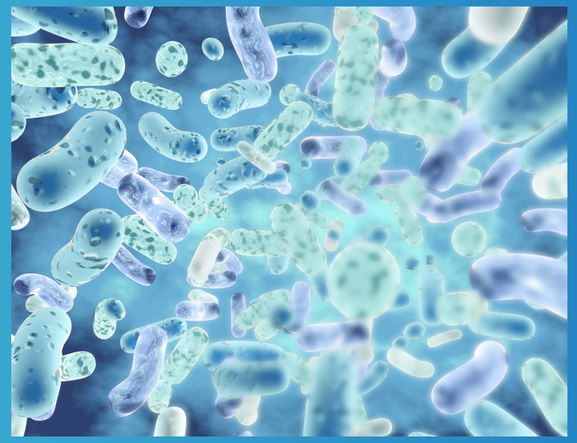
POSTBIOTICS

Andjela Subotic, ND

PREBIOTICS

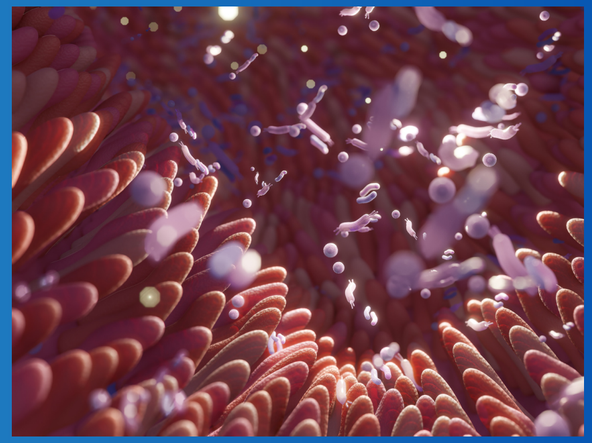
Food source for gut bacteria:
high fiber fruits, vegetables, grains, inulin

PROBIOTICS

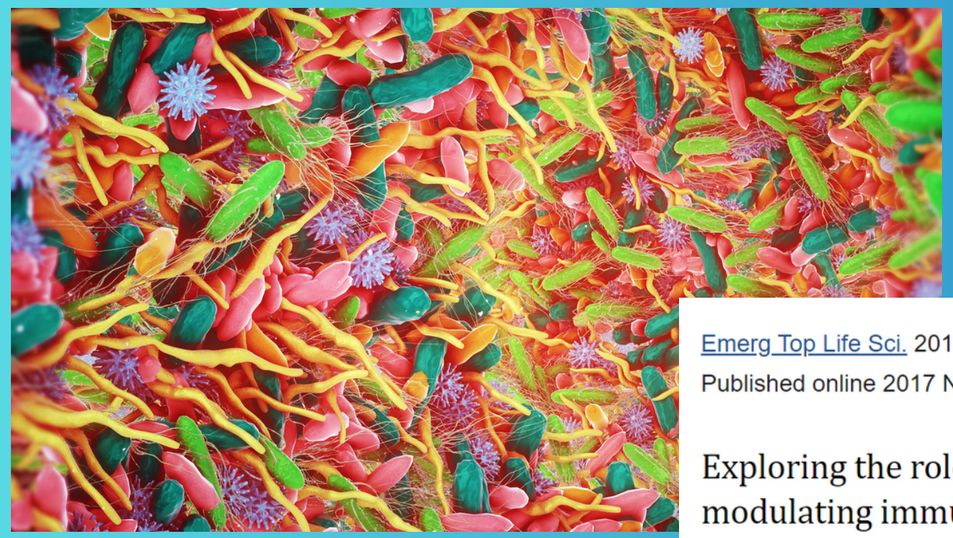


Live beneficial bacteria that benefit the body

POSTBIOTICS



Metabolites produced by probiotics through fermentation.



Emerg Top Life Sci. 2017 Nov 30; 1(4): 333–349.
Published online 2017 Nov 30. doi: 10.1042/ETLS20170058
PMCID: PMC7288987
PMID: 33525778

Exploring the role of the microbiota member *Bifidobacterium* in modulating immune-linked diseases

ELSEVIER
Immuno-Oncology Technology
Volume 8, December 2020, Pages 12-20

Review

Microbiome-based interventions: therapeutic strategies in cancer immunotherapy

C. Soto Chervin, T.F. Gajewski

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https://doi.org/10.1016/j.iotech.2020.11.001 Get rights and content

Diverse and balanced microbiome -

Normal Immune Response

Imbalanced microbiome -

Dis-Ease

Nutrients. 2021 Aug; 13(8): 2674.
Published online 2021 Jul 31. doi: 10.3390/nu13082674
PMCID: PMC8401094
PMID: 34444834

Gut Microbiota Modulation in the Context of Immune-Related Aspects of *Lactobacillus* spp. and *Bifidobacterium* spp. in Gastrointestinal Cancers

Karolina Kaźmierczak-Siedlecka,[1,*] Giandomenico Roviello,[2] Martina Catalano,[2] and Karol Polom[1]

Primary research | Open Access | Published: 12 May 2021

Anticancer effects of bifidobacteria on colon cancer cell lines

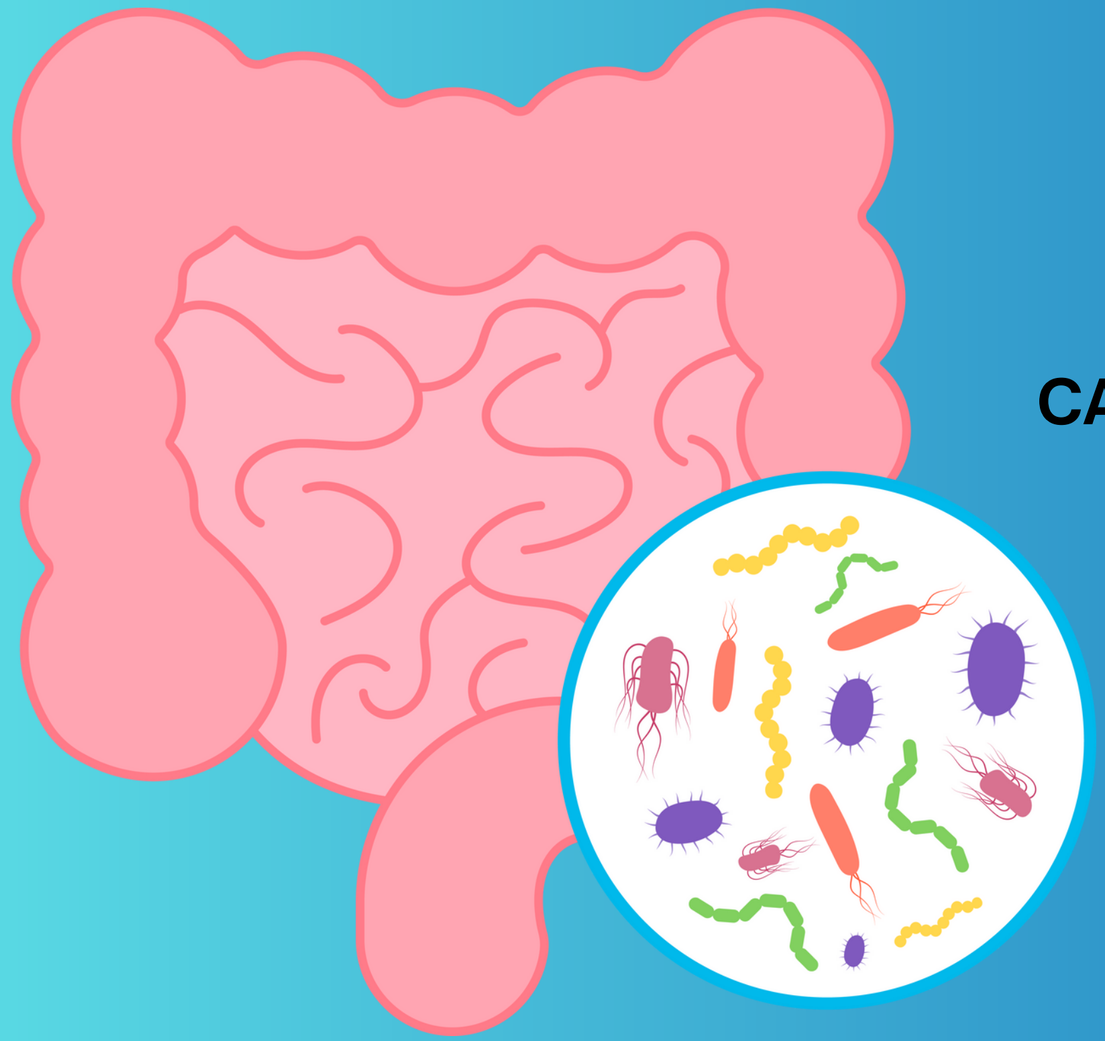
Zeinab Faghfoori, Mohammad Hasan Faghfoori, Amir Saber, Azimeh Izadi & Ahmad Yari Khosroushahi

Cancer Cell International **21**, Article number: 258 (2021) | Cite this article

https://doi.org/10.1186/s12935-021-01971-3

POSTBIOTICS

NUTRIENTS - B-vitamins, vitamin K, amino acids

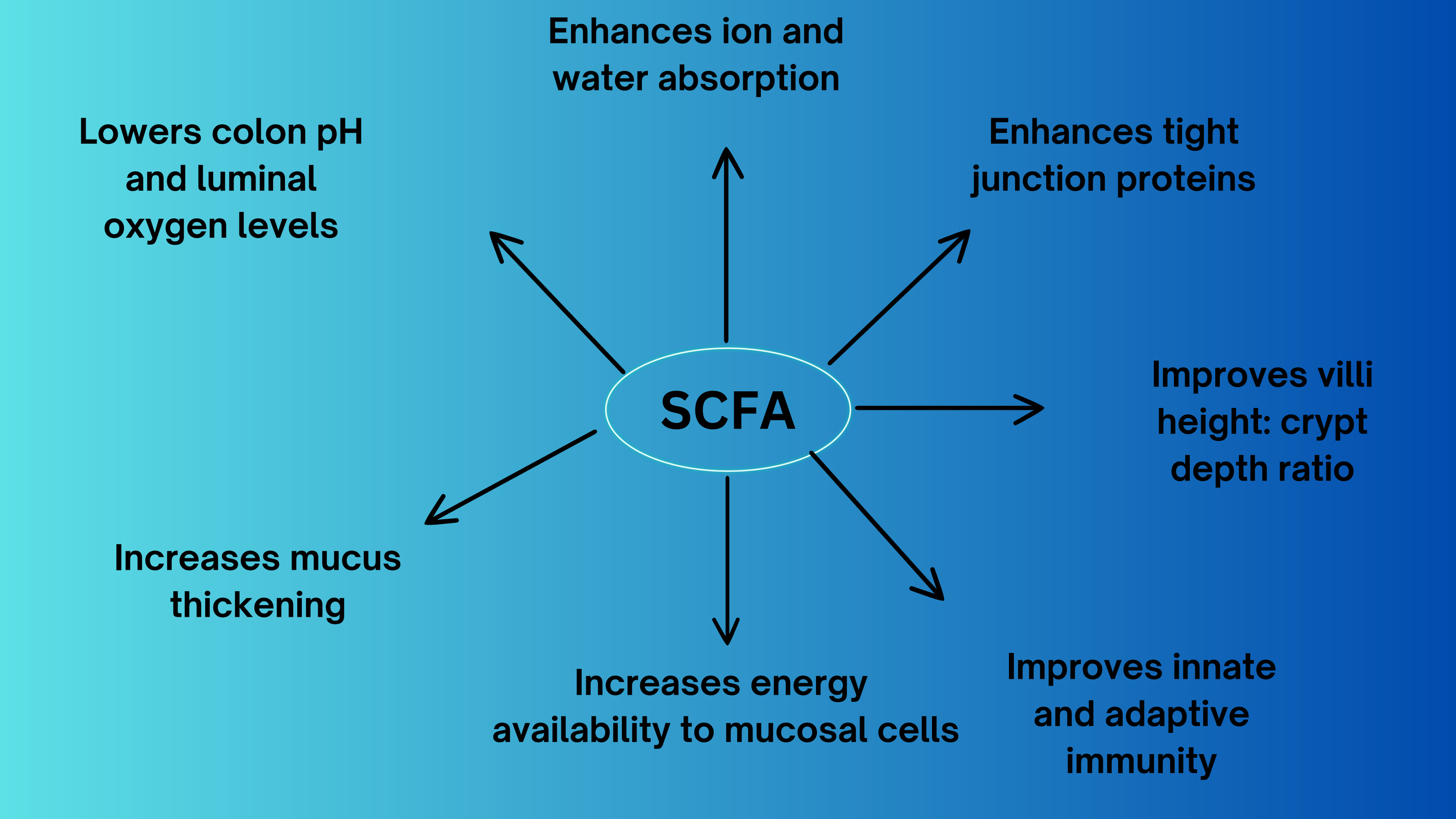


ANTIMICROBIAL PEPTIDES

SHORT CHAIN FATTY ACIDS

CARBOHYDRATE-ACTIVE ENZYMES

HYDROGEN PEROXIDE


Enhances ion and water absorption
Lowers colon pH and luminal oxygen levels
Enhances tight junction proteins
SCFA
Improves villi height: crypt depth ratio
Increases mucus thickening
Increases energy availability to mucosal cells
Improves innate and adaptive immunity

Natural Butyrate

Production

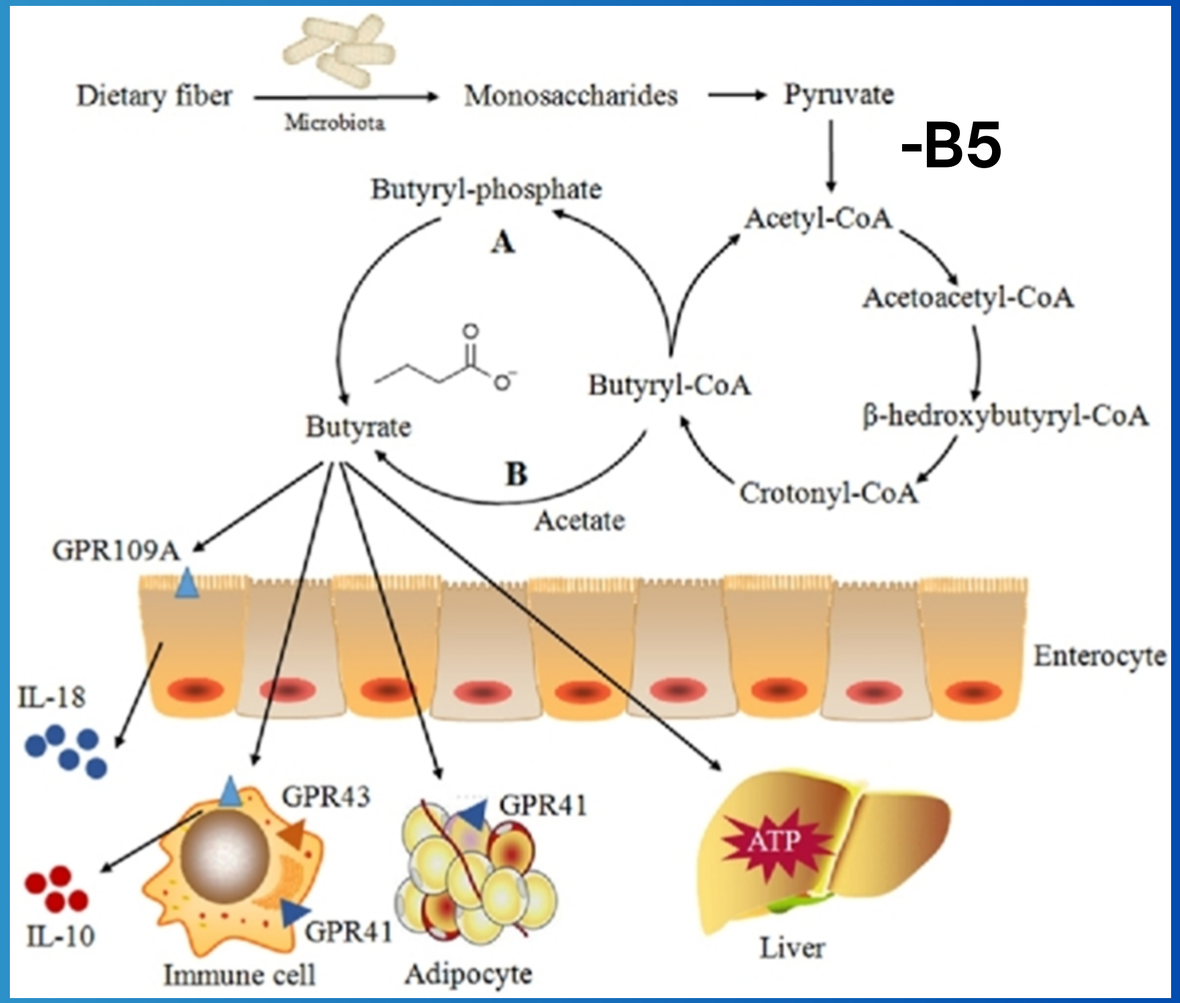
`Short-chain fatty acid

`Produced by commensal bacteria

`Produced in colon

`Derived from fermentation of dietary fiber

`Primarily indigestible plant polysaccharides and resistant starches



Natural Butyrate PRODUCTION

In addition to its well-recognized role as the preferred energy source for colonocytes, butyrate has now been shown to have a much broader physiological role that extends beyond the colon, influencing systemic metabolic and immune function, as well as reducing intestinal permeability and inflammation.

nutrients

MDPI

Review

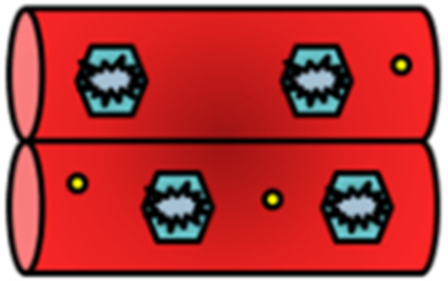
Short Chain Fatty Acids in the Colon and Peripheral Tissues: A Focus on Butyrate, Colon Cancer, Obesity and Insulin Resistance

Sean M. McNabney and Tara M. Henagan *

Department of Nutrition Science, Purdue University, West Lafayette, IN 47907, USA; smcnabne@purdue.edu
* Correspondence: thenagan@purdue.edu; Tel.: +1-765-494-4536

Received: 19 October 2017; Accepted: 5 December 2017; Published: 12 December 2017

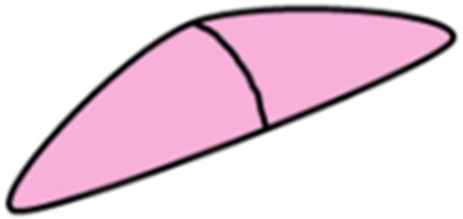
Abstract: Increased dietary fiber consumption has been associated with many beneficial effects, including amelioration of obesity and insulin resistance. These effects may be due to the increased production of short chain fatty acids, including propionate, acetate and butyrate, during fermentation of the dietary fiber in the colon. Indeed, oral and dietary supplementation of butyrate alone has been shown to prevent high fat-diet induced obesity and insulin resistance. This review focuses on sources of short chain fatty acids, with emphasis on sources of butyrate, mechanisms of fiber and butyrate metabolism in the gut and its protective effects on colon cancer and the peripheral effects of butyrate supplementation in peripheral tissues in the prevention and reversal of obesity and insulin resistance.



Colon:
Primary energy source for colonocytes
Reduced inflammatory cytokines
Maintenance of tight junctions
Regulation of colonic lumen pH
Enhanced Na+ absorption
Promotes cell cycle arrest and apoptosis in colon cancers
Increased production and secretion of satiety hormones
Altered gut microbiota

Skeletal Muscle:
Increased lean body mass
Increased and more complete β-oxidation
Increased capacity for substrate switching
Increased oxidative, type 1 fiber percentage
Decreased lipid accumulation

Butyrate



Liver:
Reduced inflammatory mediators
Enhanced antioxidant systems
Increased β-oxidation
Reduced lipid deposition

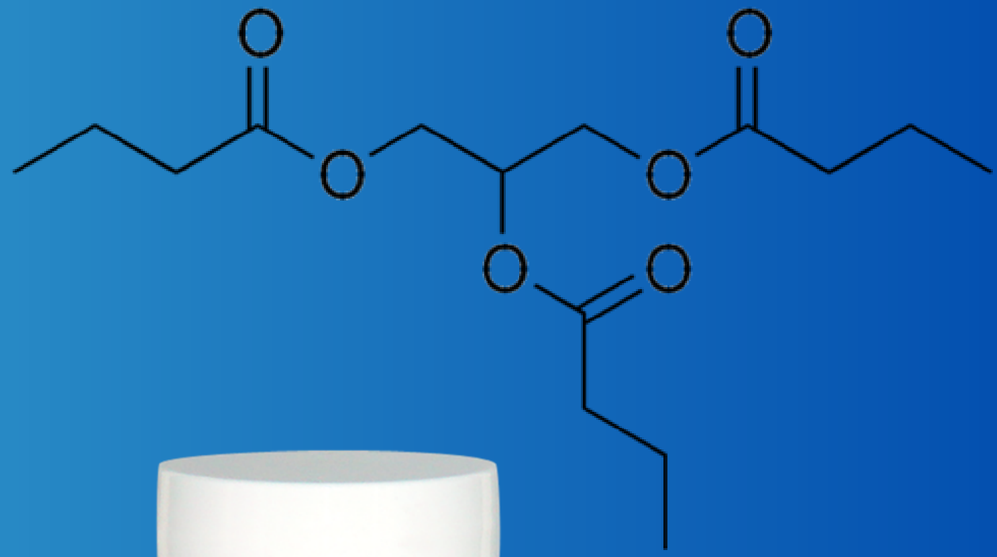
Adipose Tissue:
Decreased adipose tissue mass
Increased lipolysis *in vitro*
Increased β-oxidation
Increased SNS outflow and β-adrenergic stimulation on adipocytes
Increased leptin production and secretion
Decreased inflammation
Browning of white adipose tissue
Enhanced differentiation

TRIBUTYRIN

Trademarked, highly bioavailable form of butyrate

Sustained increase in plasma levels of butyrate with tributyrin supplementation may allow for more systemic and epigenetic effects of butyrate

Multiple studies suggest tributyrin protects the liver and intestinal barrier from a variety of insults, including ethanol and bacterial toxins



ButyraGen™

Tributyrin Complex

- Overcomes the limitations imposed by the short half-life of butyrate
- Promising results for wide-ranging effects in experimental models.
- Prevent fat accumulation and liver injury following alcohol toxicity.
- Tributyrin also protects the liver from damage in response to lipopolysaccharide (LPS)-induced liver injury
- Down-regulates NF-κB, a critical regulator of inflammation.
- Prevent oxidative stress in the colon and preserve intestinal immune function in response to ethanol-induced injury.
- Modulation of the Gut-Brain Axis through PPARγ and AMPK (also supports epithelial tight junctions)
- Protection from toxins, such as C. difficile toxins, also appears to be another mechanism by which butyrate reduces intestinal inflammation.

Complementary Benefits

- Butyric-Cal-Mag™ also contains complementary antioxidants in the form of mixed carotenoids (from vitamin A), calcium and magnesium.

- provides pantothenic acid (B5), necessary for the synthesis of acetyl CoA.
  - Inhibition of the acetyl CoA pathway has been associated with impaired butyrate synthesis.

Butyric-Cal-Mag™

Supplement Facts

Serving Size: 2 Capsules
Servings Per Container: 30

	Amount Per Serving	% Daily Value
Vitamin A (as natural mixed carotenoids and acetate)	975 mcg RAE	108%
Pantothenic Acid (as calcium pantothenate)	16.7 mg	334%
Calcium (as calcium citrate)	40 mg	3%
Magnesium (as magnesium citrate)	40 mg	10%
ButyraGen™ Tributyrin Complex	1,000 mg	*

***Daily Value not established**

Other ingredients: Capsule shell (gelatin and water), gum arabic, guar fiber, rosemary extract, silica and cellulose.

This product is gluten and dairy free.

ButyraGen™ is a trademark of NutriScience Innovations LLC.

RECOMMENDATION: Two (2) capsules as a dietary supplement or as otherwise directed by a healthcare professional.

KEEP OUT OF REACH OF CHILDREN
Store in a cool, dry area. Sealed with an imprinted safety seal for your protection.

Product # 7810 Rev. 01/23

Recommendation: Two (2) capsules each day as a dietary supplement or as otherwise directed by a healthcare professional.