XXX CONGRESSO NAZIONALE

SIAAIC

Società Italiana di Allergologia, Asma ed Immunologia Clinica

30° CONGRESSO NAZIONALE SIAAIC SINCE 1953

FIRENZE 6/9 APRILE 2017 | **WWW.SIAAIC2017.ORG**

Società Italiana di Allergologia, Asma ed immunologia Clinica

I PROBIOTICI NELLA RESISTENZA AGLI ANTIBIOTICI:

DANNO
O
OPPORTUNITÀ

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Responsabile: Prof. Lorenzo Drago

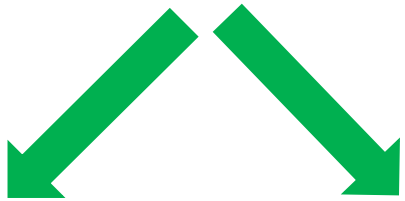
Laboratorio di Microbiologia Clinica, Università degli Studi di Milano

I PROBIOTICI

“ ***Microorganismi vivi che se amministrati in adeguate quantità possono portare effetti benefici all’ospite*** ”

…NON SOLO…

..anche componenti batteriche quali proteine, acidi nucleici e lipidi sembrerebbero possedere proprietà probiotiche



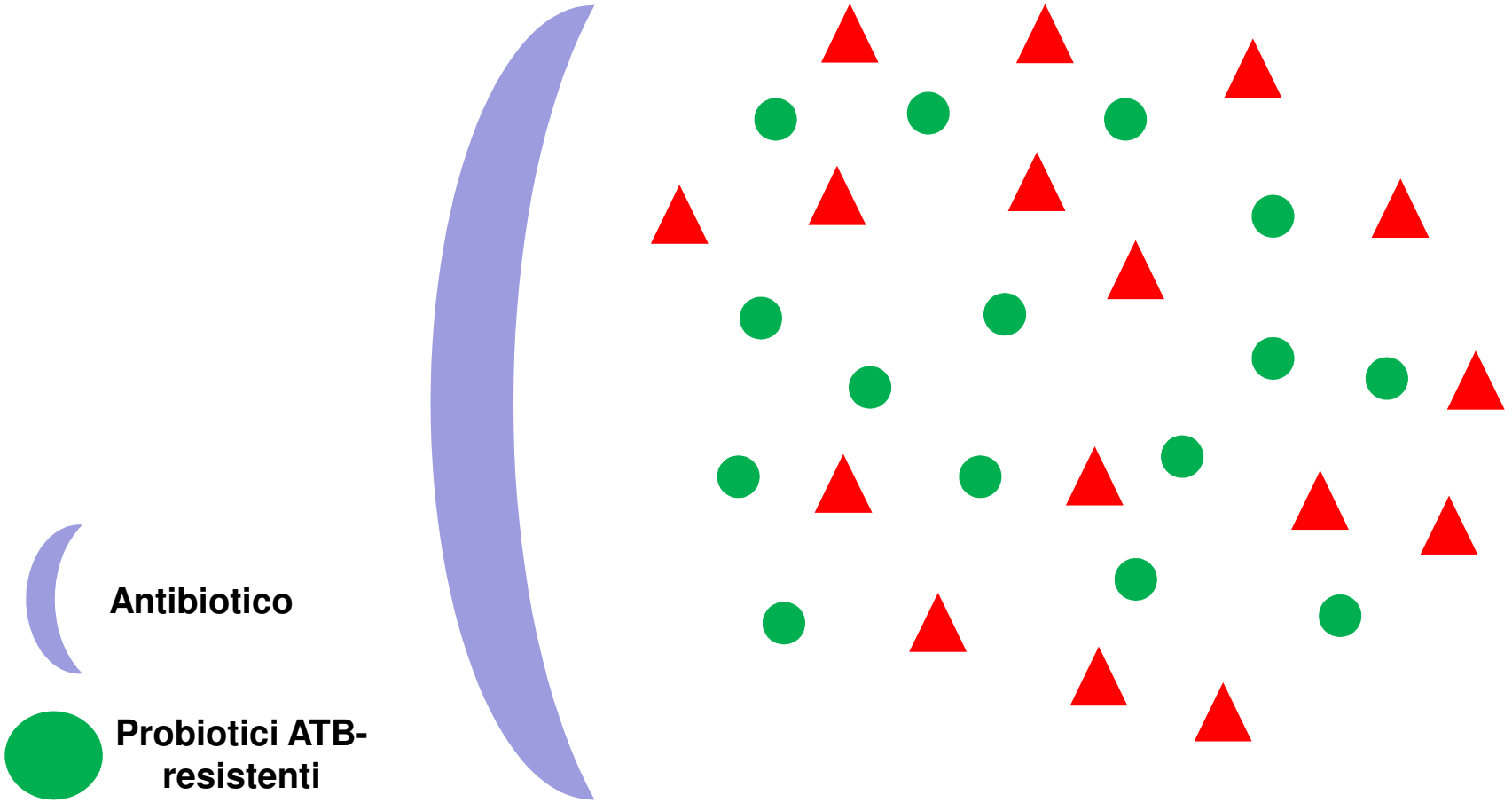
SISTEMA IMMUNITARIO **PEPTIDI ANTIMICROBICI**

By FAO/WHO (2002) Expert Consultation http://www.fao.org/es/ESN/Probio/probio.htm

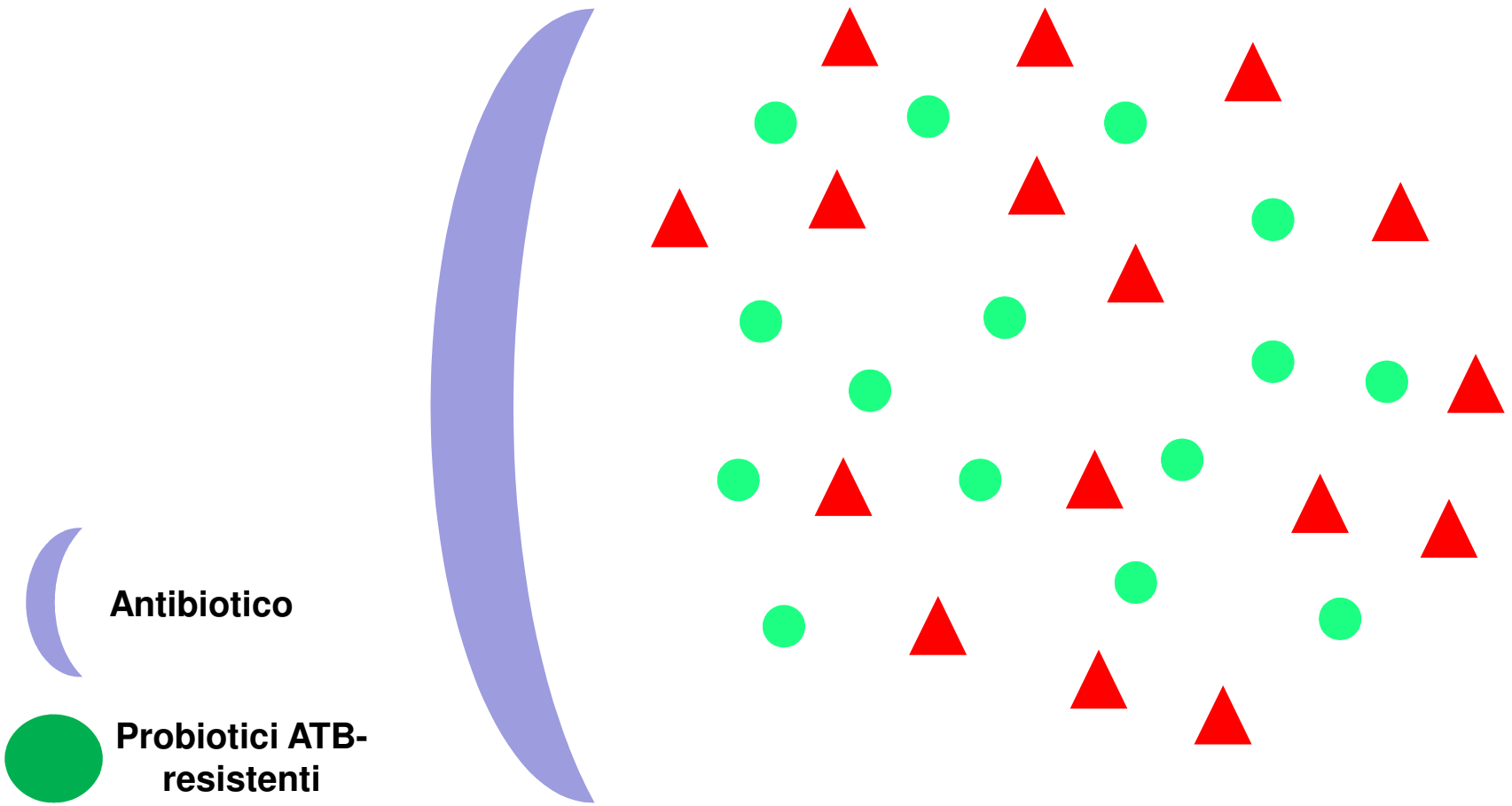
CARATTERISTICHE DEI PROBIOTICI

- Resistenza al pH gastrointestinale
- Adesione alle cellule intestinali
- Colonizzazione dell'ambiente intestinale
- NO fattori di virulenza
- Effetti benefici nell'ospite
- NO determinanti genetici di antibiotico-resistenza

PROBIOTICI e ANTIBIOTICO-RESISTENZA



PROBIOTICI e ANTIBIOTICO-RESISTENZA



PROBIOTICI e ANTIBIOTICO-RESISTENZA

European Food Safety Authority

EFSA Journal 20YY;volume(issue):NNNN

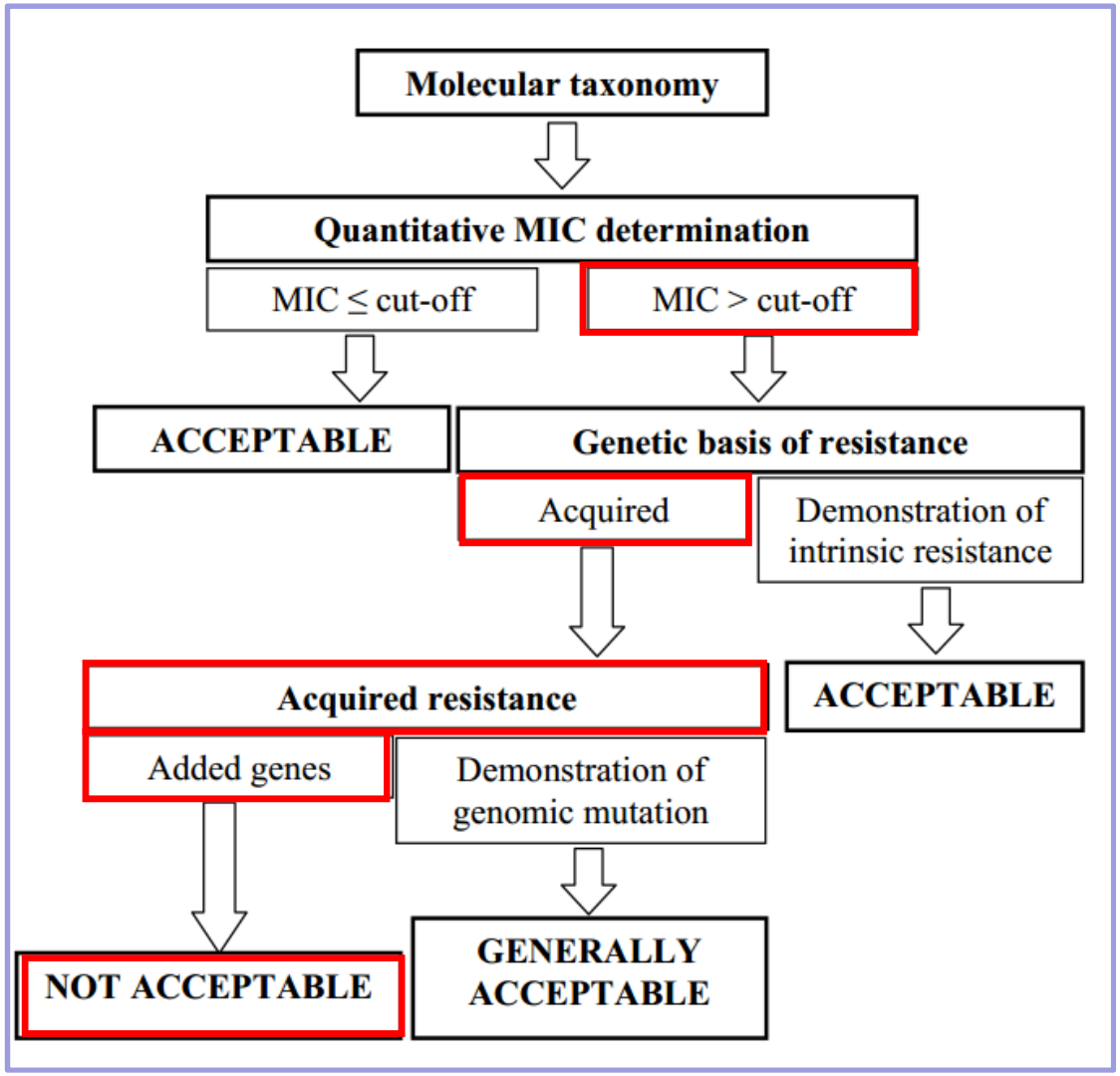
SCIENTIFIC OPINION[1]

Guidance on the assessment of bacterial susceptibility to antimicrobials of human and veterinary importance[2]

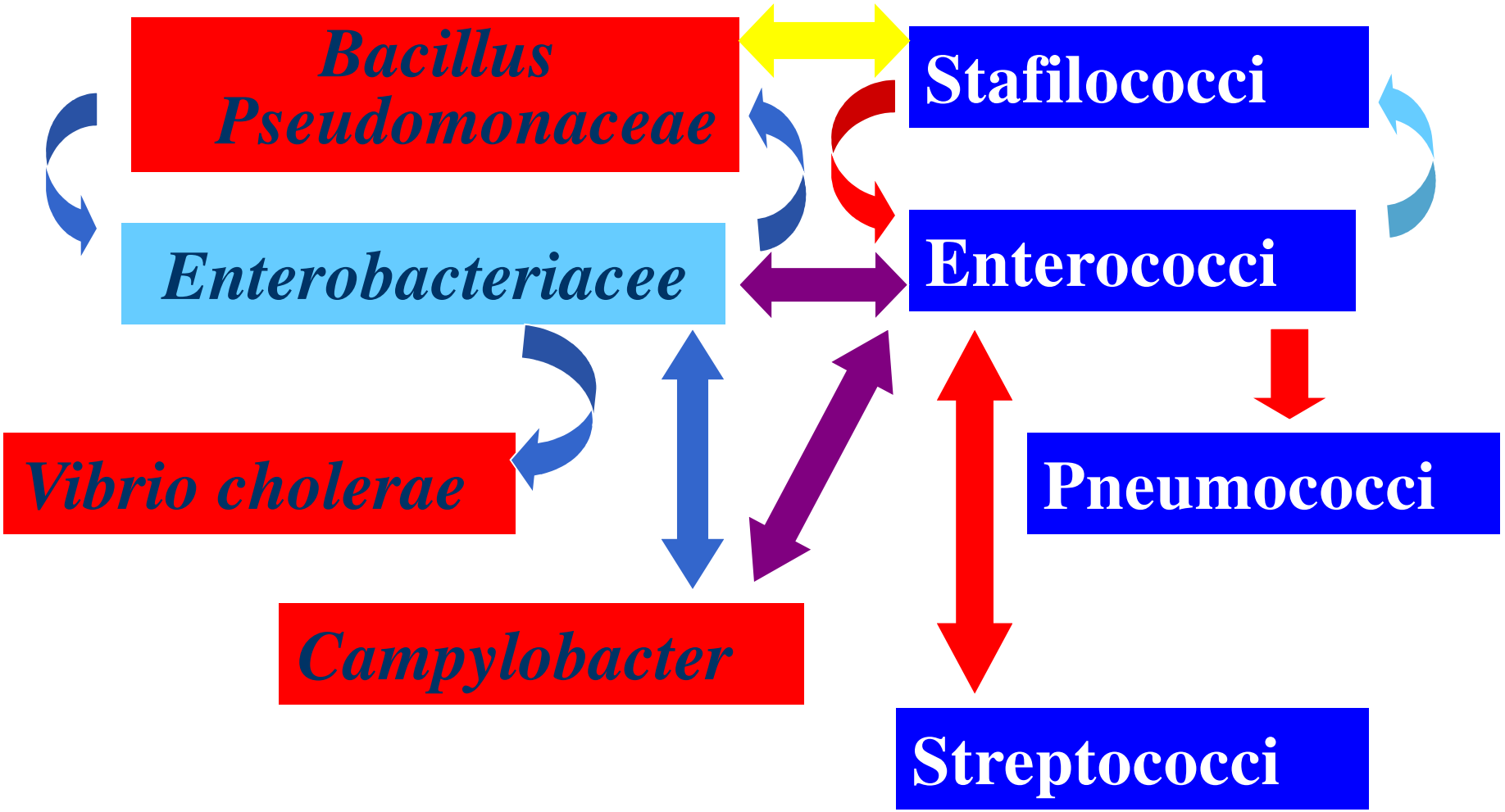
1. CRITERIA FOR IDENTIFYING BACTERIAL STRAINS WITH ACQUIRED RESISTANCE TO ANTIMICROBIALS

All bacterial products intended for use as feed additives must be examined to establish the susceptibility of the component strain(s) to a relevant range of antimicrobials of human and veterinary importance. It is essential that such tests are made in a consistent manner using internationally recognised and standardised methods. As a basic requirement, the minimum inhibitory concentration (MIC) of the antimicrobials expressed as mg/L or µg/mL should be determined for each of the following substances: ampicillin, vancomycin, gentamicin, kanamycin, streptomycin, erythromycin, clindamycin, tetracycline, chloramphenicol and, in specific cases, tylosin, apramycin, nalidixic acid, sulfonamide and trimethoprim (see Table 1). These antimicrobials are chosen to maximise the

PROBIOTICI e ANTIBIOTICO-RESISTENZA



PROBIOTICI e ANTIBIOTICO-RESISTENZA



ANTIBIOTICO-RESISTENZA in ITALIA

- **13** prodotti commerciali; **21** ceppi isolati;
- **12/13** (92%) prodotti contenevano almeno 1 ceppo resistente ad almeno 1 antibiotico;
- **10/13** (77%) prodotti presentavano almeno un ceppo contenente geni noti di antibiotico-resistenza.

Drago et al, *Int J Antimicrob Agents* (2013)

ANTIBIOTICO-RESISTENZA in ITALIA

- **21** ceppi isolati;
- **5/21** (24%) ceppi resistenti all'eritromicina:
  - **2/5** *erm*B;
- **2/21** (9,5%) ceppi resistenti alla tetraciclina:
  - **2/2** *tet*W; **1/2** *tet*S;
- **0/21** (0%) ceppi resistenti alla penicillina.

Drago et al, *Int J Antimicrob Agents* (2013)

ANTIBIOTICO-RESISTENZA in ITALIA

Product name	Species	Erythromycin	Tetracycline	Gentamicin	Penicillin
A	*B. clausii*	R (unknown)	S	S	S
B	*L. casei* DG	S	S	R (aph3-III)	S
C	*L. rhamnosus* GG	S	S	R (aadA)	S
D	*L. reuteri*	S	S	R (aac6-aph2)	S
E	*E. faecium*	R (ermB)	S	S	S
G	*L. paracasei*	S	S	R (unknown)	S
H	*L. delbrueckii*	S	S	S	S
	B. bifidum	S	S	S	S
I	*L. paracasei*	S	S	R (unknown)	S
J	*L. rhamnosus*	S	S	R (aac6-aph2)	S
				(ant6-I)	
	L. acidophilus	R (ermB)	S	R (aadA)	S

Drago et al, *Int J Antimicrob Agents* (2013)

ANTIBIOTICO-RESISTENZA in ITALIA

Product name	Species	Erythromycin	Tetracycline	Gentamicin	Penicillin
K	*E. faecium*	S	S	S	S
	L. rhamnosus	R (unknown)	R (tetS) (tetW)	R (aadA)	S
	L. acidophilus	S	S	R (unknown)	S
	Bifidobacerium spp	S	S	R (aph3-III)	S
L	*L. paracasei*	S	S	R (aadA)	S
	L. acidophilus	S	S	R (ant6-I)	S
	B. lactis BB12	S	S	R (aph3-III)	S
	E. faecium	R (ermB)	S	S	S
	B. coagulans	S	S	S	S
M	*L. paracasei*	S	S	R (aadA)	S
	L. acidophilus	S	S	R (ant6-I)	S
	B. lactis BB12	S	R (tetW)	R (aph3-III)	S
	B. coagulans	S	S	S	S
N	*L. paracasei*	R (unknown)	S	S	S
	L. plantarum	R (unknown)	S	R (aph3-III) (aadA)	S

Drago et al, *Int J Antimicrob Agents* (2013)

COME COMPORTARSI nel FUTURO?

Contents lists available at ScienceDirect

Journal of Global Antimicrobial Resistance

journal homepage: www.elsevier.com/locate/jgar

Susceptibility to antibiotics and genes involved in antibiotic resistance.

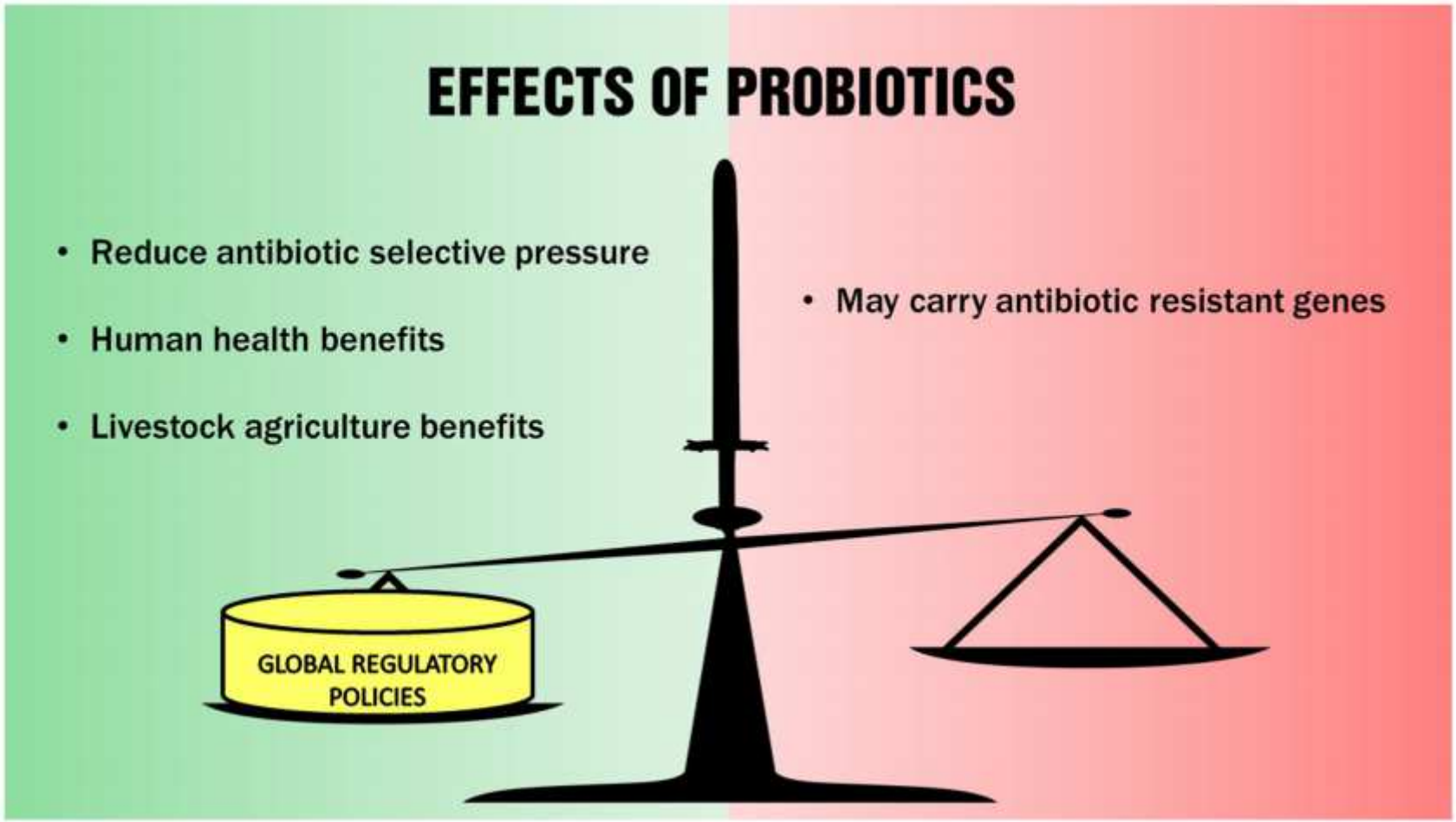
Strain	Antibiotic susceptibility [genes involved]						
	Erythromycin	Gentamicin	Penicillin	Ciprofloxacin	Tetracycline	Clindamycin	Ampicillin/ sulbactam
Lactobacillus kefiri ATCC 8007 (DSM20485)	S	R	S	R	R	S	S
Lactobacillus kefiri ATCC 35411 (DSM20587)	S	S	S	R	R	S	S
Lactobacillus kefiri LKF01 (DSM32079) LKEF	S	S	S	R	R	S	S

S, sensitive; R, resistant.

Ceppo resistente ad alcuni antibiotici ma NO geni di ATB-resistenza su elementi genetici mobili.

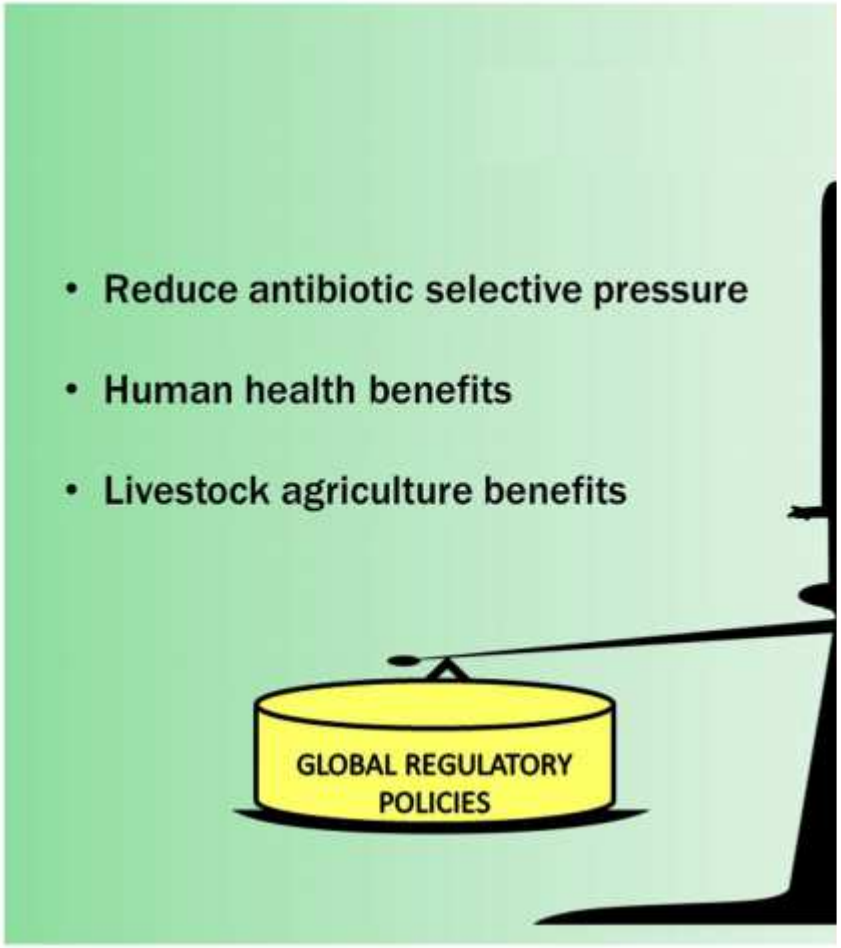
Drago et al., *J Global Antimicrob Res* (2015)

PROBIOTICI e ANTIBIOTICO-RESISTENZA

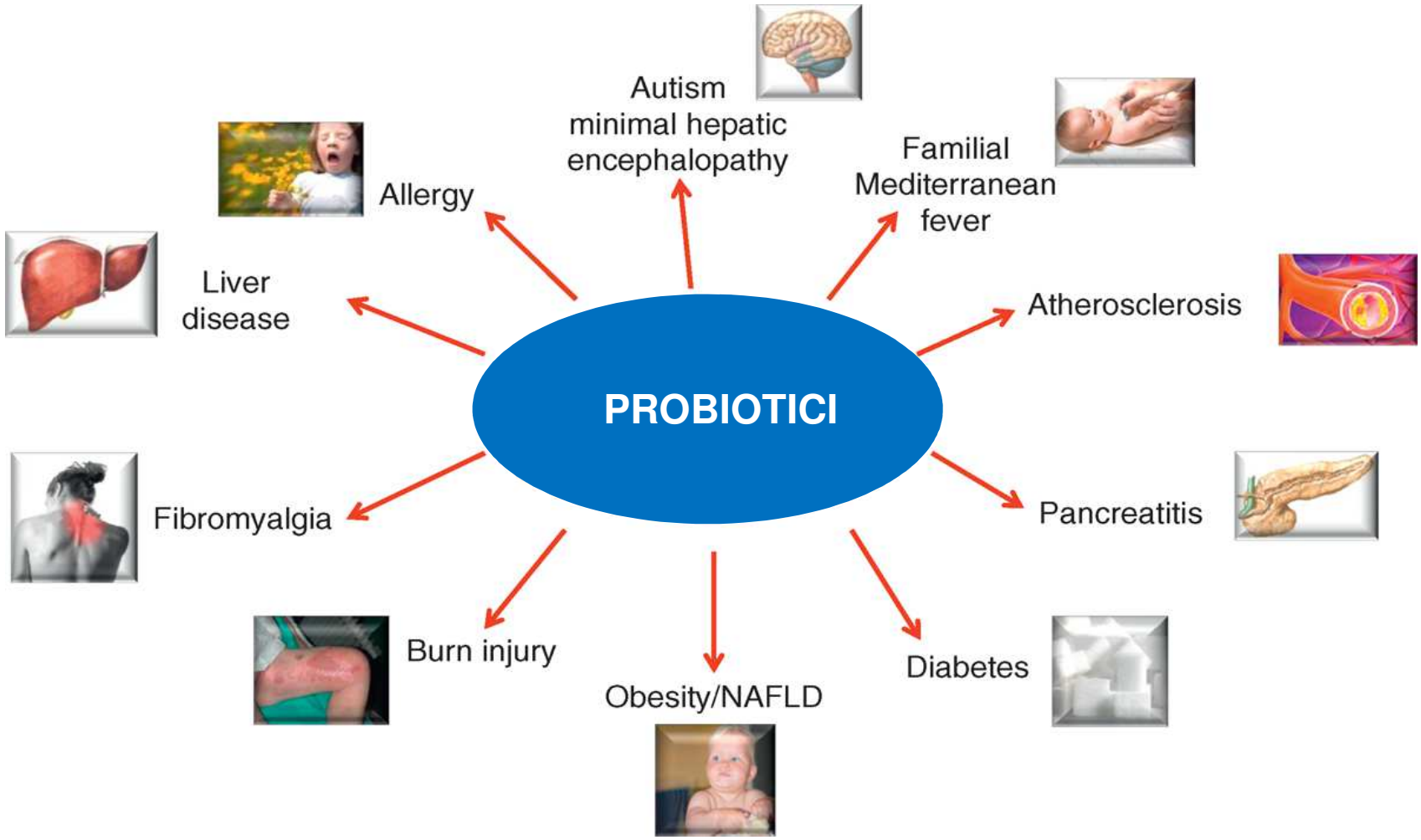


Imperial and Ibana, *Front Microbiol* (2016)

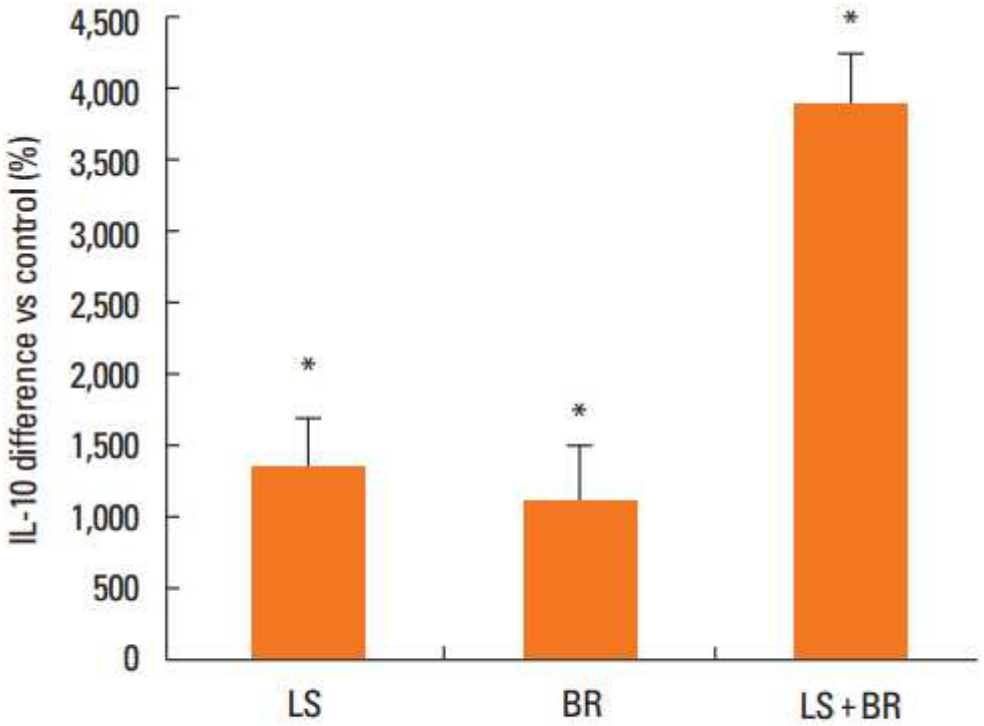
ANTIBIOTICO-RESISTENZA in ITALIA



VANTAGGI dei PROBIOTICI



PROBIOTICI e ALLERGIE



Release of IL-10 by PBMCs. *$P<0.05$ vs control (non-stimulated cells). Data are means ± SD of the 3 experiments.

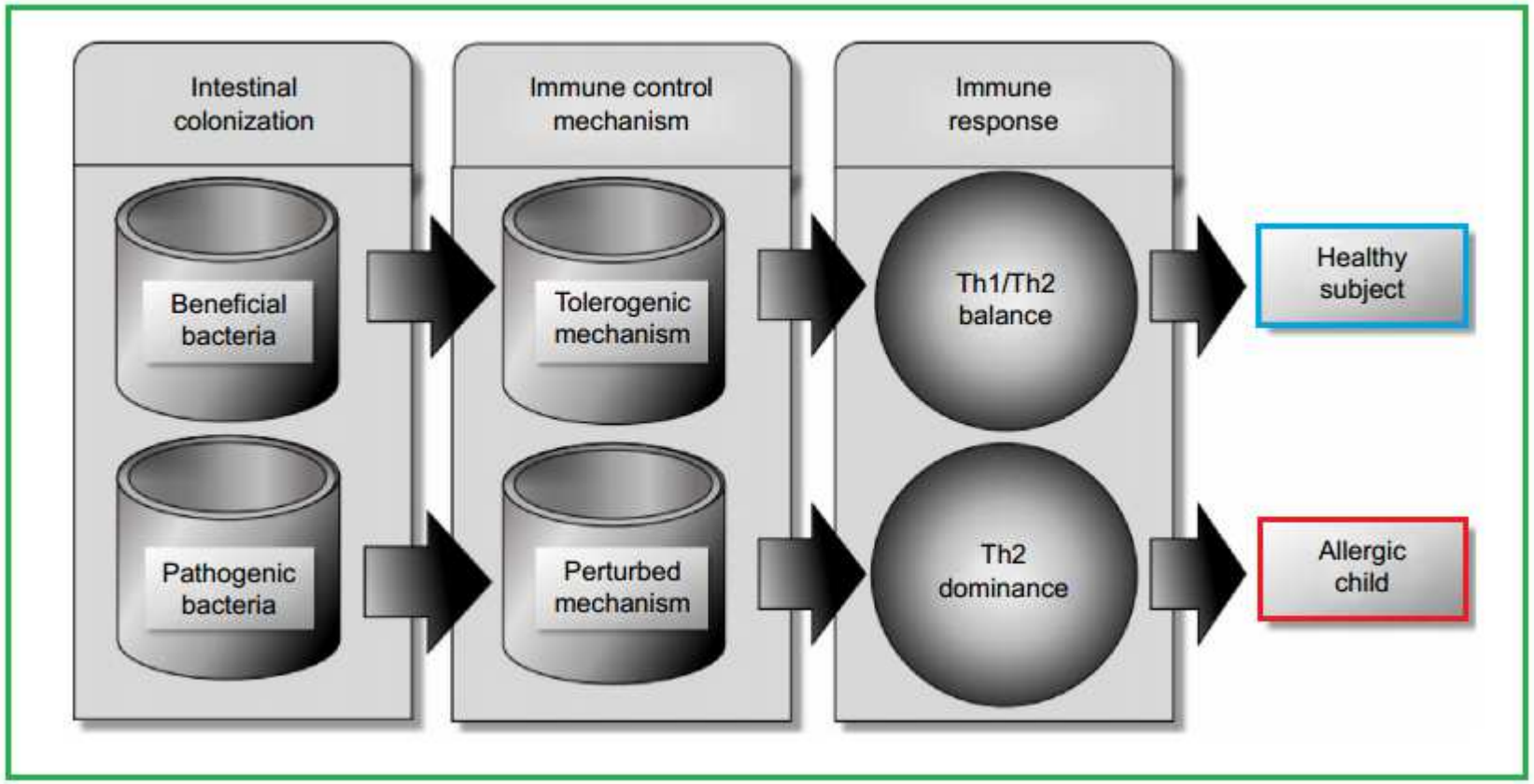
Stimolazione di citochine

anti-infiammatorie,

riduzione asma allergica.

Drago et al, *Allergy Asthma Immunol Res* (2015)

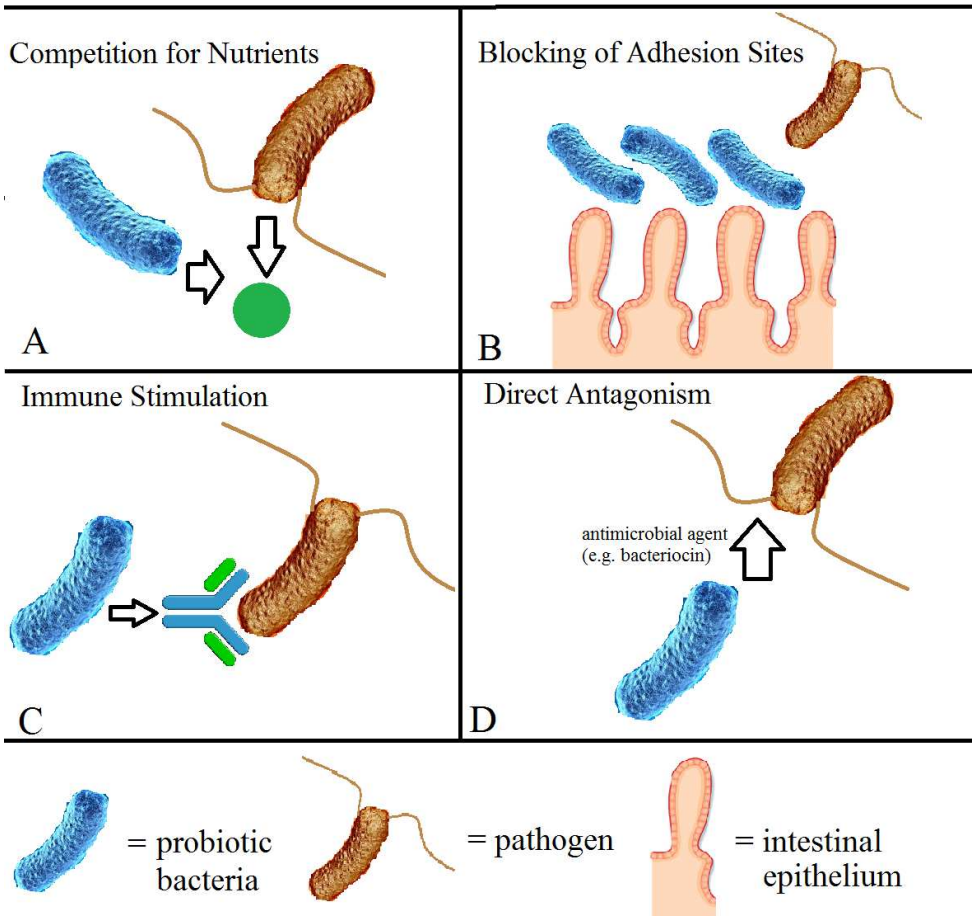
PROBIOTICI e ALLERGIE



Hendaus et al, *Ther Clin Risk Manag* (2016)

PROBIOTICI e INFEZIONI

How Probiotics Work



PROBIOTICI e INFEZIONI

- **Benefici nelle infezioni da *Clostridium difficile*;**
- **Miglioramento delle gastroenteriti acute;**
- **Riduzione delle complicazioni infettive associate al ricovero in Terapia Intensiva.**
- **Riduzione della sintomatologia infezioni gastriche nella popolazione pediatrica.**

PROBIOTICI e INFEZIONI

Ann Med. 2016;48(4):246-55. doi: 10.3109/07853890.2016.1161232. Epub 2016 Mar 26.

Probiotic approach to prevent antibiotic resistance.

Ouwehand AC[1], Forssten S[1], Hibberd AA[2], Lyra A[1], Stahl B[3].

Abstract

Probiotics are live microorganisms, mainly belonging to the genera Lactobacillus and Bifidobacterium, although also strain of other species are commercialized, that have a beneficial effect on the host. From the perspective of antibiotic use, probiotics have been observed to reduce the risk of certain infectious disease such as certain types of diarrhea and respiratory tract infection. This may be accompanied with a reduced need of antibiotics for secondary infections. Antibiotics tend to be effective against most common diseases, but increasingly resistance is being observed among pathogens. Probiotics are specifically selected to not contribute to the spread of antibiotic resistance and not carry transferable antibiotic resistance. Concomitant use of probiotics with antibiotics has been observed to reduce the incidence, duration and/or severity of antibiotic-associated diarrhea. This contributes to better adherence to the antibiotic prescription and thereby reduces the evolution of resistance. To what extent probiotics directly reduce the spread of antibiotic resistance is still much under investigation; but maintaining a balanced microbiota during antibiotic use may certainly provide opportunities for reducing the spread of resistances. Key messages Probiotics may reduce the risk for certain infectious diseases and thereby reduce the need for antibiotics. Probiotics may reduce the risk for antibiotic-associated diarrhea Probiotics do not contribute to the spread of antibiotic resistance and may even reduce it.

PROBIOTICI e INFEZIONI

RIDUZIONE INSORGENZA DI PATOGENI ANTIBIOTICO-RESISTENTI

La terapia probiotica riduce il rischio di infezioni secondarie e di conseguenza, il bisogno di antibiotici.

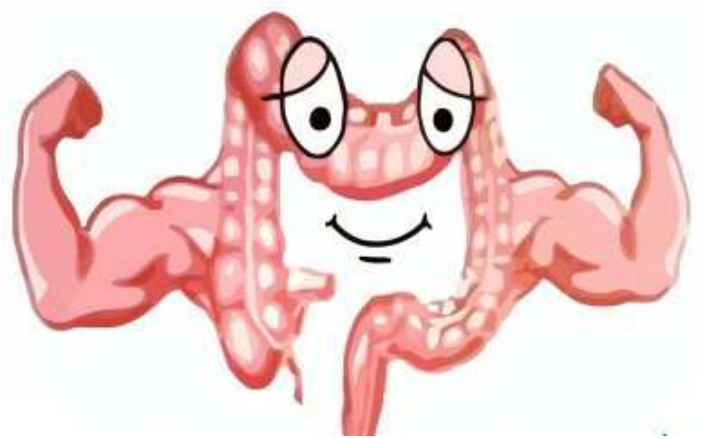
PROBIOTICI e INFEZIONI

BARRIERA CONTRO I PATOGENI

RAFFORZAMENTO SISTEMA IMMUNITARIO

MIGLIORAMENTO GENERALE DELLA SALUTE

CONCLUSIONI



Grazie per l'Attenzione!