

In patients with BJI, 6 and 12 weeks of antimicrobial therapy seems to have a similar impact on the gut microbiota and no particular antibiotic seems to impact its recovery

Tristan Ferry, MD, PhD

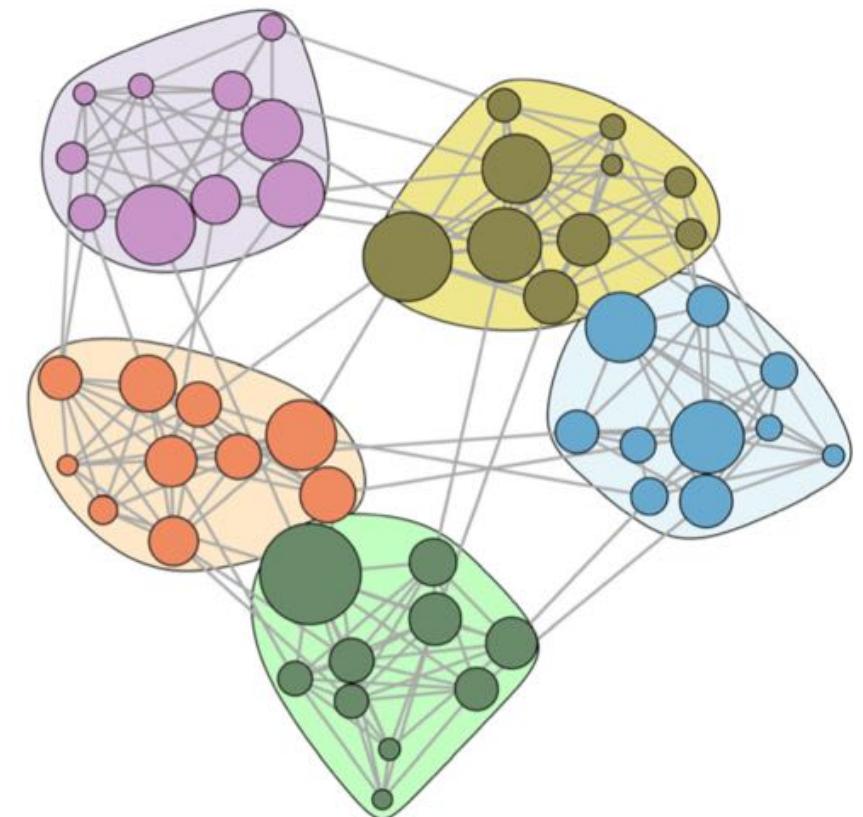
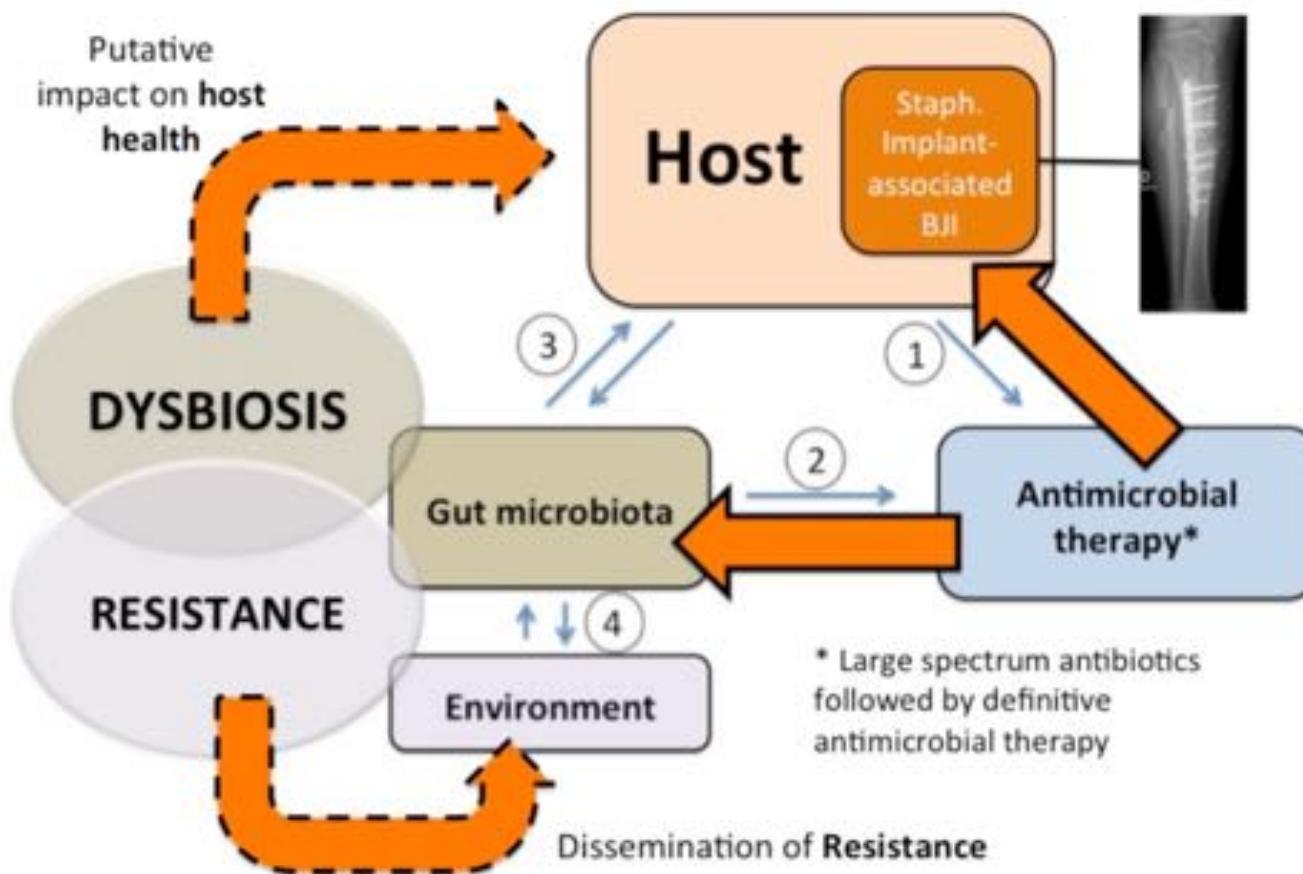
tristan.ferry@univ-lyon1.fr

Infectious and Tropical Diseases Unit, Croix-Rousse Hospital , Hospices Civils de Lyon, Claude Bernard Lyon1 University, Lyon
Centre International de Recherche en Infectiologie, CIRI, Inserm U1111, CNRS UMR5308, ENS de Lyon, UCBL1, Lyon, France
Centre de Référence des IOA complexes de Lyon (CRIOAc Lyon)

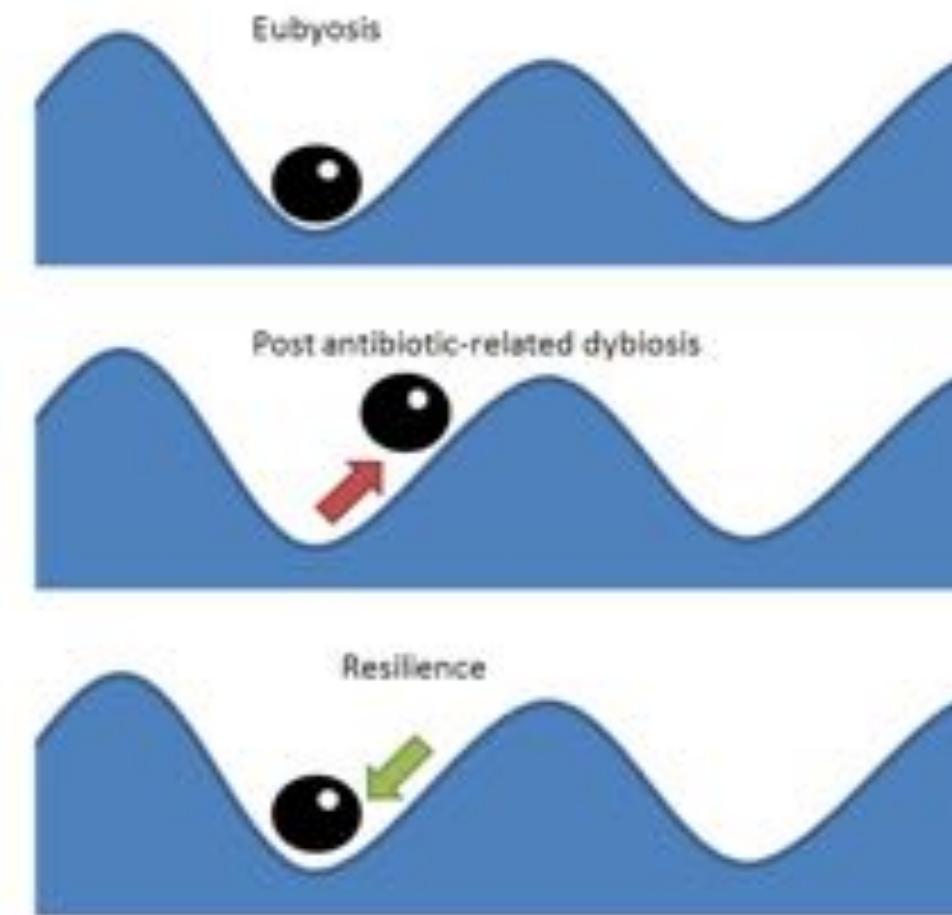
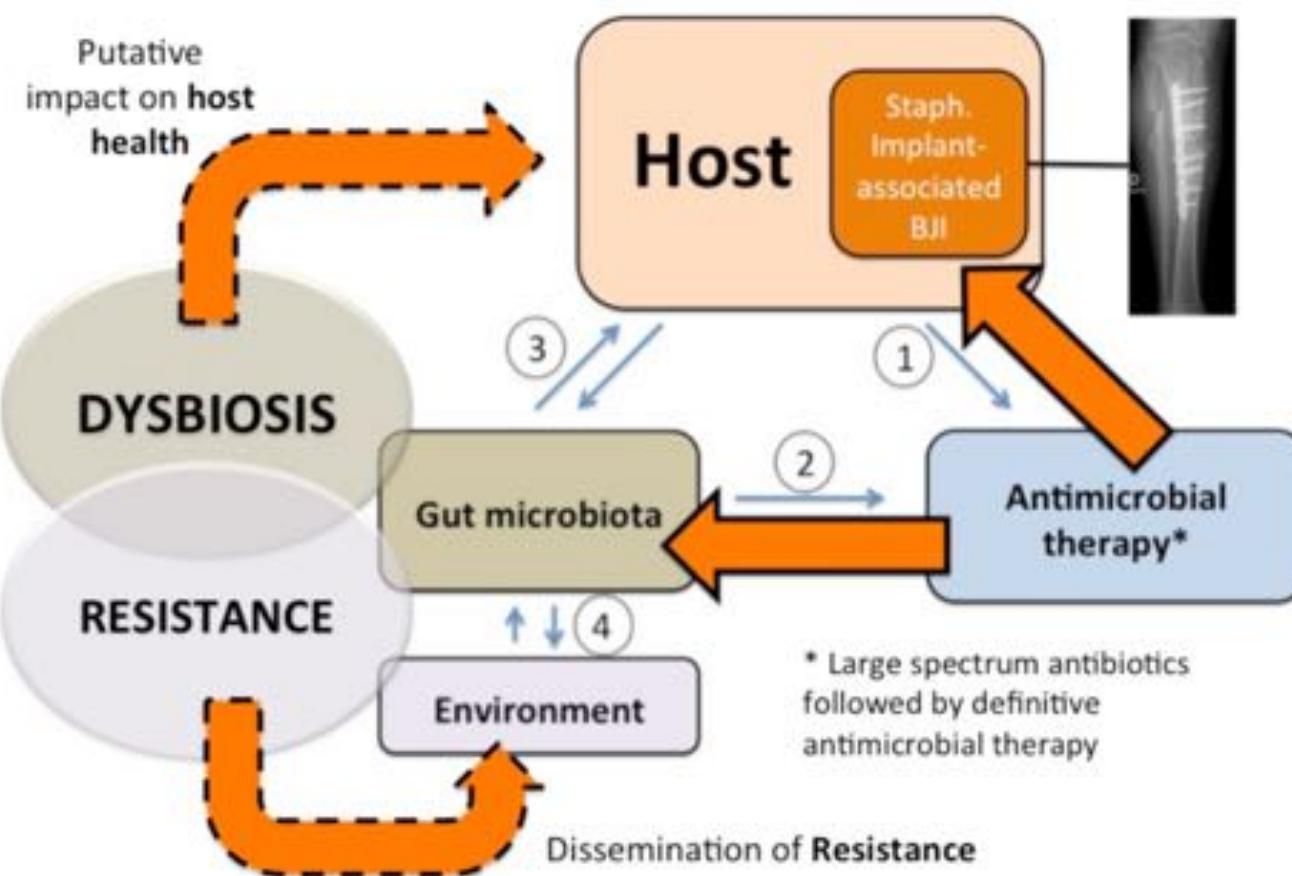
Levast B, Benech N, Gasc C, Batailler C, Senneville E, Lustig S, Pouderoux C, Boutoille D,
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Ferry T. Front. Medicine 2021



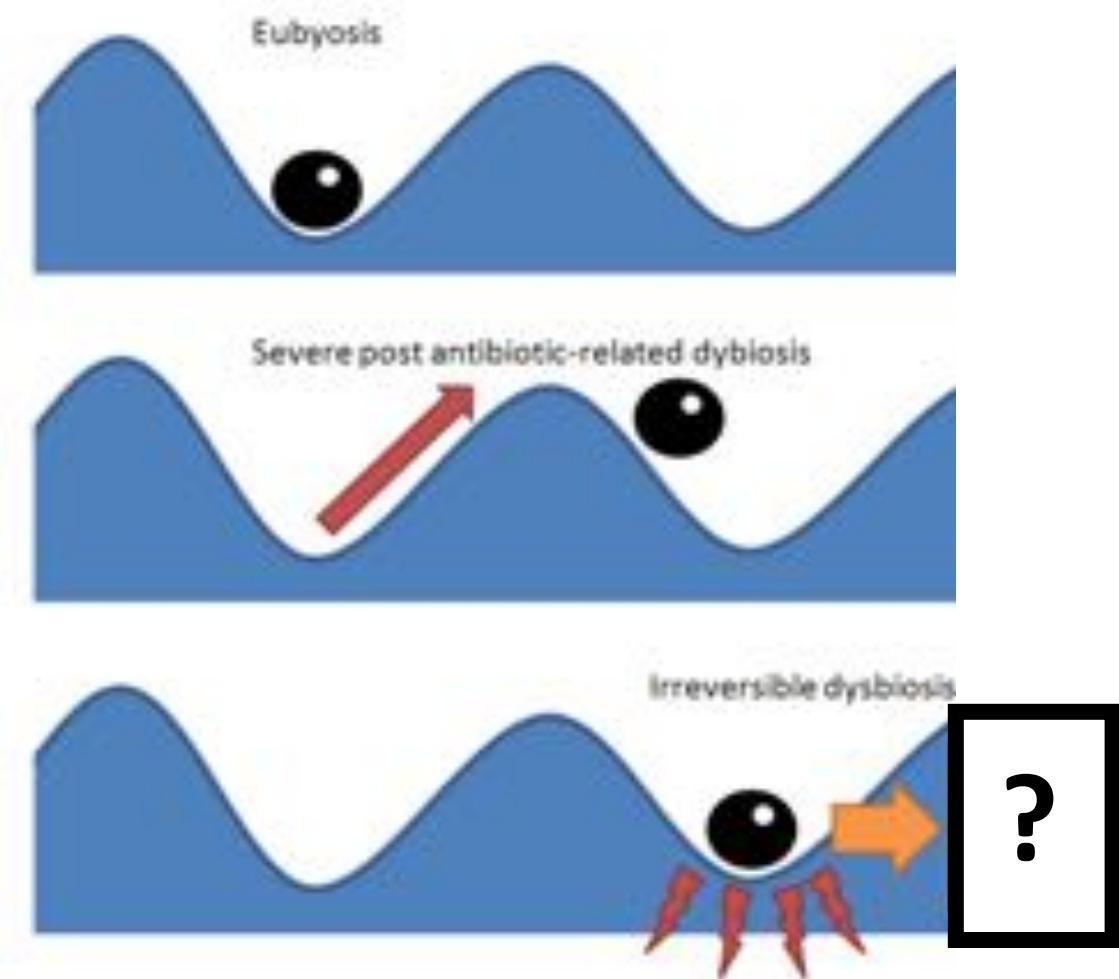
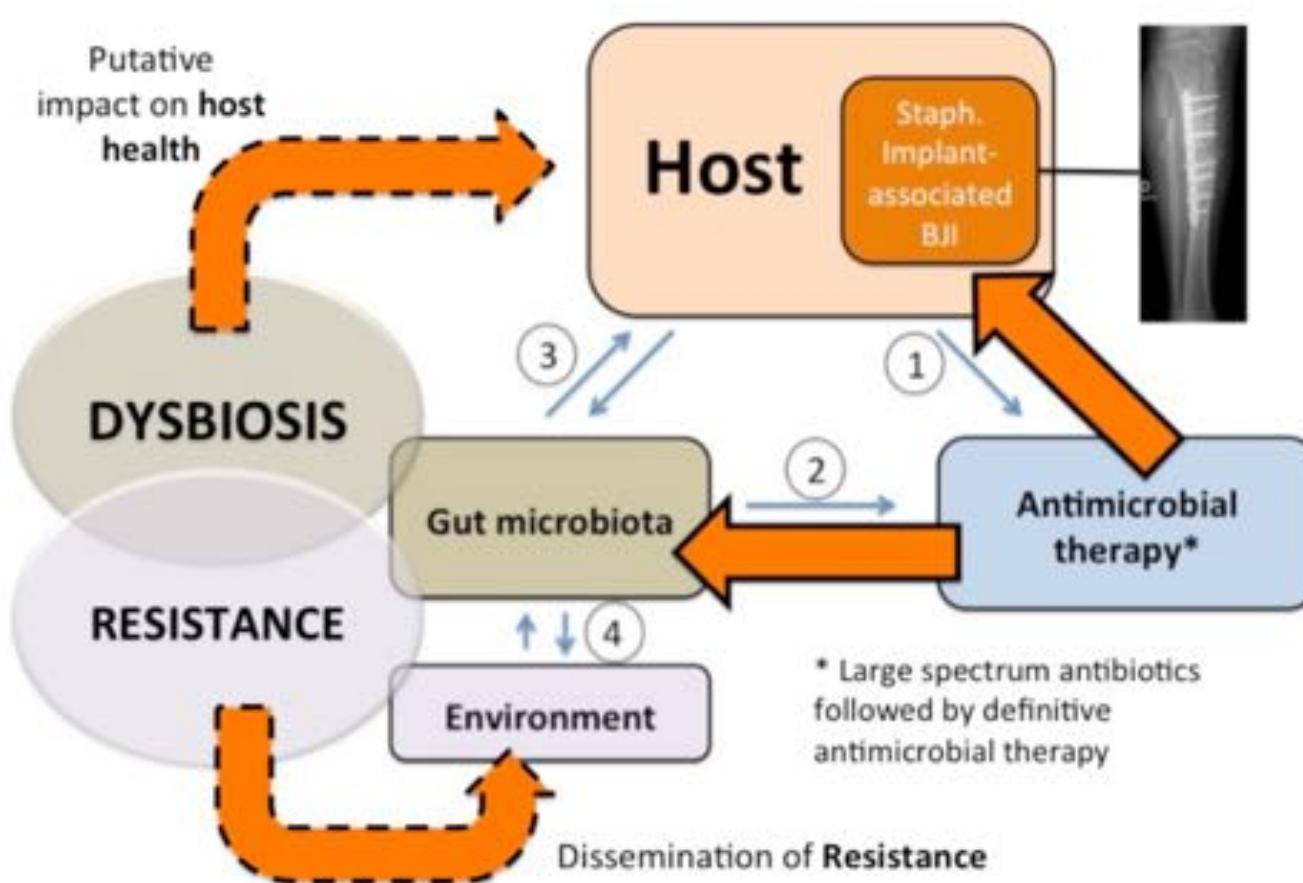
Antimicrobial therapy and gut microbiota



Antimicrobial therapy and gut microbiota

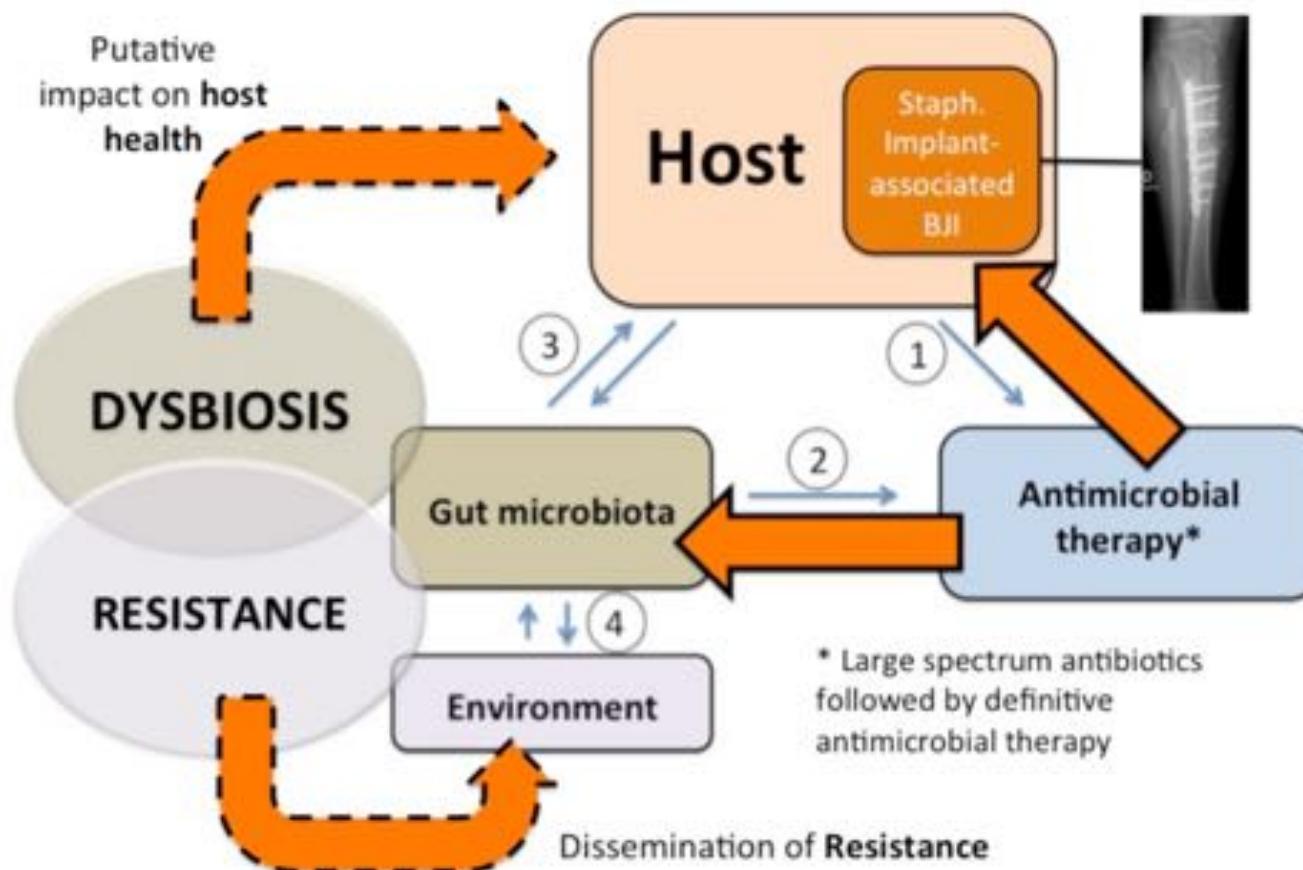


Antimicrobial therapy and gut microbiota



Relman DA. JAMA 2015

Antimicrobial therapy and gut microbiota



Antibiotics could be also associated with:

- Diarrhea and/or
- *C. difficile* infection and/or
- Acquisition of multidrug-resistant bacteria carriage
- Long-term impact of dysbiosis?

Dethlefsen et al. PNAS 2011

Jernberg et al. ISME 2007

Nguyen et al. Lancet Gastro 2020

Trasande et al. Int. J. Obes 2013

Frost et al. Gut 2021

Antimicrobial therapy and gut microbiota

- Previous studies with low sample size
- Short duration of antimicrobial therapy
 - Diarrhea and/or
- Impact of prolonged antibiotic exposure on the gut microbiota in patients with BJI has never been assessed
- Fluoroquinolones may negatively influence the resilience



en et al. PNAS 2011
erg et al. ISME 2007

Nguyen et al. Lancet Gastro 2020

Trasande et al. Int. J. Obes 2013

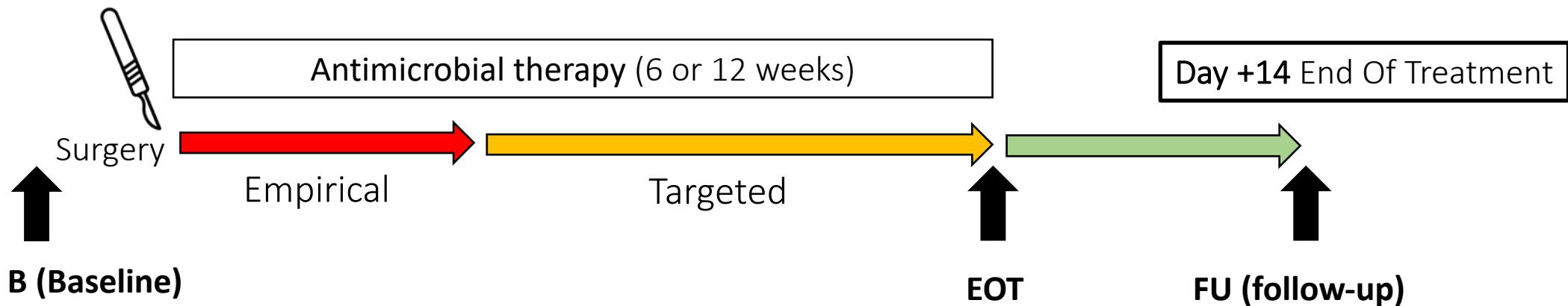
Frost et al. Gut 2021

InterventiOnal Study of Bone and Joint Infections Related Gut dysbiosIS (OSIRIS)

Multicenter observational study in CRIoAc network in France (5 centers)

Inclusion period: January to september 2017

Inclusion criteria: patients with a BJI for whom a 6 to 12 weeks of antibiotics were planned

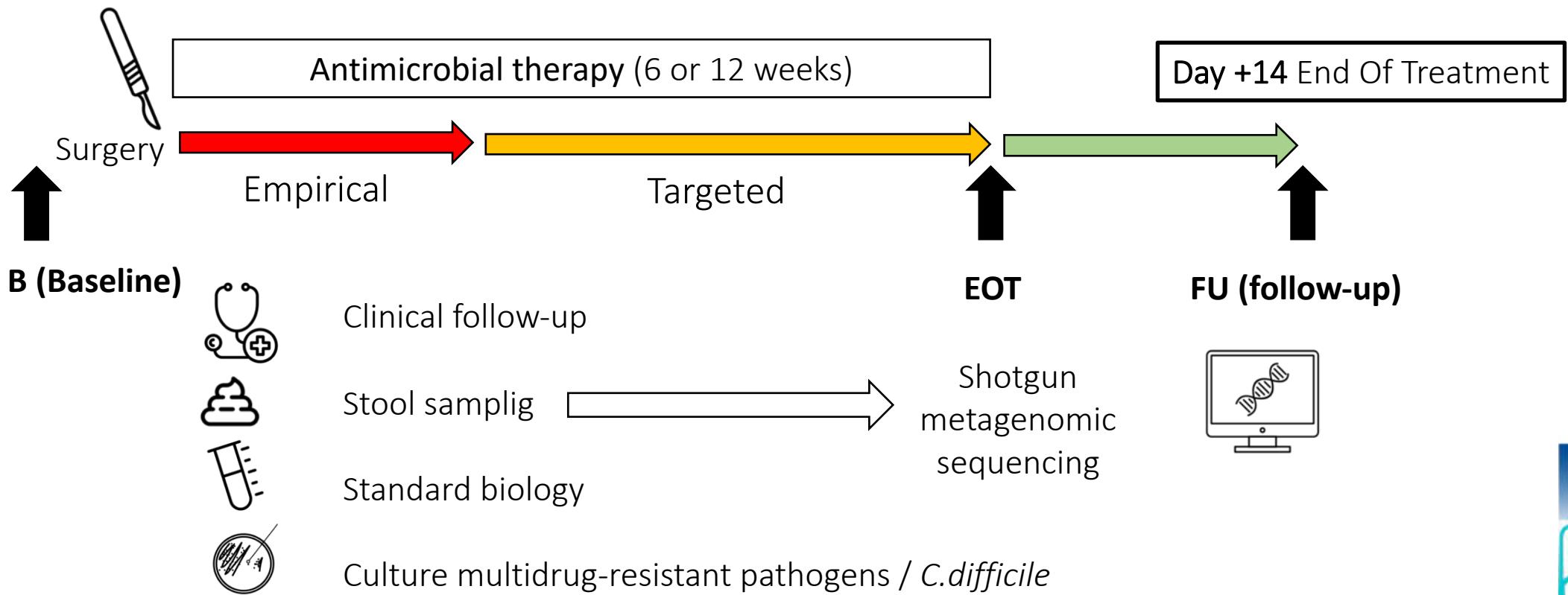


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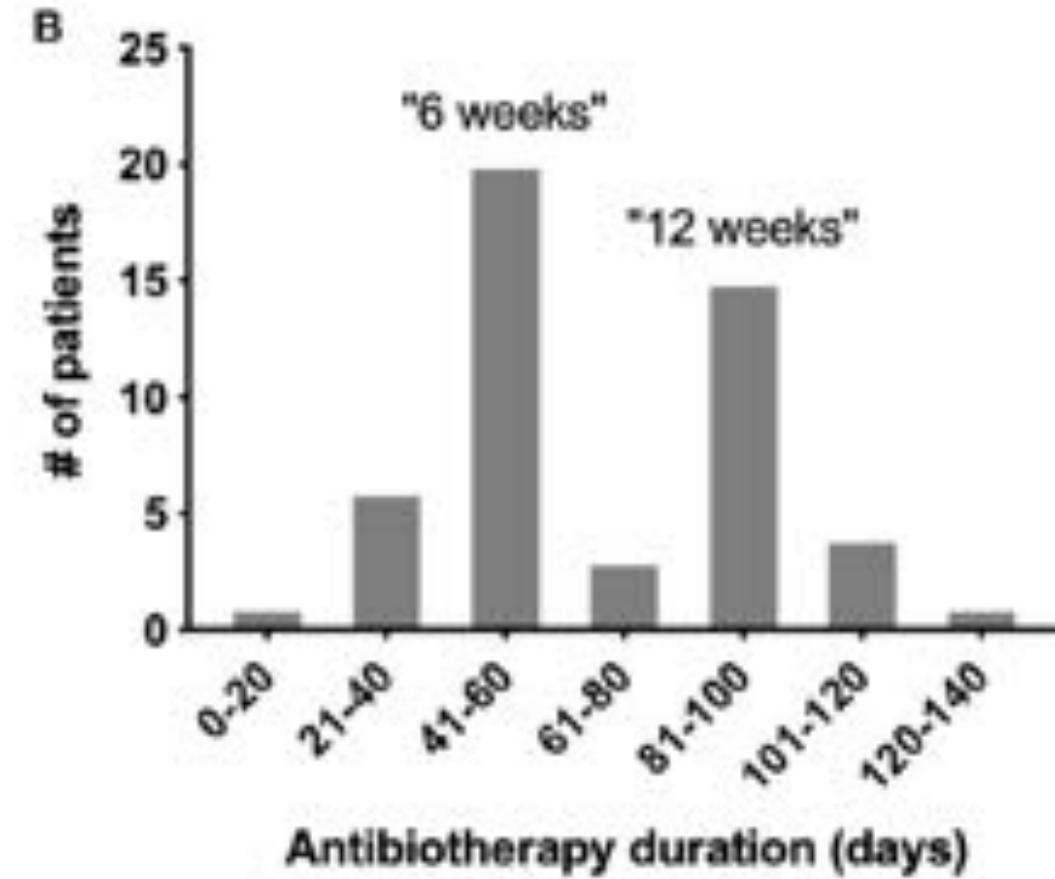
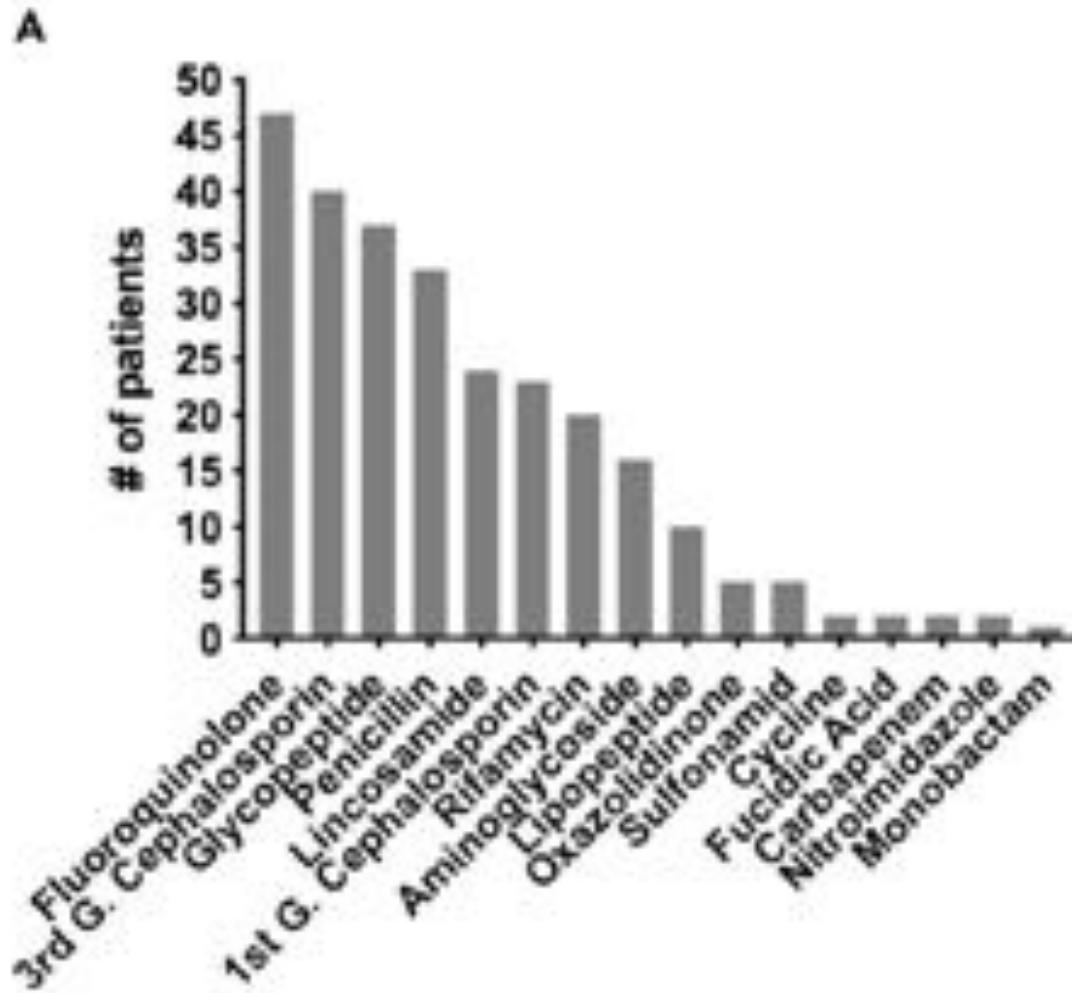
Patients' characteristics

BJI population	Native BJI (n = 27)	Osteosynthesis-related BJI (n = 14)	PJI (n = 21)	Total (n = 62)
Male (n, %)	17 (63)	10 (71.5)	13 (62)	40 (64.5)
Age (years) ^a	56.1 (13.2)	51.8 (17.6)	65.3 (9.1)	58.6 (14.1)
Antibiotic duration (days) ^a	58.8 (26.7)	69.8 (28.4)	69.3 (27.4)	64.5 (27.8)
BMI (mean) ^a	26.6 (6.5)	28.1 (5.8)	29.5 (7.0)	27.5 (6.6)
MDRB carriage at baseline (n, %)				
- MRSA	3 (11.1)	1 (7.1)	5 (23.8)	9 (14.5)
- ESBL-producing	0	0	0	0
- Enterobacteriaceae	3 (11.1)	1 (7.1)	5 (23.8)	9 (14.5)
- HREB	0	0	0	0
Clostridioides difficile carriage at baseline (n, %)	1 (3.7)	0	0	1 (1.6)

^aData are expressed as mean (standard deviation).

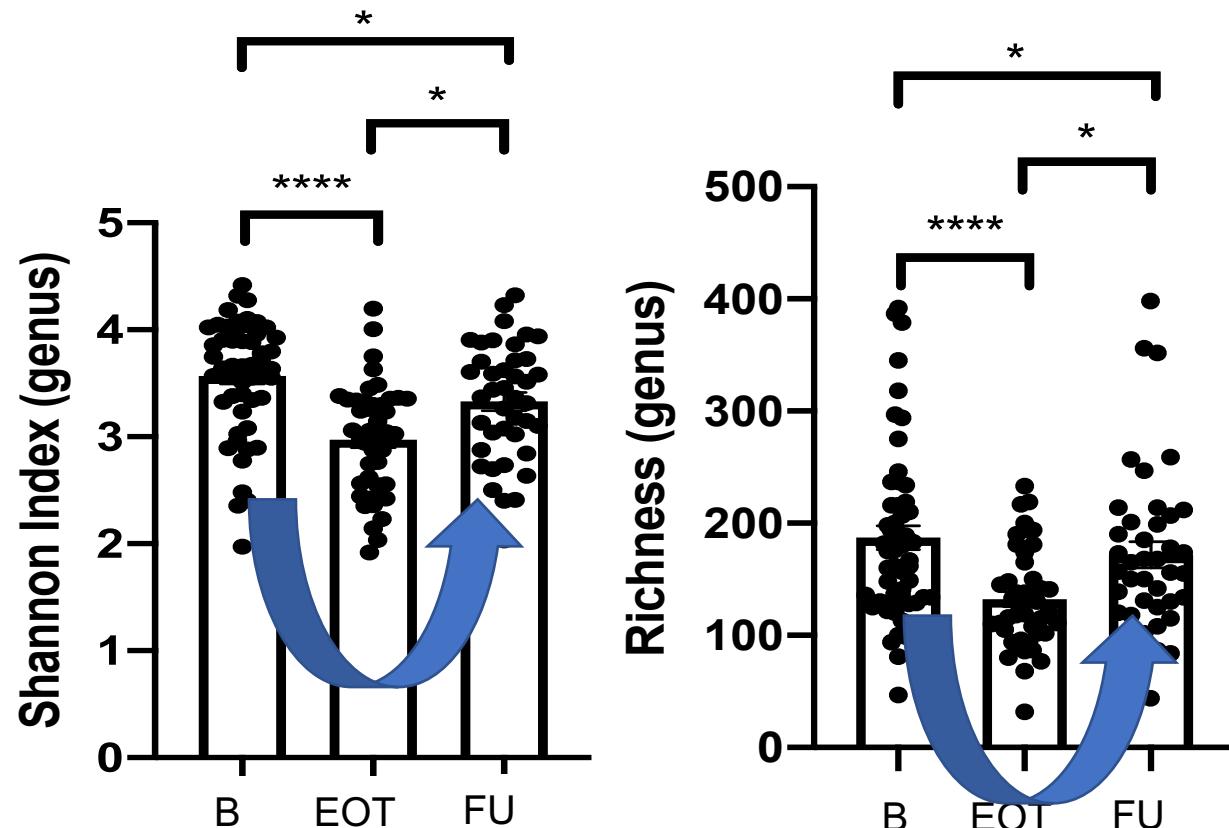
BJI, bone joint infection; PJI, prosthesis joint infection; BMI, body mass index; MDRB, multidrug-resistant bacteria; MRSA, methicillin-resistant *Staphylococcus aureus*; ESBL, extended-spectrum beta-lactamases; HREB, highly resistant emergent bacteria.

Type of antibiotics and duration

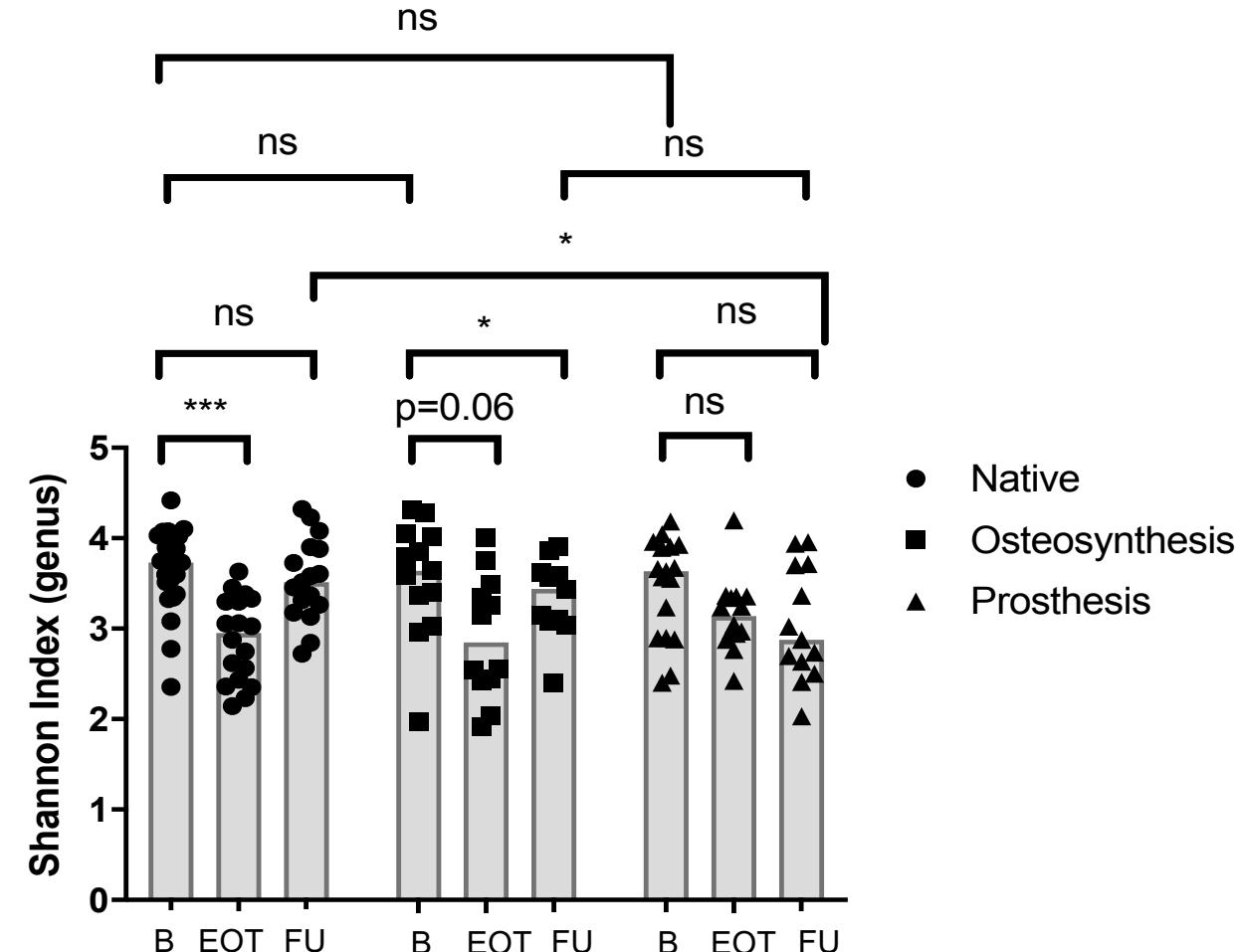


Early resilience after the end of antibiotics

All patients



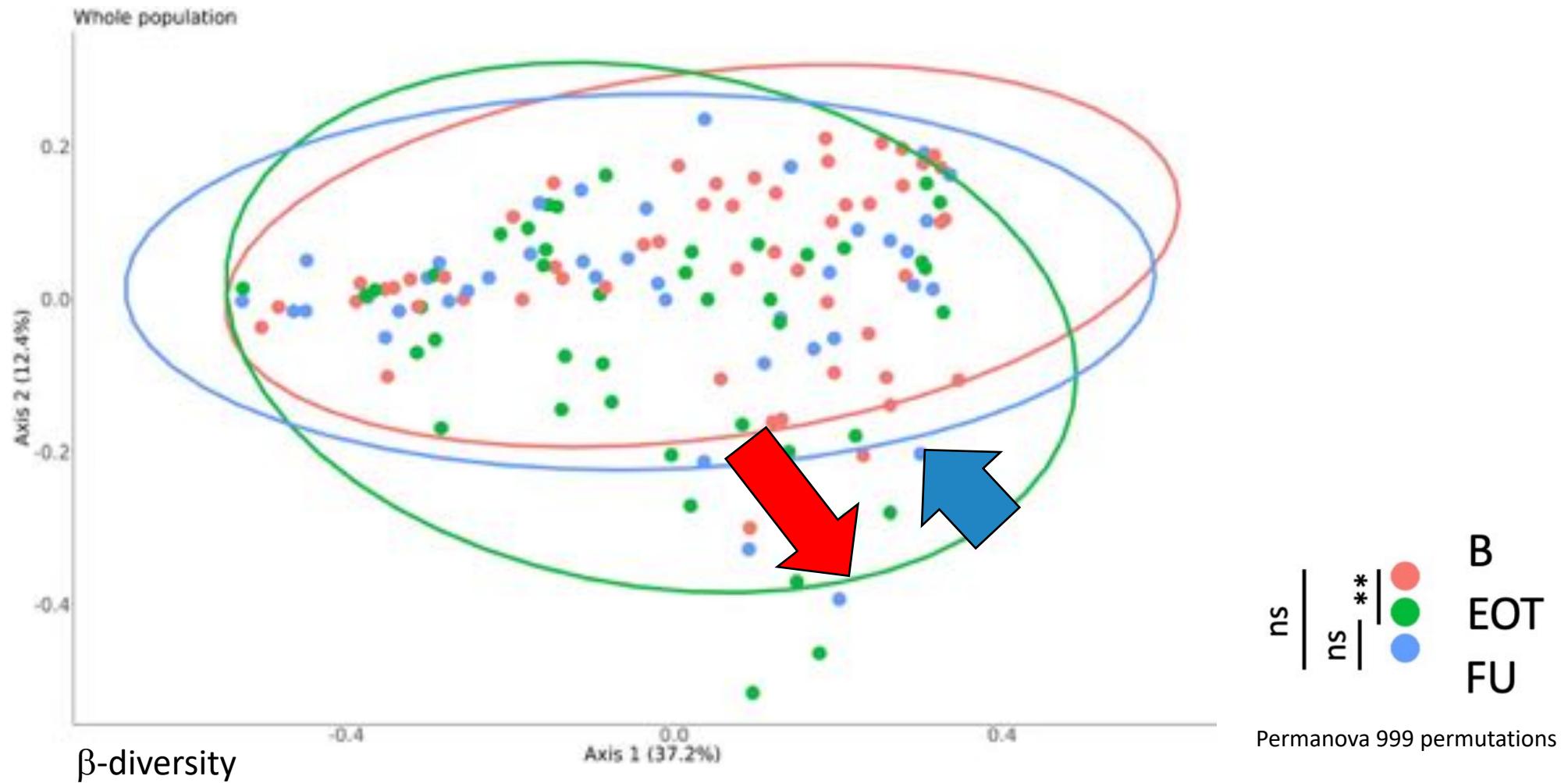
Depending on the BJJ type



Early resilience after the end of antibiotics

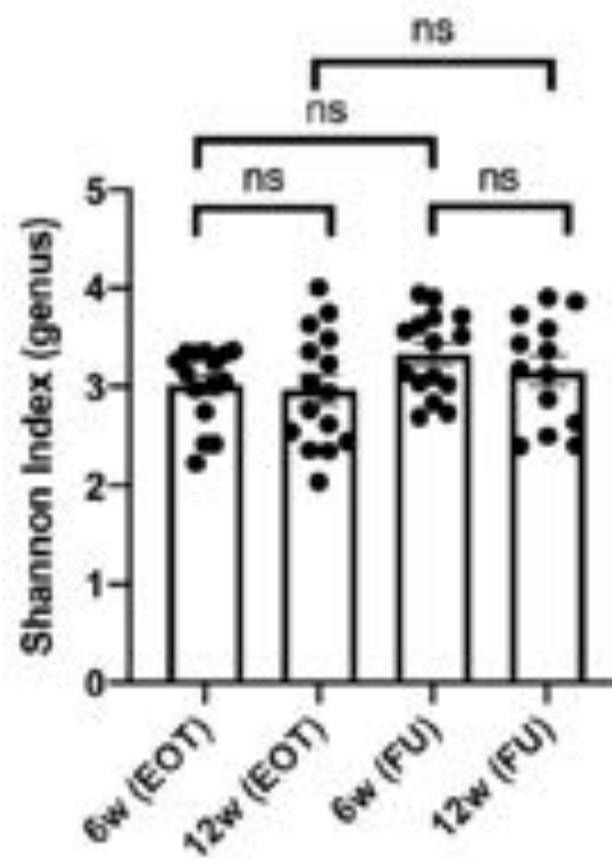
All patients

Bray Curtis distance (genus)

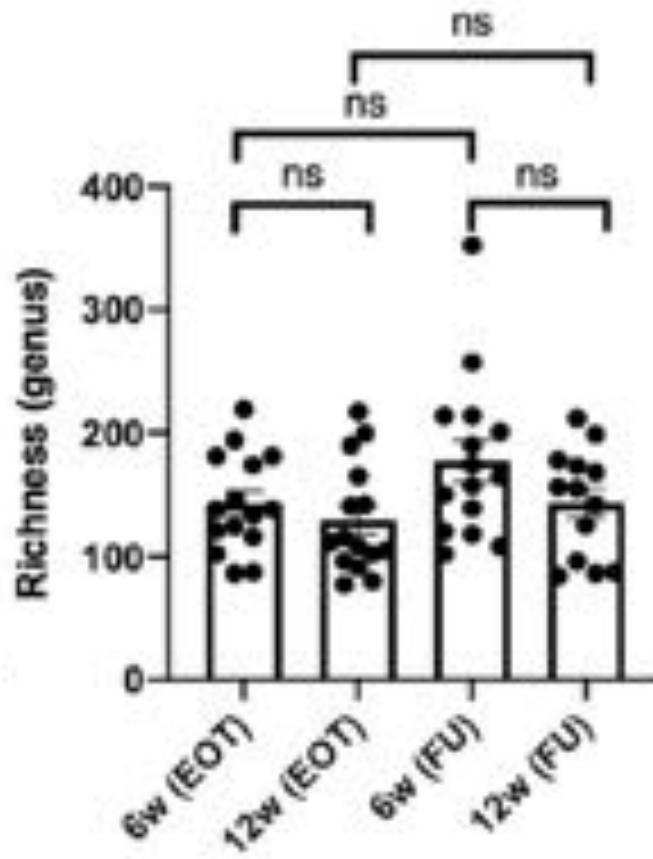


No difference between 6 weeks and 12 weeks

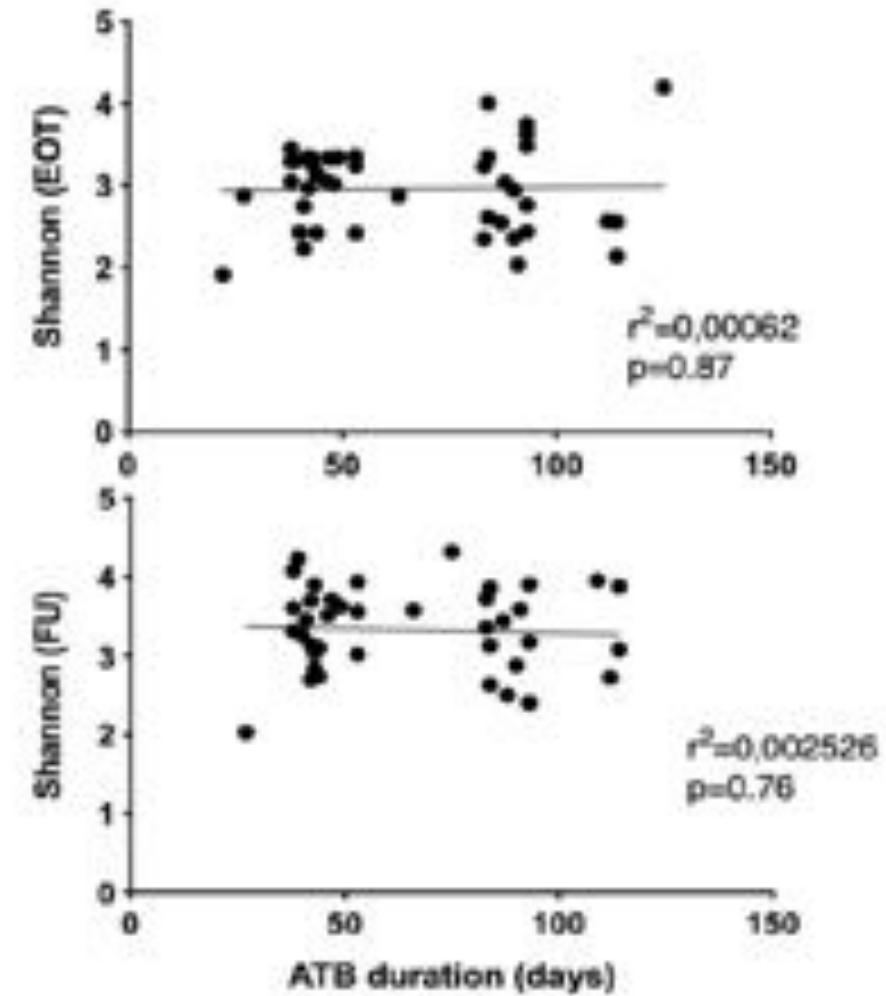
A



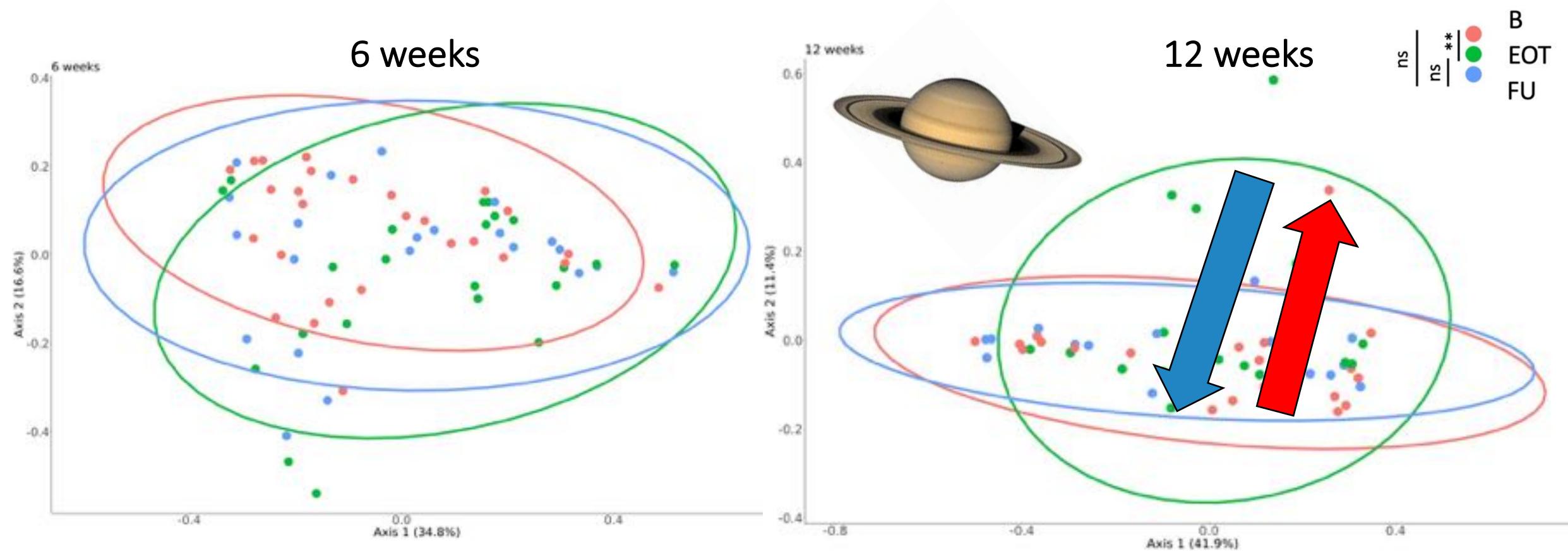
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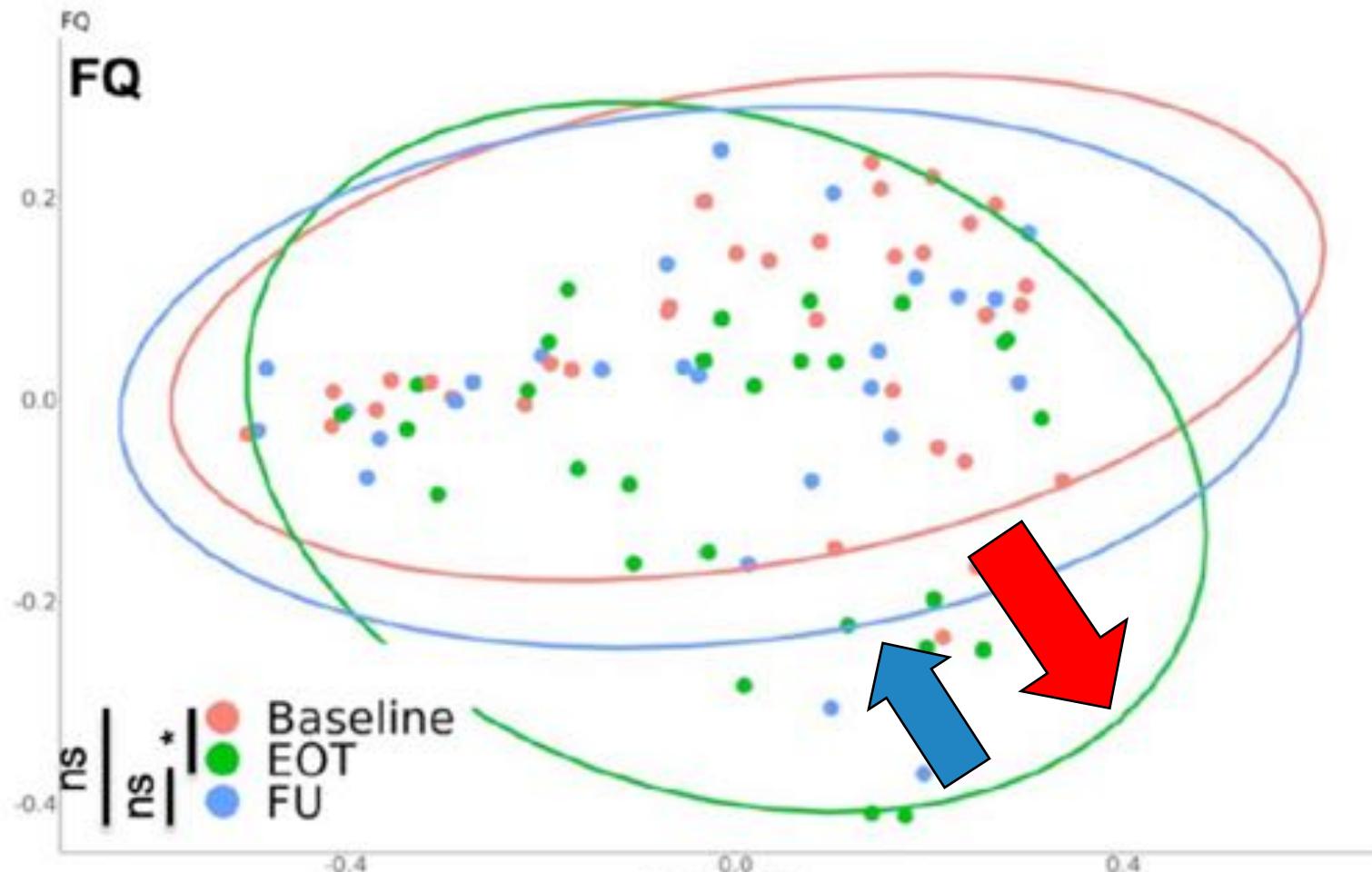
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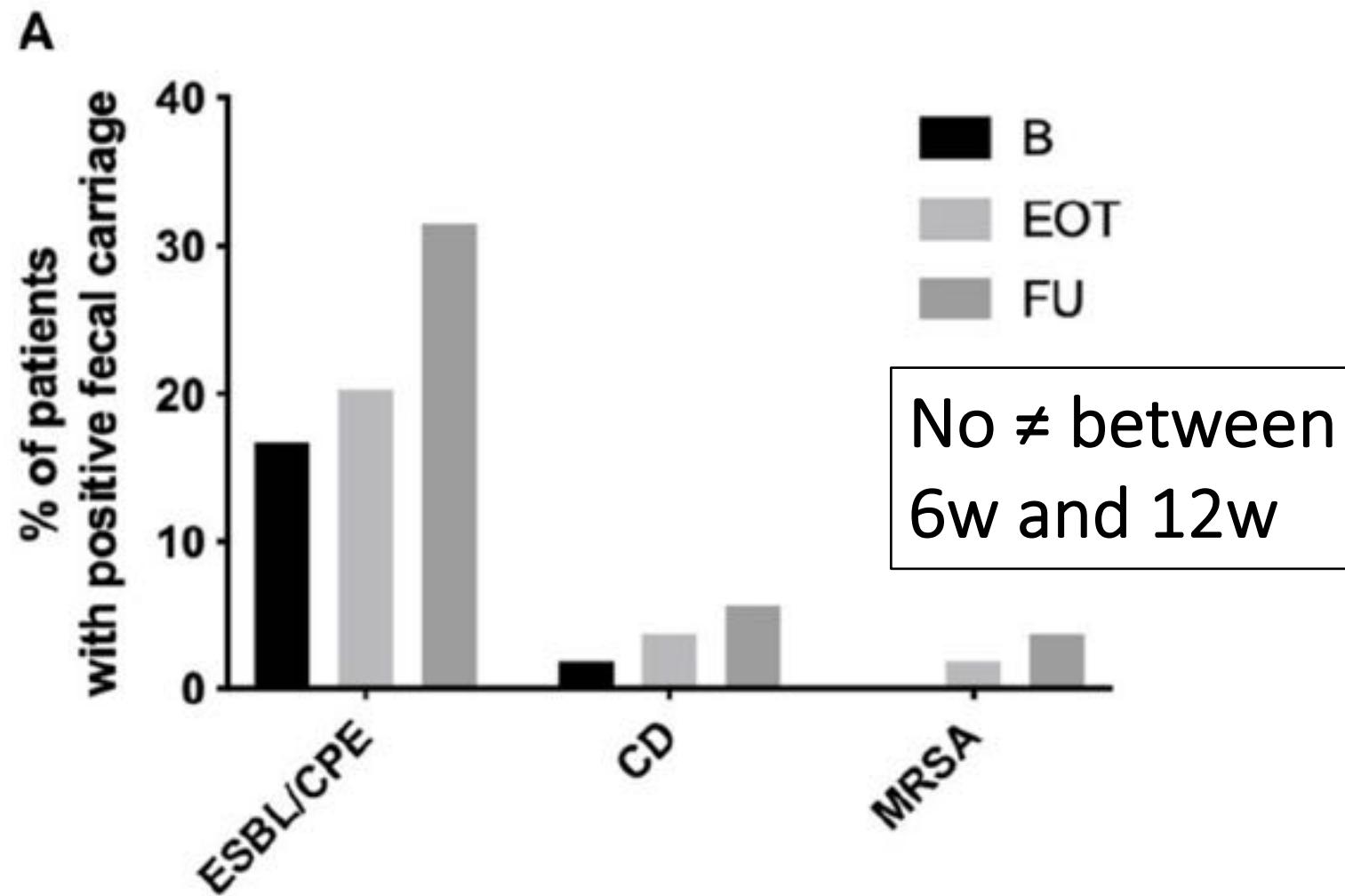
No difference between 6 weeks and 12 weeks



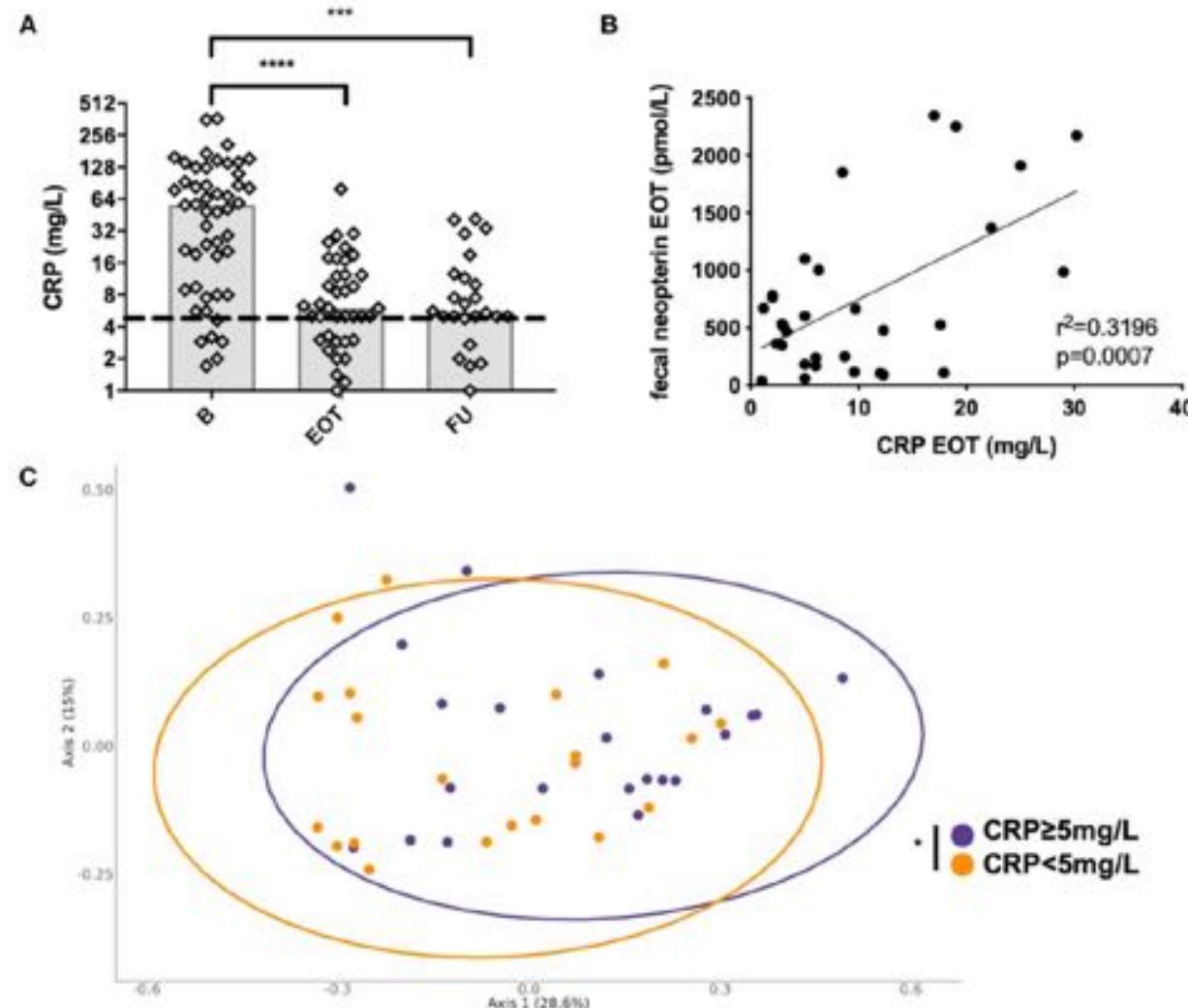
No impact of the use of fluoroquinolones



Acquisition of multidrug-resistant pathogens

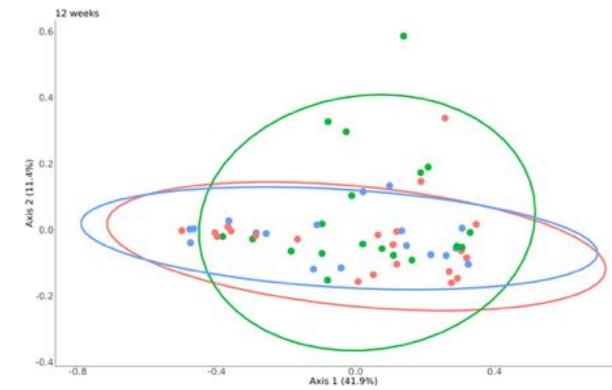


Elevated CRP at EOT might reflect persistent alteration of the gut microbiota



Conclusion

- In patients with BJI:
 - Antibiotics altered the gut microbiota diversity and composition
 - But with early resilience two weeks after antibiotic withdrawal, independently on the duration of the therapy and on the type of the antibiotic used
 - Elevated CRP at EOT might reflect persistent alteration of the gut microbiota
 - Assessment of long-term impact after the end of treatment is on-going



Lyon BJI Study group

Coordinator: Tristan Ferry

Infectious Diseases Specialists – Tristan Ferry, Florent Valour, Thomas Perpoint, Florence Ader, Sandrine Roux, Agathe Becker, Claire Triffault-Fillit, Anne Conrad, Cécile Pouderoux, Pierre Chauvelot, Paul Chabert, Johanna Lippman, Evelyne Braun

Surgeons – Sébastien Lustig, Elvire Servien, Cécile Batailler, Stanislas Gunst, Axel Schmidt, Elliot Sappey-Marinier, Quentin Ode, Michel-Henry Fessy, Anthony Viste, Jean-Luc Besse, Philippe Chaudier, Lucie Louboutin, Adrien Van Haecke, Marcelle Mercier, Vincent Belgaid, Aram Gazarian, Arnaud Walch, Antoine Bertani, Frédéric Rongieras, Sébastien Martres, Franck Trouillet, Cédric Barrey, Ali Mojallal, Sophie Brosset, Camille Hanriat, Hélène Person, Philippe Céruse, Carine Fuchsmann, Arnaud Gleizal;

Anesthesiologists – Frédéric Aubrun, Mikhail Dziadzko, Caroline Macabéo, Dana Patrascu;

Microbiologists – Frederic Laurent, Laetitia Beraud, Tiphaine Roussel-Gaillard, Céline Dupieux, Camille Kolenda, Jérôme Josse;

Imaging – Fabien Craighero, Loic Boussel, Jean-Baptiste Pialat, Isabelle Morelec;

PK/PD specialists – Michel Tod, Marie-Claude Gagnieu, Sylvain Goutelle;

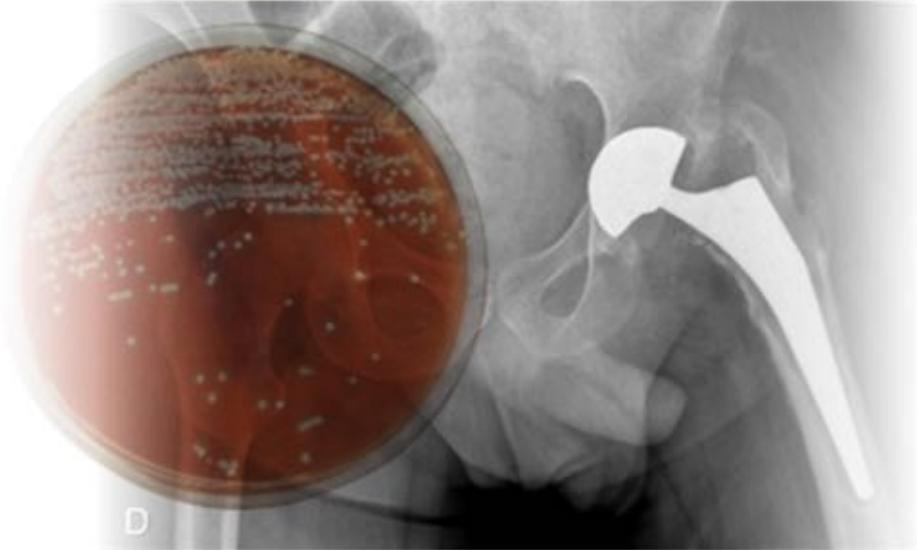
Clinical research assistant and database manager– Eugénie Mabrut



Croix-Rousse Hospital



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Guest international speakers

J. Parvizi
O. Cornu



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