



CENTER FOR
INTEGRATIVE
ONCOLOGY

Estroboloma e rischio oncologico

Gemelli



Stefano Magno, MD
Breast Unit
Center for Integrative Oncology

7 Dicembre 2019

**Fondazione Policlinico Universitario A. Gemelli
Università Cattolica del Sacro Cuore**

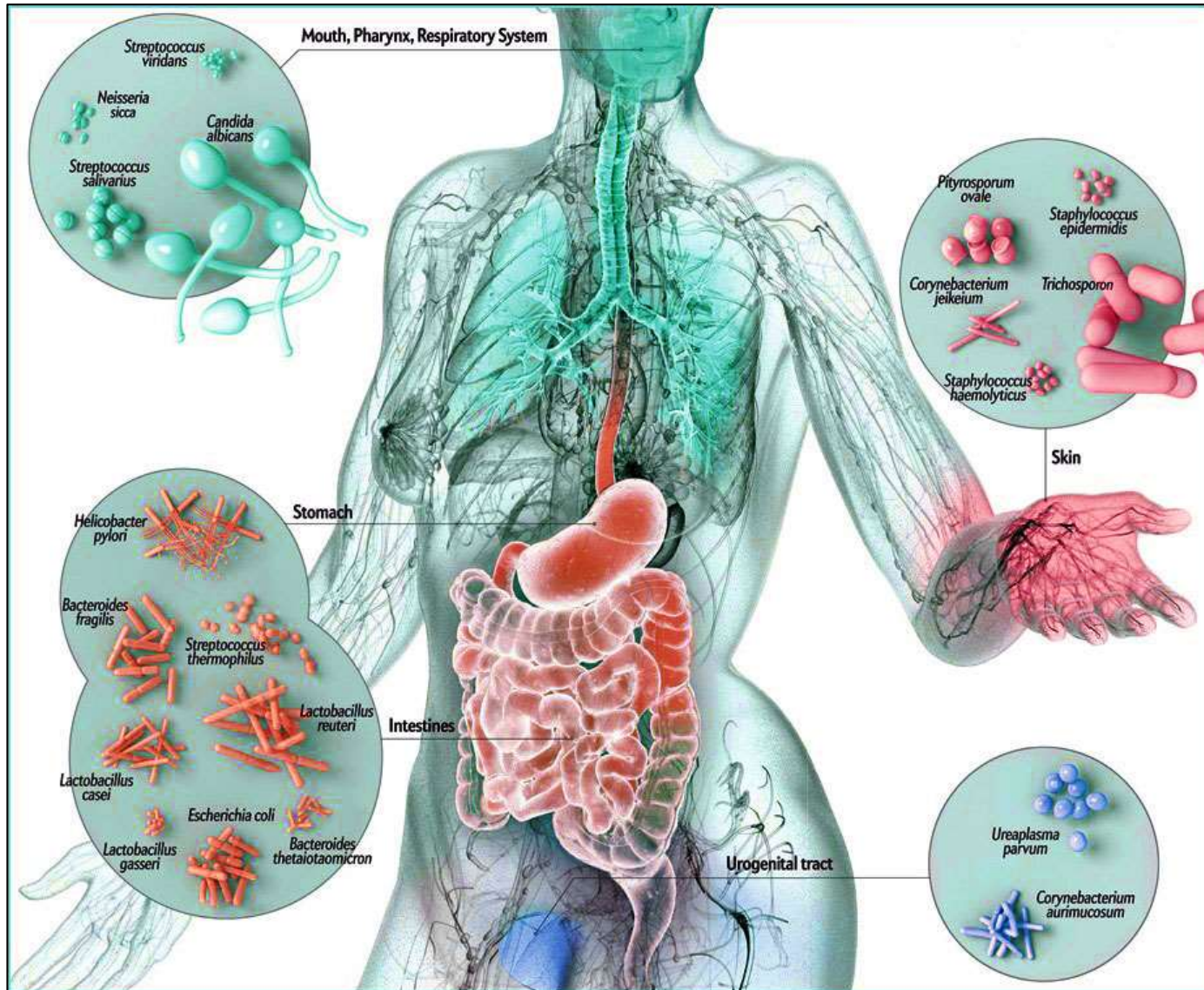


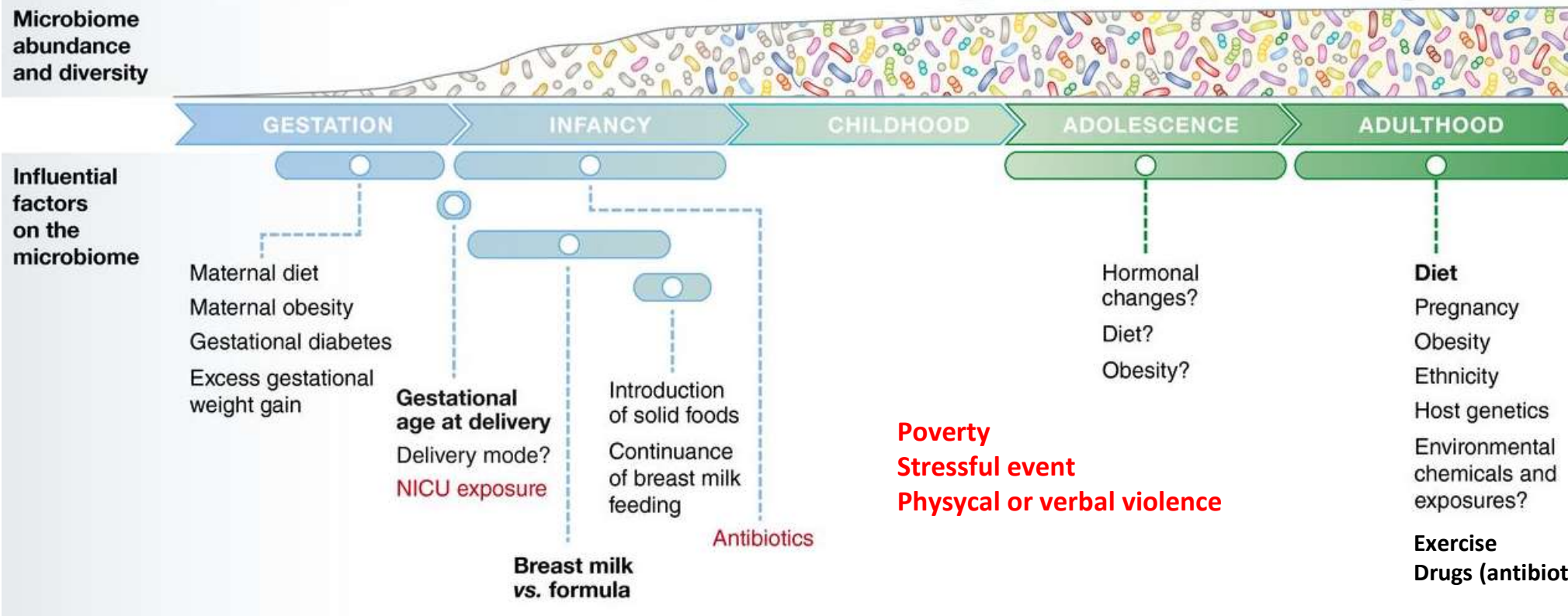
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Conflitti di interesse da dichiarare:

nessuno

Microbiota revolution

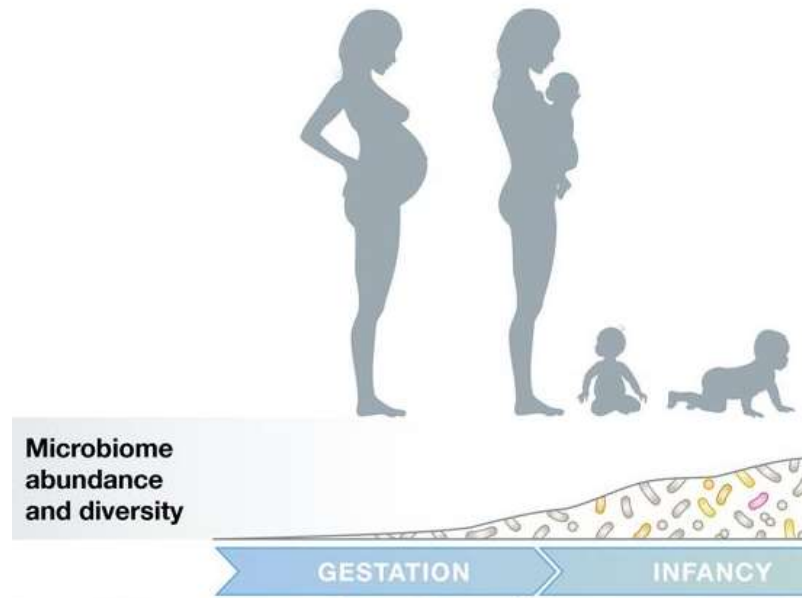




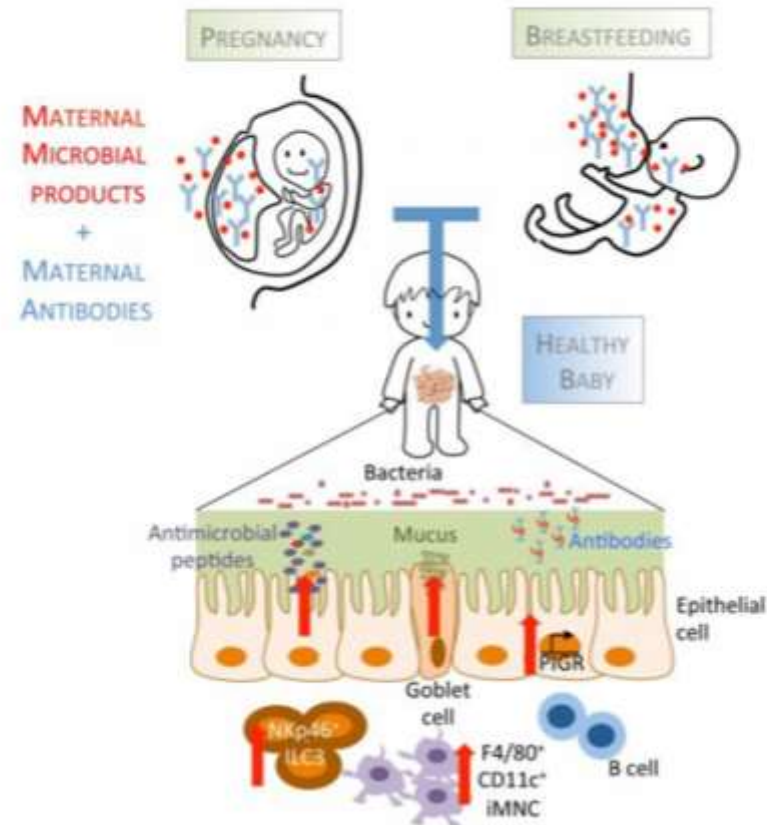
The maternal microbiota drives early postnatal innate immune development

Mercedes Gomez de Agüero,^{1*} Stephanie C. Ganai-Vonarburg,^{1*} Tobias Fuhrer,² Sandra Rupp,¹ Yasuhiro Uchimura,¹ Hai Li,¹ Anna Steinert,¹ Mathias Heikenwalder,³ Siegfried Hapfelmeier,⁴ Uwe Sauer,² Kathy D. McCoy,^{1*} Andrew J. Macpherson^{1*}†

Postnatal colonization of the body with microbes is assumed to be the main stimulus to postnatal immune development. By transiently colonizing pregnant female mice, we show that the maternal microbiota shapes the immune system of the offspring. Gestational colonization increases intestinal group 3 innate lymphoid cells and F4/80⁺CD11c⁺ mononuclear cells in the pups. Maternal colonization reprograms intestinal transcriptional profiles of the offspring, including increased expression of genes encoding epithelial antibacterial peptides and metabolism of microbial molecules. Some of these effects are dependent on maternal antibodies that potentially retain microbial molecules and transmit them to the offspring during pregnancy and in milk. Pups born to mothers transiently colonized in pregnancy are better able to avoid inflammatory responses to microbial molecules and penetration of intestinal microbes.



Shaping of the immune system starts with the MATERNAL microbiota





ELSEVIER

See related Commentary on page 229

MUSCULOSKELETAL PATHOLOGY

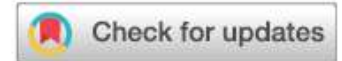
Antibiotic Perturbation of Gut Microbiota Dysregulates Osteoimmune Cross Talk in Postpubertal Skeletal Development

Jessica D. Hathaway-Schrader,^{*†} Heidi M. Steinkamp,^{*‡} Michael B. Chavez,^{*§} Nicole A. Poulides,^{*†} Joy E. Kirkpatrick,^{*} Michael E. Chew,^{*} Emily Huang,^{*} Alexander V. Alekseyenko,^{*¶} Jose I. Aguirre,^{||} and Chad M. Novince^{*†}

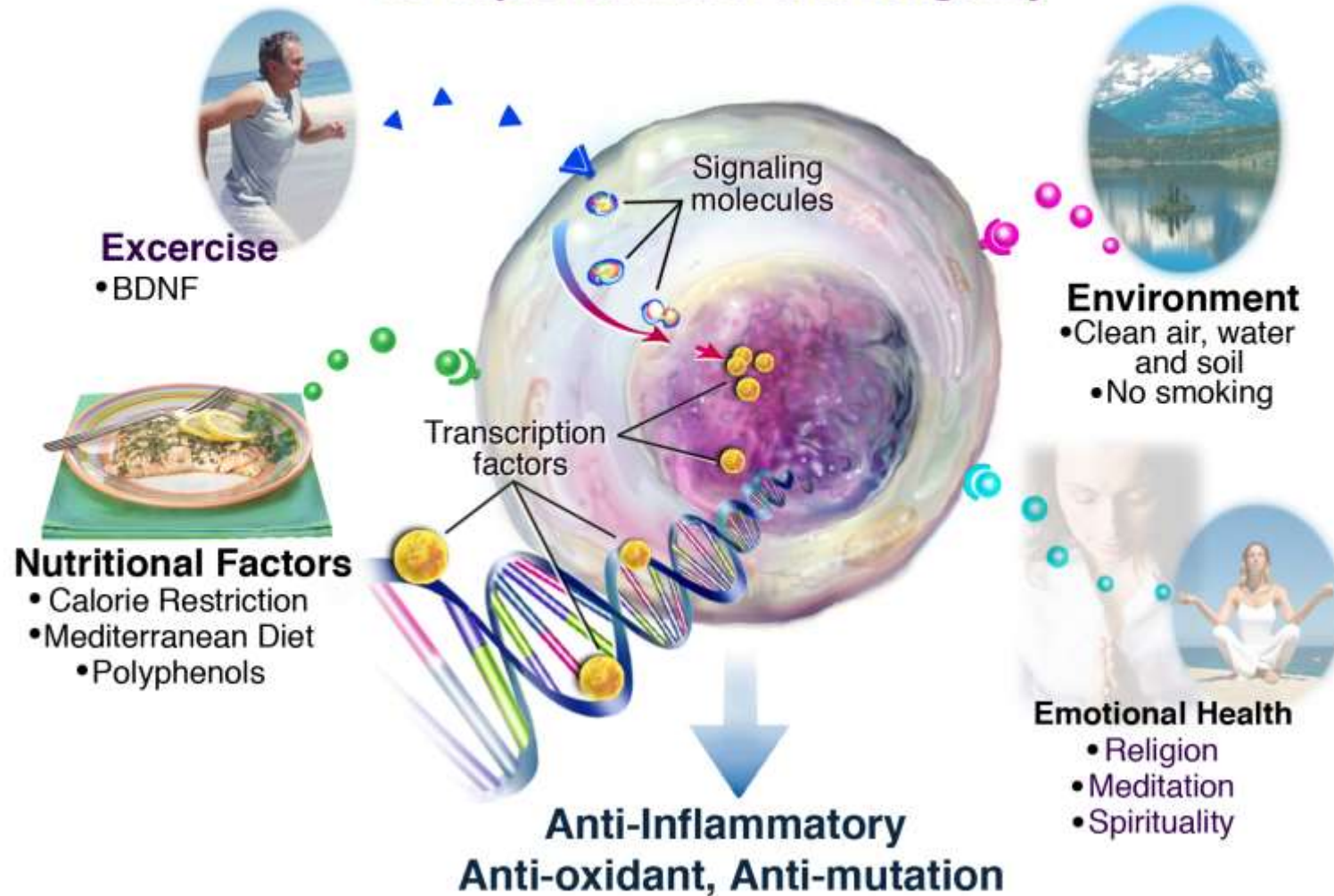
The American Journal of

PATHOLOGY

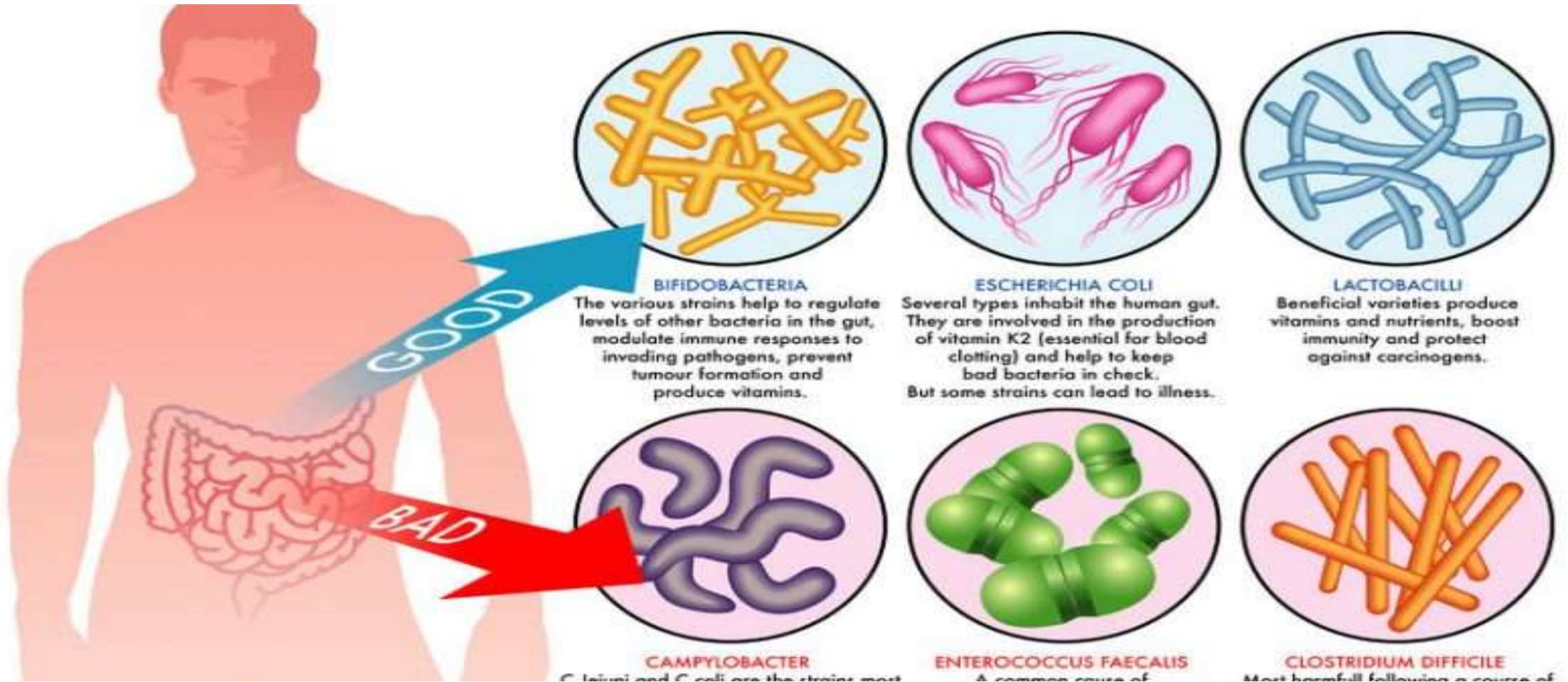
ajp.amjpathol.org



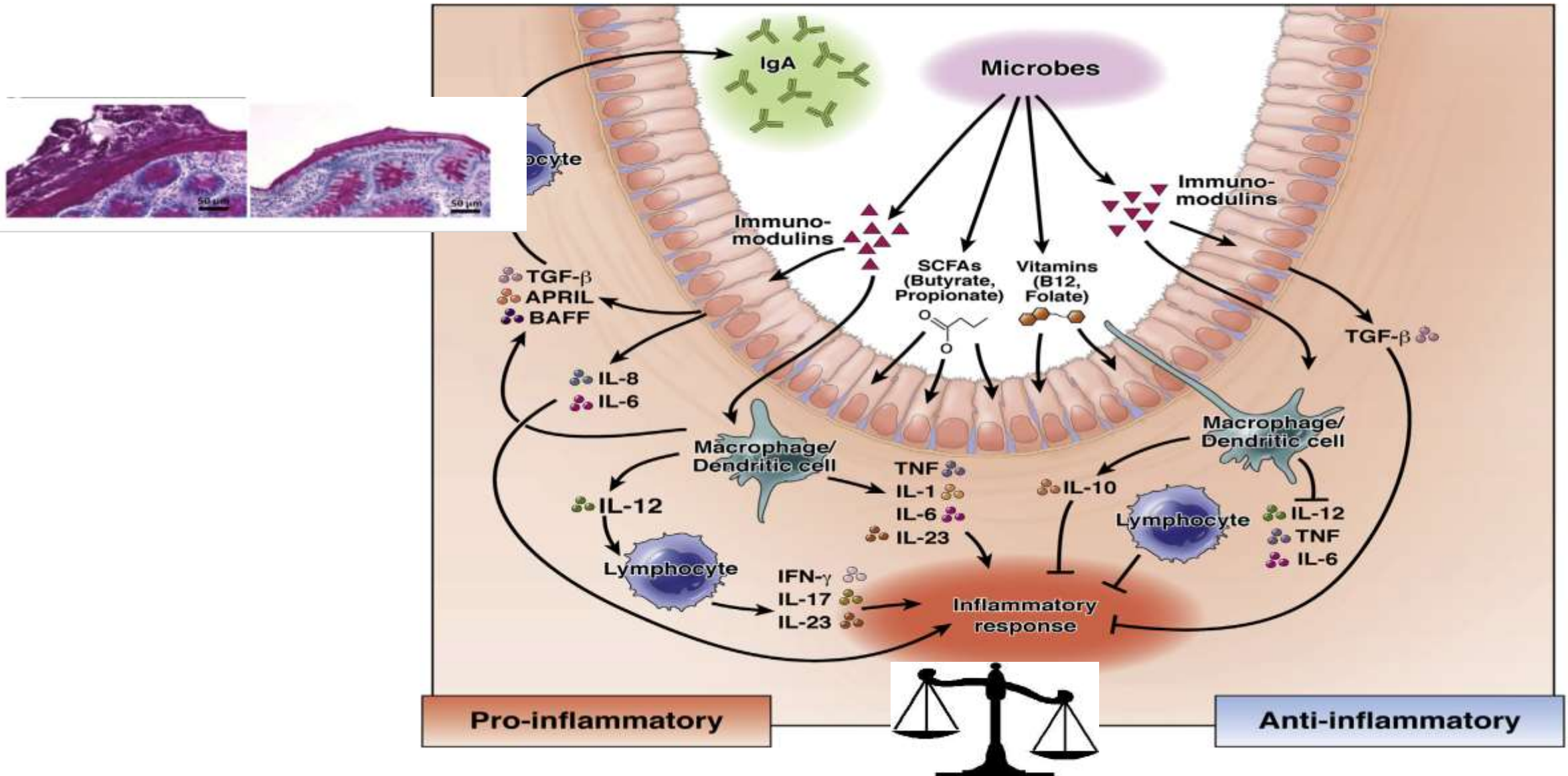
Epigenetics and Gene Activation for Improved Health and Longevity



Microbiota composition

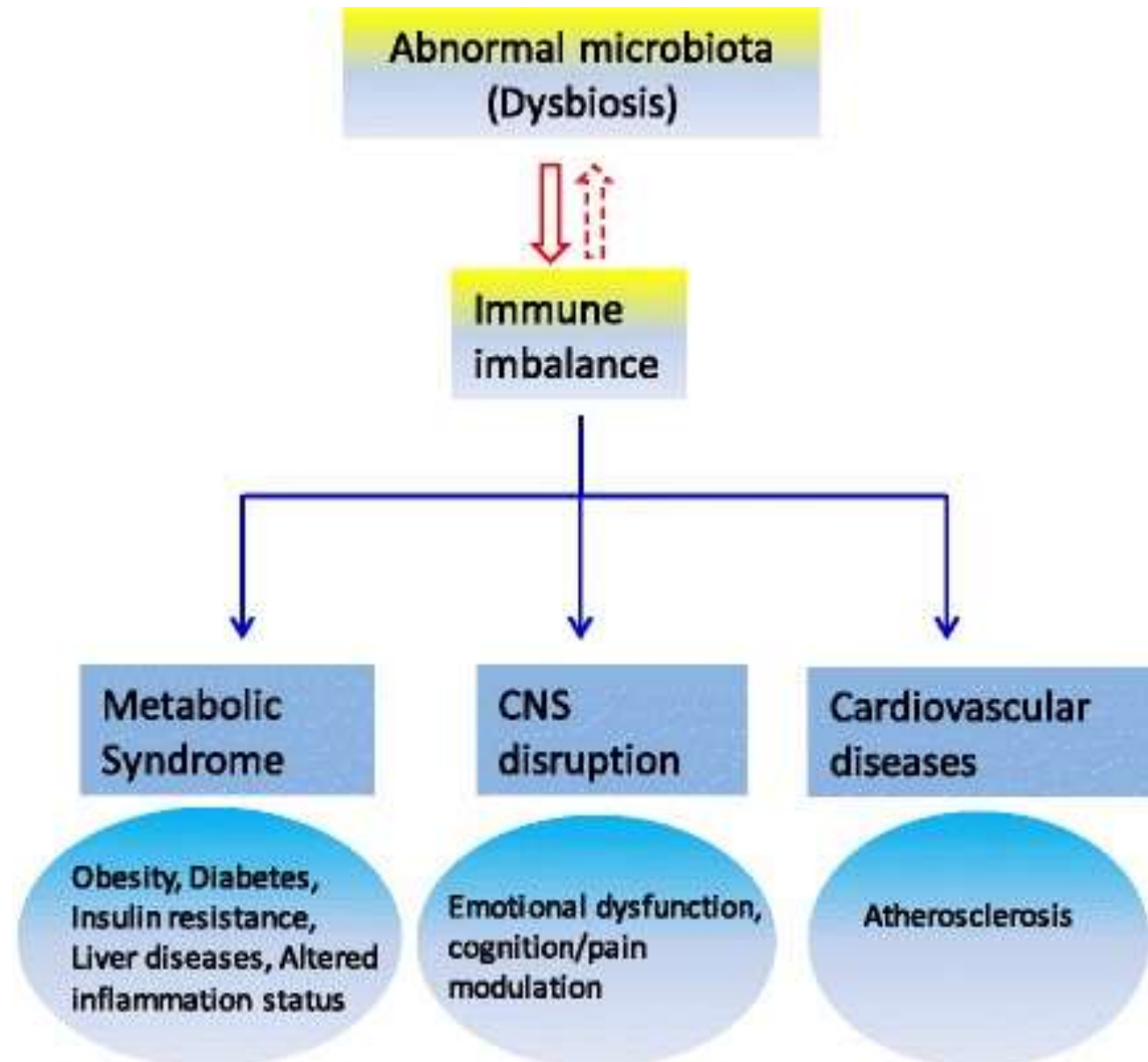


Microbiota modulates local and systemic inflammation

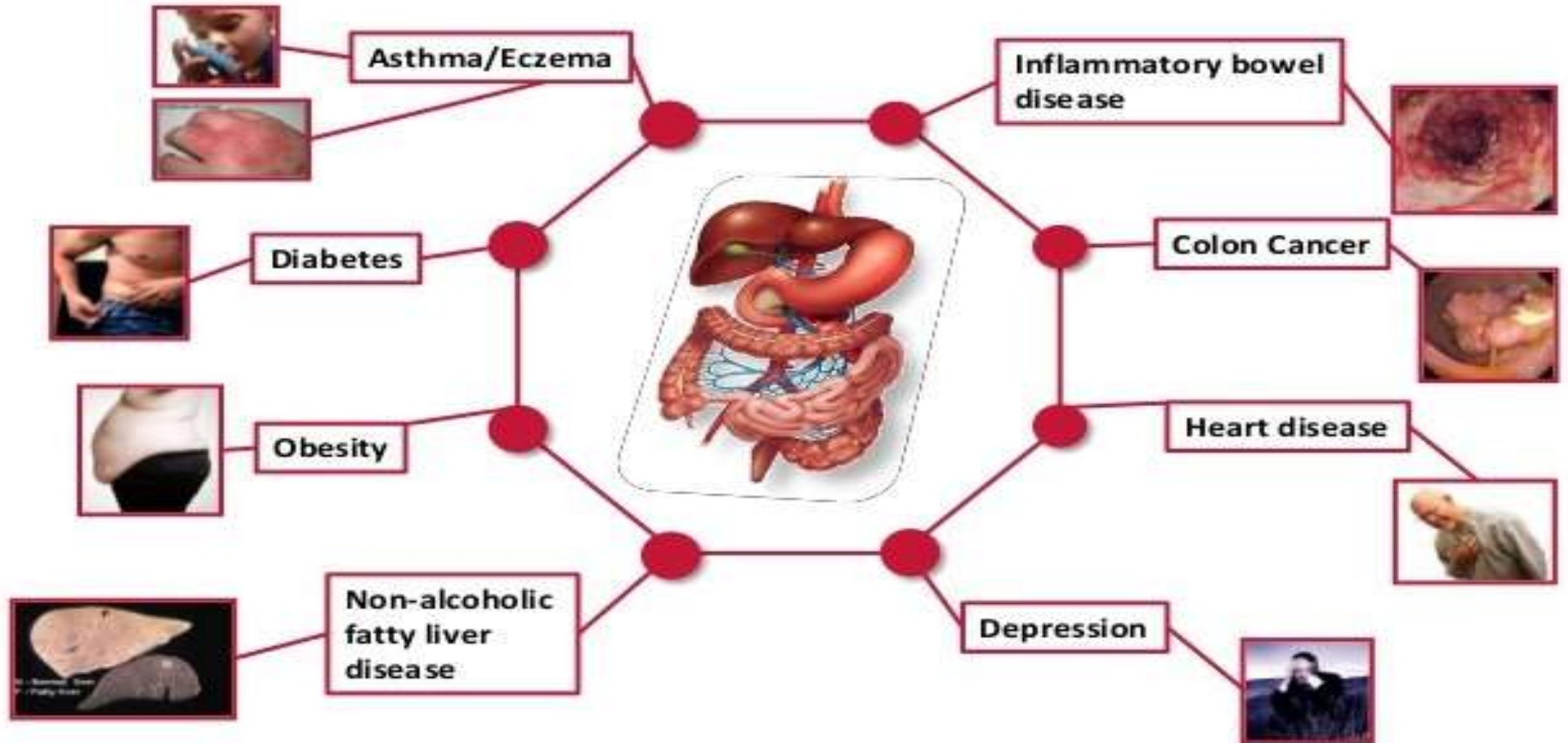


Role of intestinal microbiota and metabolites on gut homeostasis and human diseases

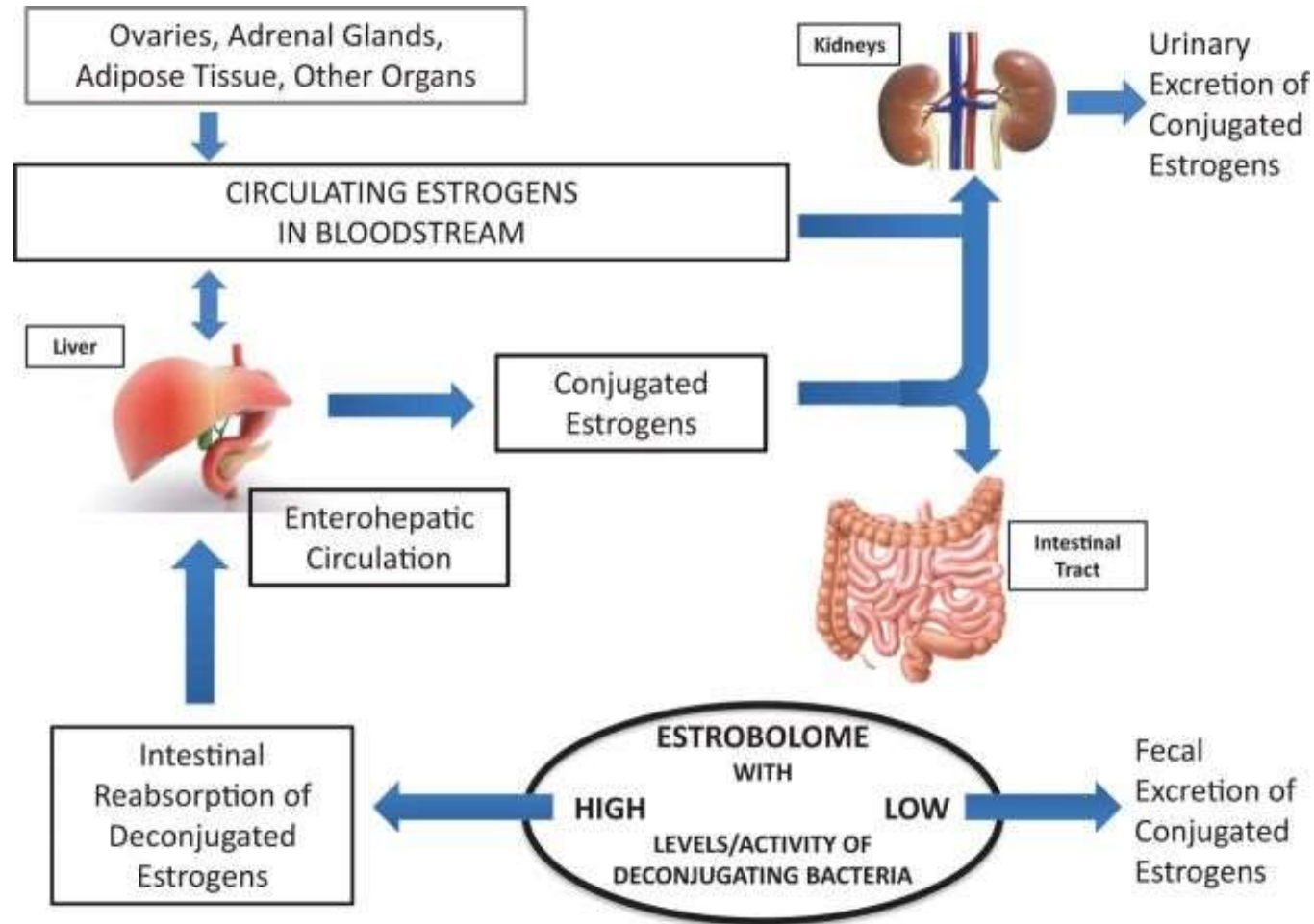
Lin and Zhang *BMC Immunology* (2017) 18:2
DOI 10.1186/s12865-016-0187-3



Gut Dysbiosis

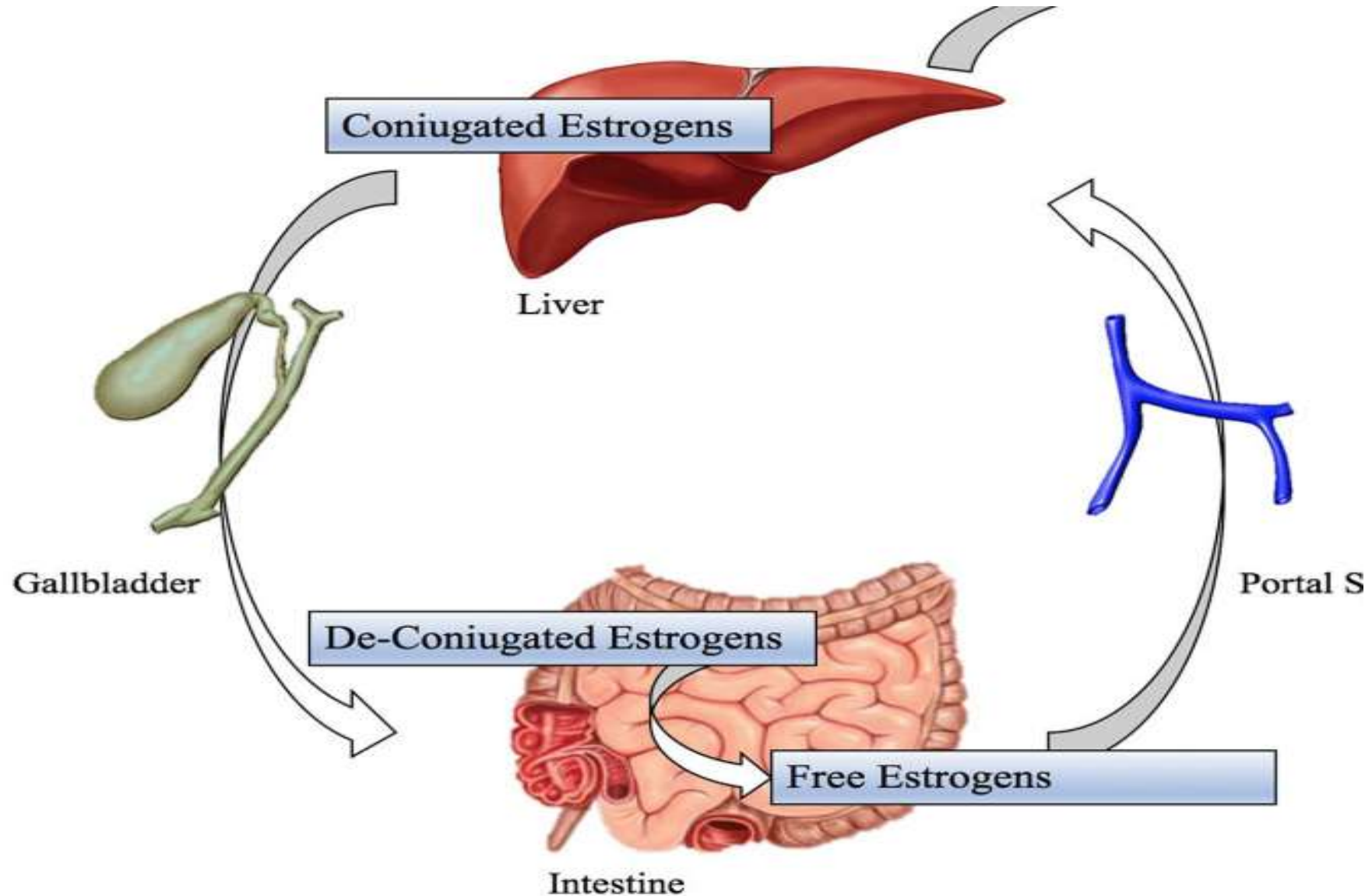


Microbiota and sexual hormones- Estrobolome



Kwa et al., Journal of the National Cancer Institute (2016)

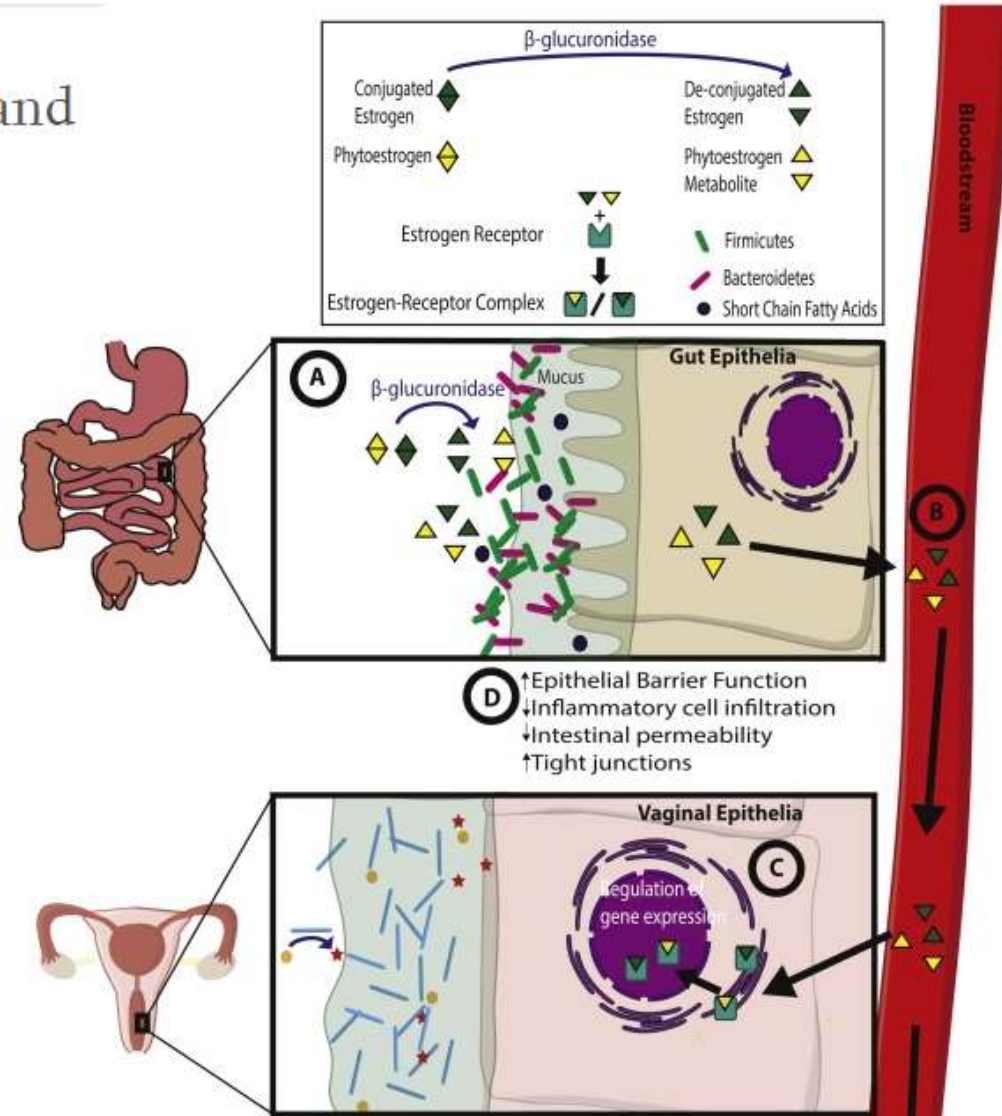
Microbiota and sexual hormones- Estrobolome

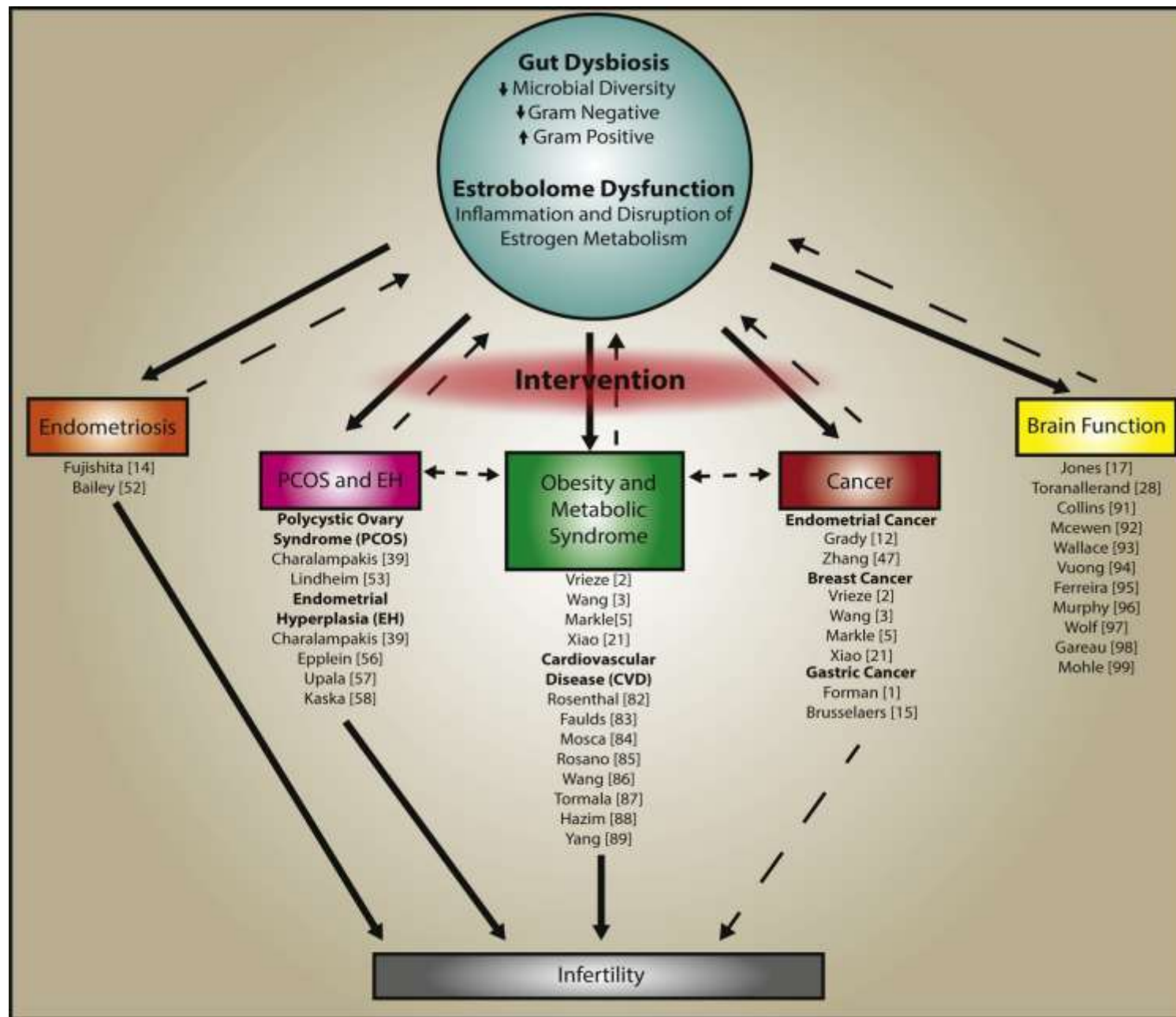


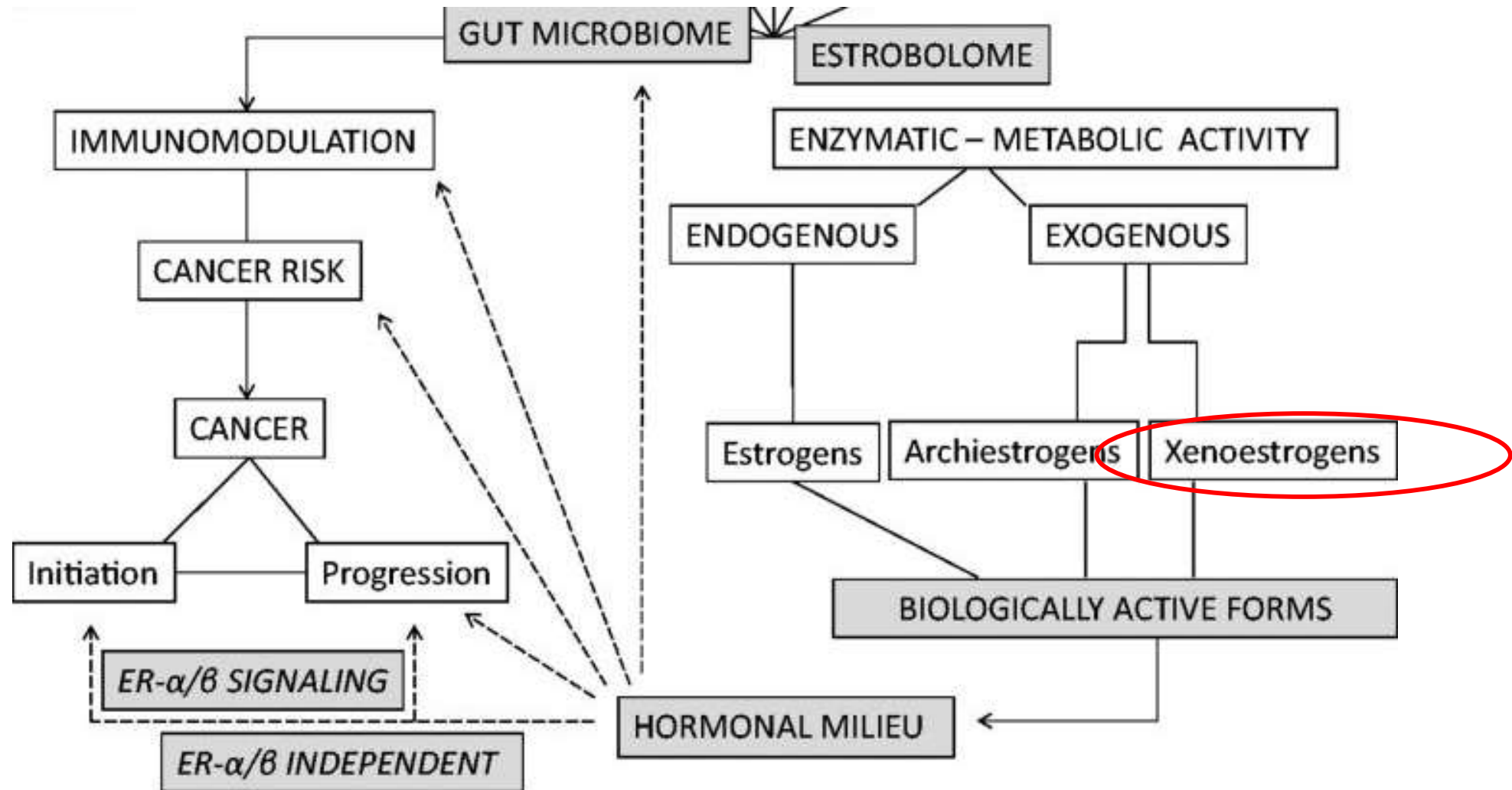
Review

Estrogen–gut microbiome axis: Physiological and clinical implications

James M. Baker^a, Layla Al-Nakkash^a, Melissa M. Herbst-Kralovetz^a







Microbiota and xenobiotics

Cell

Volume 152, Issues 1–2, 17 January 2013, Pages 39–50



Article

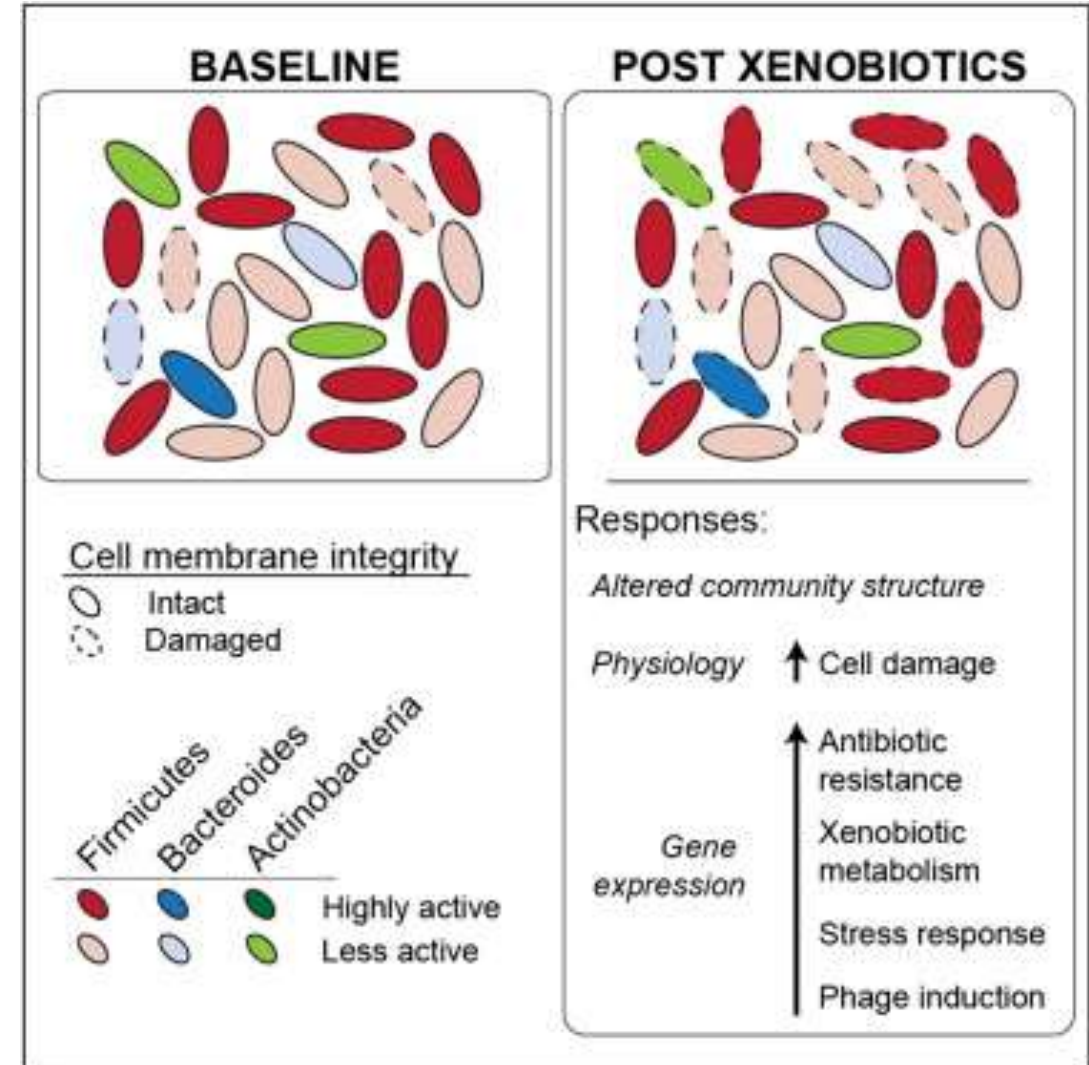
Xenobiotics Shape the Physiology and Gene Expression of the Active Human Gut Microbiome

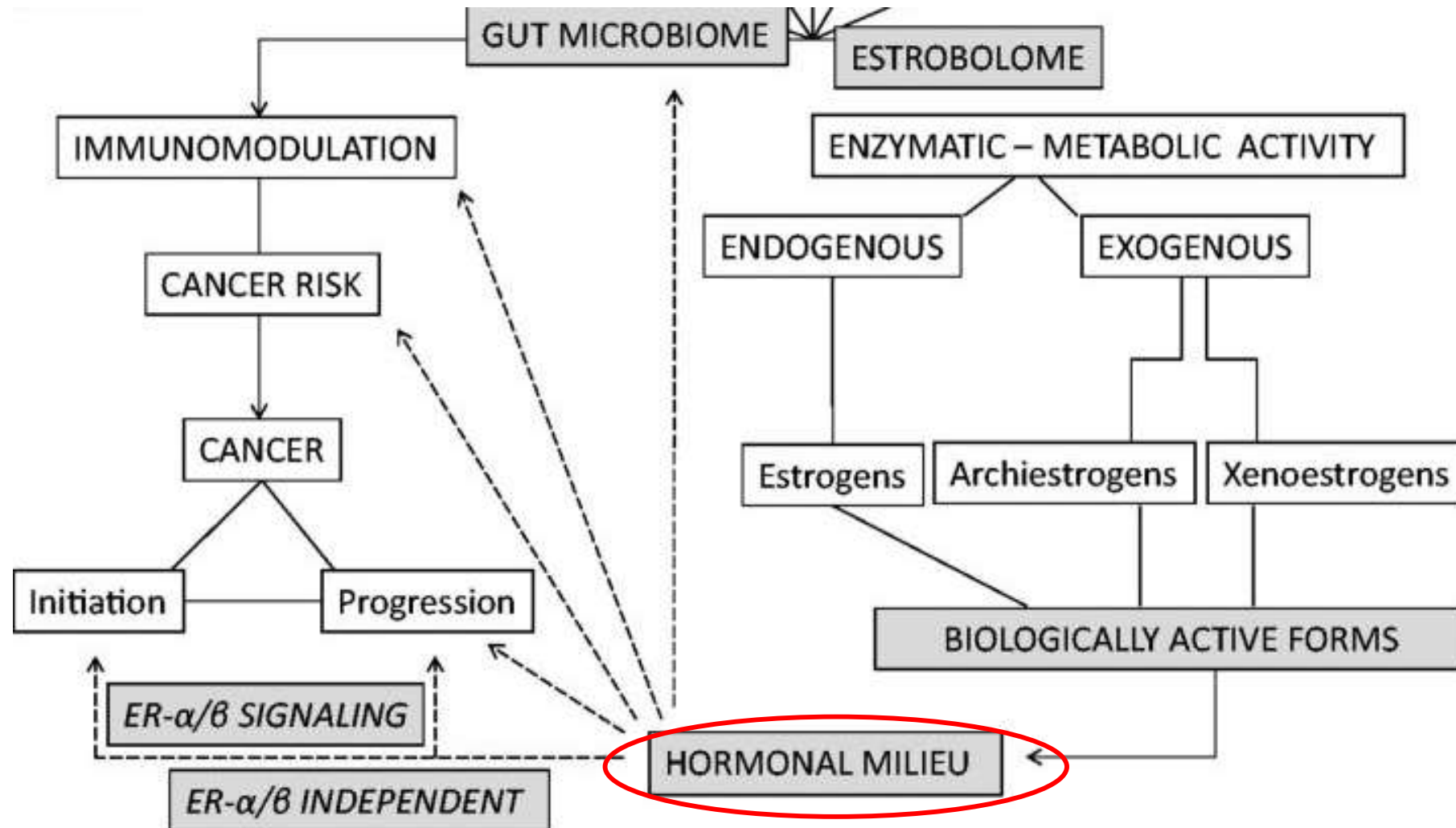
Corinne Ferrier Maurice¹, Henry Joseph Haiser¹, Peter James Turnbaugh¹

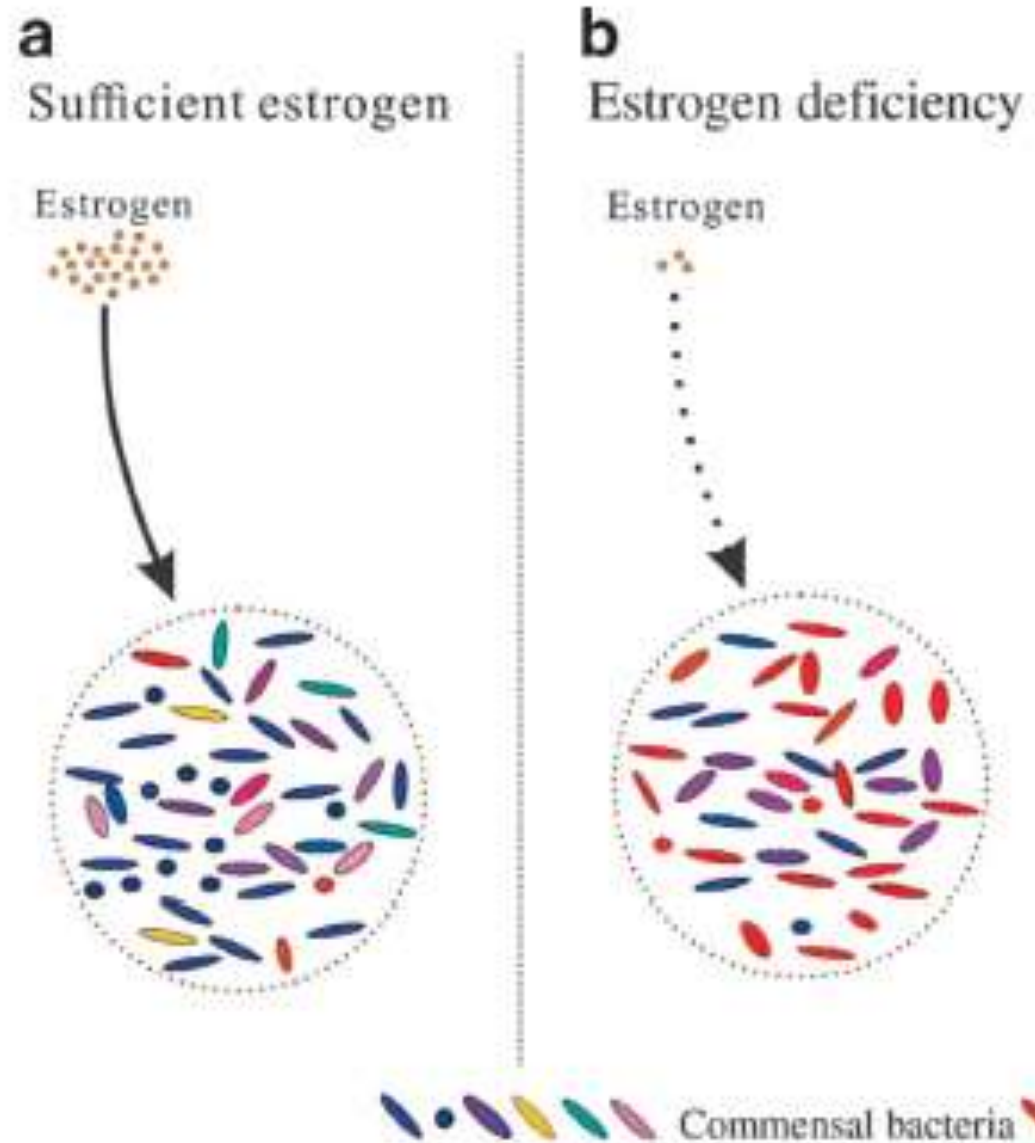
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<https://doi.org/10.1016/j.cell.2012.10.052>

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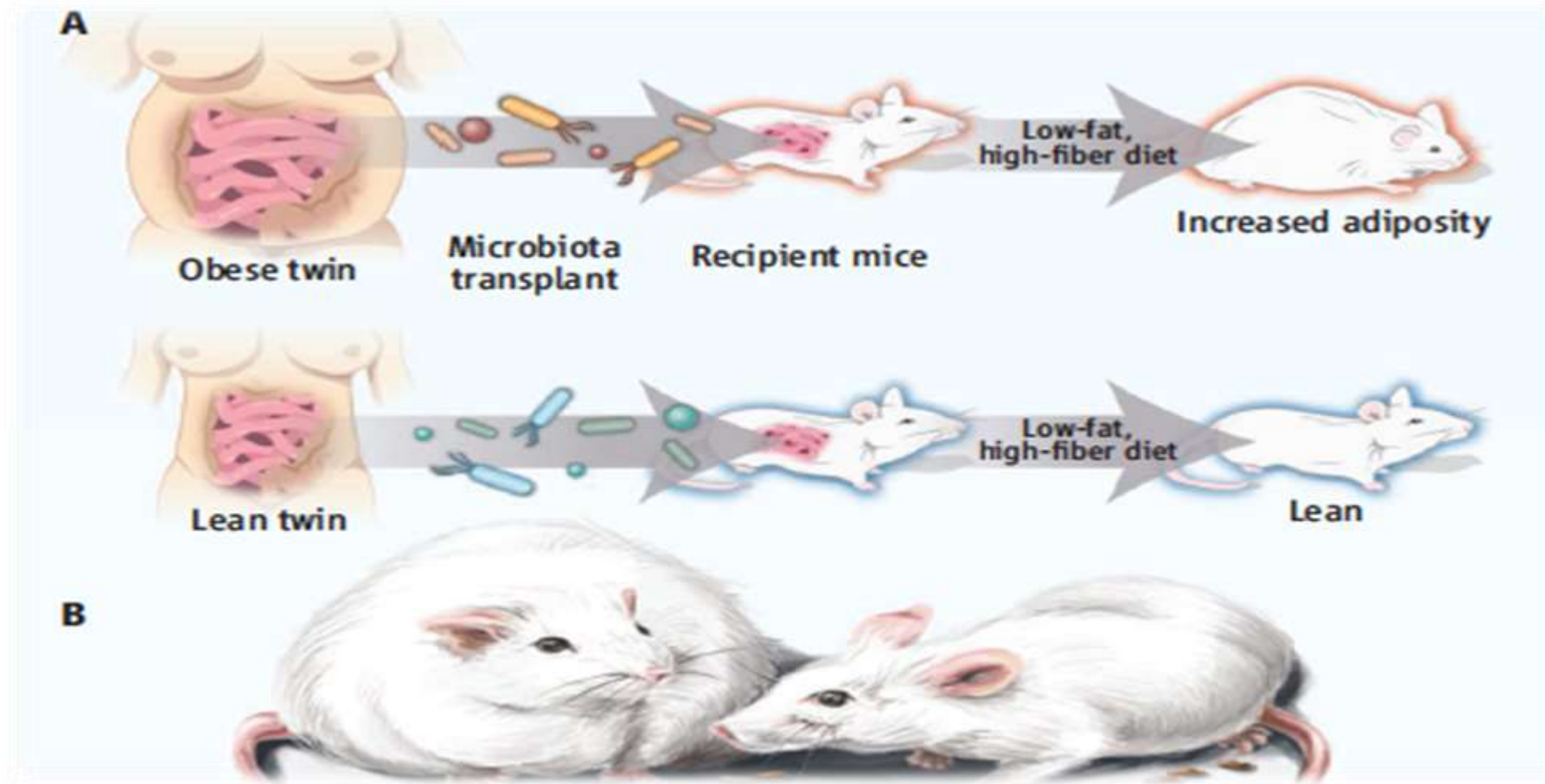






Carenza estrogenica riduce la biodiversità microbica

Microbiota and metabolism



Ridaura VK et al. Science 2013
Walker AW et al. Science 2013

[Endocr Rev.](#) 2013 Jun; 34(3): 309–338.

PMCID: PMC3660717

Published online 2013 Mar 4. doi: [10.1210/er.2012-1055](https://doi.org/10.1210/er.2012-1055)

PMID: [23460719](https://pubmed.ncbi.nlm.nih.gov/23460719/)

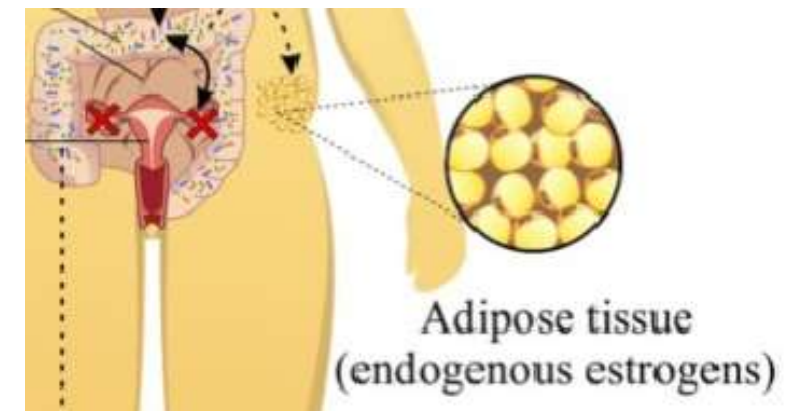
The Role of Estrogens in Control of Energy Balance and Glucose Homeostasis

[Franck Mauvais-Jarvis](#), [Deborah J. Clegg](#), and [Andrea L. Hevener](#)

Influence of Oral and Gut Microbiota in the Health of Menopausal Women

Angélica T. Vieira,¹ Paula M. Castelo,^{2,3} Daniel A. Ribeiro,^{3,4} and Caroline M. Ferreira^{2,3,*}

Obesity affects 65% of postmenopausal women and is associated with the onset of metabolic dysfunction ([Leeners et al., 2017](#)). Multiple studies have suggested that postmenopausal women exhibit increased total fat mass and abdominal fat and decreased lean body mass compared with those of premenopausal women, regardless of aging ([Aloia et al., 1995](#); [Schreiner et al., 1996](#); [Cordina-Duverger et al., 2016](#)). The accumulation of abdominal fat in postmenopausal women appears to be a critical factor in the development of insulin resistance and type 2 diabetes ([Lobo et al., 2014](#)), and the relationship between the gut microbiota and a lack of estrogen is likely responsible for weight gain and lipid deposition during menopause.



Estrogens and female liver health

Karen L. Chen^a, Zeynep Madak-Erdogan^a

Abstract

Due to declining estrogen levels during menopause, NAFLD prevalence is higher in postmenopausal women compared to in premenopausal women or in men. Postmenopausal women are more susceptible to weight gain, fat redistribution and dyslipidemia, all major hallmarks of metabolic syndrome associated with increased NAFLD risk. Gut microbiota plays important roles in development of gastrointestinal tract, metabolism and immunity. Host-microbe interactions allows regulation of a wide range of pathways that affect healthy and diseased physiology.

Conclusions and future research

Treatment may also involve using microbiota therapies in combination with estrogen therapies that work independently or synergistically to provide a more holistic treatment approach to prevent metabolic disease.

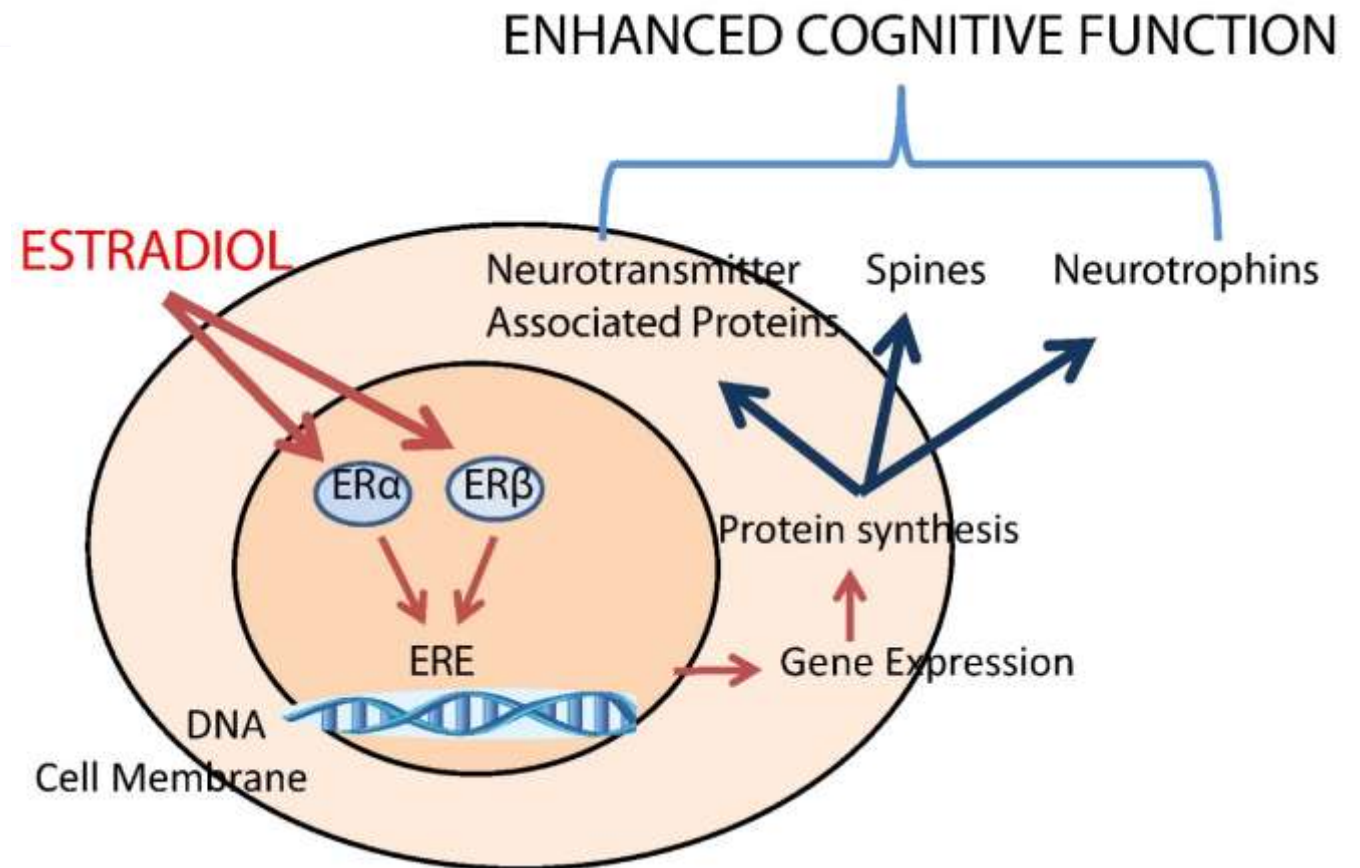


Review

Estradiol and cognitive function: Past, present and future

Victoria N. Luine*

Department of Psychology, Hunter College of CUNY, New York, NY, USA



Review

Estrogen–gut microbiome axis: Physiological and clinical implications

James M. Baker^a, Layla Al-Nakkash^a, Melissa M. Herbst-Kralovetz^a

The reduction in diversity of the gut microbiome in CVD patients and the putative reduction in estrogen and phytoestrogen levels may be a key aspect of the gut microbiome-CVD interaction

Microbiota and Bone health – Endocrine pathway

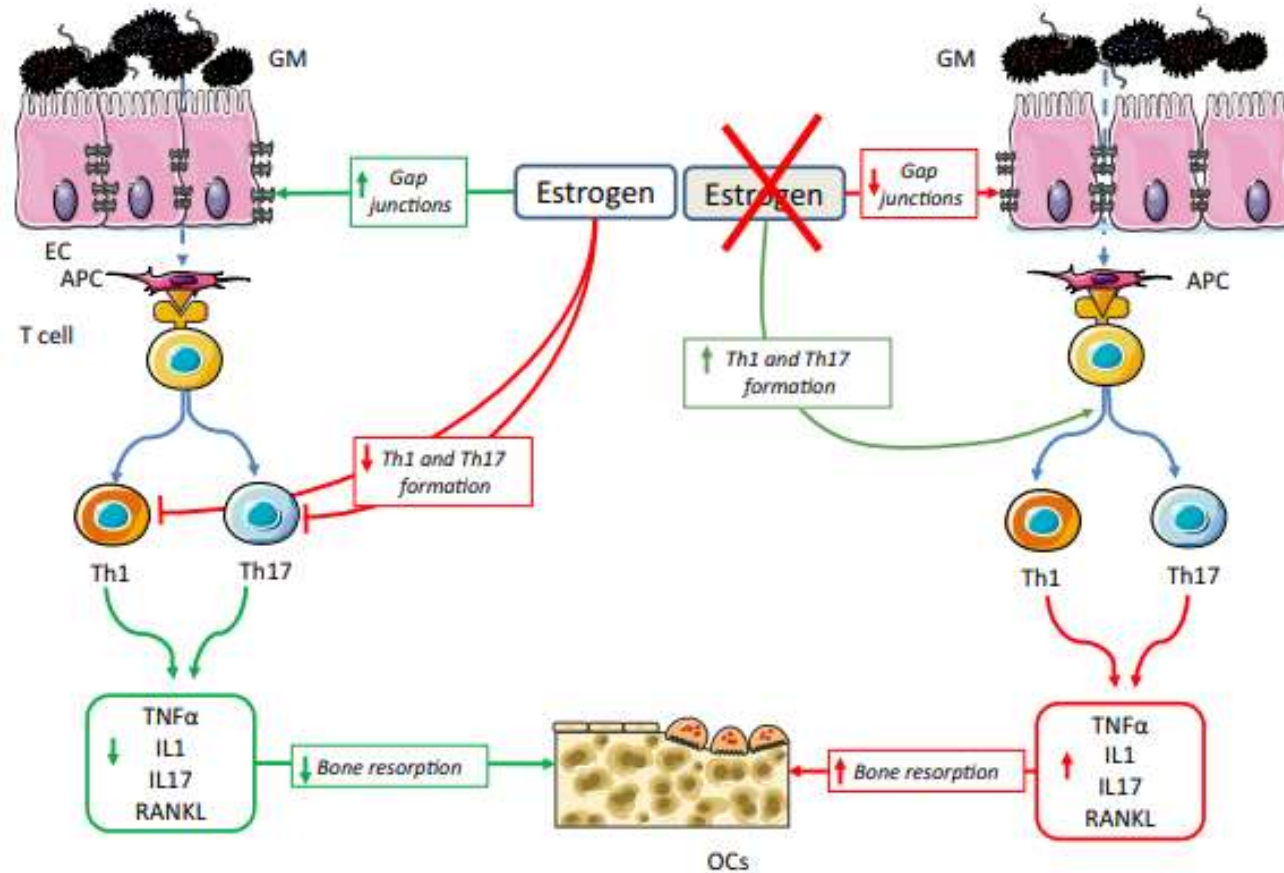
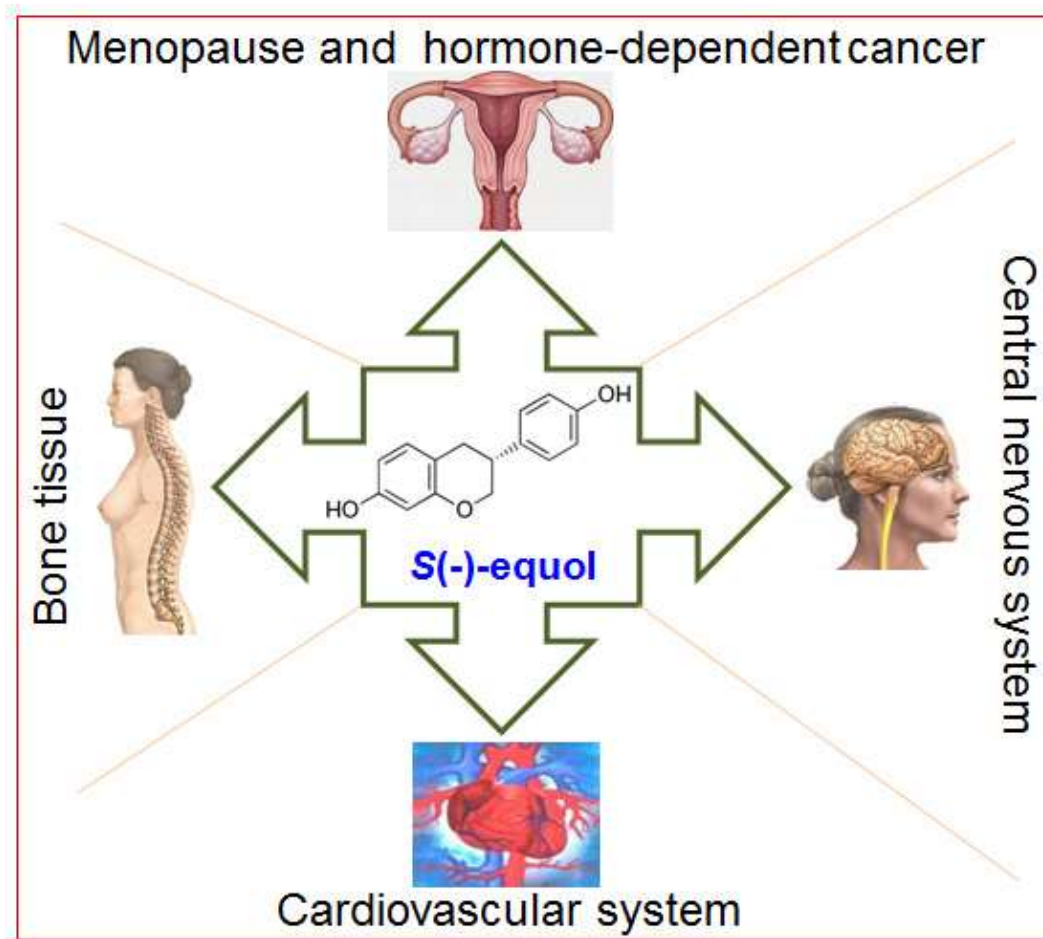


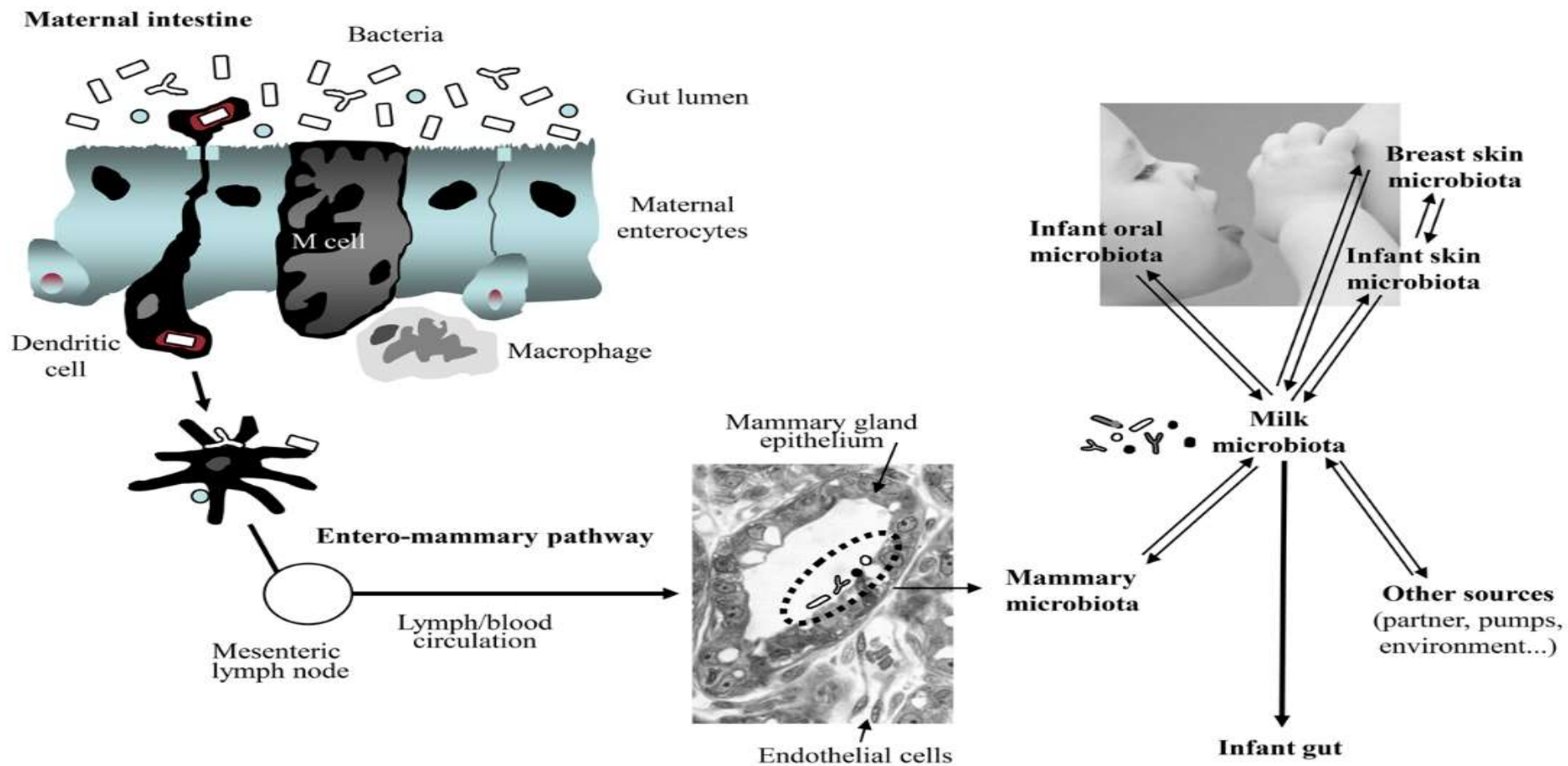
Fig. 2 The complex relationships between immune system, estrogen deficiency-bone loss, and gut microbiota: enteral barrier integrity, cytokine production, immune, and bone cells are involved. *GM* gut

microbiota, *EC* enteral cells, *APC* antigen-presenting cells, *Treg* T regulatory cells, *Th1* T helper-1, *Th17* T helper-17 cells, *OBs* osteoblasts, *OCs* osteoclasts

Equol: A Bacterial Metabolite from The Daidzein Isoflavone and Its Presumed Beneficial Health Effects



Gut - breast axis



Rodriguez et al., 2014. doi:10.3945/an.114.007229
Rescigno et al., 2001, doi: 10.1038/86373

Breast tissue dysbiosis

www.nature.com/scientificreports

SCIENTIFIC REPORTS



OPEN

Characterization of human breast tissue microbiota from core needle biopsies through the analysis of multi hypervariable 16S-rRNA gene regions

Lara Costantini¹, Stefano Magno², Davide Albanese³, Claudio Donati³, Romina Molinari¹, Alessio Filippone², Riccardo Masetti^{2,4} & Nicolò Merendino¹

Breast microbiota compositions are not well understood, and a few recent reports have begun to explore the correlation between breast tissue dysbiosis and cancer. Given that various methods for breast microbiota detection were used, the aim of the present paper was to clarify which hypervariable region of the 16S-rRNA gene (V2, V3, V4, V6 + 7, V8, and V9) is the most informative for breast tissue microbiota. Core needle biopsies (CNBs) were compared with surgical excision biopsies (SEBs) to find

Gregory B. Gloor,^a Chwanrow K. Baban,^c Gregory B. Gloor,^a Gregor Reid^{a,b}
logy, Western University, London, Ontario, Canada^a; Cork Cancer
ario, Canada^b; Department of Biochemistry, Western University,
sging, Perkin Elmer, Alameda, California, USA^c

REPORTS

Aseptically
Breast Tissue in
ant Disease

arina Walther-Antonio^{1,4}, Stephen Johnson²,
eith L. Knutson⁵, Krishna R. Kalari²,
^{1,2} & Amy C. Degnim²

8, (No.50), pp: 88122-88138

Research Paper
s in breast cancer

olly Green⁴, Benjamin C.
and Charis Eng^{1,2,3,7,8}

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AMERICAN SOCIETY FOR MICROBIOLOGY Applied and Environmental Microbiology

The Microbiota of Breast Tissue and Cancer

Camilla Urbaniak,^{a,b} Gregory B. Gloor,^c Muriel Brackston,
Lawson Health Research Institute, London, Ontario, Canada^a; Department
of Biochemistry, Western University, London, Ontario, Canada^b; London
College Cork, Cork, Ireland^c

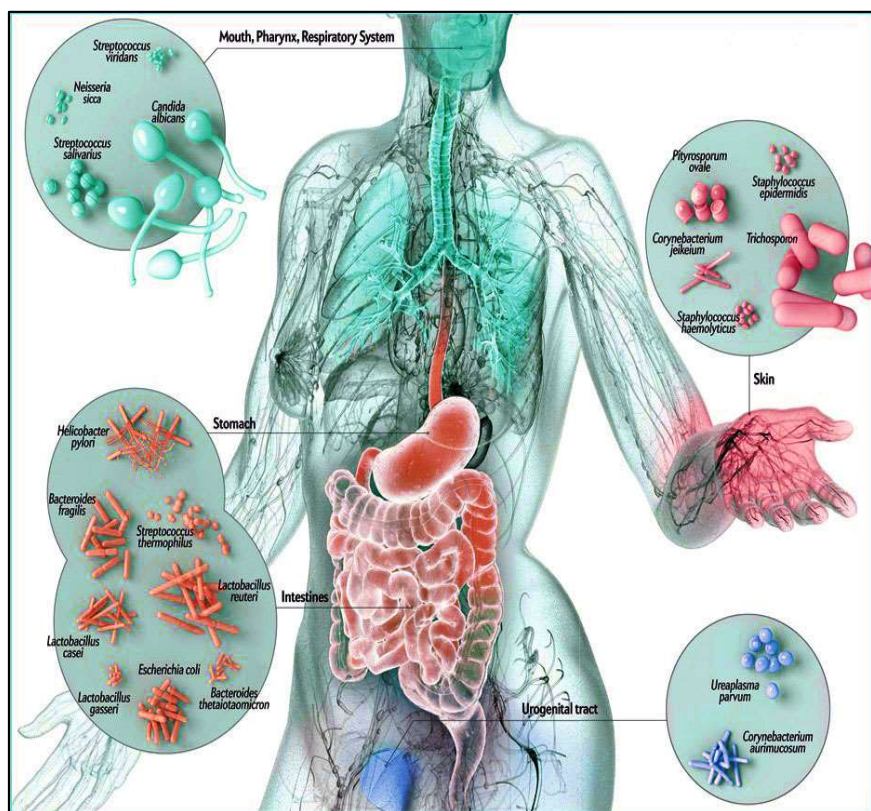


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OncoBiotica

Ruolo del microbiota nella cura integrata
della paziente oncologica





May 2014





Mindfulness



Qi Gong



Musicoterapia



Arteterapia



Psiconcologia



Sostanze
Naturali



LIFESTYLES

WELLBEING

COMPLEMENTARY
THERAPIES

Agopuntura



Riflessologia
Plantare



Fisioterapia

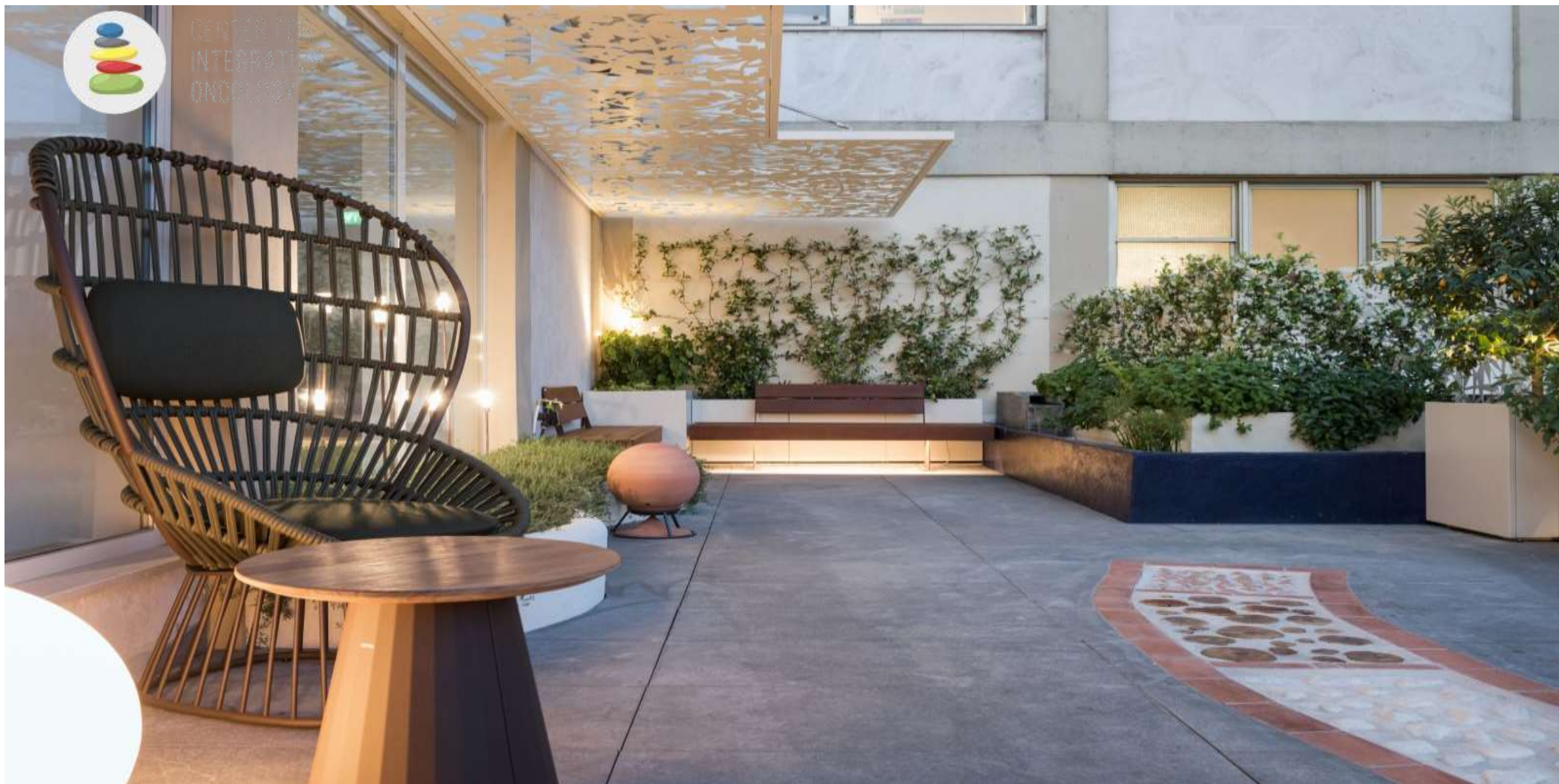




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Il giardino terapeutico



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Work in progress













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