



Abstract Submission for Having IMPACTT 3: Advancing Microbiome Research Symposium

July 10-12, 2023

Malcolm Hotel, Canmore, AB, Canada

Presenter Information

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Current Position/Title*	Graduate student

*Mandatory field

Submission Information

What would you like to be considered for?*	<input checked="" type="checkbox"/> Short Talk (10 min + Q&A) <input checked="" type="checkbox"/> Poster Presentation
If you are selected for a Poster Presentation, would you like to be considered for a Flash Talk (3 min)?*	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

*Mandatory field

Note: If you select Short Talk but are not successful, you will automatically be considered for a Poster Presentation

Travel Award

If you're a postdoc or graduate student and would like to be considered for a travel award (\$250 CAD), please check the appropriate box.	<input type="checkbox"/> Postdoctoral Researcher Travel Award <input checked="" type="checkbox"/> Graduate Student Travel Award
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Abstract Information

Title (30 words max.)

Characterization of the archaeal community bound by immunoglobulins in colostrum and newborn feces.

Author List (please add in order of appearance and include affiliations)

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Abstract (300 words max.)

Archaea, the most recently discovered prokaryote lineage, were thought to inhabit only extreme environments until they were isolated from human feces in the early 80s. For instance, the presence of methanogenic archaea has been demonstrated in human milk, meconium, and neonatal stool obtained from healthy donors, suggesting they are pioneer colonizers of the human gut. However, we do not know their mechanisms of colonization. In the case of bacteria, the better-known human-associated prokaryotes, they are coated by maternal immunoglobulins in human colostrum and are vertically transmitted to the newborn during breastfeeding. These bacteria might train the newborn's developing immune system to tolerate specific symbionts that will initiate the colonization in the gut.

Our objective was to describe the taxonomic composition of archaea differentially bound by immunoglobulin A (subclass 1 and 2), G, and M, in human colostrum and neonatal stool. With this purpose, we used monoclonal antibodies to label the immunoglobulin-coated archaea, isolating them as complexes using magnetically activated cell sorting and carrying 16S rRNA amplicon sequencing.

We found that members of the genera *Methanosarcina* and *Methanoculleus* were the most abundant and densely coated archaeal taxa in colostrum and neonatal stool, whereas some taxa appeared to escape immunoglobulin-coating in colostrum but not in the neonatal stool. Interestingly, non-classified archaea are bound by IgM and IgG in colostrum but by IgA1 and IgA2

in stool samples, which suggests differential recognition patterns in colostrum that may shift under the environmental conditions in the newborn's gut. Additionally, functional metagenome prediction shows that while archaea in colostrum are associated to anaerobic respiration (i.e. methanogenesis), nucleotide and amino acid biosynthesis are the most abundant pathways in newborn feces. **Acknowledgments.** Work supported by CONACyT 163235 INFR-2011-01 and CONACyT FORDECYT-PRONACES/6669/2020_Programa Presupuestario F003-Ciencia de Frontera 2019.



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To whom it may concern,

This letter is to confirm that Diana Laura Rojas Guerrero (CINVESTAV, México) attended the **Having IMPACTT 3: Advancing Microbiome Research Symposium** on July 10-12, 2023 in Canmore, Canada and presented a short talk titled *Characterization of the archaeal community bound by immunoglobulins in colostrum and newborn feces*. Diana's abstract can be found on the IMPACTT website [here](#).

Kind regards,

Sydney Morgan, PhD
IMPACTT Education & Communication Coordinator
University of Calgary
Calgary, Canada