LIVER BACTERIAL COLONIZATION IN PATIENTS WITH OBESITY AND GUT DYSBIOSIS

Lucia Paiano, *Giuseppina Campisciano, Biagio Casagranda, Manola Comar, Nicolò de Manzini, Silvia Palmisano*

University of Trieste- Surgical Clinic Unit,

Cattinara Hospital, ASUGI

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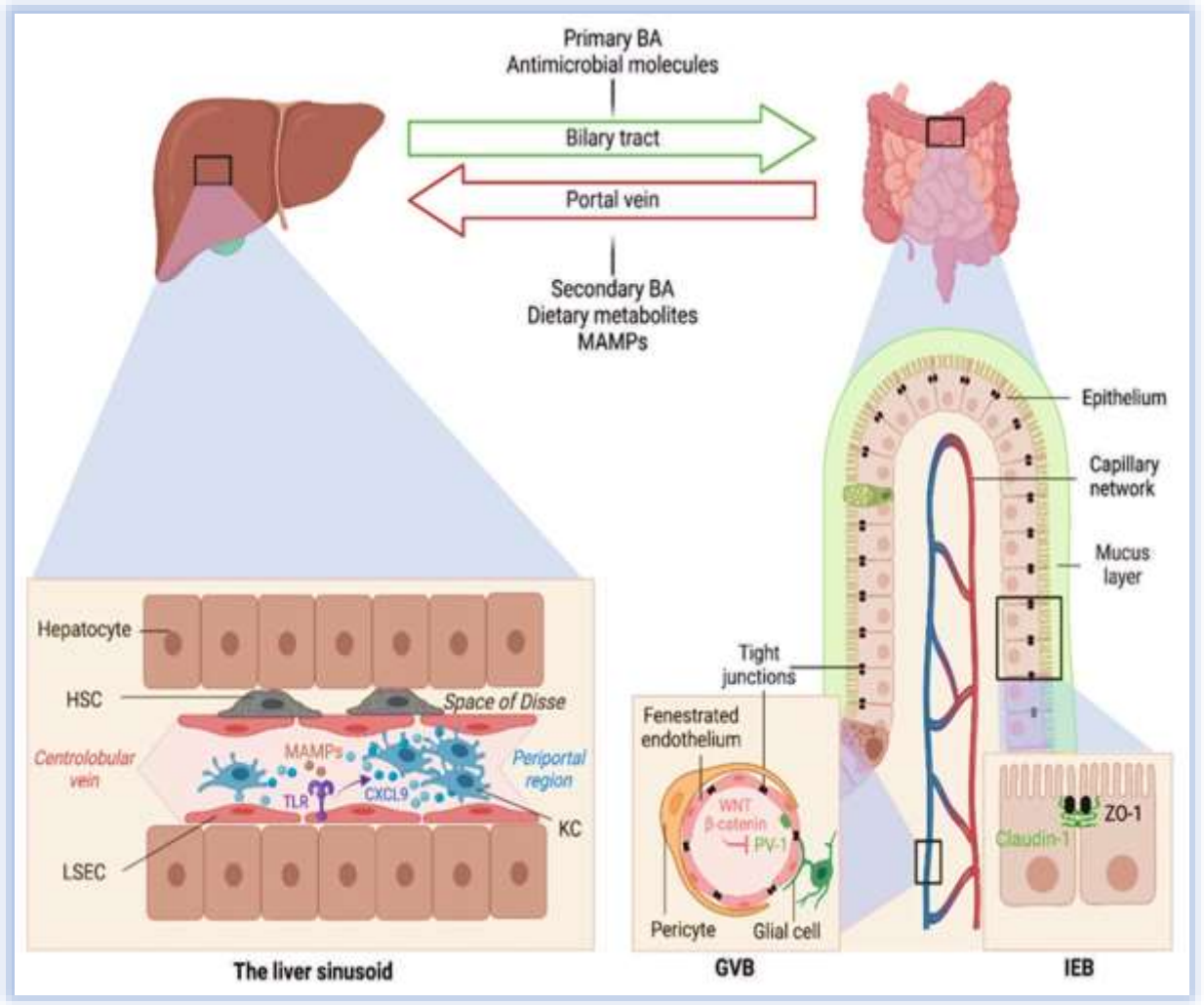
Background:

Link between

- ❑ Gut microbiota,
- ❑ Obesity
- ❑ Liver inflammation

FOCUS OF RESEARCH



Obesity → chronic dysbiosis gut microbiota

Gut Microbiota Dysbiosis in Human Obesity: Impact of Bariatric Surgery
Jean Debédat et al ***Curr Obes Rep 2019***

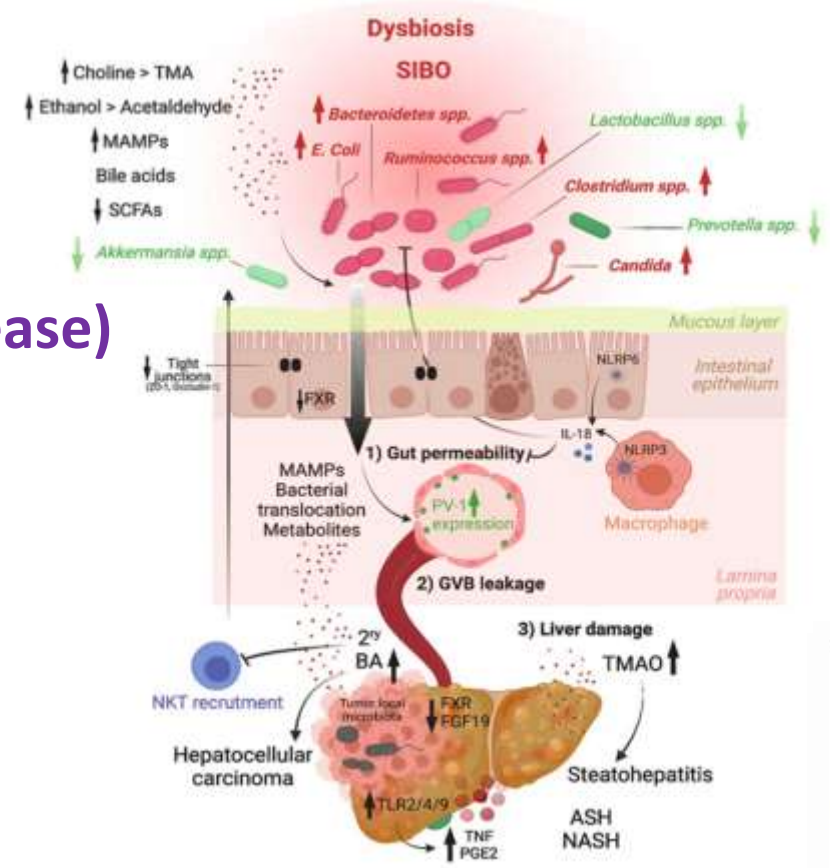
Background:

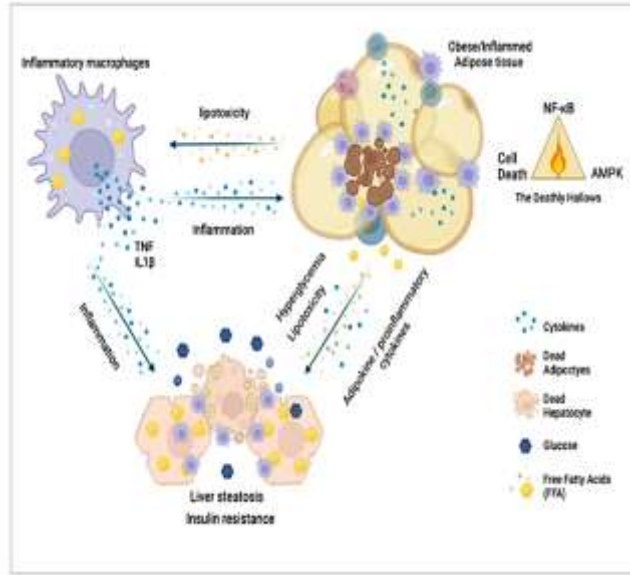
In the inflammatory status

(Obesity → chronic inflammatory disease)

Gut permeability

Translocation of MAMPs an DAMPs
(microbial and danger associated molecular pattern)
from the gut to the liver





Cell death and inflammation during obesity: "Know my methods, WAT(son)
Ximena Hildebrandt et al ***Nature Sep 2022***

Host–Microbiota Interactions in Liver Inflammation and Cancer
Julie Giraud et al ***Cancer 2021***

PubMed

NO studies that demonstrate the presence of the bacterial genome in obese patients liver biopsy.

AIMs OF THE STUDY:

- **Search for BACTERIAL GENOMA IN LIVER BIOPSY (neither MAMPs nor DAMPs)**
- Compare the bacterial genome founded in the **liver with gut** microbiota composition in fecal samples (gut-liver axis)

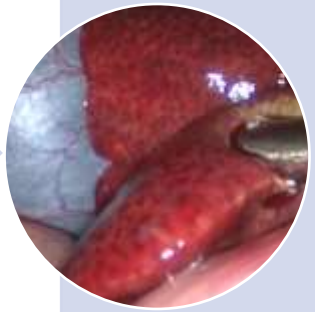
Methods:

Prospective study → Enrollement patients undergoing bariatric surgery consequently .
Signature of informed consent, collection anamnestic/anthropometric information.

Patients data

Stool samples

Day before surgery



Laparoscopic liver biopsy

V3-16S rRNA region sequencing
Ion Torrent new generation sequencing platform

Results:

n= 23 patients
Stools samples and liver biopsy

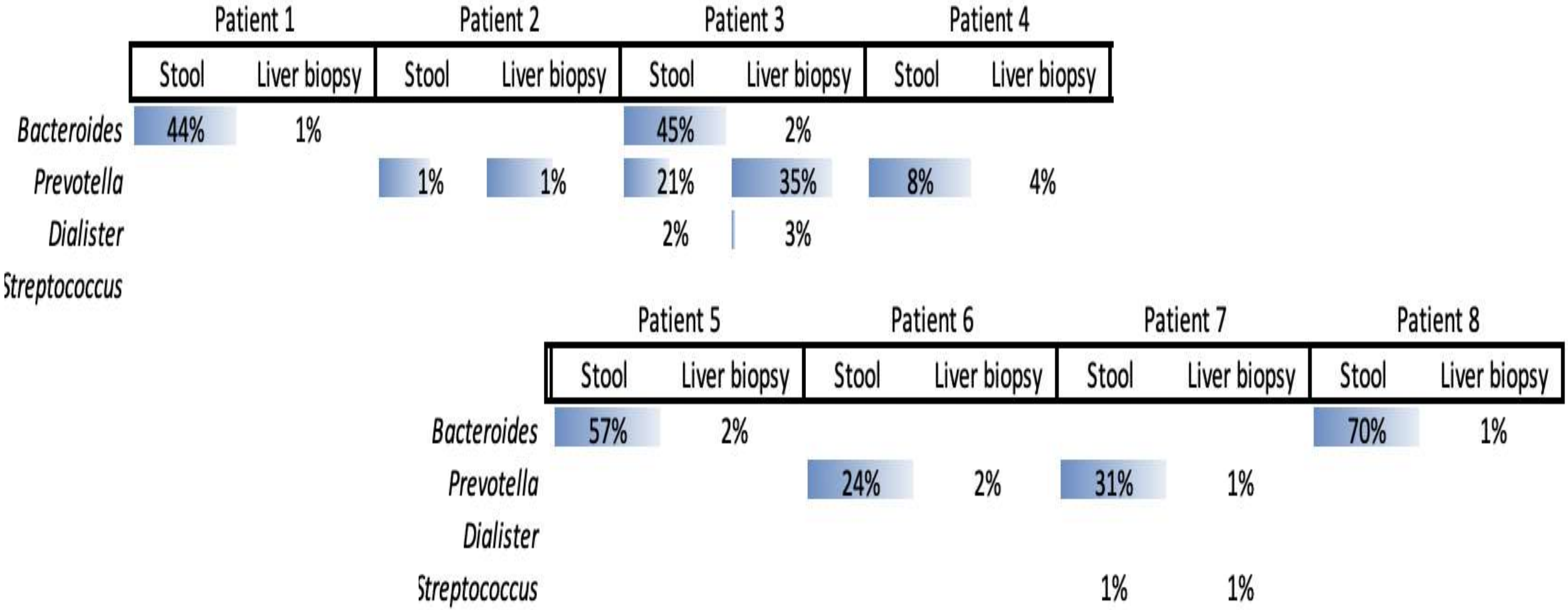
V3-16S rRNA region sequencing

n=8 patients (34,7%)
The same bacterial genoma in stools samples and in liver biopsy

n=15 patients (65,3%)
Baterial genoma only in stools samples

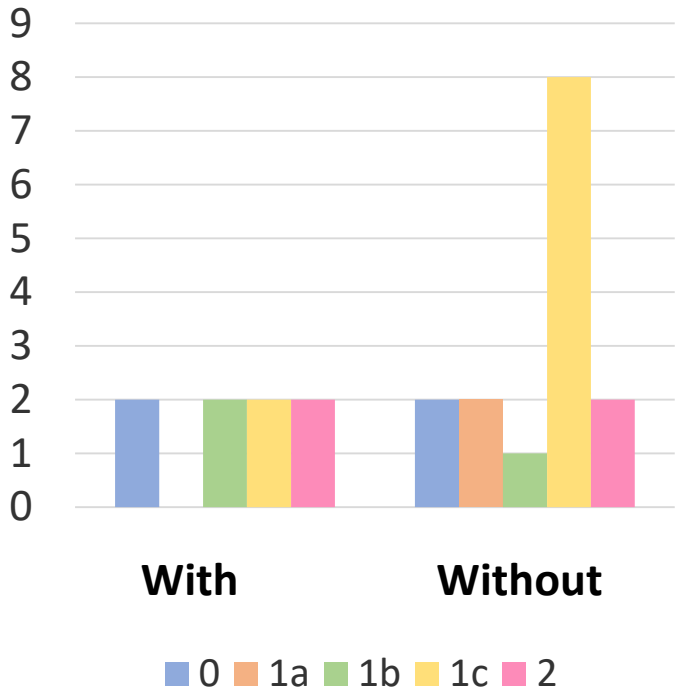
Prevotella (62,5%), Bacterioides (50%), Dalister (12,5%), Streptococcus (12,5%)

Results:


Patient 1
Patient 2
Patient 3
Patient 4
Stool
Liver biopsy
Stool
Liver biopsy
Stool
Liver biopsy
Stool
Liver biopsy
Bacteroides
44%
1%
45%
2%
Prevotella
1%
1%
21%
35%
8%
4%
Dialister
2%
3%
Streptococcus
Patient 5
Patient 6
Patient 7
Patient 8
Stool
Liver biopsy
Stool
Liver biopsy
Stool
Liver biopsy
Stool
Liver biopsy
Bacteroides
57%
2%
70%
1%
Prevotella
24%
2%
31%
1%
Dialister
Streptococcus
1%
1%

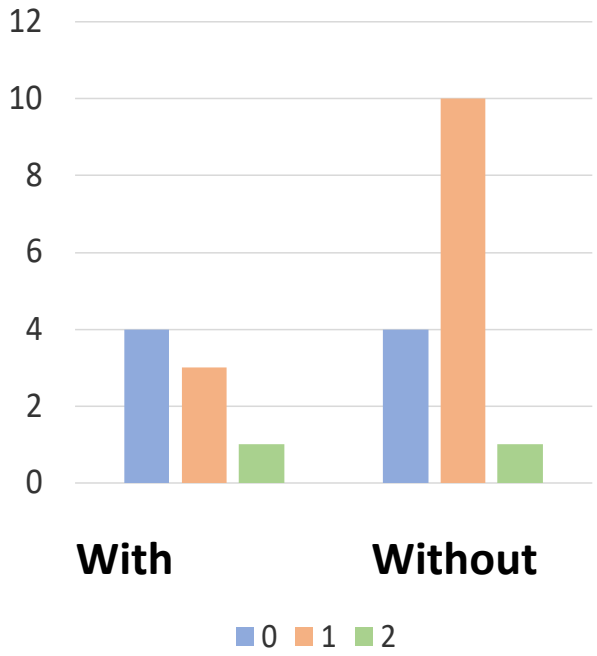
Results:

Kleiner fibrosis



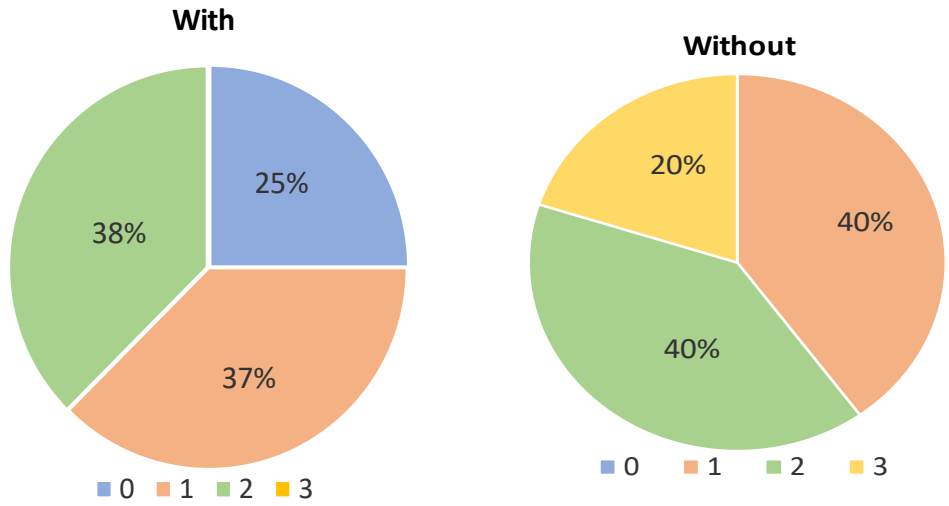
p = 0.4

Kleiner lobular inflammation



p = 0.3

Brunt steatoephatitis



p = 0.2

Results:

Complication rate according to *Dindo Clavien* *90 days*

	Obese w liver colonization	Obese w/o liver colonization	
0	12 (80%)	6 (75%)	***p = 0.9***
1	1 (6.7%)	1 (12%)	
2	2 (13%)	1 (12%)	

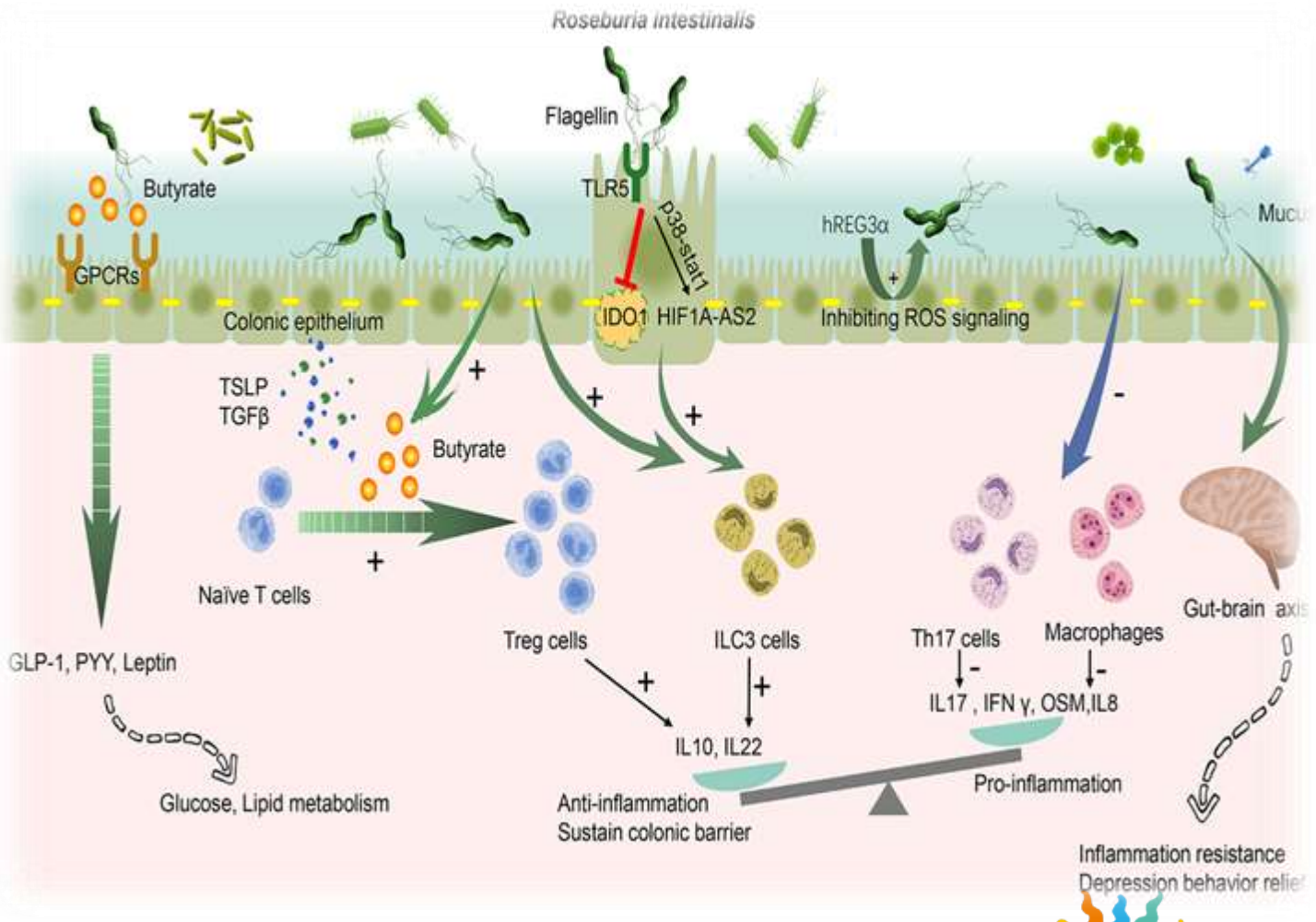
% Body Weight Lost at 1 year (Exces poids)	**83,6 %**	**74,4 %**	***p = 0.4***

Microbiota analysis (median) :

Species	Obese w/o liver colonization	Obese w liver colonization	P value
Bacteroides coprocola	2%	0%	0.810
Bacteroides dorei	1%	0%	0.070
Bacteroides faecis	1%	1%	0.441
Bacteroides massiliensis	2%	2%	0.246
Bacteroides thetaiotaomicron	1%	0%	0.515
Bacteroides uniformis	3%	6%	0.582
Bacteroides vulgatus	6%	4%	0.496
Barnesiella intestinihominis	0%	1%	0.718
Blautia wexlerae	1%	1%	0.794
Clostridium bartlettii	1%	1%	0.347
Clostridium glycyrrhizinilyticum	1%	0%	0.818
Clostridium symbiosum	2%	1%	0.219
Faecalibacterium prausnitzii	4%	2%	0.496
Fusicatenibacter saccharivorans	1%	2%	0.496
Gemmiger formicilis	0%	1%	0.258
Parabacteroides distasonis	1%	0%	0.631
Parabacteroides merdae	1%	1%	0.794
Roseburia intestinalis	3%	1%	0.034
Sutterella wadsworthensis	1%	0%	0.896

Mann Whitney two-sided test

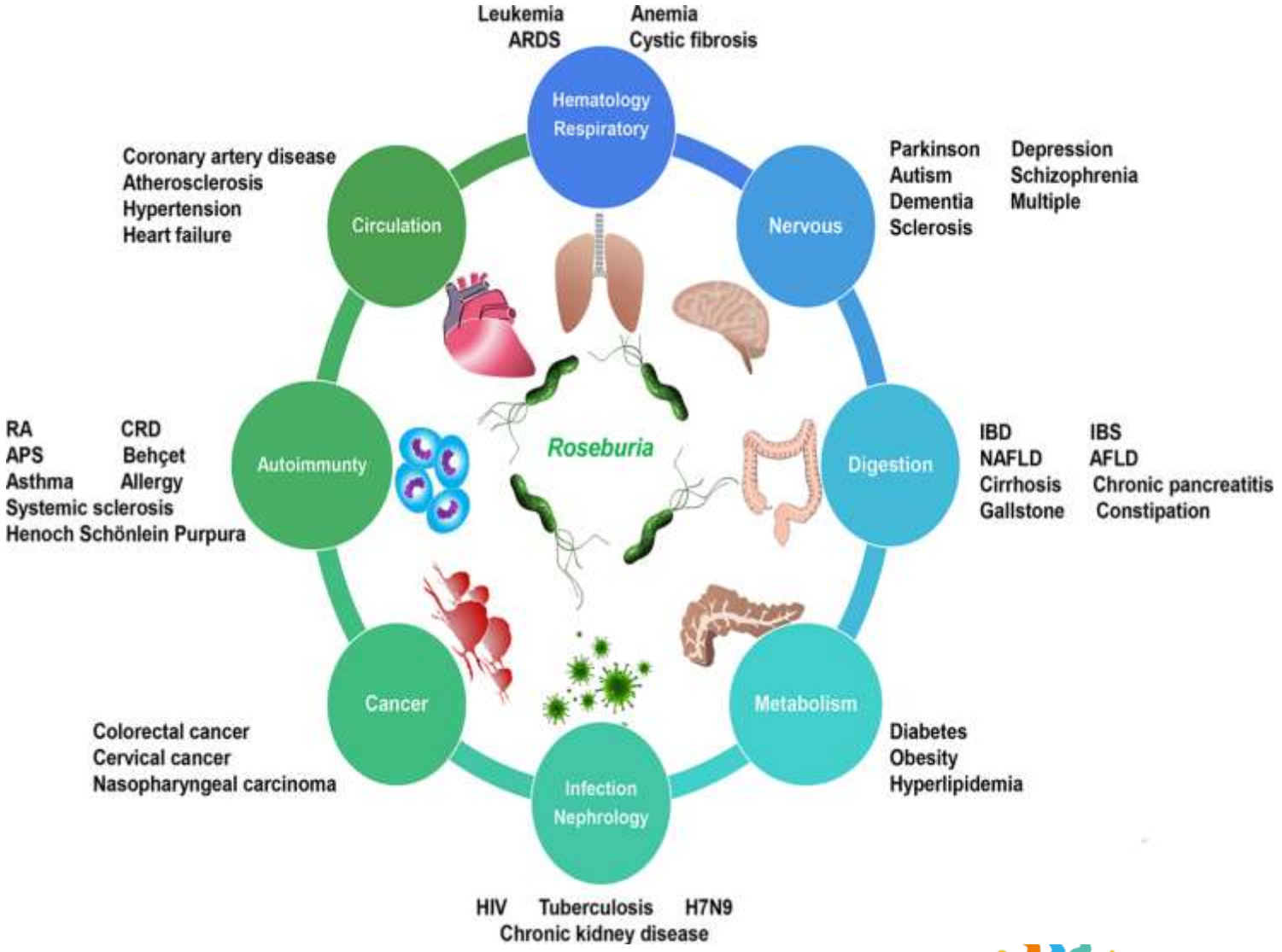
Roseburia intestinalis modulation in the gut tract



- Production of butyrate
- Stimultation exctretion cytokines
- Promotion differentiation and regulation T cells
- Activation ILC3
- Suppression TH17 and macrophages
- Its flagellin displays an anti-inflammation effect through TLR5.

Roseburia intestinalis: A Beneficial Gut Organism From the Discoveries in Genus and Species Kai Nie et al

Roseburia dysbiosis-associated diseases exist in different systems



IBD (inflammatory bowel diseases)
IBS (irritable bowel syndrome)
NAFLD
AFLD,
CRD (chronic rheumatoid disease)
APS(antiphospholipid syndrom)
etc…

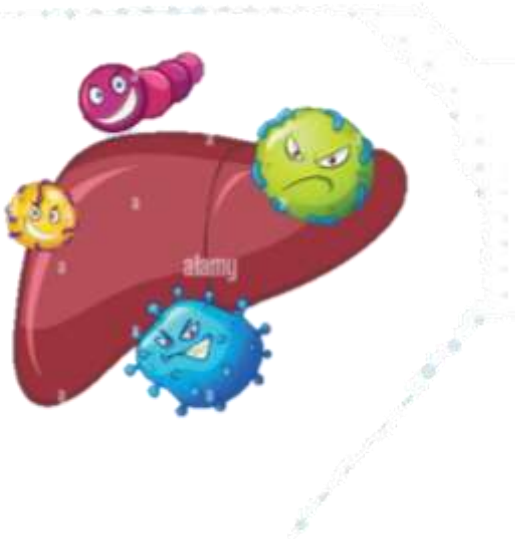
Roseburia intestinalis: A Beneficial Gut Organism From the Discoveries in Genus and Species Kai Nie et al

Conclusions:

- **First** study reporting the **presence of bacterial genome in a liver biopsy** on bariatric patients.

- In 8 patients, we found ***same bacterial genoma in stools samples and in liver biopsy*** → *bacterial traslocation from gut or vascular barrier to the liver*

- In our population, the ***Roseburia intestinalis*** **dysbiosis** was associated with the presence of bacterial genome in the liver, probably related with a greater permeability of the gut and vascular barriers.



In accordance with «EACCME criteria for the Accreditation of Live Educational Events»:

I have no potential conflict of interest to report

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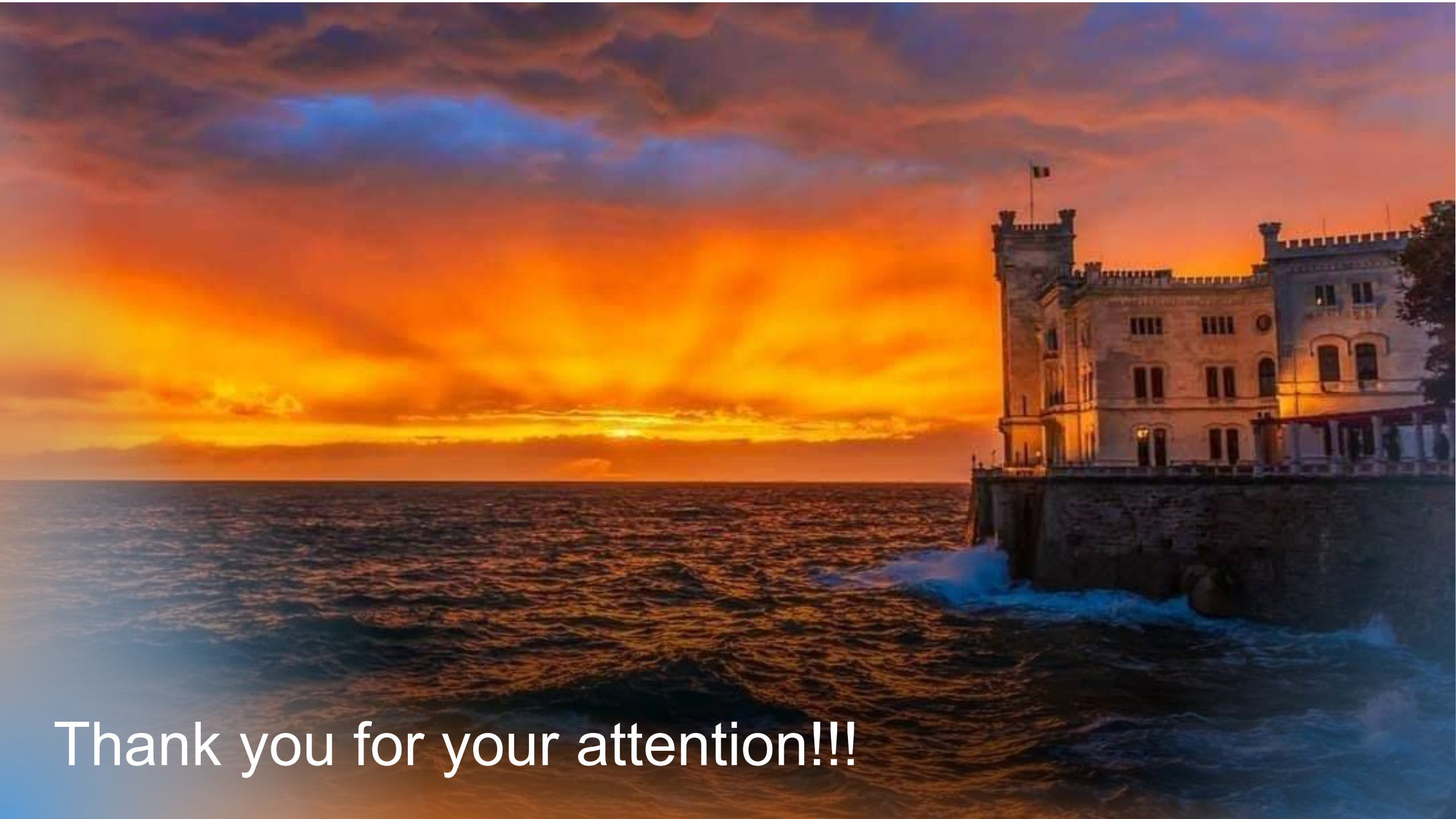
Thank you for your attention!!!