



Sempozyum

Alkol Dışı Karaciğer Yağlanması: Klinik ve Laboratuvar

İNTESTİNAL MİKROBİYOTA

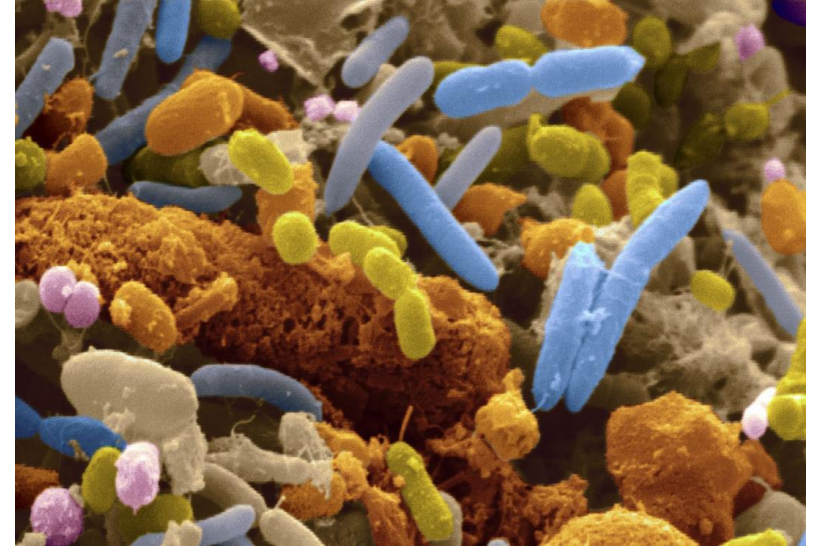
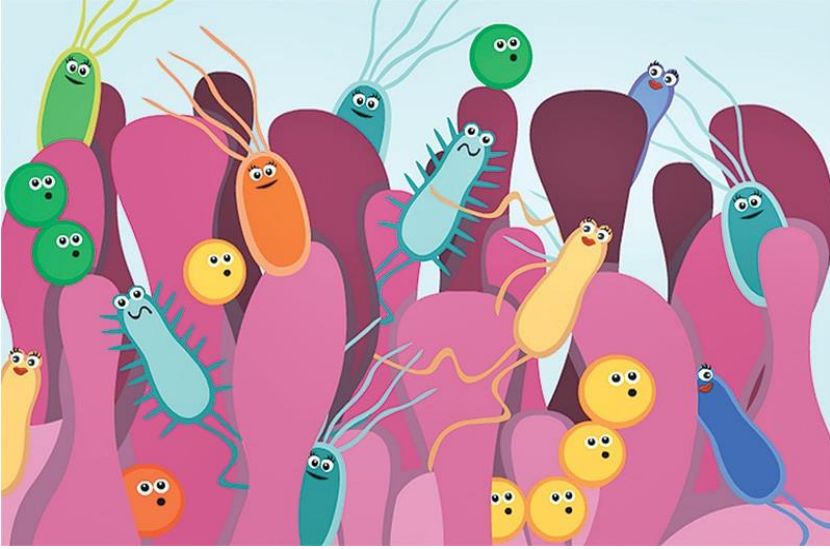
Dr. Uğur Demirpek

Mikrobiyoloji & Klinik Mikrobiyoloji Uzmanı

Tıbbi Parazitoloji Uzmanı

İstanbul Üniversitesi İstanbul Tıp Fakültesi

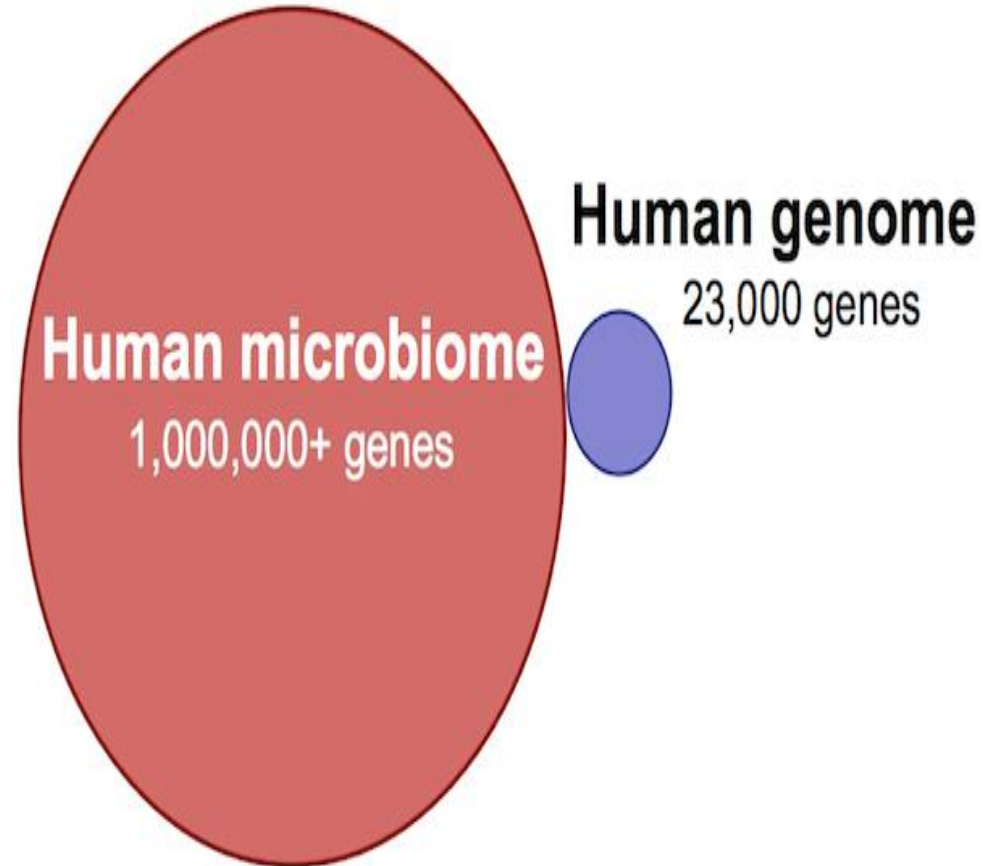
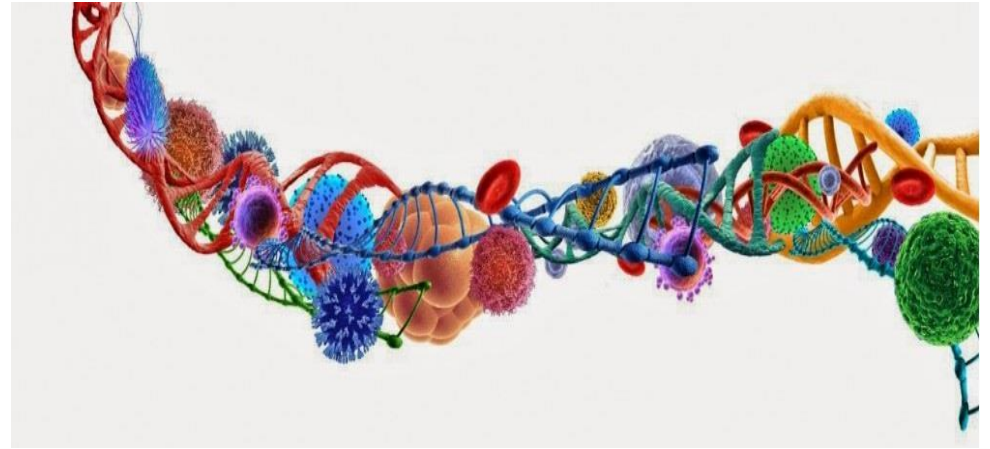
MİKROBIYOTA



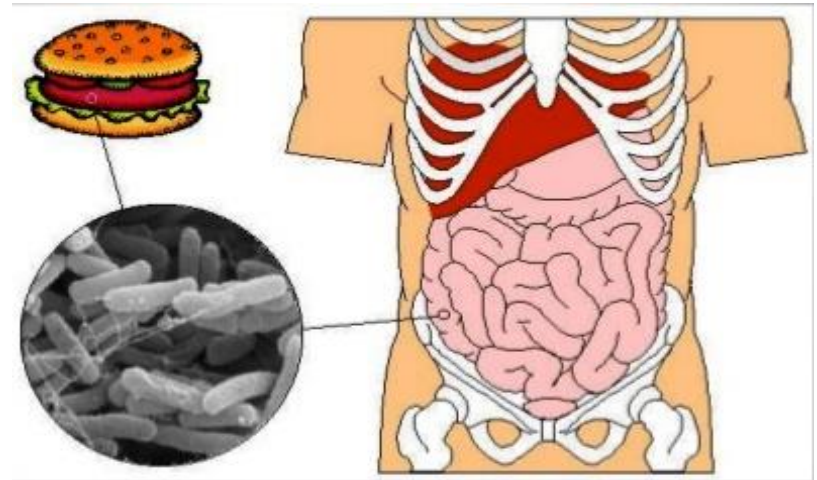
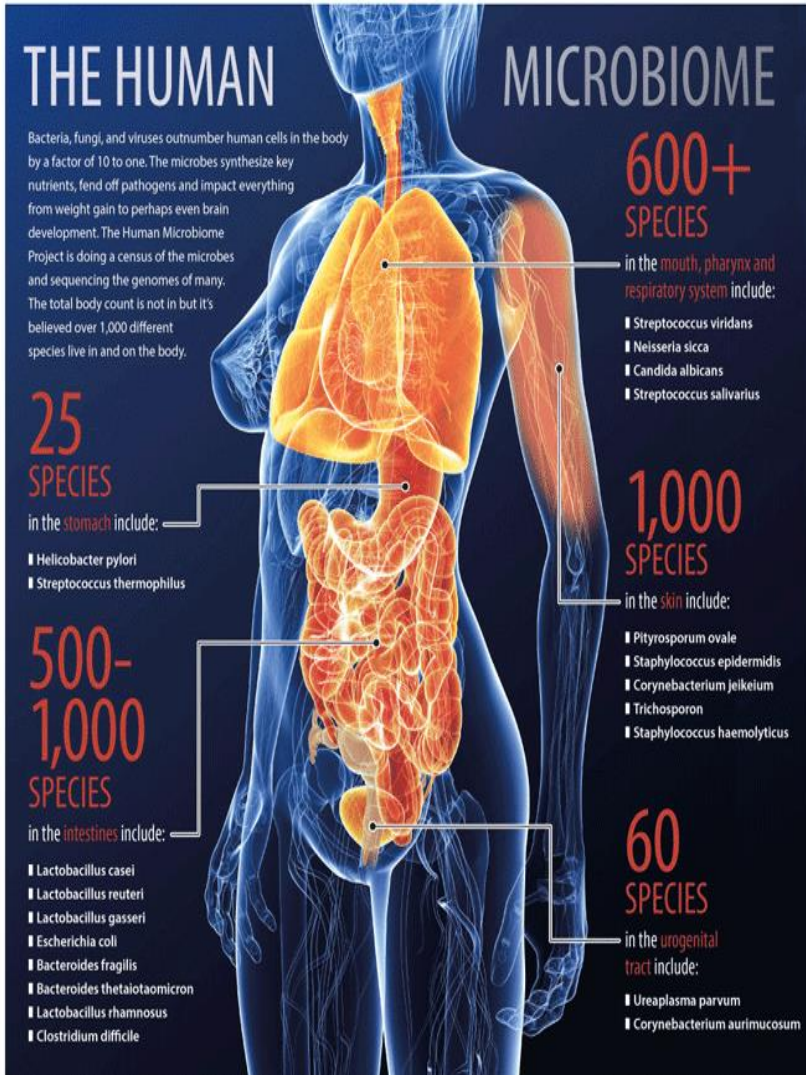
- ❖ 10^{14} bakteri
- ❖ İnsan mikrobiyomunun %99

MİKROBİYOM

- Ağız
- Cilt
- Boğaz
- Ürogenital (♂/♀)
- İntestinal.....

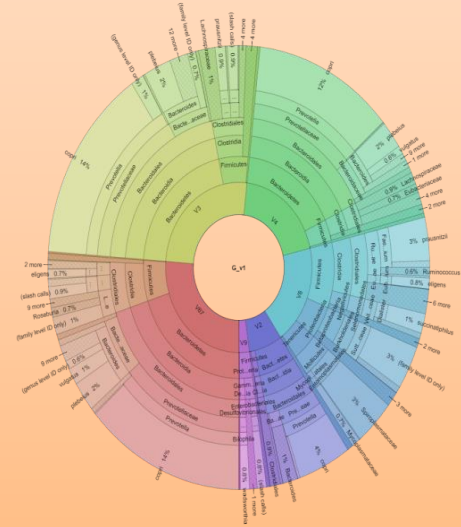


Symbiosis/ simbiyozis



Mikrobiyota/Mikrobiyom Analizi

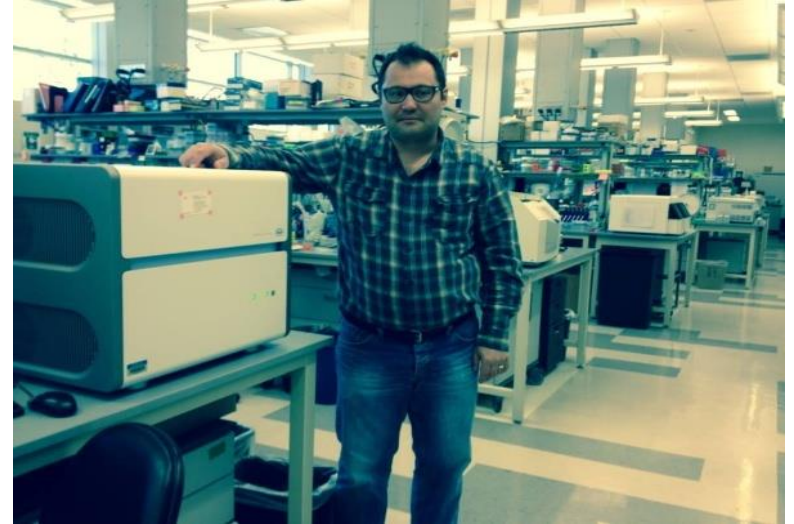
- Araştırılan vücut bölgesinden uygun klinik örnek olarak o bölgede bulunan ve mikrobiyotayı oluşturan mikroorganizmaları ve miktarlarını tespit etmek.
- Metagenomik yaklaşım



Metagenomik yöntem nedir?

- Genetik ve biyoinformatik teknolojiler kullanılarak canlı toplulukların tüm içeriğini araştırmak için kullanılan yöntemlerdir.
 - Kültür
 - FISH
 - PCR
 - Parmak izi analiz yöntemleri (DGGE, TGGE, T-RFLP)
 - Dijital PCR
 - DNA Mikroarray
 - Yeni Nesil Dizileme ve Biyoinformatik analiz

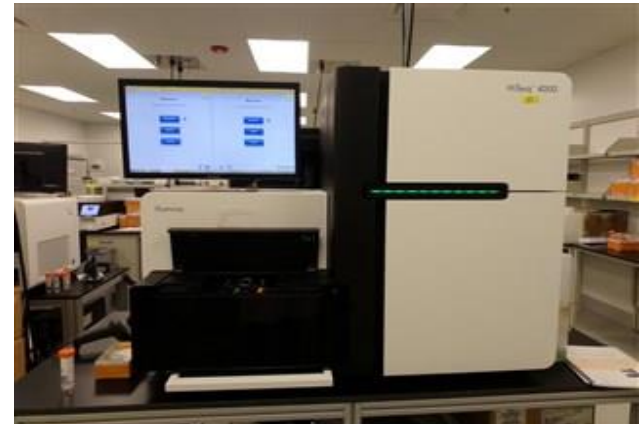
Yeni Nesil Dizileme ve Biyoinformatik Analiz



Ion S5 Systems



Ion PGM System



Biyoçeşitlilik

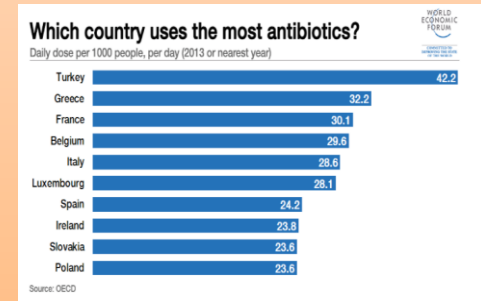
- Bir canlılar topluluğunda bulunan tür çeşidi ve bu türlerin miktarlarındaki dağılım
- Tür sayısı ne kadar çok ve dağılımlar ne kadar eşitse biyoçeşitlilik o kadar fazla hesaplanır

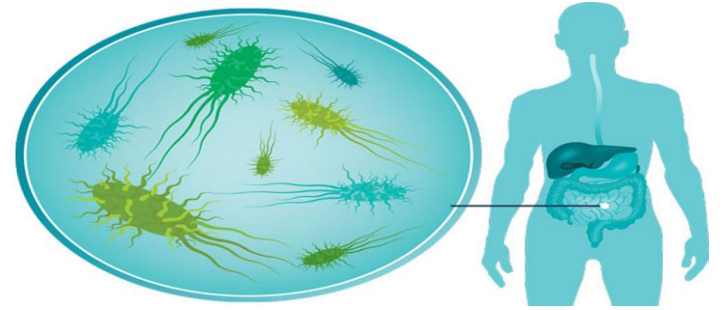
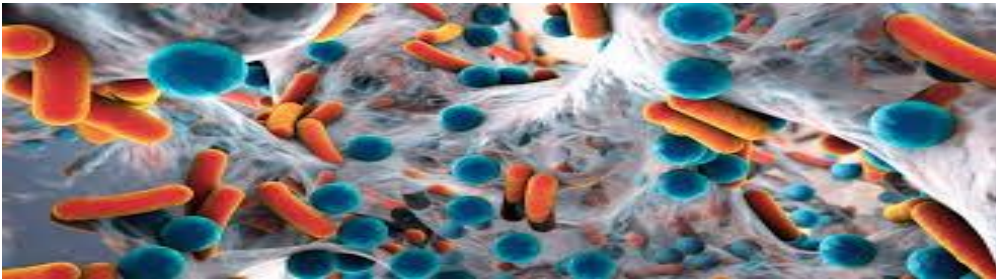
Biyçeřitlilik

SampleID	Seqs/Sample	chaol Ave.	chaol Err.	observed_species Ave.	observed_species Err.	shannon Ave.	shannon Err.	simpson Ave.	simpson Err.
S001_S_v1	10.0	12.000	nan	5.700	nan	2.230	nan	0.742	nan
S001_S_v1	24352.0	76.848	nan	76.000	nan	3.538	nan	0.806	nan
S001_S_v1	48694.0	79.493	nan	78.600	nan	3.530	nan	0.805	nan
S001_S_v1	73036.0	79.650	nan	79.600	nan	3.533	nan	0.805	nan
S001_S_v1	97378.0	79.850	nan	79.800	nan	3.528	nan	0.804	nan
S001_S_v1	121720.0	80.000	nan	80.000	nan	3.531	nan	0.805	nan
S001_S_v1	146062.0	80.100	nan	80.000	nan	3.532	nan	0.805	nan
S001_S_v1	170404.0	80.000	nan	80.000	nan	3.530	nan	0.804	nan
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S001_S_v1	219088.0	80.000	nan	80.000	nan	3.529	nan	0.804	nan
S001_S_v1	243430.0	80.000	nan	80.000	nan	3.529	nan	0.805	nan

Bakteriyel içerik

- Filum düzeyinde Firmicutes, Bacteroidetes, Proteobacteria
- Çeşitliliği oluşturan az sayıdaki mikroorganizmalar
- Synergistetes, Lentisphaerae





DOMAIN	ŞUBE	CİNS
Bacteria	Firmicutes	Clostridium, Faecalibacterium*, Lactobacillus, Enterococcus, Ruminococcus, Veillonella
Bacteria	Bacteroidetes	Bacteroides*, Prevotella*
Bacteria	Actinobacteria	Bifidobacterium*, Atopobium
Bacteria	Proteobacteria	Escherischia, Desulfovibrio, Helicobacter
Bacteria	Fusobacteria	Fusobacterium
Bacteria	Verromicrobia	Akkermansia*
Archaea	Euryarchaeota	Methanobrevibacter

Enterotip

- Enterotip 1 Bacteroides
- Enterotip 2 Prevotella
- Enterotip 3 Ruminococcus



The image shows a screenshot of a journal article page from Nature. At the top left, there is a red navigation bar with a white 'v' icon and the 'nature' logo, with the tagline 'International journal of science' below it. Below the navigation bar, the word 'Article' is displayed in a small, grey font. The main title of the article, 'Enterotypes of the human gut microbiome', is written in a large, dark blue serif font. Below the title, the authors' names 'Manimozhiyan Arumugam, Jeroen Raes [...] Peer Bork' are listed in a smaller blue font, with a small blue square icon containing a white 'x' at the end. At the bottom of the page, there are two columns of text: 'Nature 473, 174–180 (12 May 2011)' on the left and 'Received: 12 March 2010' on the right.

 **nature**
International journal of science

Article

Enterotypes of the human gut microbiome

Manimozhiyan Arumugam, Jeroen Raes [...] Peer Bork 

Nature **473**, 174–180 (12 May 2011) | Received: 12 March 2010

İntestinal Mikrobiyota ve Metabonomik İnceleme

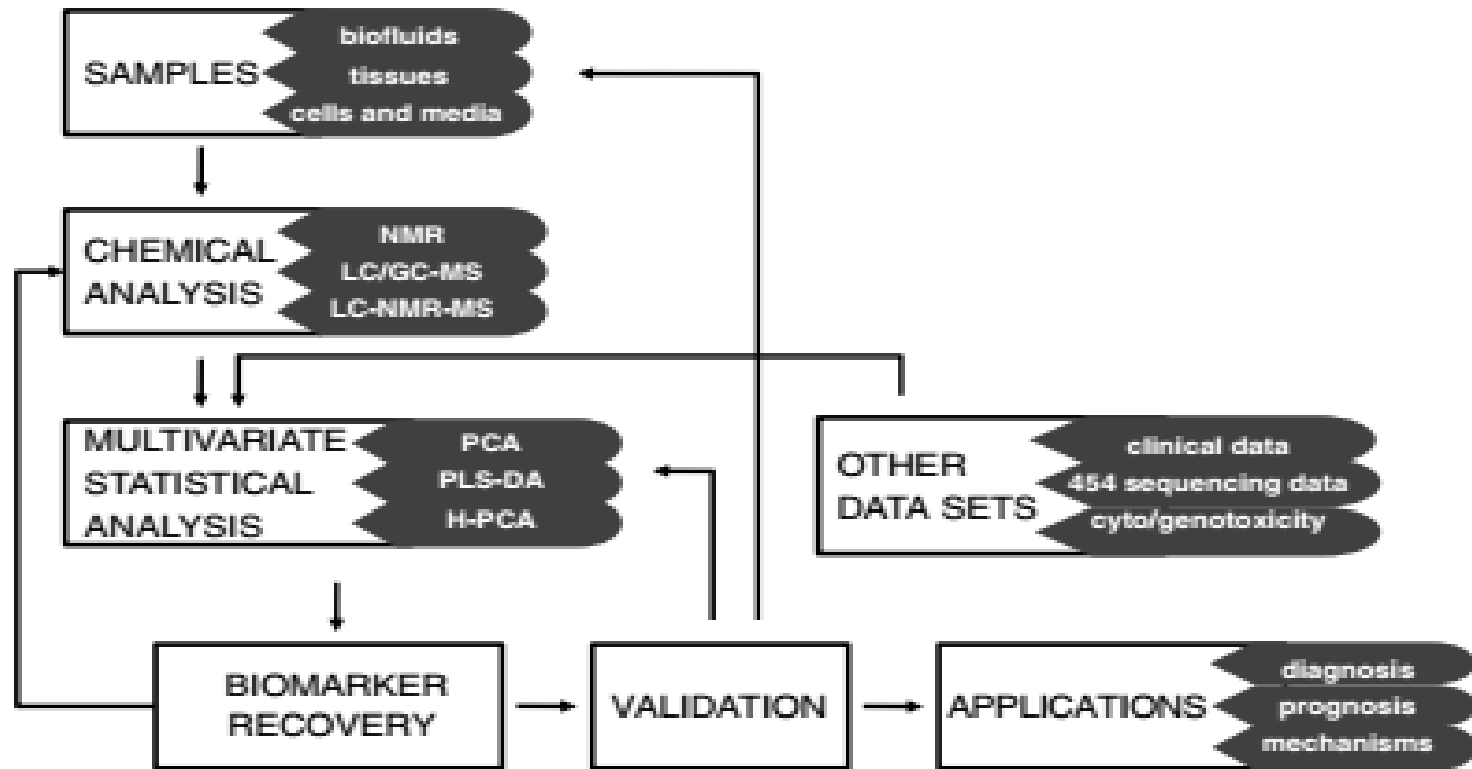


Fig. 11.1 A schematic illustration of metabolic profiling strategy.

Metabonomik ve Metagenomik

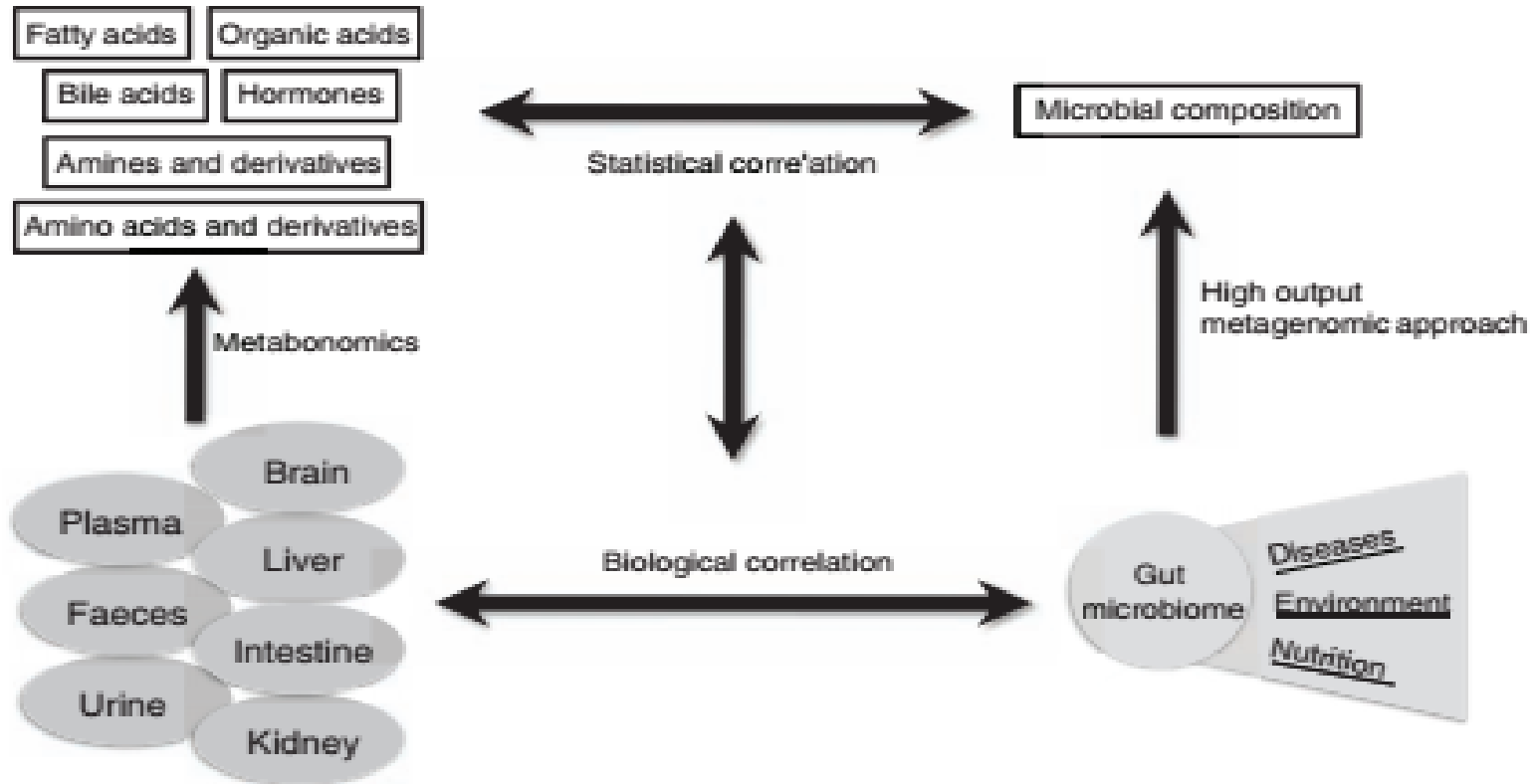
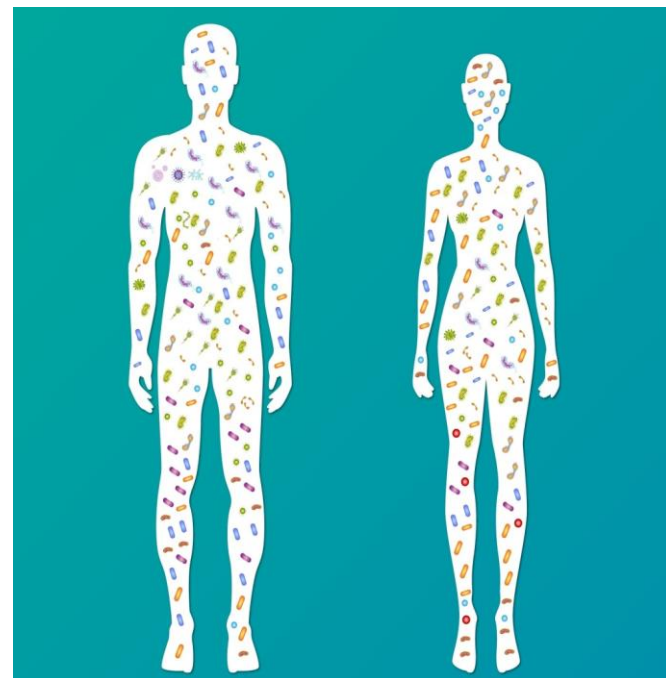


Fig. 11.5. A schematic illustration of the combined approach of metabonomics and metagenomics in characterization of the host-microbial symbiotic relationship.

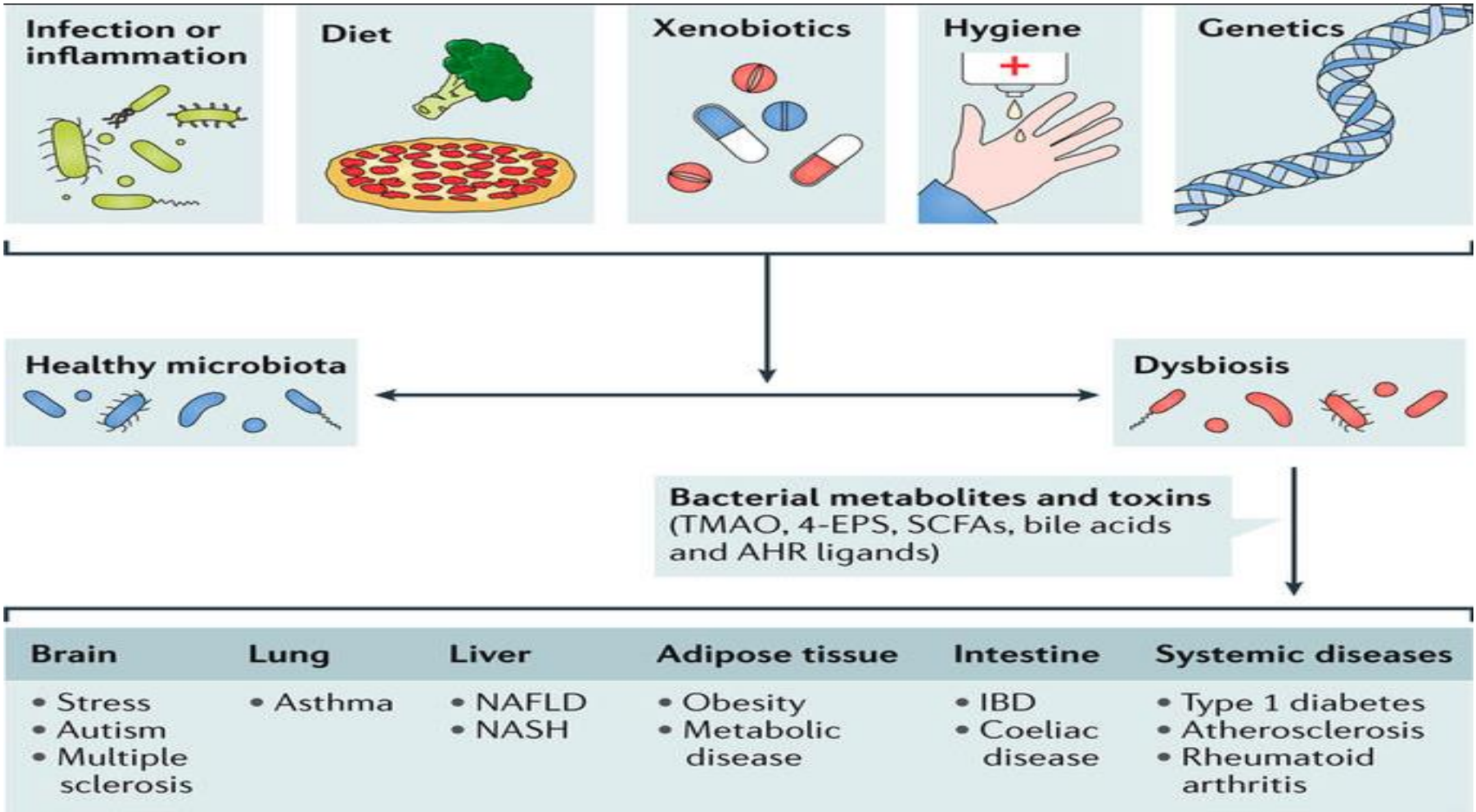


NIH Human Microbiome Project

- 16S rRNA DİZİLEME
- 14.23 terabytes



Mikrobiyota ilişkili hastalıklar



Nature Reviews | Immunology

Disbiyozis: Mikrobiyotada oluşan dengesizlik, zararlı mikroorganizmaların artışı

Mikrobiyota ilişkili hastalıklar

138

M. Ventura *et al.*

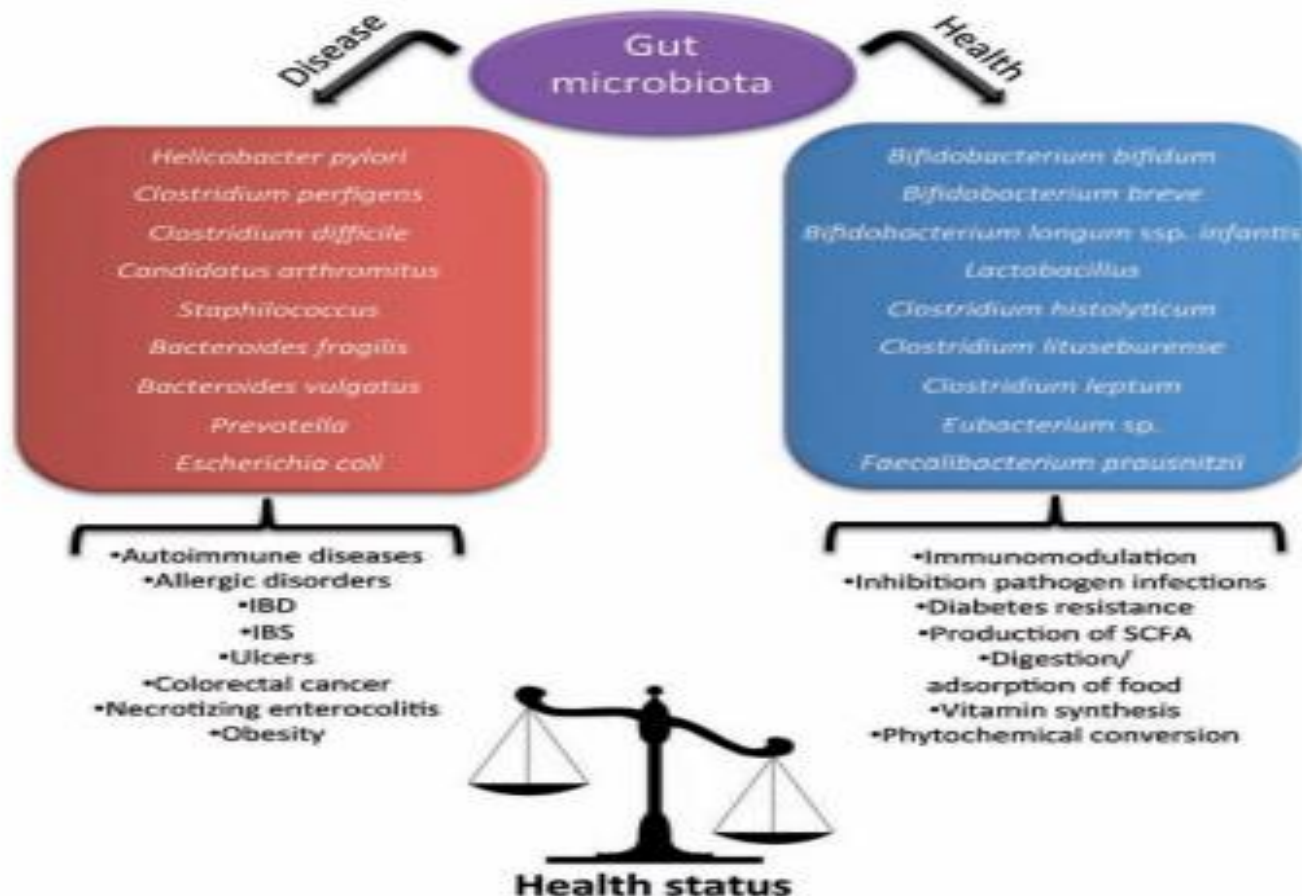


Fig. 9.1. Schematic representation of the key microbial players in promoting health/diseases in humans.

Gut microbiome influences efficacy of PD-1–based immunotherapy against epithelial tumors

Bertrand Routy^{1,2,3}, Emmanuelle Le Chatelier⁴, Lisa Derosa^{1,2,3}, Connie P. M. Duong^{1,2,5}, Maryam Tidjani Alou^{1,2,3}, Romain ...

+ See all authors and affiliations

Science 05 Jan 2018:
Vol. 359, Issue 6371, pp. 91-97
DOI: 10.1126/science.aan3706

Article

Figures & Data

Info & Metrics

eLetters

 PDF

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Good bacteria help fight cancer

Resident gut bacteria can affect patient responses to cancer immunotherapy (see the Perspective by Jobin). Routy *et al.* show that antibiotic consumption is associated with poor response to immunotherapeutic PD-1 blockade. They profiled samples from patients with lung and kidney cancers and found that nonresponding patients had low levels of the bacterium

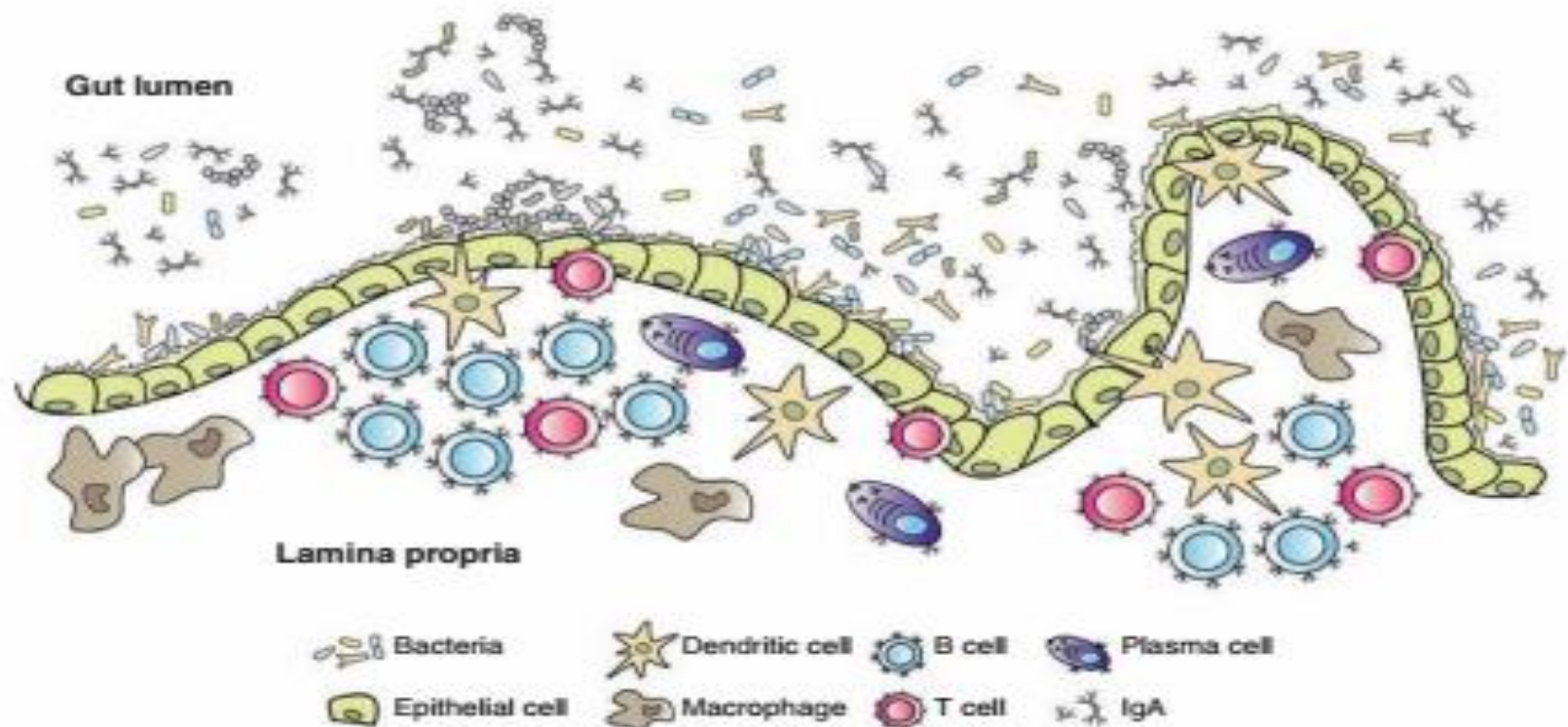


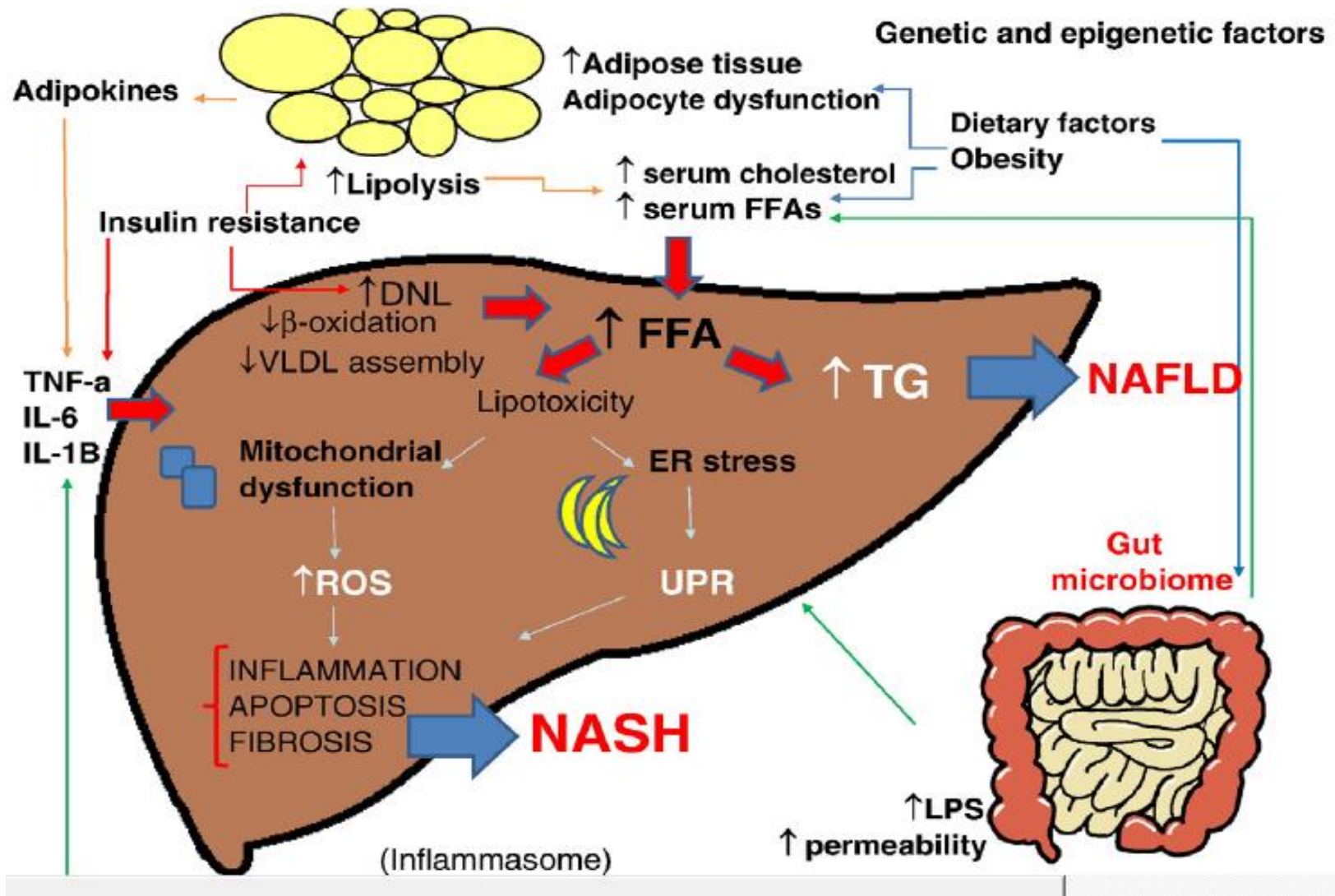
Fig. 9.2. Representation of sites where the gut microbiota can interact with the gut immune cells.

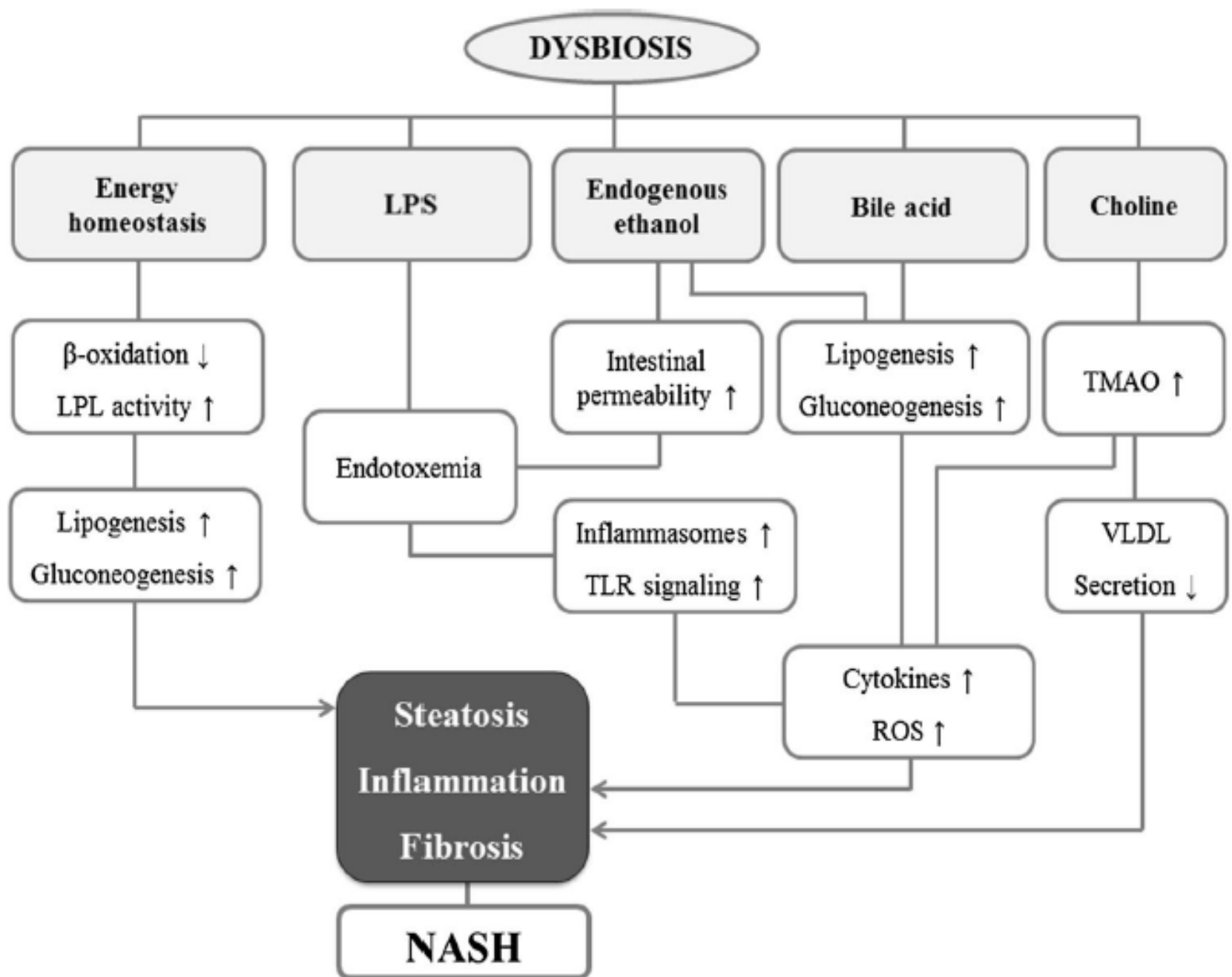
Rutinde Mikrobiyota Analizi

- Gastrointestinal hastalıklar
- Otoimmün hastalıklar
- Otizm, depresyon...

- Kişiselleştirilmiş tedavi
- Kanser
- Kardiyovasküler hastalıklar

NASH / Mikrobiyota





Teşekkür ederim