# Human Microflora and Probiotics

Normal Human Microflora- What is it?

The microbial population which resides in humans, which is both persistent and stable, and which does not elicit an acute immune response in normal circumstances

Where is it?
1. The GI tract
2. The genito-urinary tract
3. The respiratory tract
4. The skin

ADULT MICORFORA

- Numbers of bacteria increase as you descend thru the GI tract

- Lactobacilli (acidopholus) dominate the upper small intestine

- Bacteroides and Bifidobacteria dominate the lower small intestine and large intestine

- Meat eaters will have a dominance of bacteroides (up to 95%)

- Vegetarian diet will have about 50% bacteroides and 50% bifidobacteria

- Bacteroides are generally benign but they can convert non- carcinogenic food components into carcinogenic components (phecopentanes, hetracyclic amines)

- Bifidobacteria don't have capability to make these conversions.

- Red meat eaters are more susceptible to colorectal cancer, but the cause may not be the meat or lack of fiber, but the ratio of microflora in the gut.

When supplementing with probiotics, always use lactobacillus (acidopholus) which can attach to cell wall and is targeted to upper GI tract. Use biobifidus for targeting the lower GI tract

MICROFLORA IMPORTANT FOR NON-IMMUNOLOGICAL DEFENSE AGAINST INFECTIONS

Most important feature of microflora defense is spatial exclusion

If there is already lactobacillus attached to cell wall, Candida albicans cannot attach itself to cell wall.

**METABOLIC ACTIVITIES OF NORMAL FLORA**

A. Synthesis of Vitamins:

B vitamins (produce more than they use)

- B12

- Folic Acid

- Biotin

- Riboflavin

- Vitamin K

B. Syntehsis of Short Chain Fatty Acids (Butyrate, Aspartate)

- 50-60% of energy for the gut comes from short-chain fatty acids (SCFA's).

- Colonic cells deprived of butyrate begin to atrophy in approximately 5 days. This decreases cell integrity and creates leaky gut syndrome

C. Enzyme production

- Normal flora produce lactase which decrease severity of lactose intolerance.

- Persons with lactose intolerance should supplement with probiotics

D. Detoxification and toxin production.

Heavy metals will bind to microflora and come out in the feces.
IMBALANCE OF NORMAL INTESTINAL FLORA

Causes of Major Imbalances of Normal Flora
1. Antibiotics
2. GI tract infection/Diarrhea
3. GI tract surgery
4. Starvation (anorexia)

Causes of Minor Imbalances of Normal Flora
1. Chronic Illness
2. Stressful lifestyle
3. Poor diet

**Effects of Antibiotics on Normal Flora**

- Lactobacilli and Bifidobacteria are fragile, both in probiotics and in the intestine, so even small stresses can cause imbalances

- This fragility causes a very severe drop in lactobacilli after taking antibiotics. Worse in upper GI tract where there are smaller numbers of bacteria.

- Most antibiotics absorbed in upper GI tract, less concentrated in the lower GI tract

- Even a single course of antibiotics will cause major imbalances in GI tract microflora

- (ampicillin, clindamycin, erythromycin, tetracycline, metronidazole) can cause a loss of 90% of microflora.

- If no probiotics given after antibiotic use, after re-growth, the type of flora will be altered. There will be more yeast and more bacteria which are resistant to the antibiotic

- It is best to take probiotics during antibiotic use, because taking probiotic after taking antibiotic will help to replace normal flora but process will take longer

**SHELF LIFE OF PROBIOTICS**

- Enterococcus faecium has a long shelf life, so it was used quite a bit to claim long shelf life of probitoics
- Exponential effect of temperature and half life of lactobacillus acidophulus and Bifidiobacterium bifidum
- In freezer, probiotic will last forever
- Many,many studies show that probiotics prevent overgrowth of Candida albicans after taking antibiotics
- If you have leaky gut syndrome, you can get Candida into blood.