



National Institutes of Health
Office of Dietary Supplements



Dietary Modulation of the Microbiome and Cancer Risk

Cindy D. Davis
davisci@mail.nih.gov

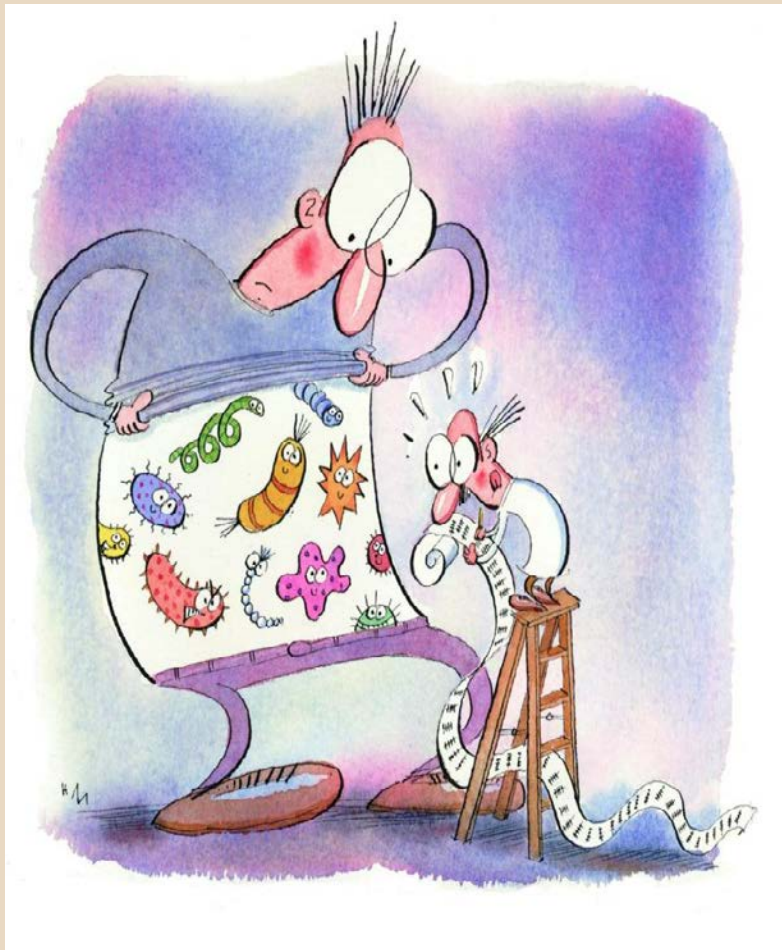


The Human Microbiome

- We are a composite of species: eukaryotic, bacterial, viral- up to 10x more microbial cells than human
- Gut **Microbiota**= microbes in our GI tract, ~100 trillion organisms
- **Microbiome**= their collective genome, >100 times as many genes as human genome



What Do Microbes Do For Us?



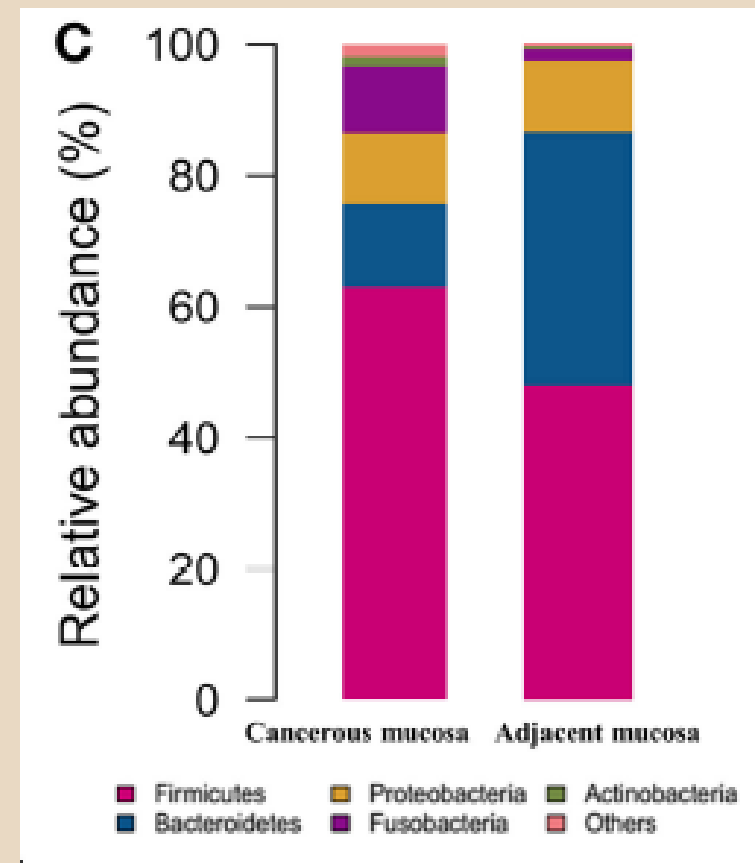
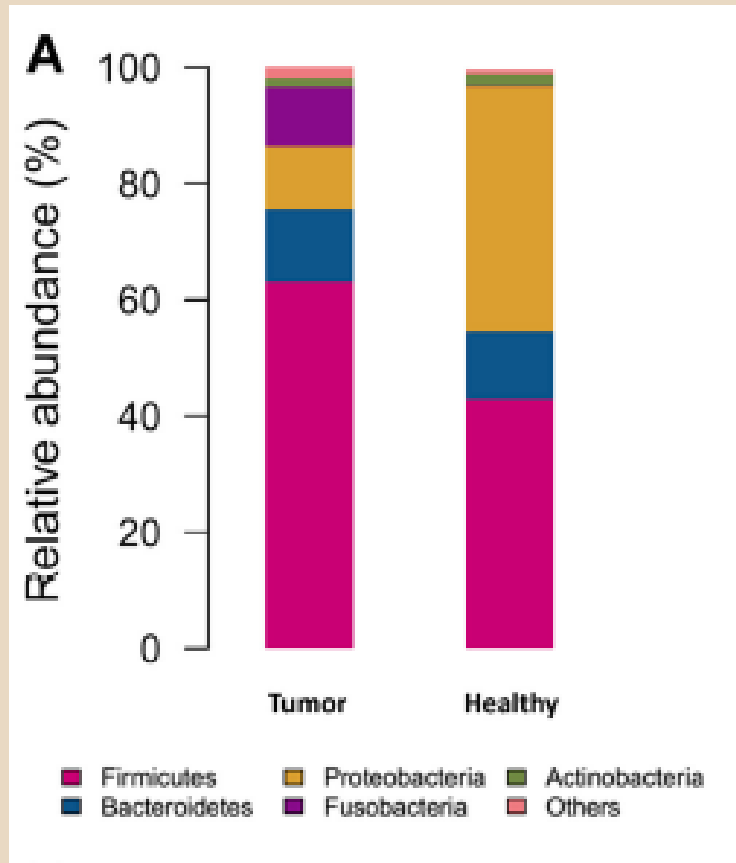
- Provide ability to harvest nutrients
- Produce additional energy otherwise inaccessible to the host
- Produce vitamins
- Metabolize carcinogens
- Prevent colonization by pathogens
- Assist in the development of a mature immune system

Specific Bacteria Can Influence Cancer Risk !!

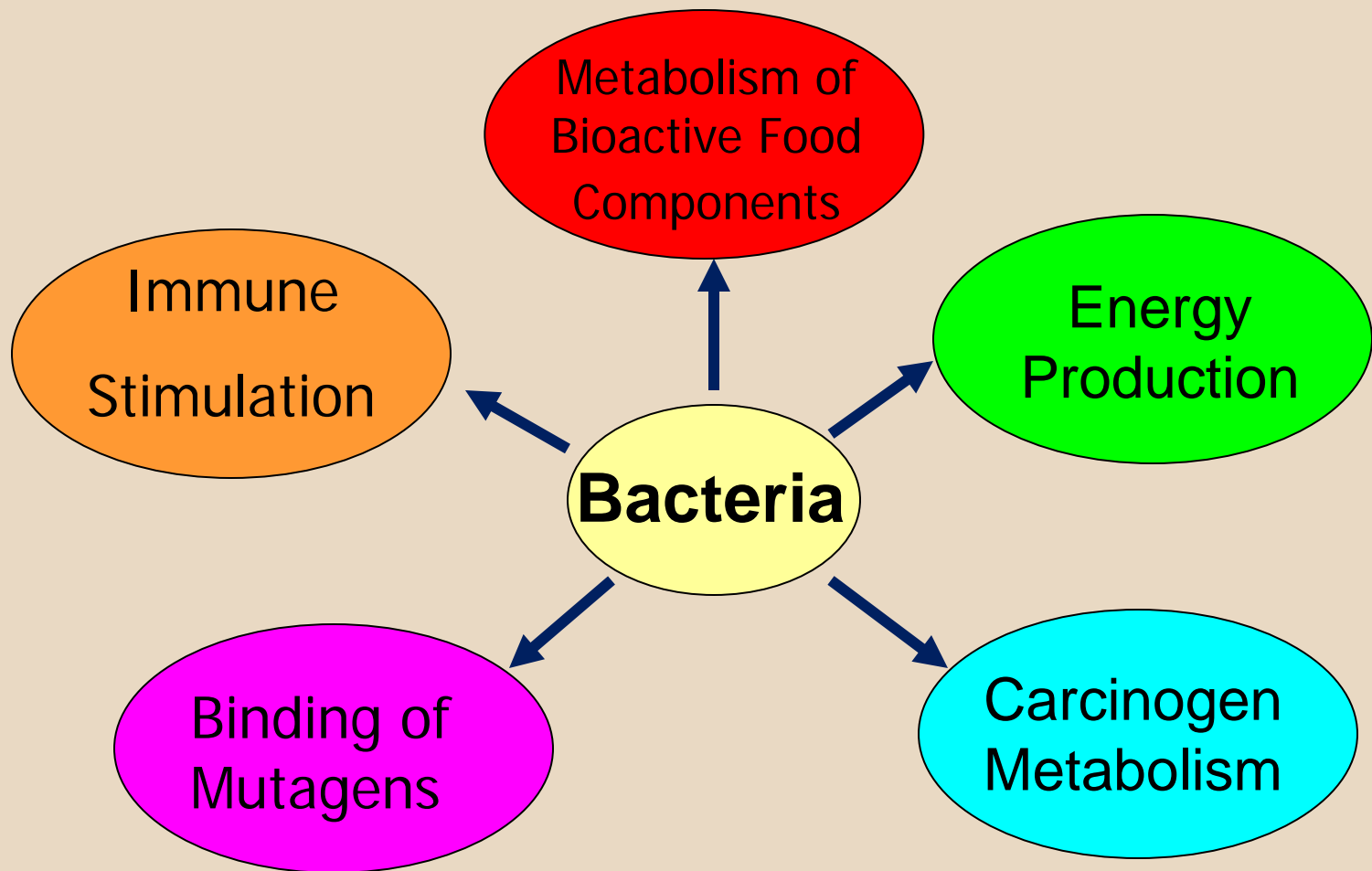


- Specific strains of bacteria implicated in cancer risk at several organ sites
- Balance between detrimental and beneficial bacteria
- Dietary components can modify this balance

The Gut Microbiota Differs between Healthy Individuals and Colorectal Cancer Patients



Mechanisms Whereby the Bacterial Population Can Modify Carcinogenesis



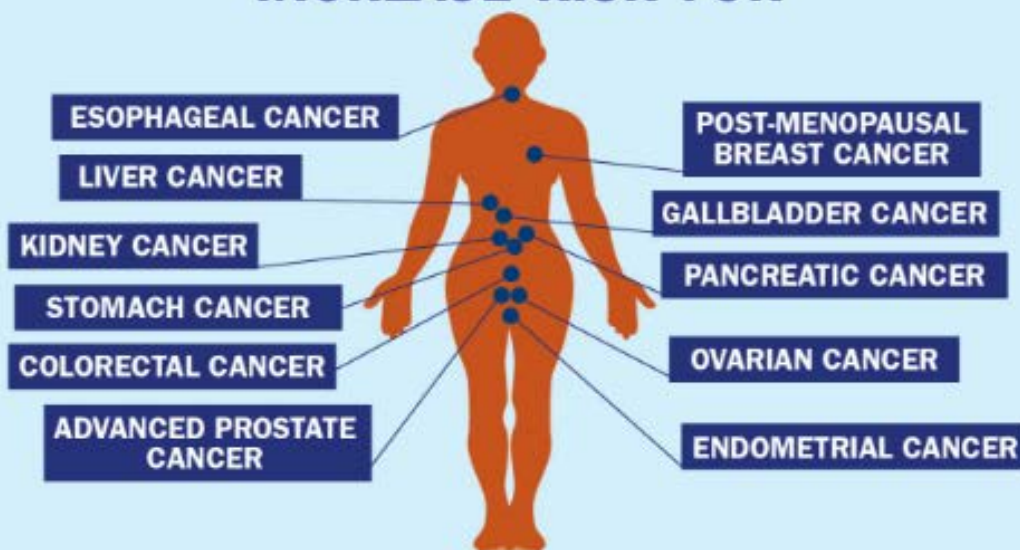
WHAT YOU NEED TO KNOW ABOUT OBESITY AND CANCER



After not smoking,
BEING AT A HEALTHY WEIGHT
is **THE MOST IMPORTANT THING** you can do
to prevent cancer.



Overweight and obesity INCREASE RISK FOR



AICR ESTIMATES THAT **EXCESS BODY FAT** IS A CAUSE OF APPROXIMATELY

130,600

U.S. CANCER CASES EVERY YEAR.

AND YET...
7 in 10 Americans
are currently
overweight or obese.



AND ...
Only about half of
all Americans
are even aware of the
obesity-cancer link.

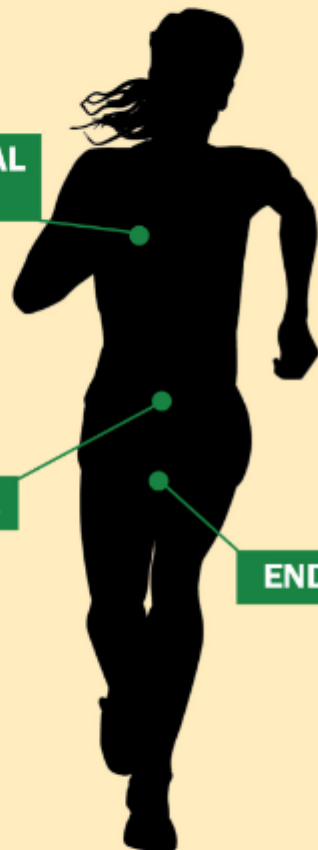


BEING PHYSICALLY ACTIVE DECREASES RISK OF THESE CANCERS:

POST-MENOPAUSAL
BREAST

COLORECTAL

ENDOMETRIAL



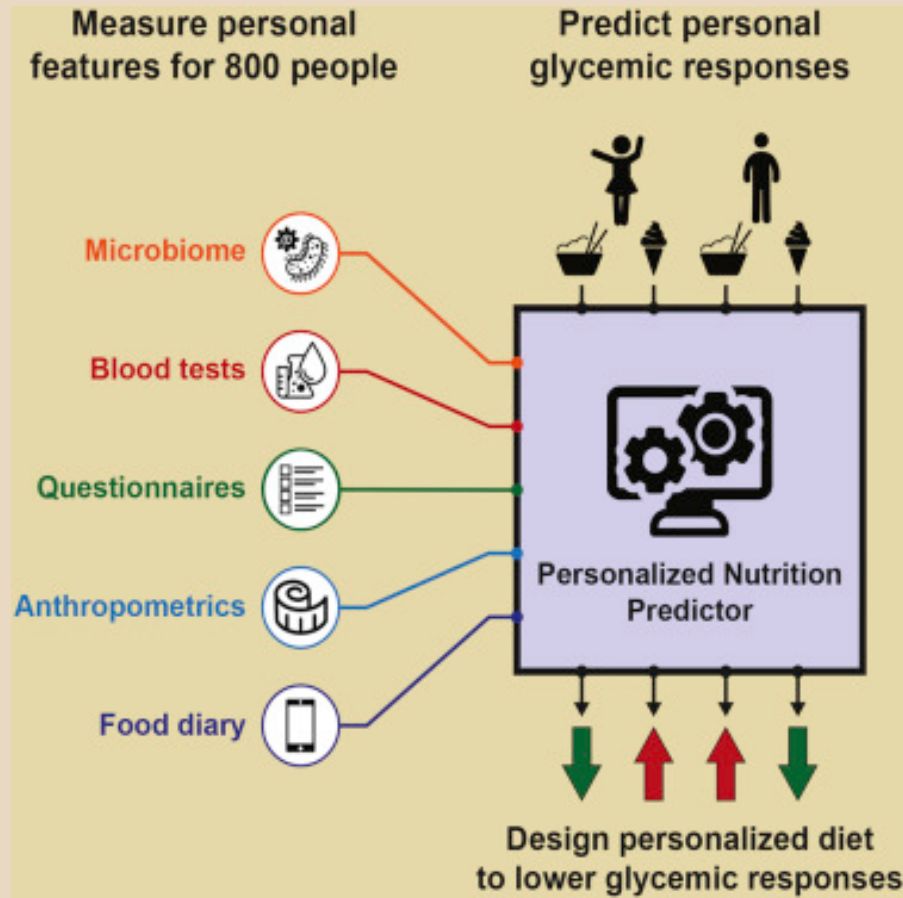
Activity helps to:

- Regulate blood levels of hormones that contribute to cancer risk
- Speed food through the colon, reducing exposure to dietary carcinogens
- Prevent the build up of body fat, a cause of many cancers

AIM FOR 30 MINUTES A DAY, IN ANY WAY

The evidence is the latest from the *Continuous Update Project (CUP)*, which systematically updates and reviews the research conducted worldwide into cancer risk related to diet, physical activity and body weight. All the evidence gathered is then assessed by a panel of independent scientists who make recommendations for cancer prevention.

Can We Use Information about the Microbiome and Diet to Make Personalized Recommendations for Disease Prevention?



Session Speakers

- **Diet, the Microbiome and Cancer**
Johanna Lampe, Fred Hutchinson Cancer Center
- **The Microbiome and Obesity**
Vanessa Leone, University of Chicago
- **The Effect of Exercise on the Microbiome**
Corrie Whisner, Arizona State University
- **The Microbiome and Personalized Nutrition**
Erin Elinav, Weizmann Institute of Science

A Metagenomic View of our Dinner Plate

