THE ABORIGINAL AND TORRES STRAIT ISLANDER MICROBIOME REFLECTS LONG TERM CONNECTION TO COUNTRY

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HUMAN HEALTH MAY BE TIGHTLY LINKED TO OUR MICROBIAL HEALTH

Microbiota:
the microorganisms (bacteria, fungi, viruses) that live in the body
>50% of total cells; >1,000 species; 1.4 kg of body weight

Microbiome:
the genetic and environmental content of the microbiota present in the body
2-5 million genes per individual; 99% of your genetic makeup!
MICROBIOTA PLAY KEY FUNCTIONS

Food Digestion
- OBESITY,
- Malnutrition

Vitamin Production
- Pregnancy Issues
- Organ function

Drug Metabolism
- Dosage Effects
- and Toxicity

Immune System
- Development
- Diabetes, Allergy,
- IBD, Eczema,
- Periodontal disease

Infectious Disease
- Protection
- Salmonella or
- whooping cough

Detoxify
- Toxicity
ENVIRONMENT IMPACTS THE MICROBIOME

- Diet
- Home
- Job
- Chemical Exposure
- Human Interactions
- Pets
- Medical Treatment
- Pollution
- Seasonality

- Hygiene hypothesis
- Old Friends hypothesis
- Biodiversity hypothesis
- Widespread Antibiotic use
DRASTIC CHANGES IN ENVIRONMENT IN AUSTRALIA

- End-stage kidney disease: x7
- Diabetes: x5
- Hospitalisations for respiratory conditions: x3
- Obesity: x5
- Cancer deaths rate: x1.5
- Youth suicide—female: x5.9
- Youth suicide—male: x4.4

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• Increased diversity
• Novel oral species (Endomicrobium) from environment

Handsley-Davis, Kapellas, Hedges, Jamieson, and Weyrich. In Review.
Early Childhood Caries in Aboriginal and Torres Strait Children

- >80% of children have active caries (cavities) compared to <20% of non-Indigenous Children

- Identify microorganisms linked to severe caries

- Caucasian children = *Streptococcus mutans*

- Indigenous children = *Lactobacillus salivarus, L. reuteri, Prevotella multisaccharivorax*, and *Mitsuokella HMT*

- Two species linked to periodontal disease in adults

How do we ‘rewild’ our microbiomes?

• No one knows for sure...
• Dietary change
  • High fiber diet?
  • Fermented foods?
  • Acids?
• Environmental exposure
  • Birth?
  • Outdoor activity?
  • Animal exposure?
• Farms? or Hay Exposure?

Mills, et al., 2016