Investigating Leishmaniasis Infection: A Molecular and Clinical Approach

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Introduction

- Laboratory of Molecular Biology of Parasites and Vectors (LBMPV) at Fiocruz, the leading research institution of Latin America and part of Brazil's Ministry of Health.
- Specialized focus in leishmaniasis, a parasitic infection spread by sand flies and considered a neglected tropical disease. Transmission control strategies have been hampered by insecticide resistance, and the few available clinical treatments options are correlated with significant toxicity.

Objectives

- Gain wet lab techniques & clinical experience
- Increase my exposure to global health systems and challenges

Work Profile

- Contributed to ongoing research of a project involving paratransgenesis
- Observed the comprehensive care of and clinical procedures involving patients with leishmaniasis and similar dermatological infections (outpatient clinic, National Institute of Infectiology (INI) at Fiocruz)

LBMPV
IOC-FIOCRUZ

Reflection & Results

Figure A

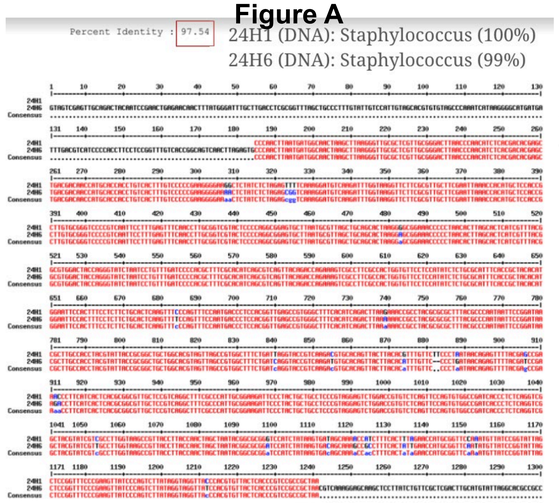
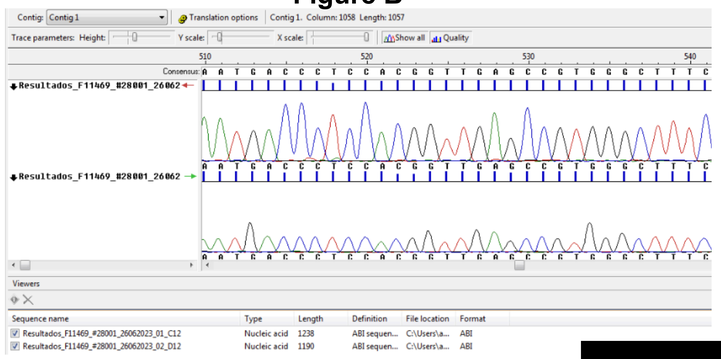


Figure B



Following training in bacterial ribosomal DNA extraction, amplification, purification, and sequencing, I was able to taxonomically identify potential commensal bacteria extracted from the sand fly intestinal midgut by sequencing the ribosomal 16S gene. This identification will be important for selecting cultivable commensal bacteria to then genetically modify so that they express the anti-leishmanial protein melittin.

(A) Alignment of two 16S rDNA gene sequence results, demonstrating both samples belong to the genus *Staphylococcus.*
(B) DNA sequencing chromatogram

In the clinic, I observed the patient impact, clinical progression, and treatment challenges of leishmaniasis. I gained insight into the Brazil's Unified Health System and learned about the myriad barriers restricting access to healthcare for underserved communities in and beyond Rio.

Cutaneous leishmaniasis lesion, healed nearly to completion.

Several laboratory colleagues and I at our *Festa Junina*-themed lab party

My colleagues helped to acquaint me with Brazilian and *carioca* customs and traditions.

Looking Ahead

- Much work remains in developing safer treatments and control strategies for neglected tropical diseases like leishmaniasis.
- I can foresee a more enriching course of study in the global health academic program because of my exposure to laboratory techniques and projects.

Conclusions

Combining both laboratory and clinical experiences, I learned about leishmaniasis from multiple angles, working with the parasites that cause, the sand flies which transmit, and the patients who contract it.
I have taken back with me a deepened understanding of not only health challenges and systems, but also social and cultural values, viewpoints, and experiences.

Acknowledgments

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