytes/macrophages activation and function in HTLV-1 infection. XXXIX Congress of the Brazilian Society of Immunology. São Paulo, Brazil

LANGUAGES

- Portuguese
- English
- Spanish