

# The Healing Power Of Nutrition: How Diet Can Shape The Gut Microbiome And Dictate The Balance Between Health and Disease

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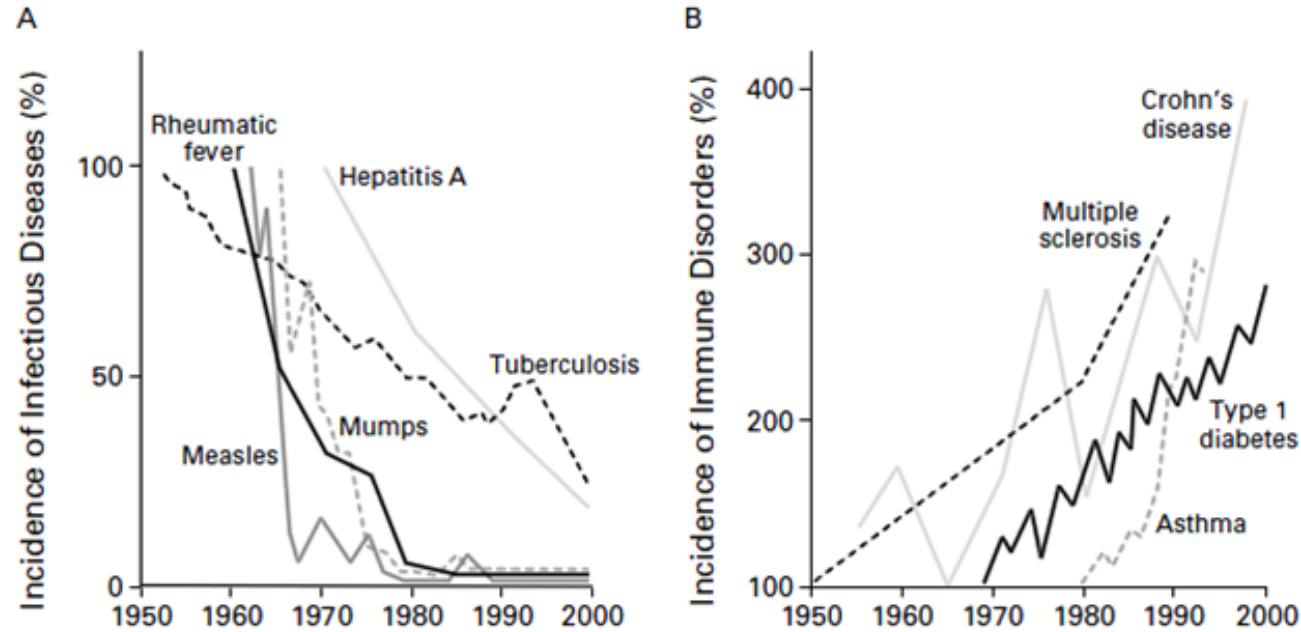
Mucosal Biology and Immunology Research Center

And Center for Celiac Research

Massachusetts General Hospital for Children



# The Epidemics of Chronic Inflammatory Diseases (CID) In The Western Hemisphere: The Hygiene Hypothesis



Autoimmune disorders incidence



Helminths infestation incidence



Personal communication from Dr. Joel Weinstock

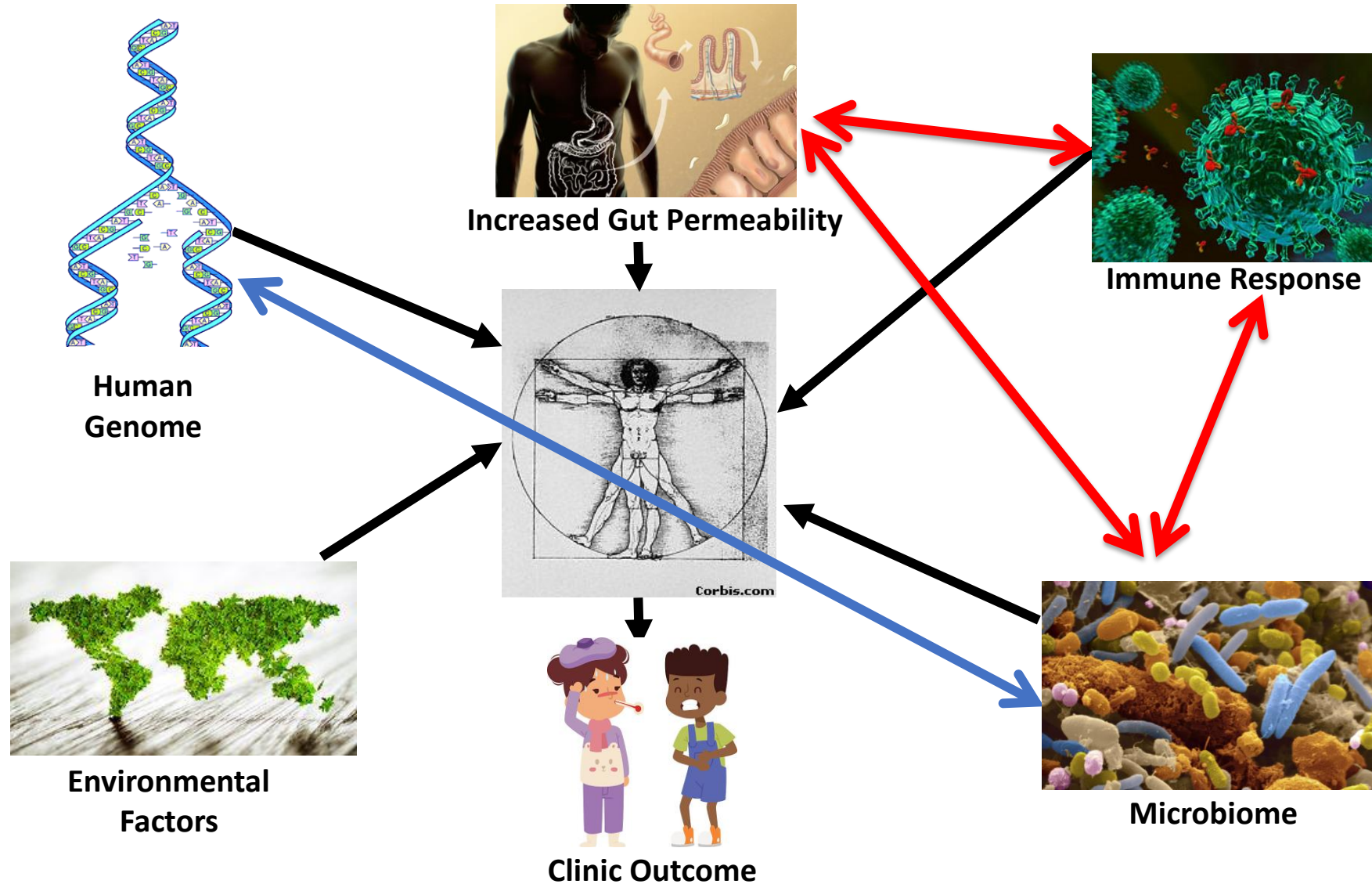
# Pathogenesis CID

We May Be “*Predisposed*”, but Are Not Born “*Destined*”  
to Develop Chronic Inflammatory Diseases

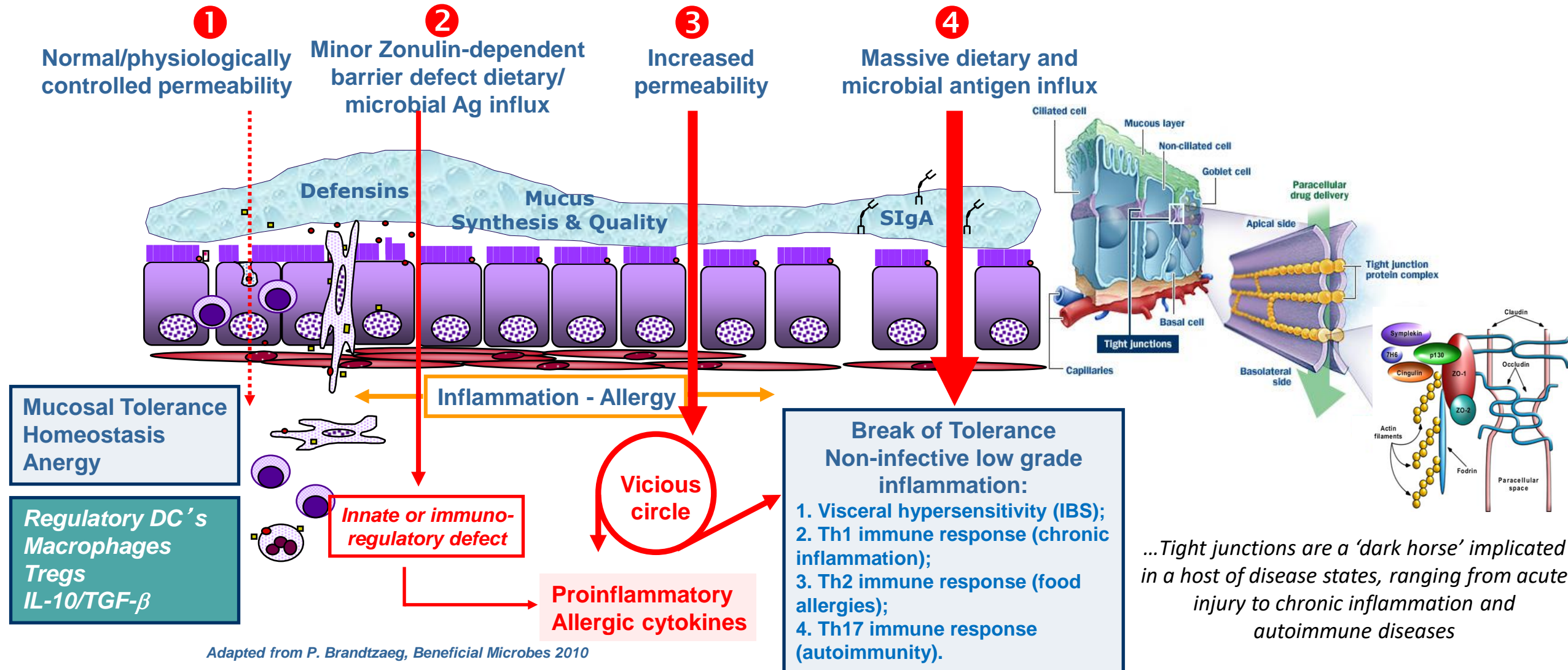




# The Yin and Yang Between Tolerance and Immune Response Leading To CID

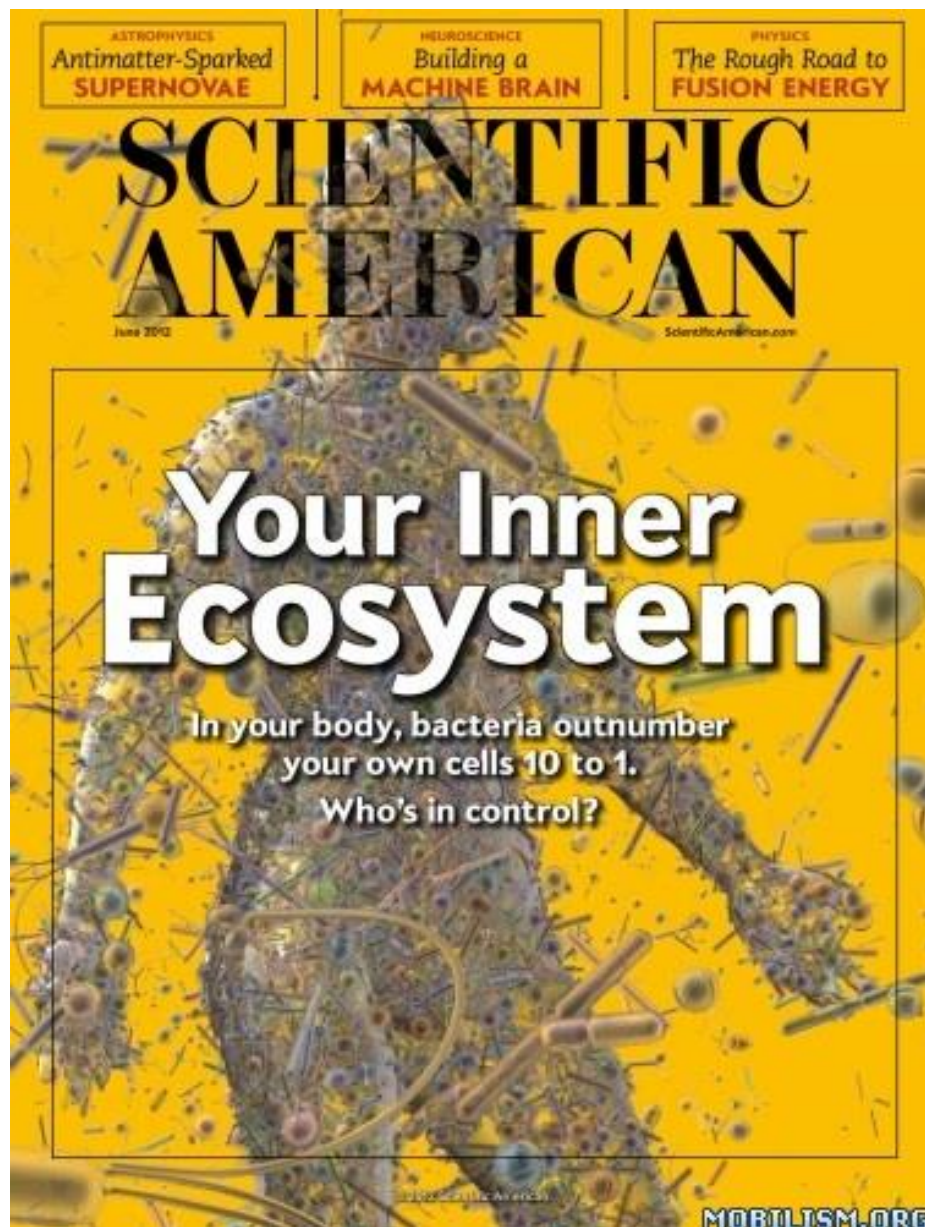


# Excessive and Inappropriate Inflammatory Process Associated to a Dysfunction of Intestinal Barrier: Loss of Mucosal Immune Homeostasis





# The Changing Face Of Gut Microbes





# The Microbiome Is Essential To Health

## 100 TRILLION

The human microbiome is made up of more than 100 trillion bacteria, fungi, protozoa, and viruses that live in and on the human body

>10,000 different species of bacteria are resident in the human intestinal microbiota (400-500/person)

## 2-5x More



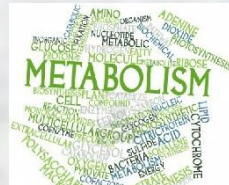
Microbial cells than human cells and the majority live in our gut

## 150x More

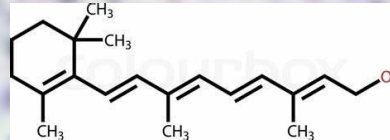
Genes than the human genome



Energy From Food



Regulates  
Metabolism



Producing Essential  
Vitamins



Regulate  
Immune System

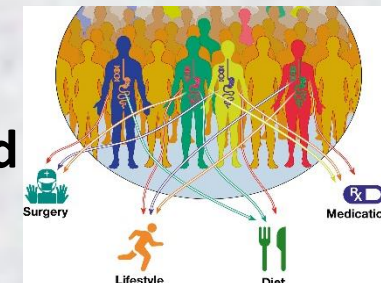


Protection from  
pathogenic bacteria

## Symbiotic

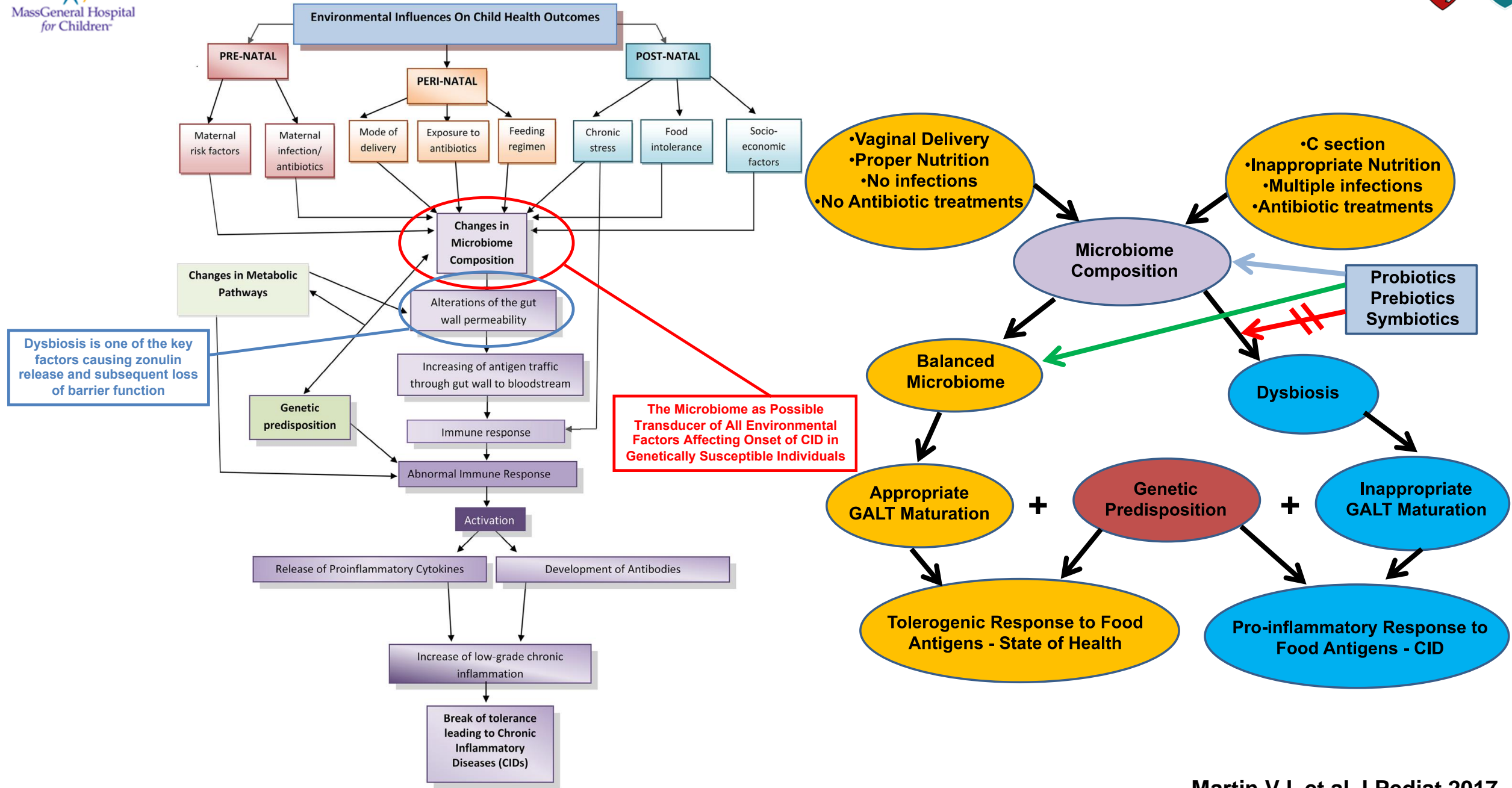


## Personalized



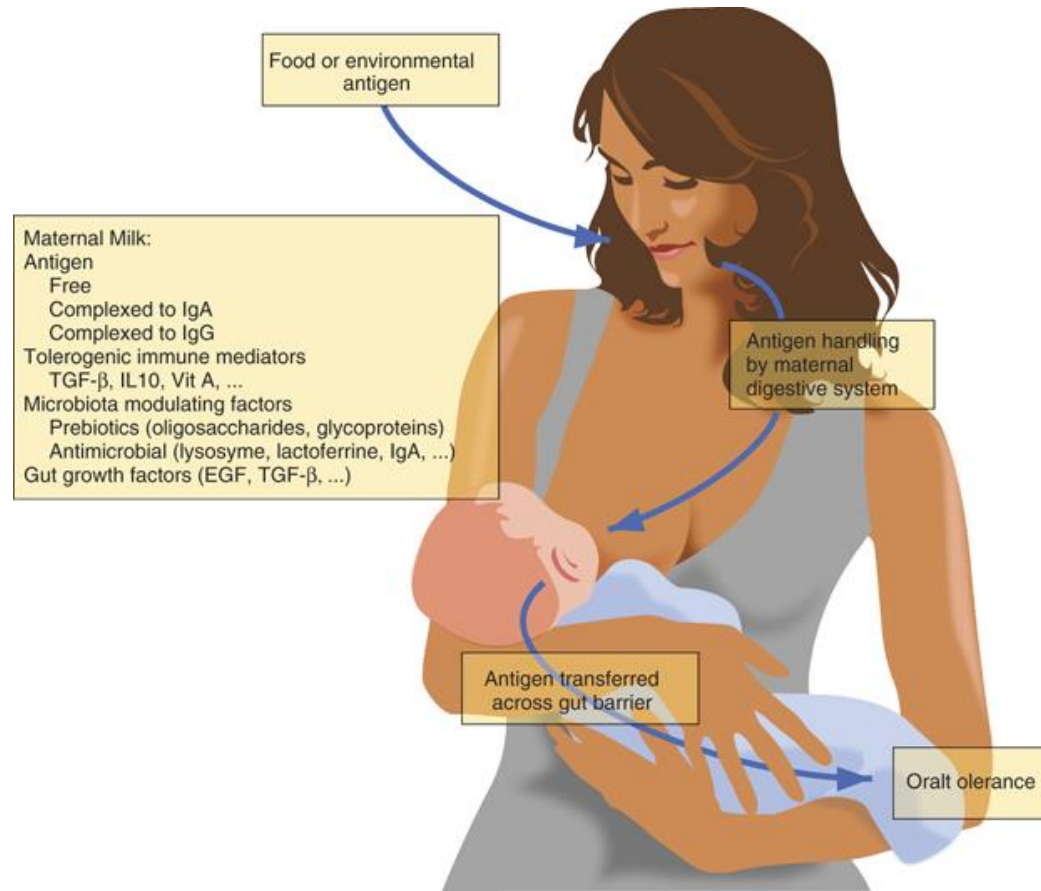


# Why The First 1000 Days Of Life Are Instrumental For Clinical Destiny



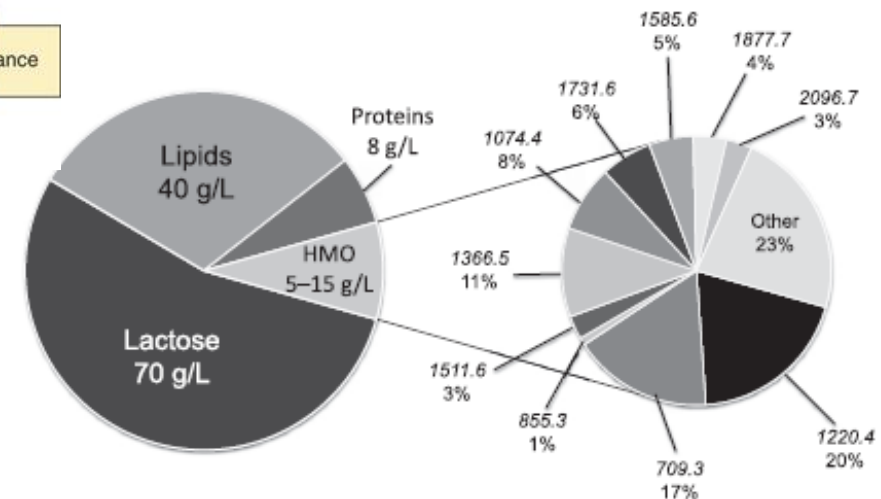


# Role of Breastmilk

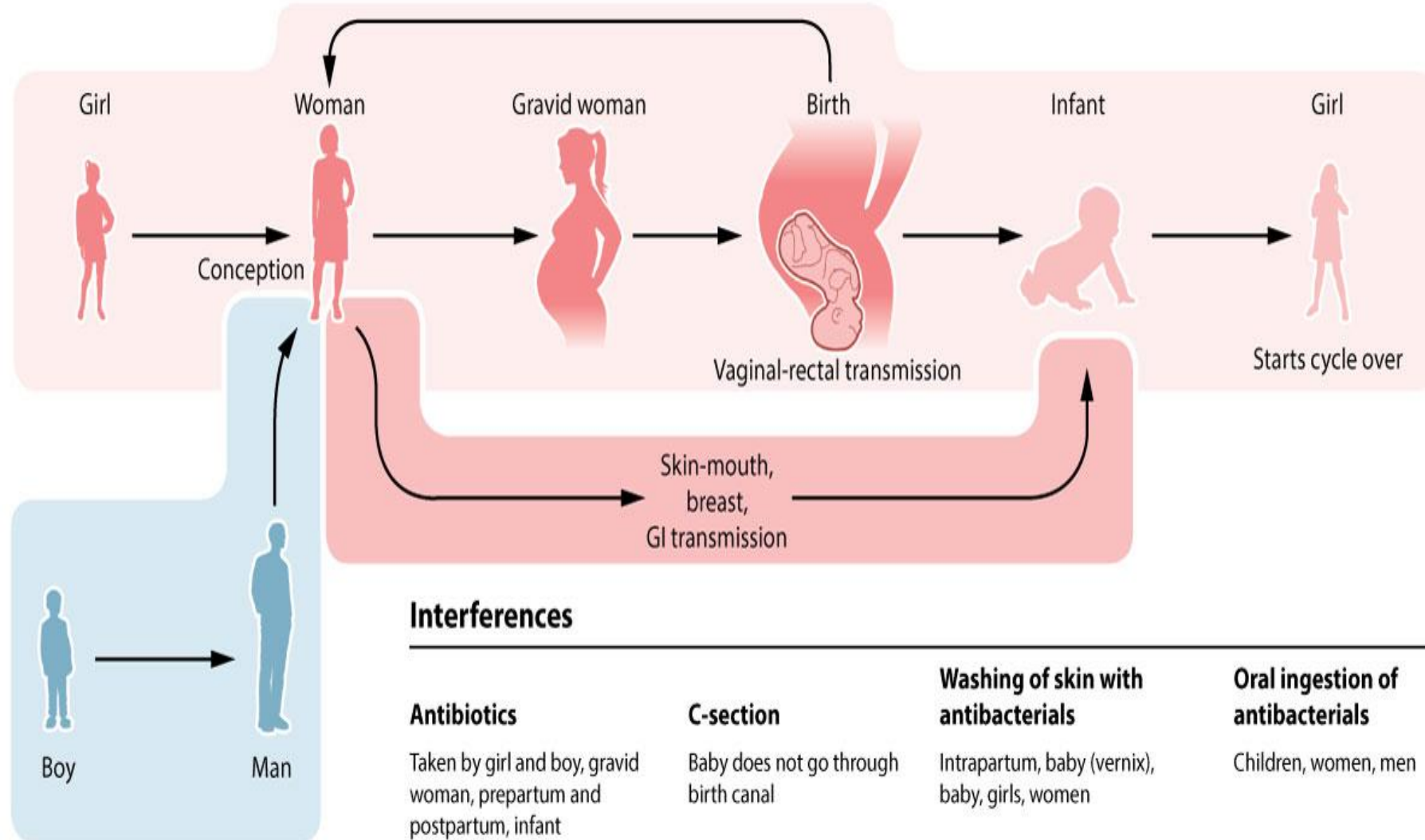


<http://www.nature.com>

## Impact of human milk glycomicrobiome on the infant intestinal microbiota



# Cycle of Microbiota Transmission

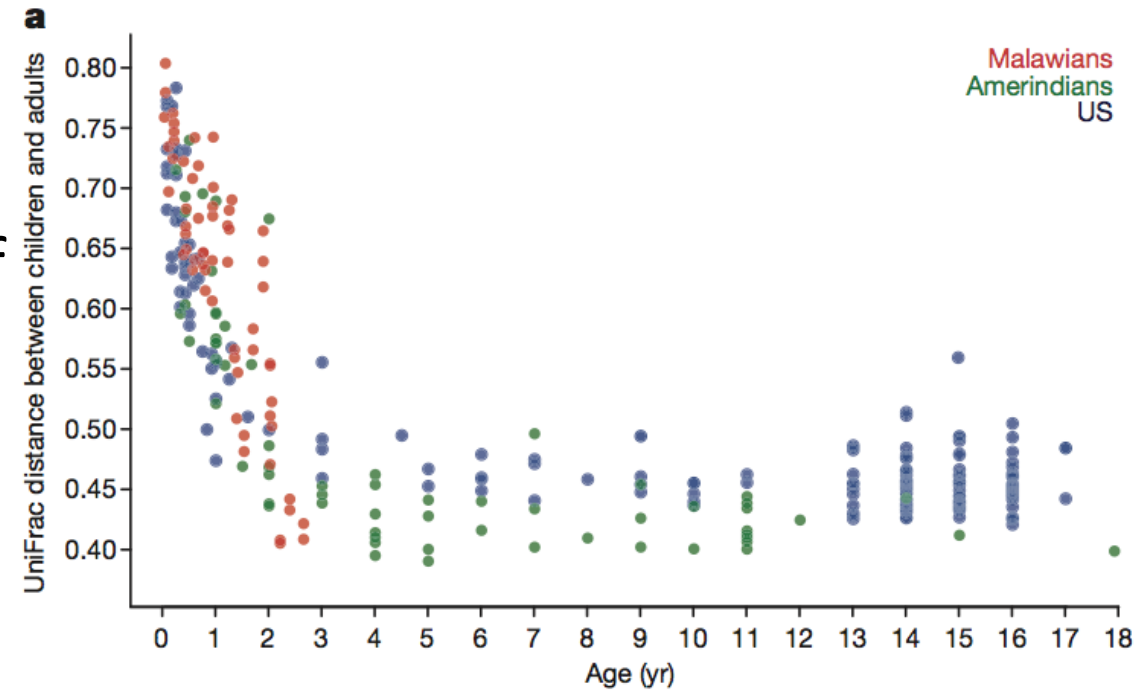




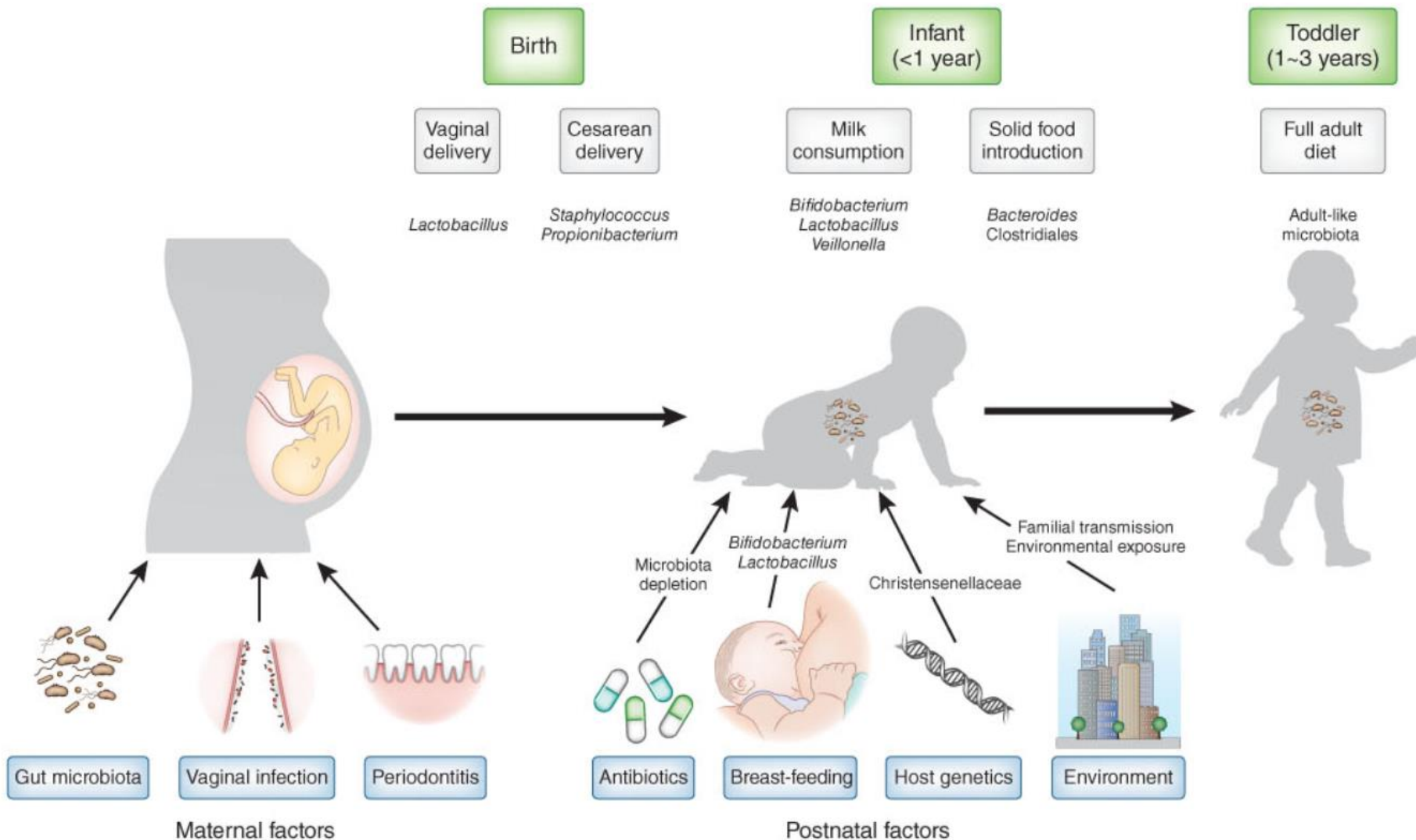
# Baby's first bacteria

THE WOMB WAS THOUGHT TO BE STERILE. SOME SCIENTISTS ARGUE IT'S WHERE THE MICROBIOME BEGINS.

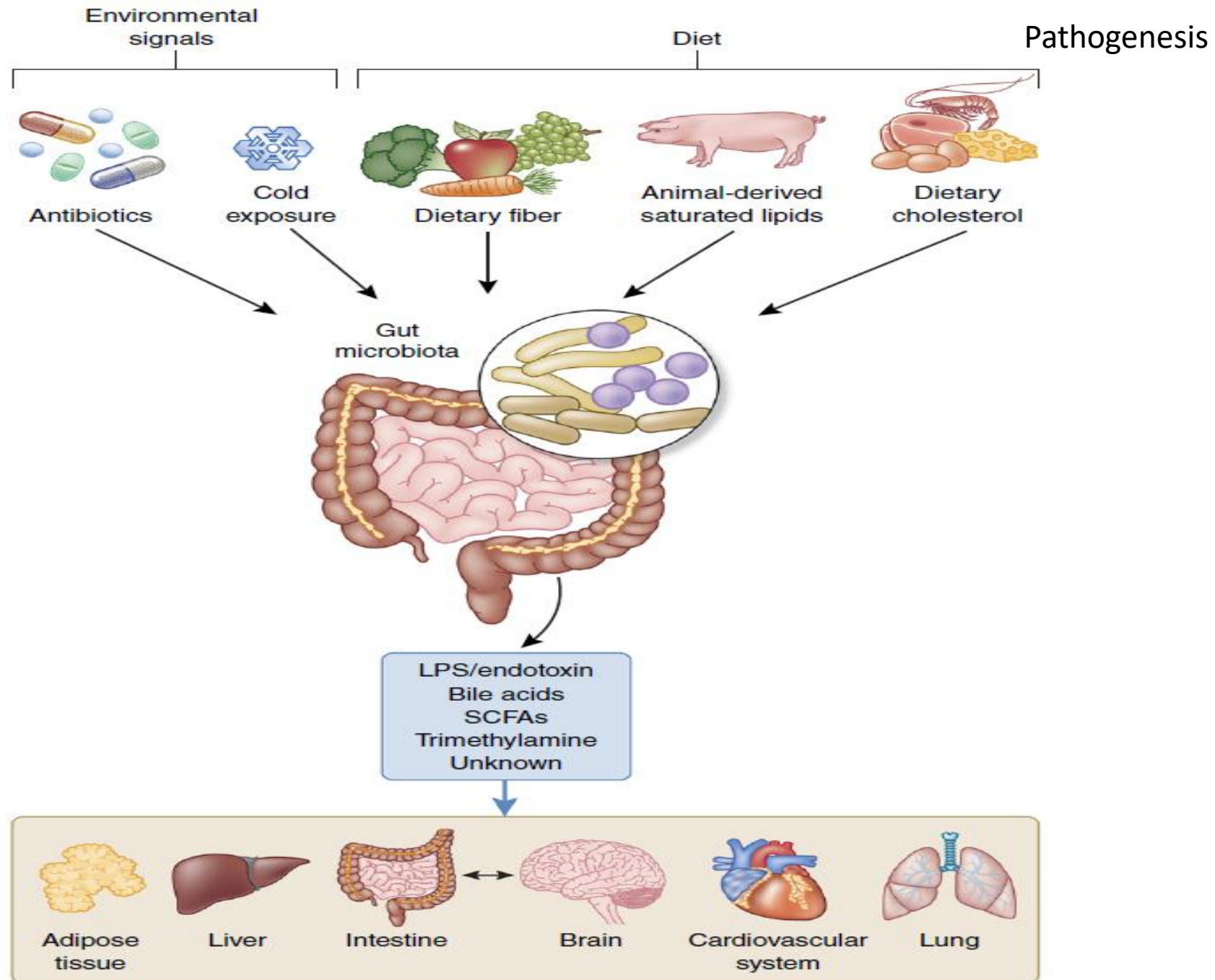
- Exactly when an infant is first exposed to microbes is still under debate
- Largest microbial transfer occurs at birth
- Microbial colonization of the newborn intestine contributes to the development of the host's immune function
- The first 1-3 years of an infant's microbiome development is characterized by chaotic and dramatic shifts until stabilization at approximately age 3



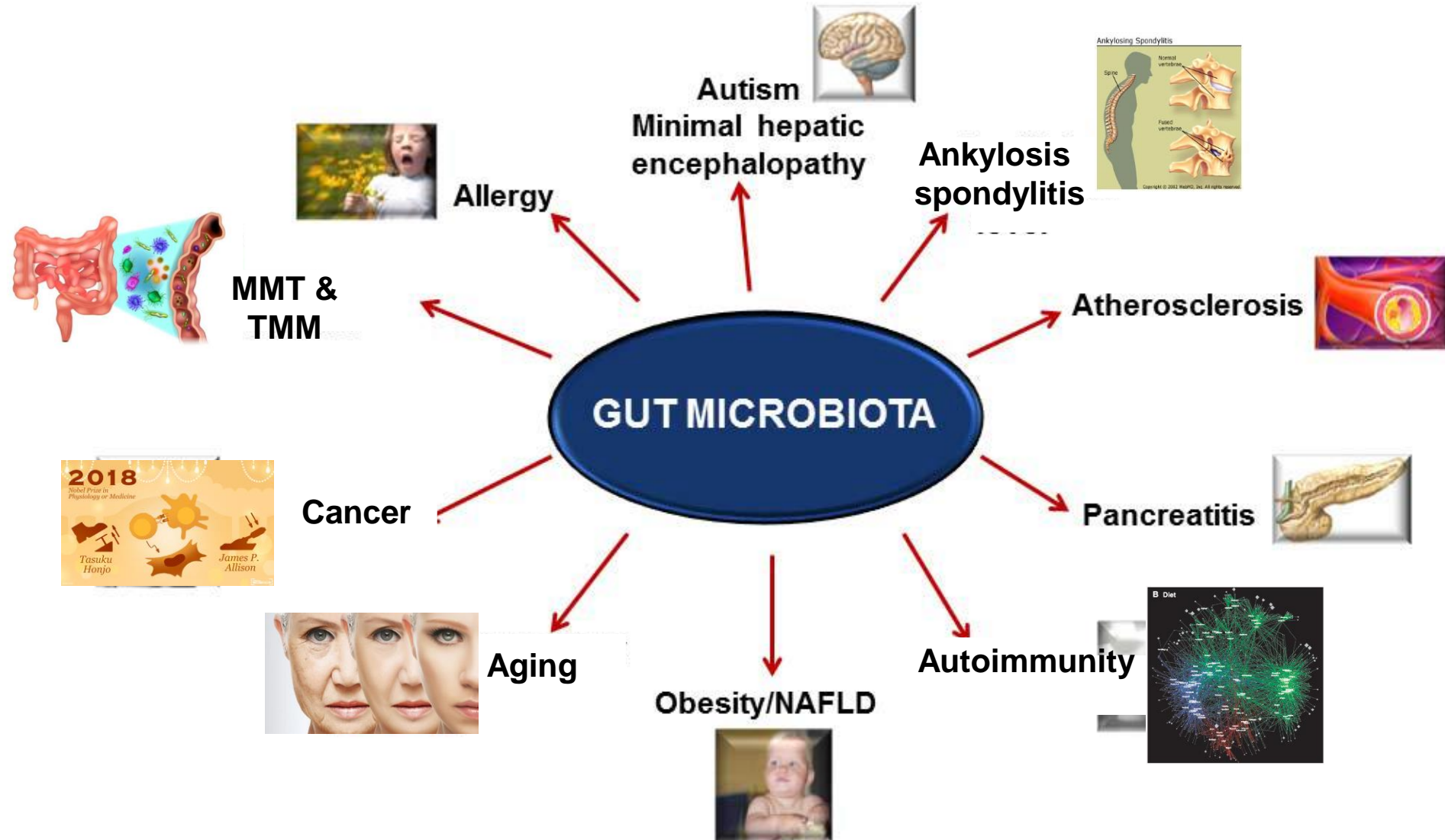
# The Wisdom of Microscopic Species







# The Microbiome's Role in Diseases





# Manipulating The Microbiome To Maintain Health

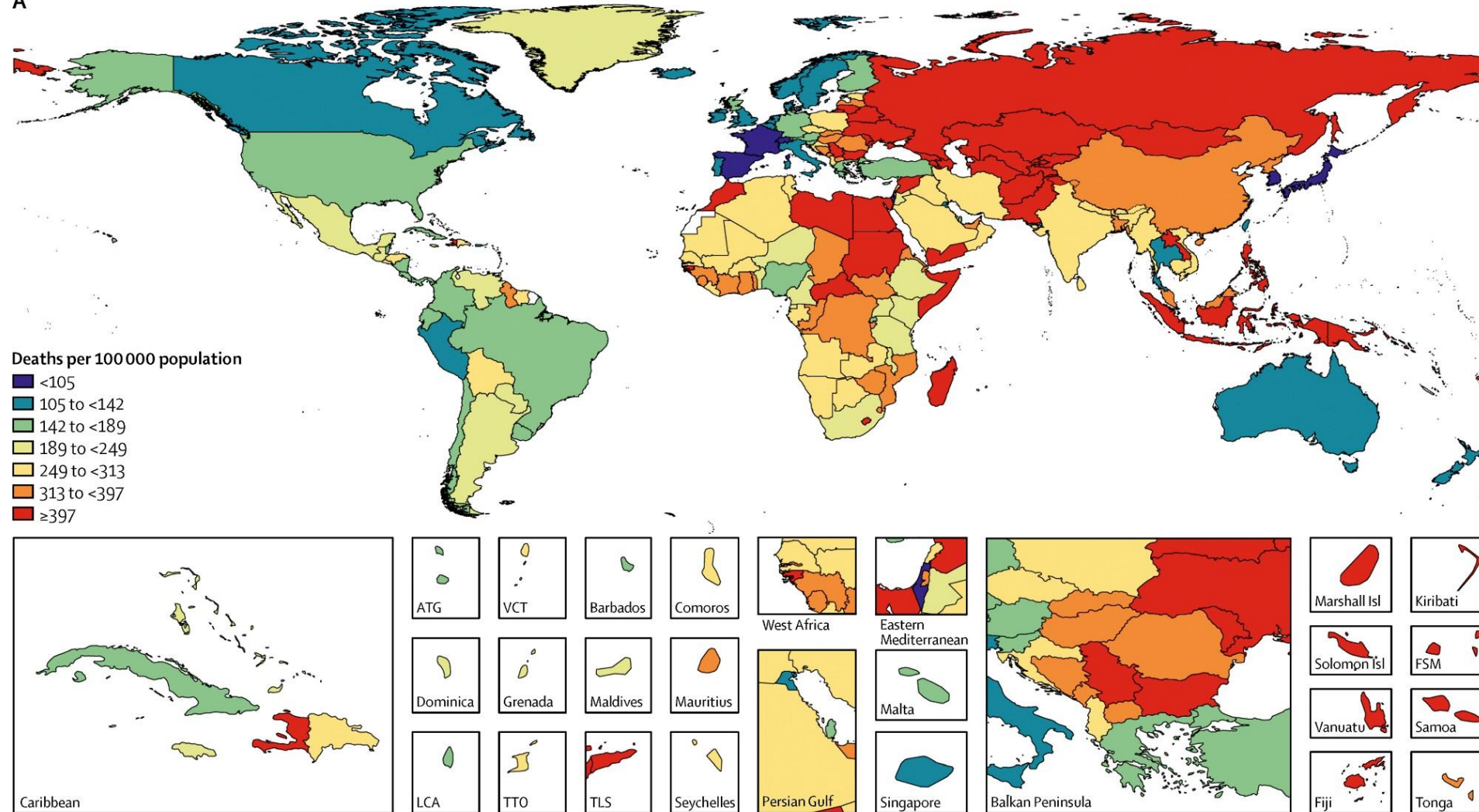




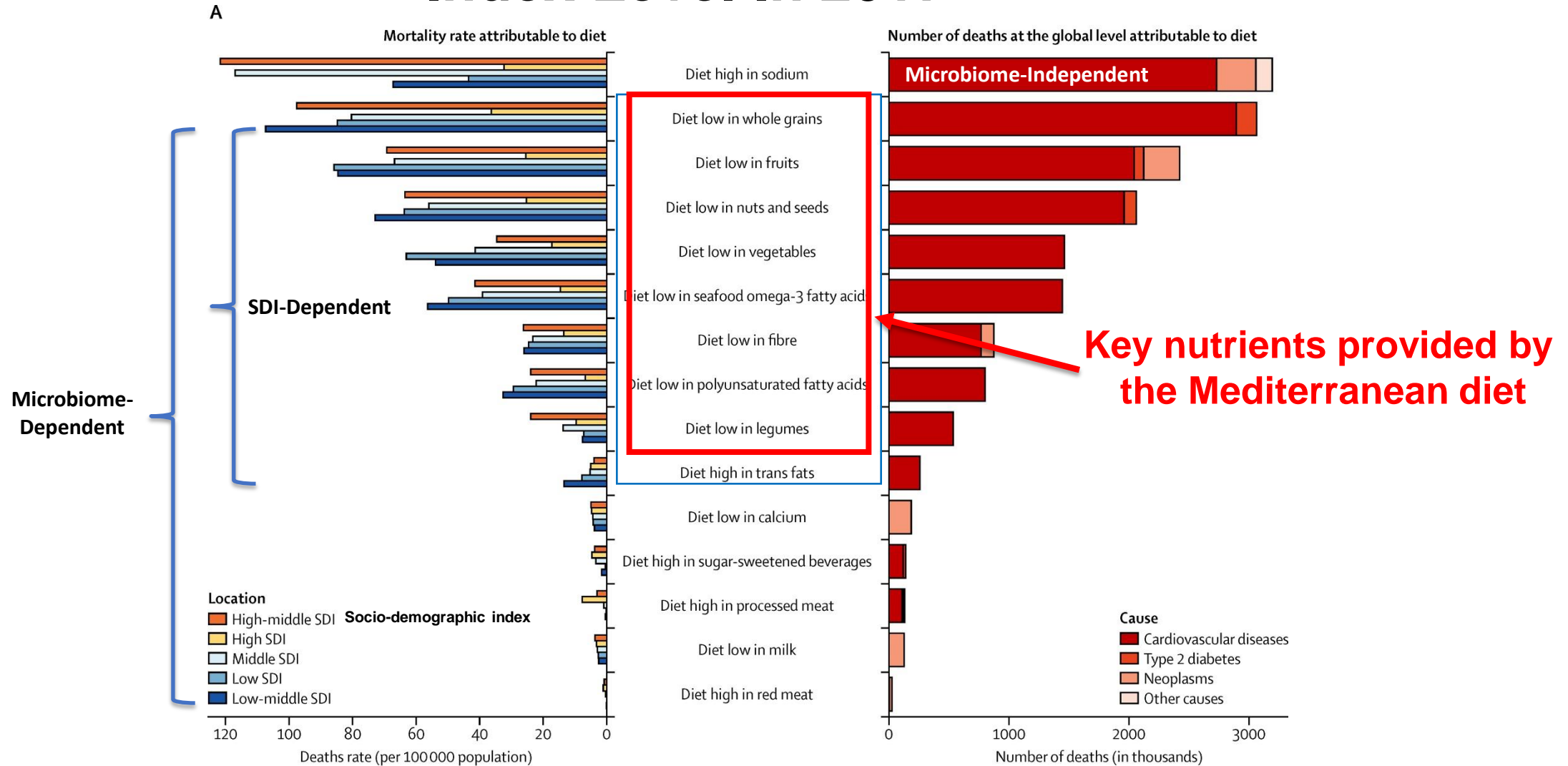


# Age-Standardized Mortality Rate Per 100,000 Population Attributable To Diet in 2017

A



# Number Of Deaths Attributable To Individual Dietary Risks At The Global And Socio Democratic Index Level In 2017



# The Mediterranean Lifestyle

## Mediterranean Diet Pyramid

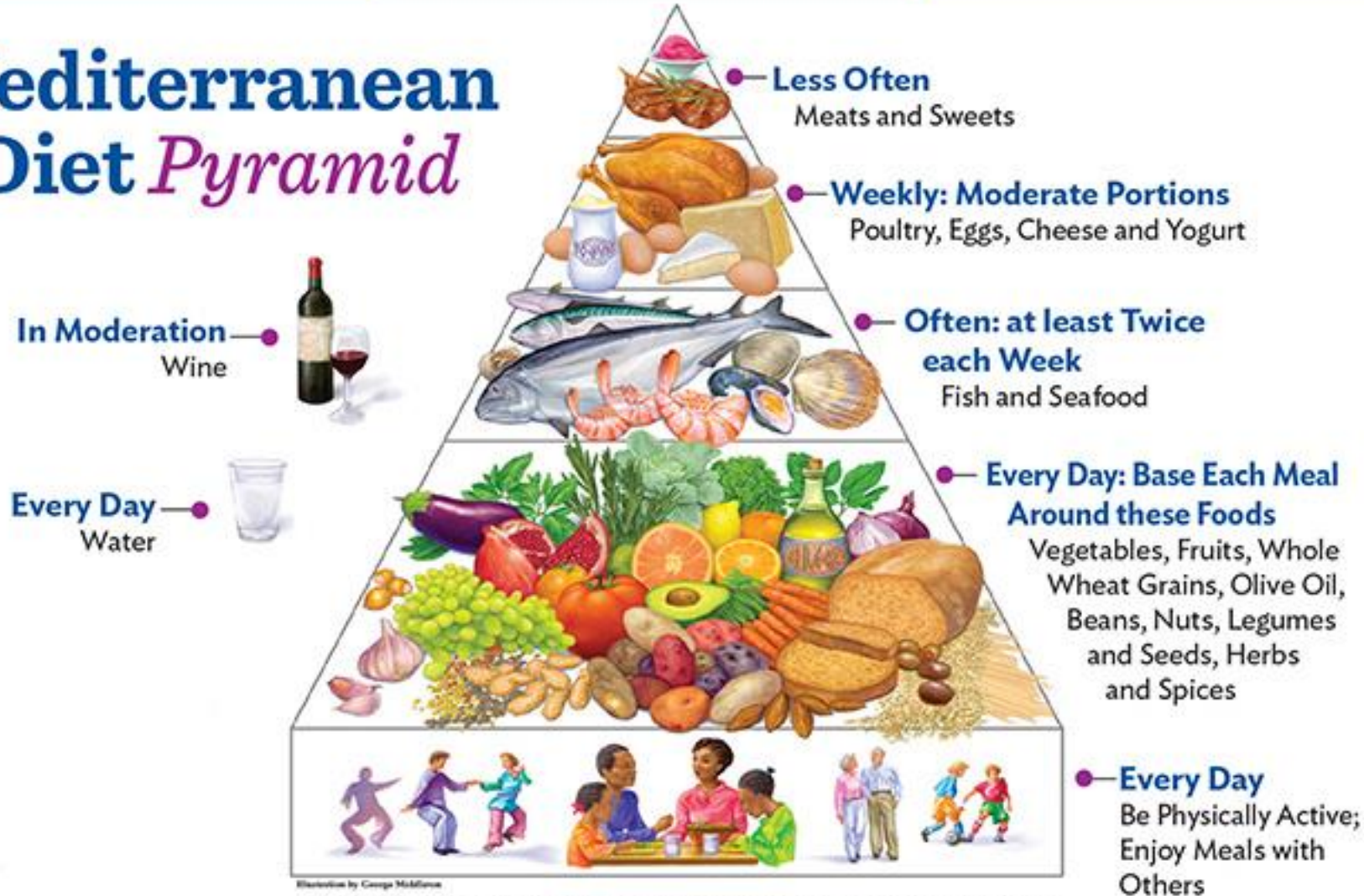


Illustration by George Mollman

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MassGeneral Hospital  
for Children

Raffaella de Franchis

# La Dieta Mediterranea *nel primo anno di vita*

Presentazione  
Salvatore Auricchio



1966-2013  
CUZOLIN

Raffaella de Franchis

# La Dieta Mediterranea e il bambino: tra scienza e pratica



FIMP  
Federazione Italiana Medici Pediatri  
Sezione Provinciale di Napoli

Guida editori



# Remy And His Brother Emile

## From The Movie Ratatouille

Emile loves food; however, he often swallows food whole and, to Remy's disappointment, doesn't savor the flavors.



Emile's feelings about food: *"Food is fuel. You get picky about what you put in the tank, your engine is gonna die. Now shut up and eat your garbage".*  
Remy's feeling about food: *"If you are what you eat, then I only want to eat the good stuff. Anyone can cook, but only the fearless can be great".*