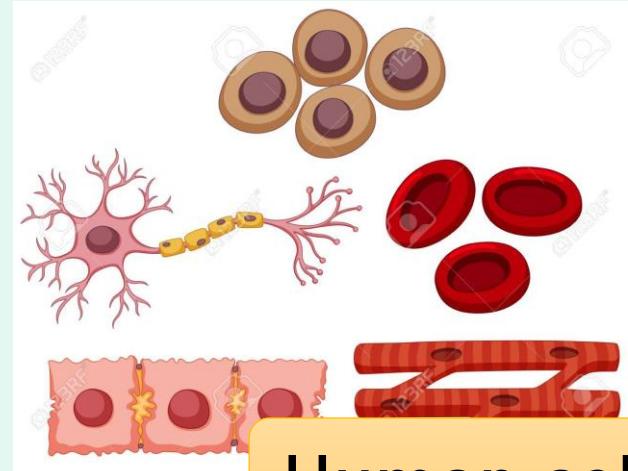


Why are intestinal microbes important?

20200289 배가현, 20200884 Noppanat Wadlom



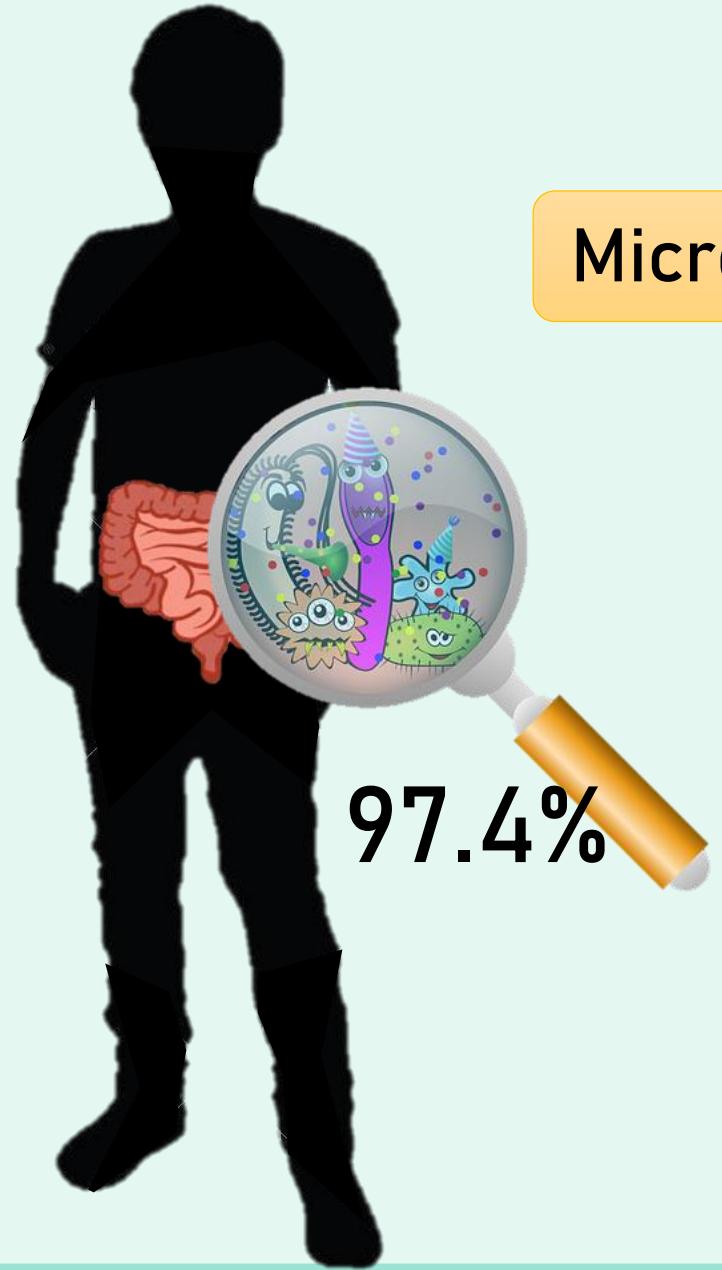
Human cell

23000
genes

Microorganism

X 10

3000000
genes



Microorganism

Intestinal microbes

97.4%

Appendix

1. Effects on humans' health

- Gut-brain axis (GBA)
- Obesity

2. Effects of diets on the composition of intestinal microbes

- Fibers and prebiotics
- Artificial sweeteners
- Gluten-free diet

3. How to keep intestinal microbes healthy

How do intestinal microbes affect our bodies?

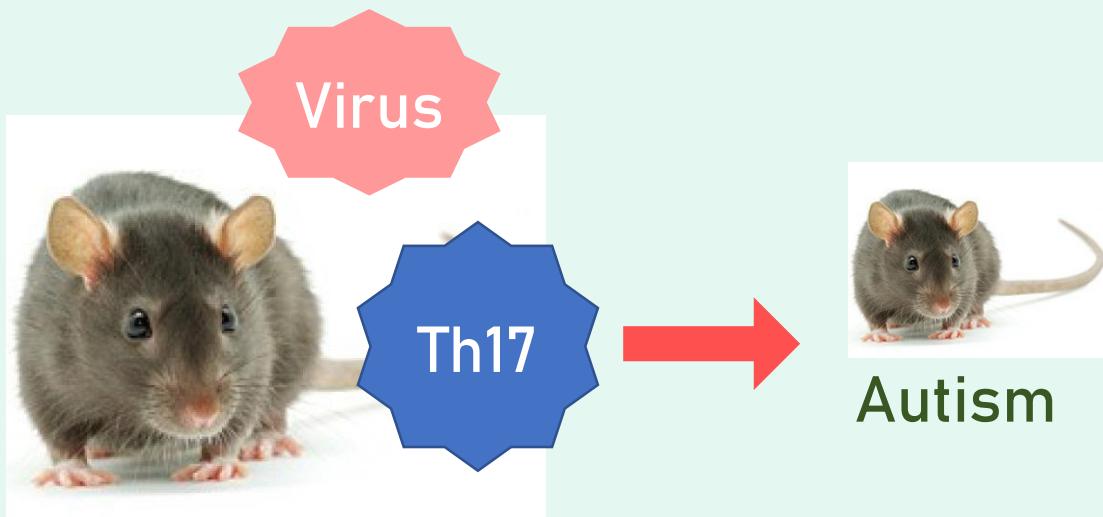
Using this fact

How can we be healthy??



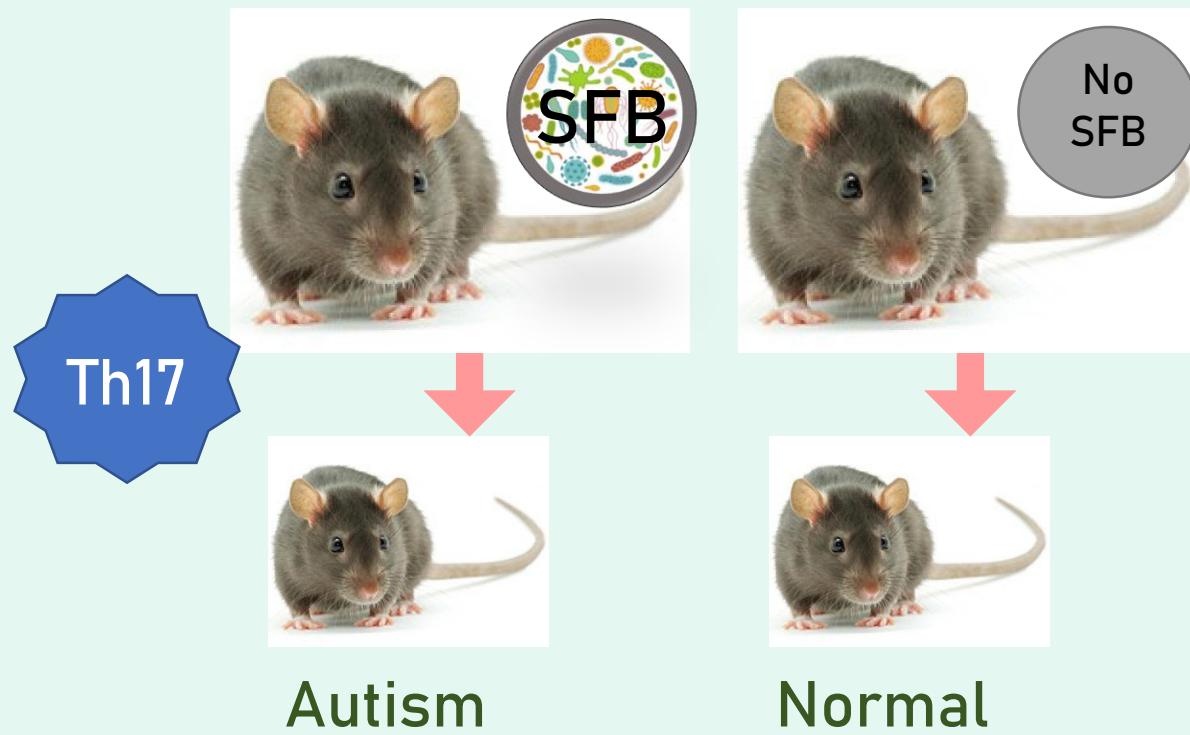
Effects on human's health

Autism(자폐증)



Effects on human's health

Autism(자폐증)



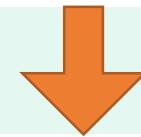
Effects on human's health

Autistic patient Normal



Autism(자폐증)

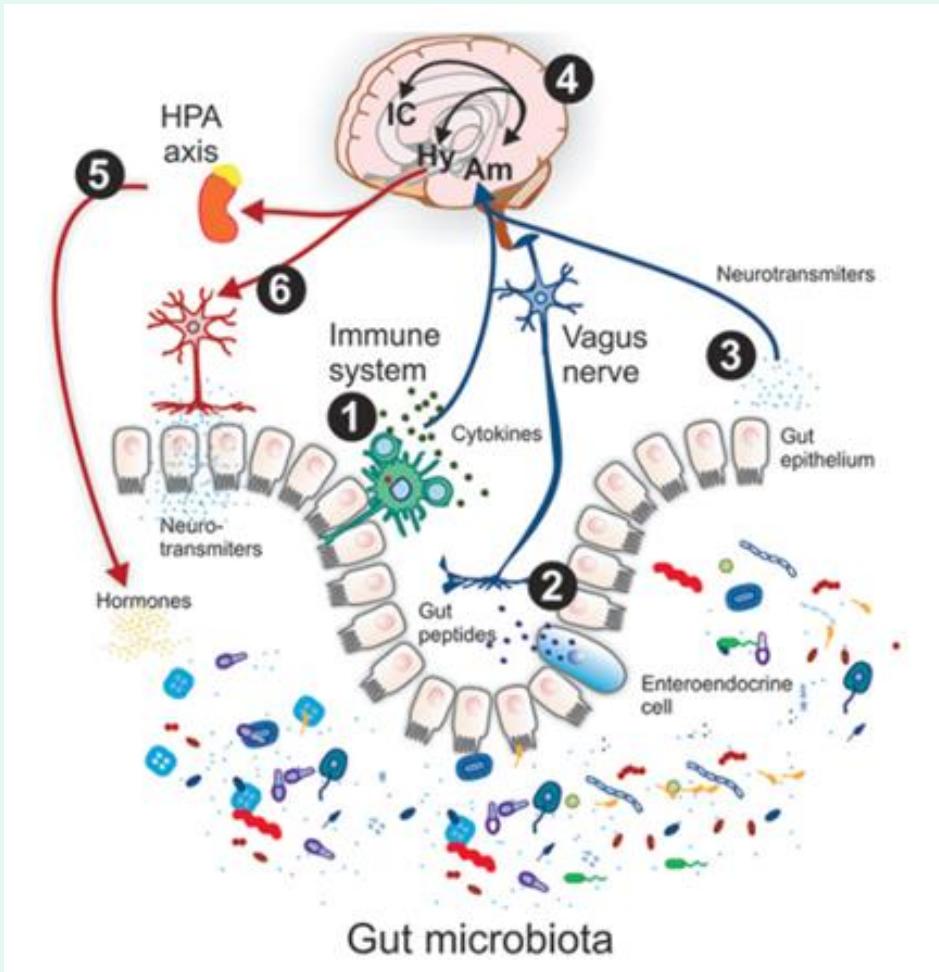
Configuration of intestinal microbes



Immune system of the gut

Brain disease

Effects on human's health



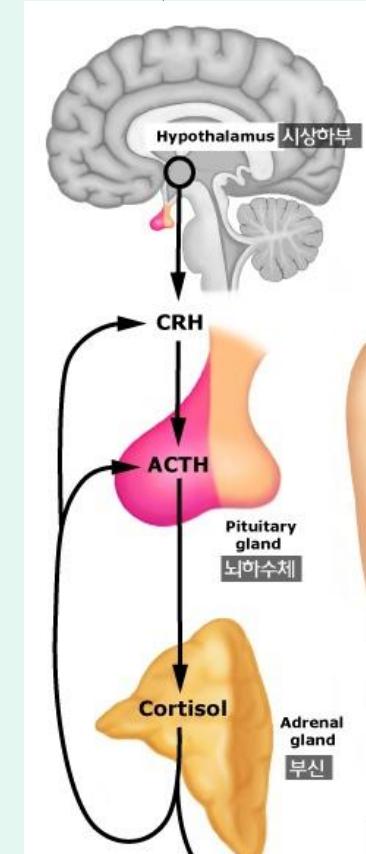
Gut-brain axis (GBA) Immune system

HPA

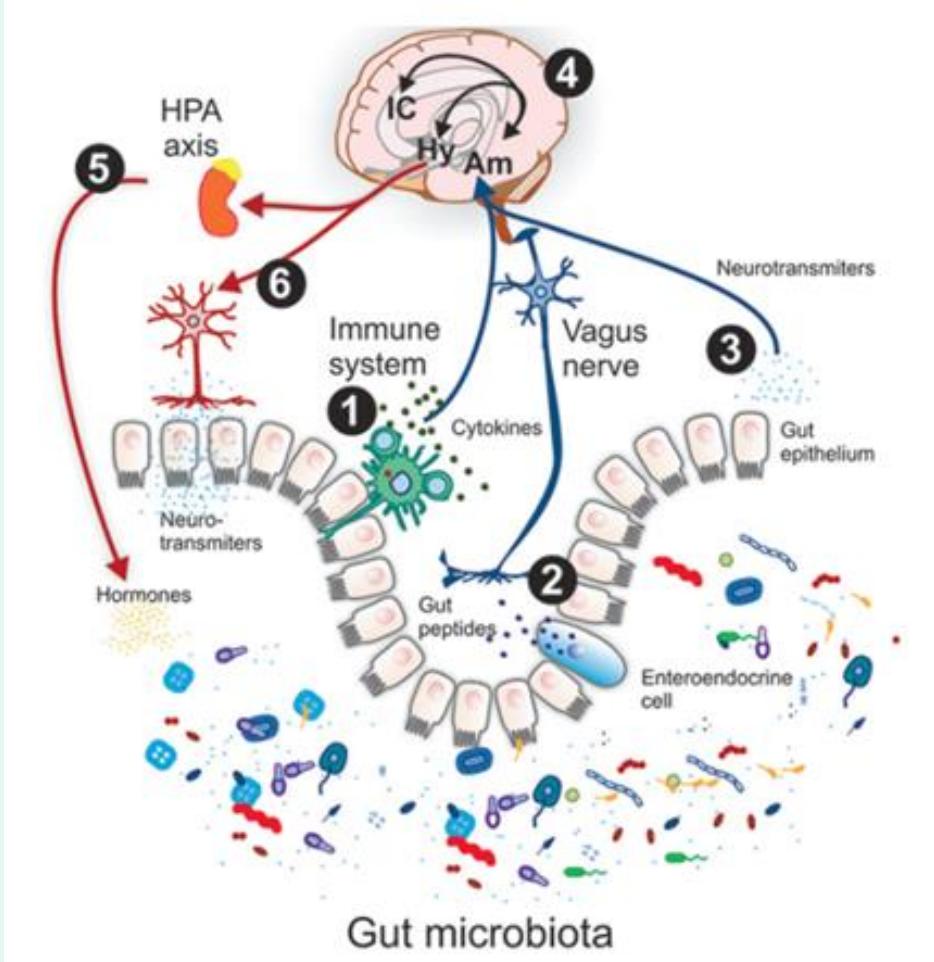
(Hypothalamic-Pituitary-Adrenal Axis)
(시상하부-뇌하수체-부신 축)

→ Hormone

Vagus nerve(미주신경)

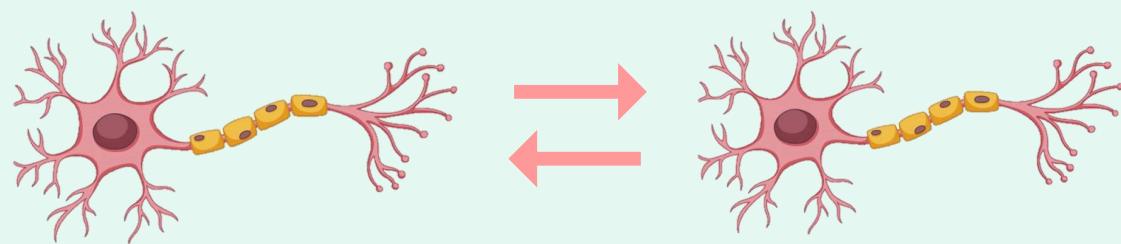


Effects on human's health



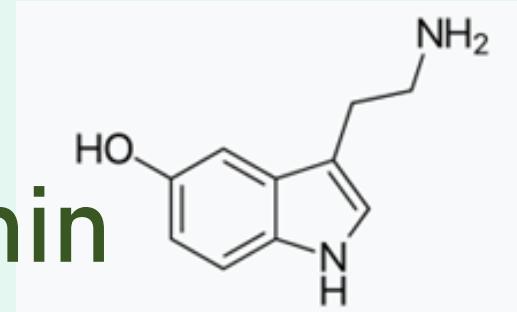
Gut-brain axis (GBA)

Neurotransmitter



Effects on human's health

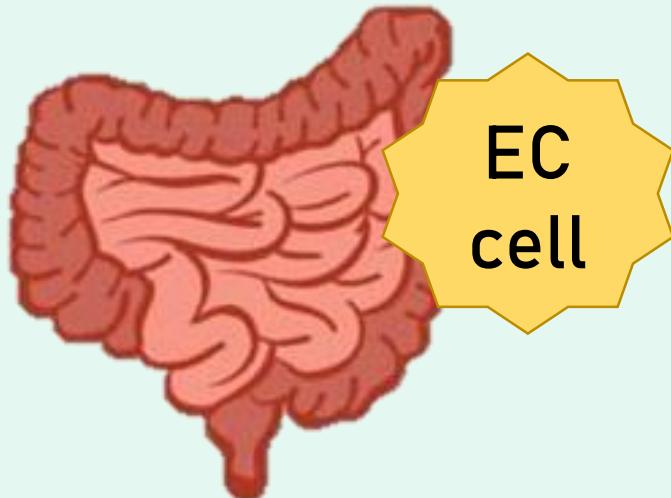
Serotonin



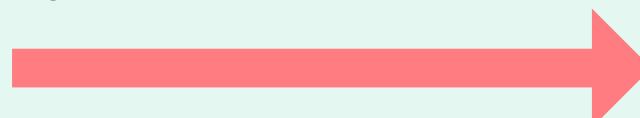
Emotional behavior

Mood

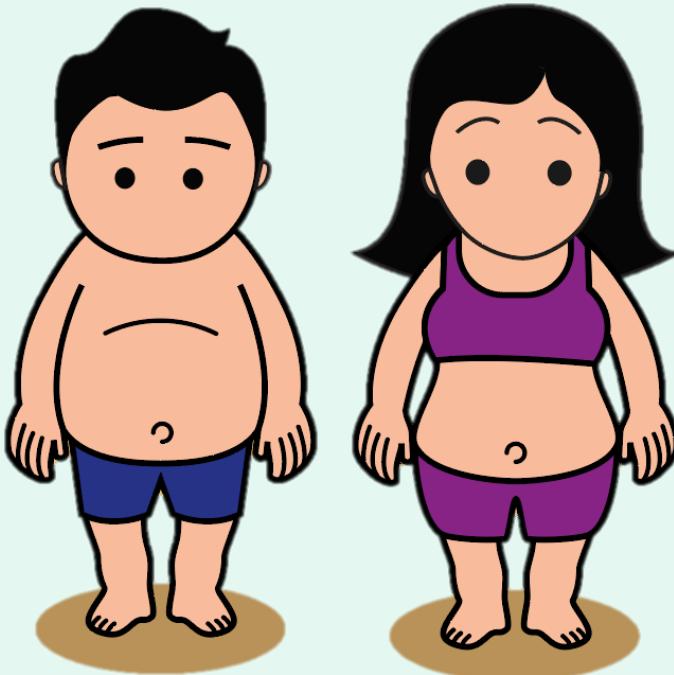
Blood clotting(혈액응고)



90%



Effects on human's health



What is obesity?

Overweight

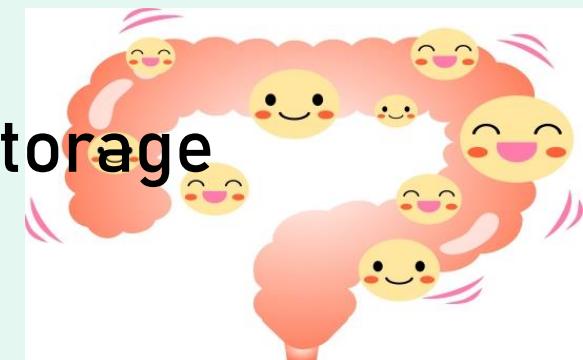


$$BMI = \frac{\text{Weight(kg)}}{[\text{Height(m)}]^2}$$

30 ↑

Why do people become obese?

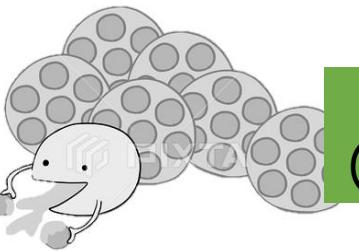
Nutrient acquisition,
energy regulation, fat storage



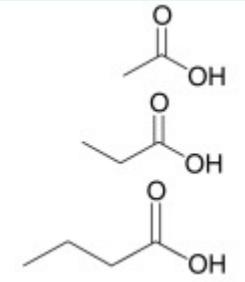
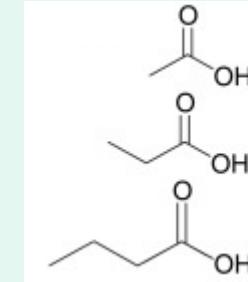
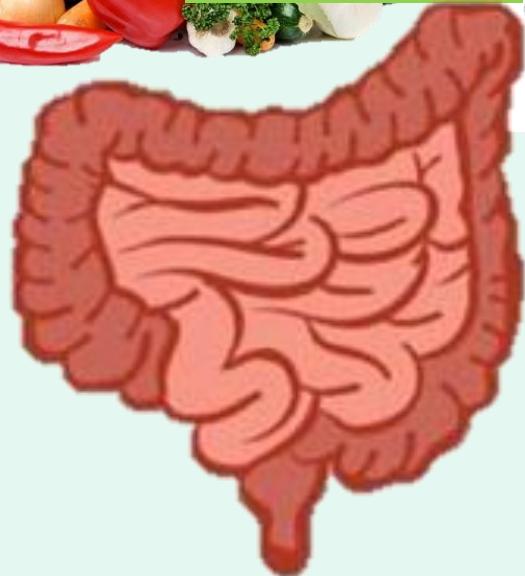
Effects on human's health



Dietary fiber
(식이섬유)



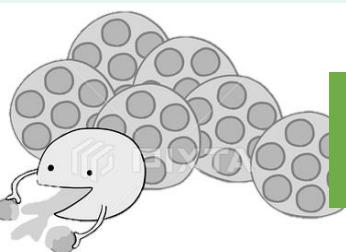
SCFAs
(Short-chain fatty acids)



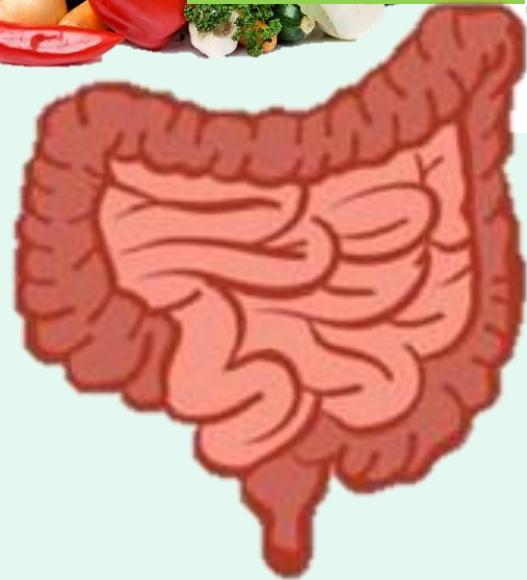
Fatty acid with carbons less than six

Prevent Obesity

Effects on human's health



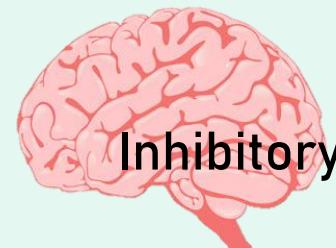
SCFAs
(Short-chain fatty acids)



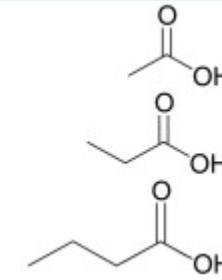
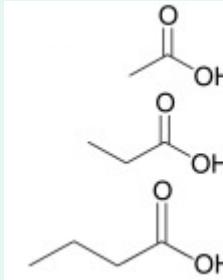
GLP-1

PeptideYY
3-36

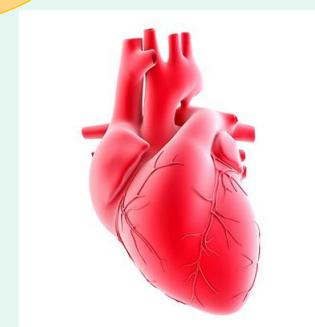
Hormone



Inhibitory effect of appetite



Fatty acid with carbons less than six



Sympathetic nerve(교감신경)

Increase in energy consumption

Effects of diets on intestinal microbes

Certain food, drugs, and dietary patterns can influence the diversity of intestinal microbes and result in different health outcomes.

Fibers and prebiotics



Artificial sweeteners



Gluten-free diet



Effects of fibers and prebiotics

Fibers and prebiotics

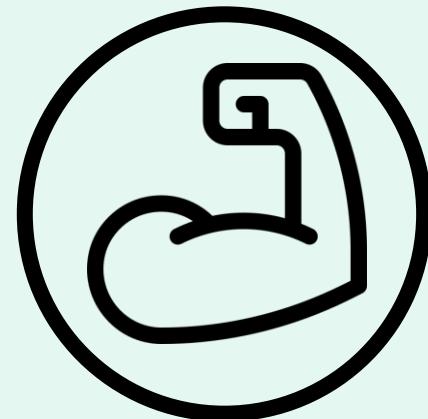


Fibers are carbohydrate polymers that are indigestible by humans' guts but are fermentable by intestinal microbes.

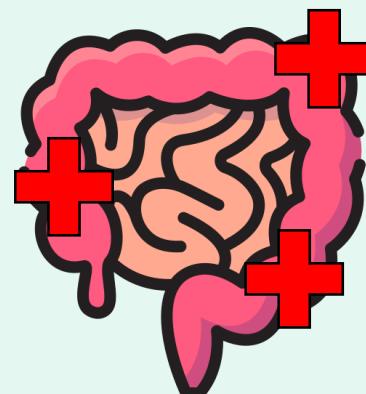
Prebiotics are food components that promote the growth and activities of beneficial microbes.

Effects of fibers and prebiotics

Increase diversity
(resistant to external
changes)



Promote SCFA
production
(maintain healthy guts and
prevent obesity)



Maintain mucosal
barrier
(resistant to pathogens)



SCFAs: Short-chain fatty acids – They are produced by intestinal microbes and help regulate glucose homeostasis and satiety.

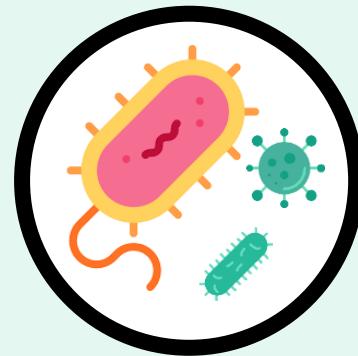
Effects of artificial sweeteners

Artificial sweeteners



Such as sucralose,
aspartame, and saccharin

Disrupt the balance
(susceptible to external
changes)



Disrupt the production
of metabolites
(unhealthy guts)

Inflammatory
responses



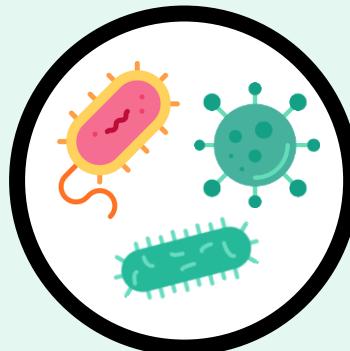
Effects of gluten-free diet

Gluten-free diet

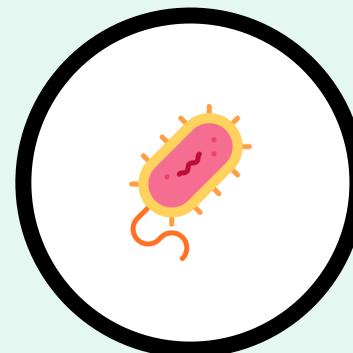


Gluten is a type of proteins found in grains like wheat and barley.

Reduce dysbiosis
in people with gluten-related diseases



Decrease
beneficial microbes
in healthy people



How to keep intestinal microbes healthy

Consume a diverse range of foods



Eat vegetable, fruits, beans, and legumes

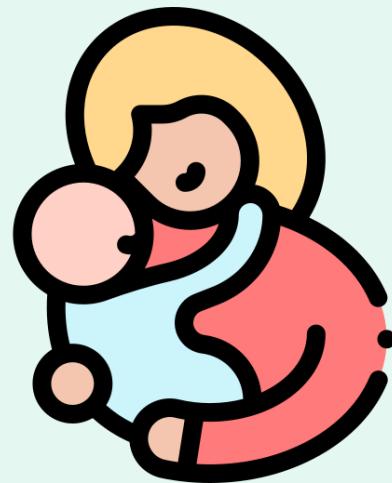


Avoid eating artificial sweeteners



How to keep intestinal microbes healthy

Breastfeed for at least six months



Eat whole grains

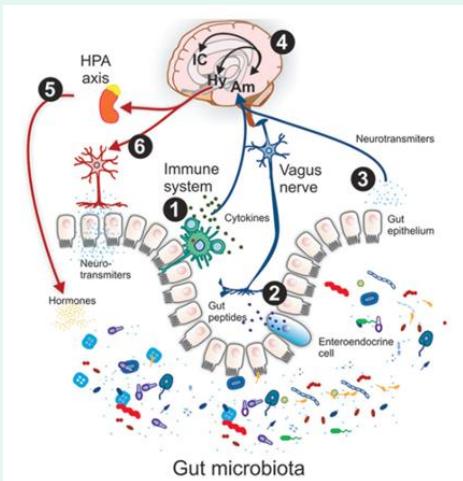


Eat food containing probiotics



Conclusion

Microorganisms living inside our body account for more cells than our own cells.



Intestinal
microbes

Endocrine system
Nervous system

Obesity

Autism

Serotonin

Proper diets can help nourish beneficial intestinal microbes.



References

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THANK YOU