The effect of alcohol to our body

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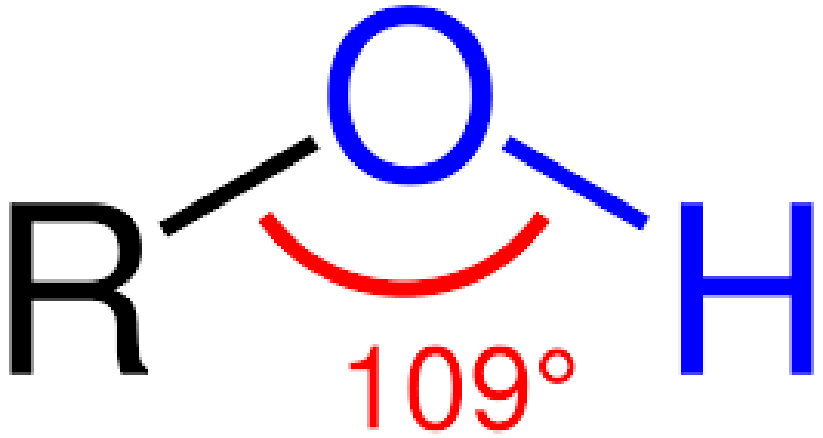
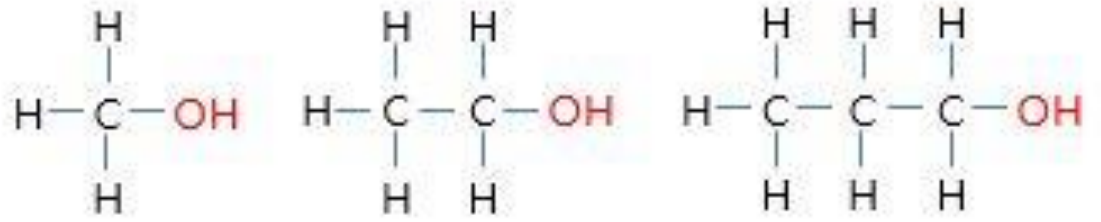
What Is Alcohol?

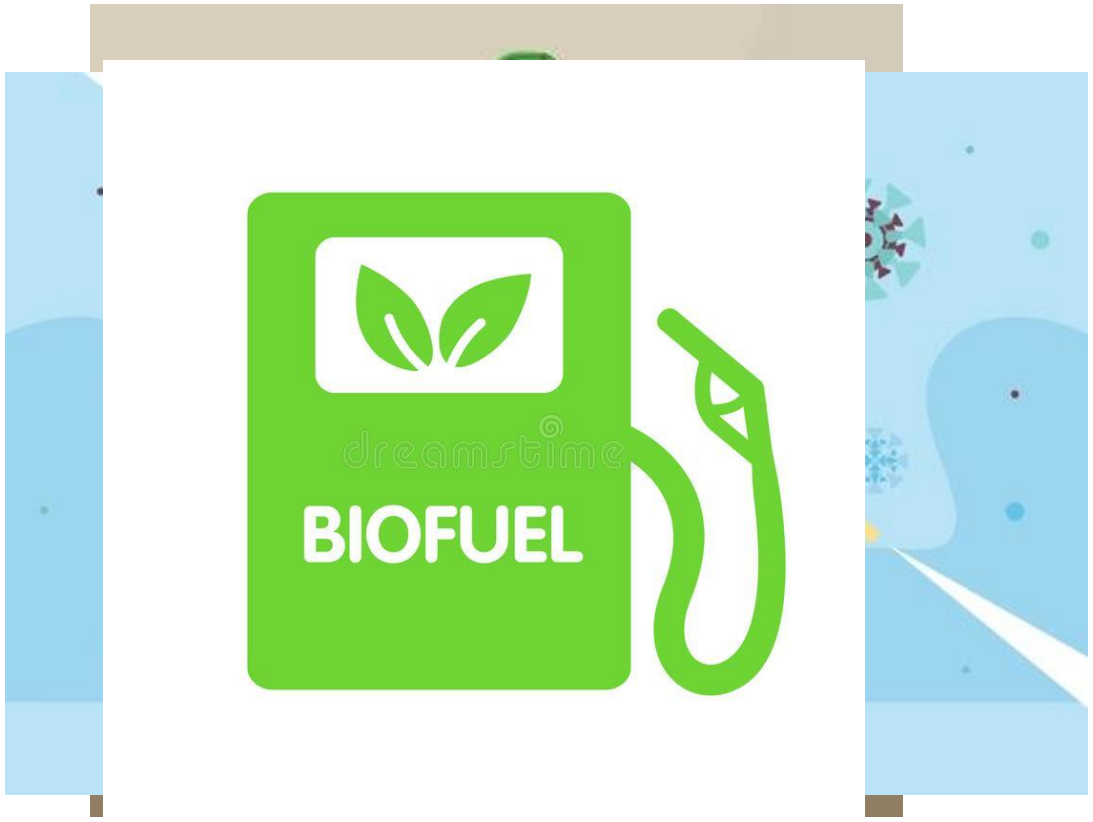


Alcohol

- Organic compound that carries one hydroxyl functional group
- CnH2n+1OH
- Methanol, Ethanol, Propanol
- Alcohol in alcoholic beverages is called ethanol.



What Is Alcohol?

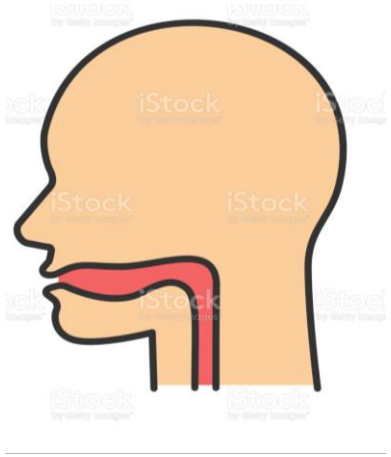


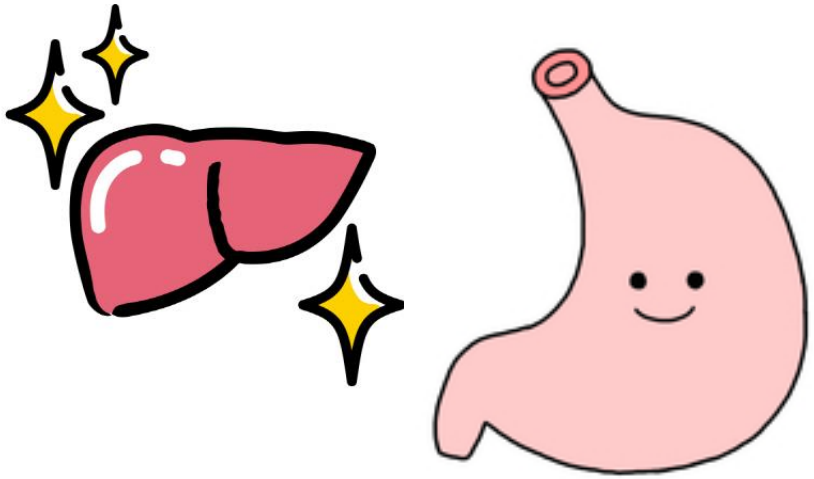
Ethanol

- One of the alcohol
- Main component of alcoholic beverages
- C2H5OH
- The only organic solvent that can be diluted.
- Use for sterilization, disinfection and biofuel
- One of WHO-designated carcinogens

Alcohol Metabolism

What happened in our body when we drink?

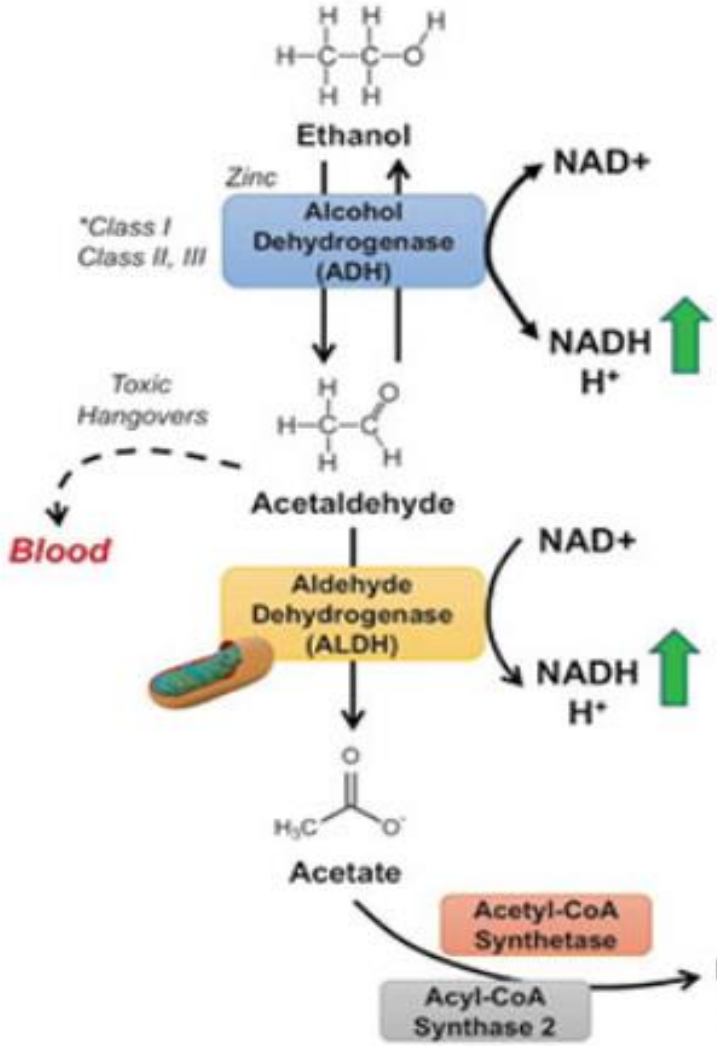




Alcohol Metabolism

Stomach Lining

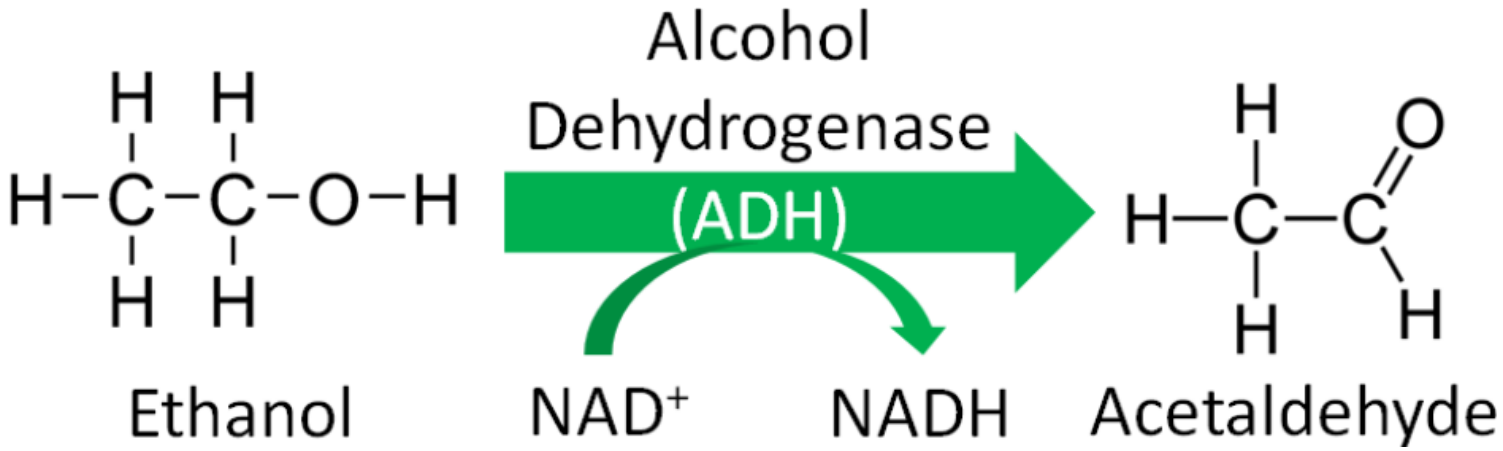
Liver

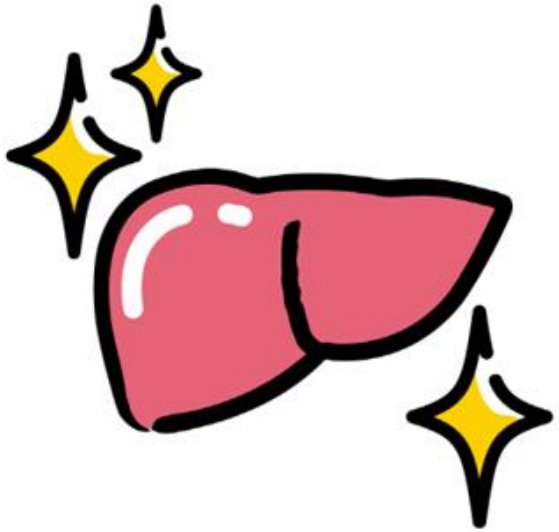


~90% Ethanol Metabolism

Alcohol Metabolism

Step 1





$$CH_3CH_2OH + NAD^+ \xrightarrow{\text{Alcohol dehydrogenase}} CH_3CHO + NADH + H^+$$

Ethanol — Acetaldehyde

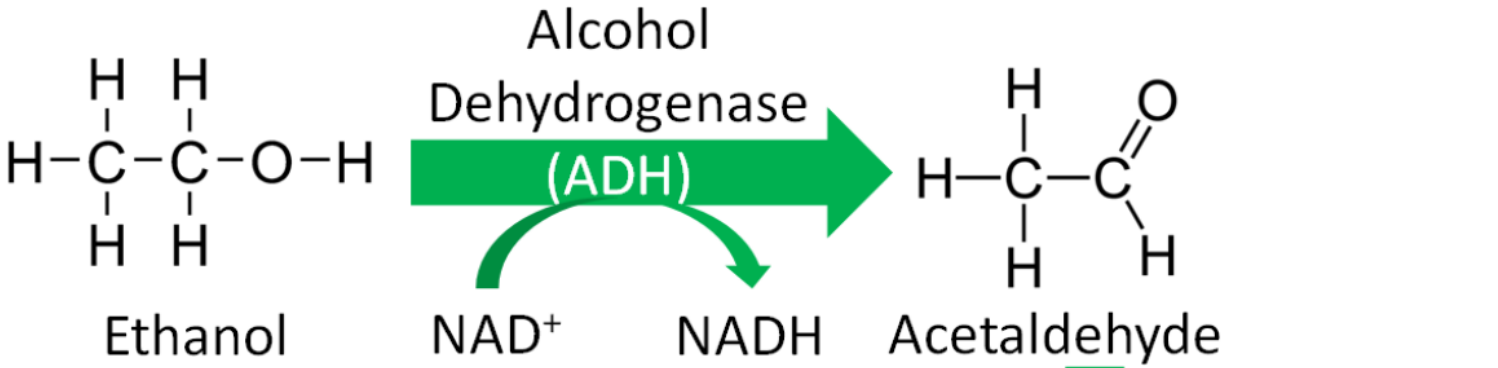
NAD : Nicotinamide adenine dinucleotide

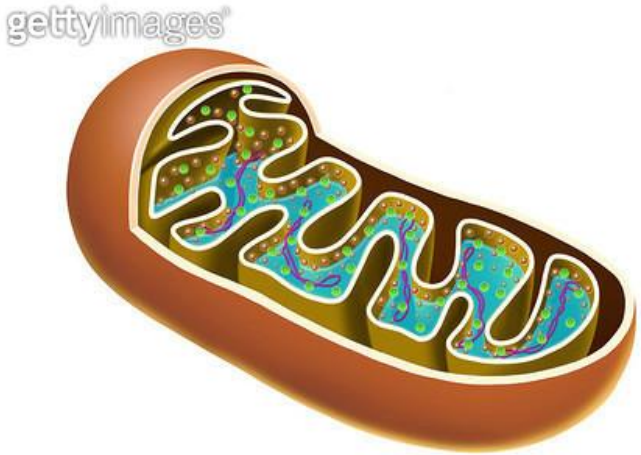
Alcohol Metabolism

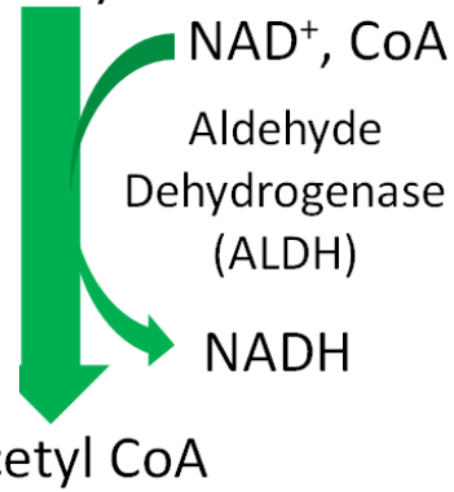
Step 2

$$CH_3CHO + NAD^+ + H_2O \xrightarrow{\text{Aldehyde dehydrogenase}} CH_3COO^- + NADH + H^+$$

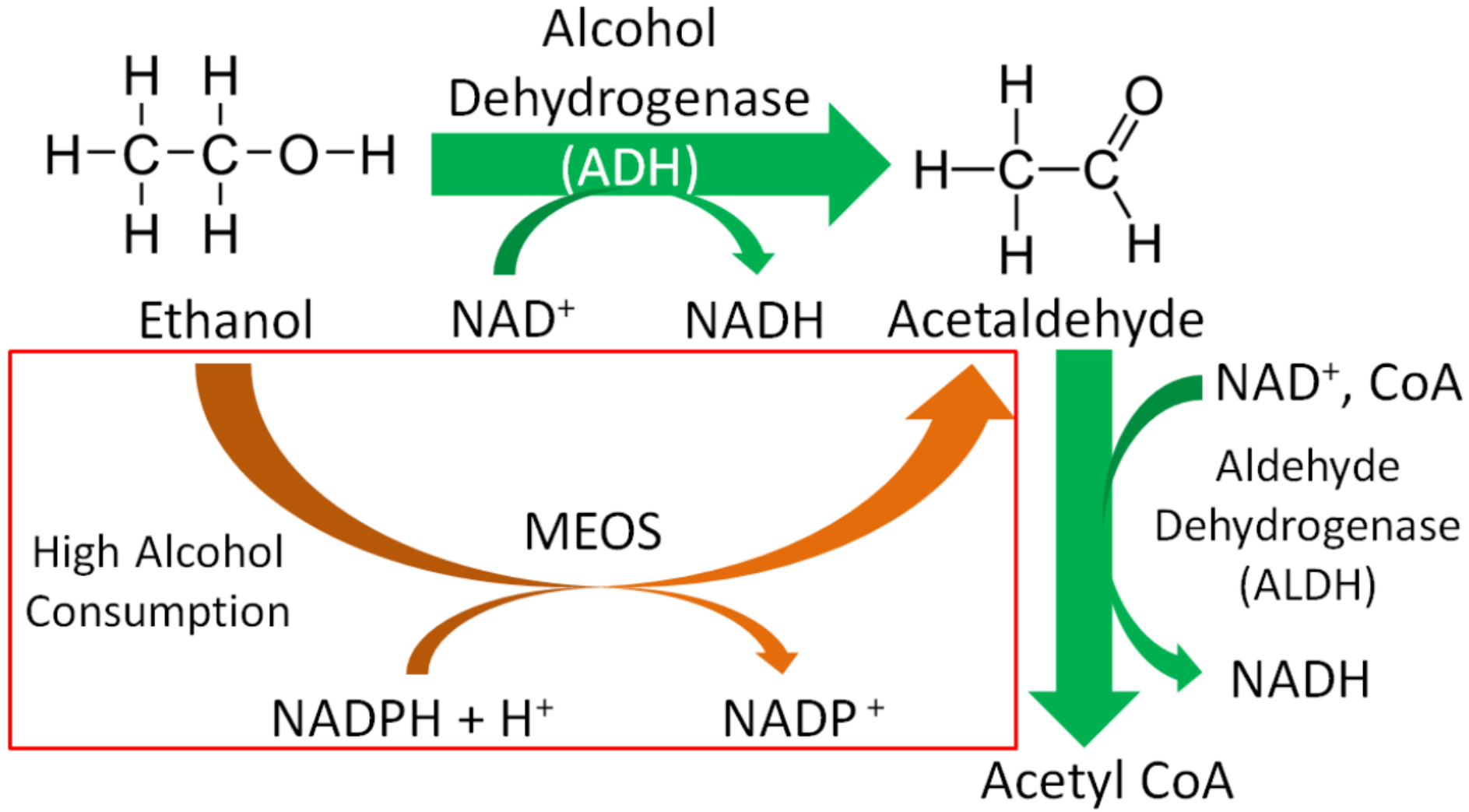
Acetaldehyde → Acetate







Alcohol Metabolism



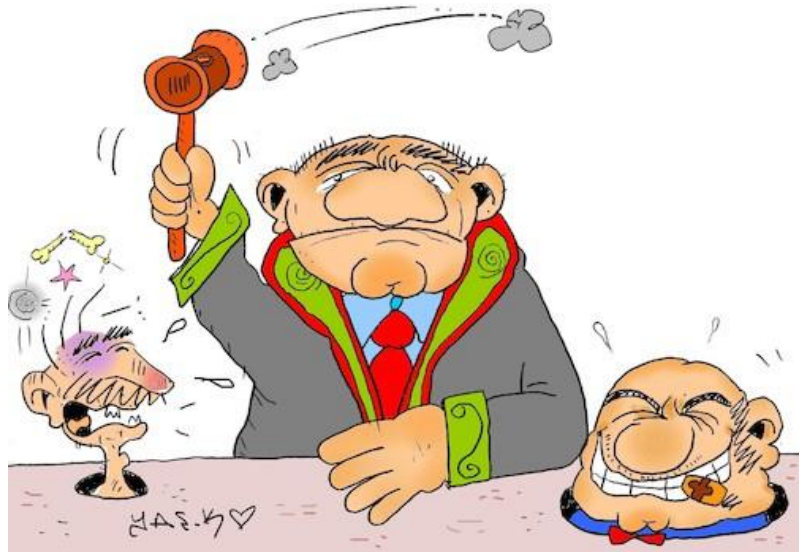
MEOS – Microsomal Ethanol Oxidizing System

Effect of alcohol to body

Short-term Effect

- Related to level of BAC
- Increase BAC by about 0.02
- Up to 0.05 -> talkative, relaxed and more confident
- Up to 0.08 -> impaired judgement and movement & reduced inhibitions
- Up to 0.15 -> unstable emotions & nausea and vomiting
- Up to 0.3 -> sleepy, difficulty breathing, memory loss

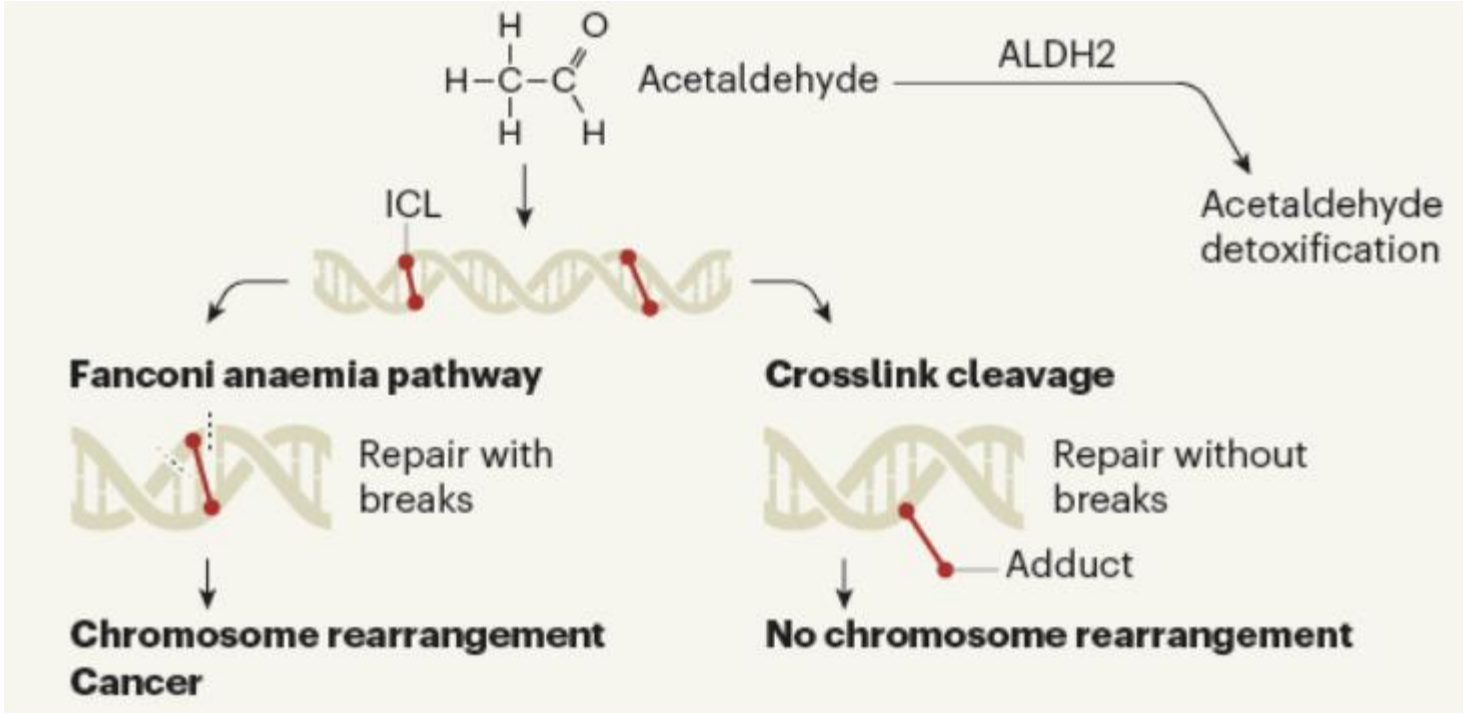
The level of alcohol in your blood is called blood alcohol concentration (BAC). A BAC of 0.01 means there is 0.01g of alcohol in 100ml of your blood.

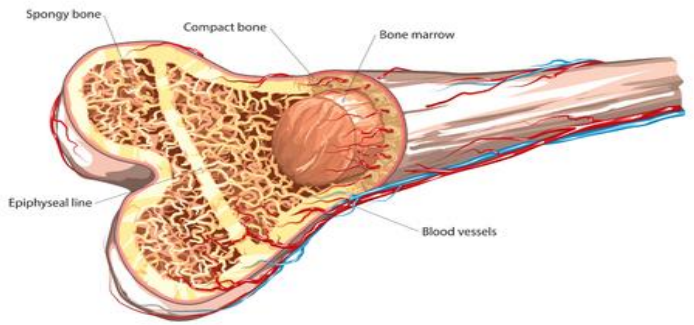


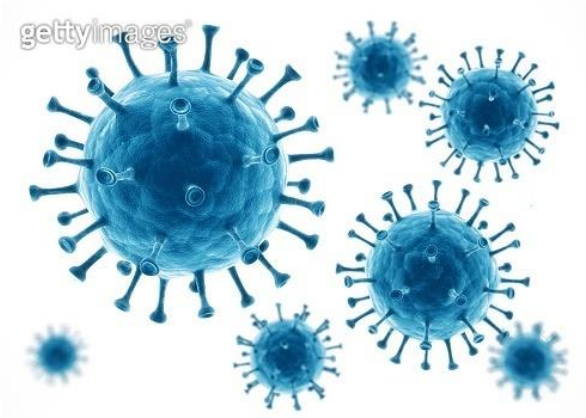
Effect of alcohol to body

Long-term Effect

- Damage to DNA arrangement



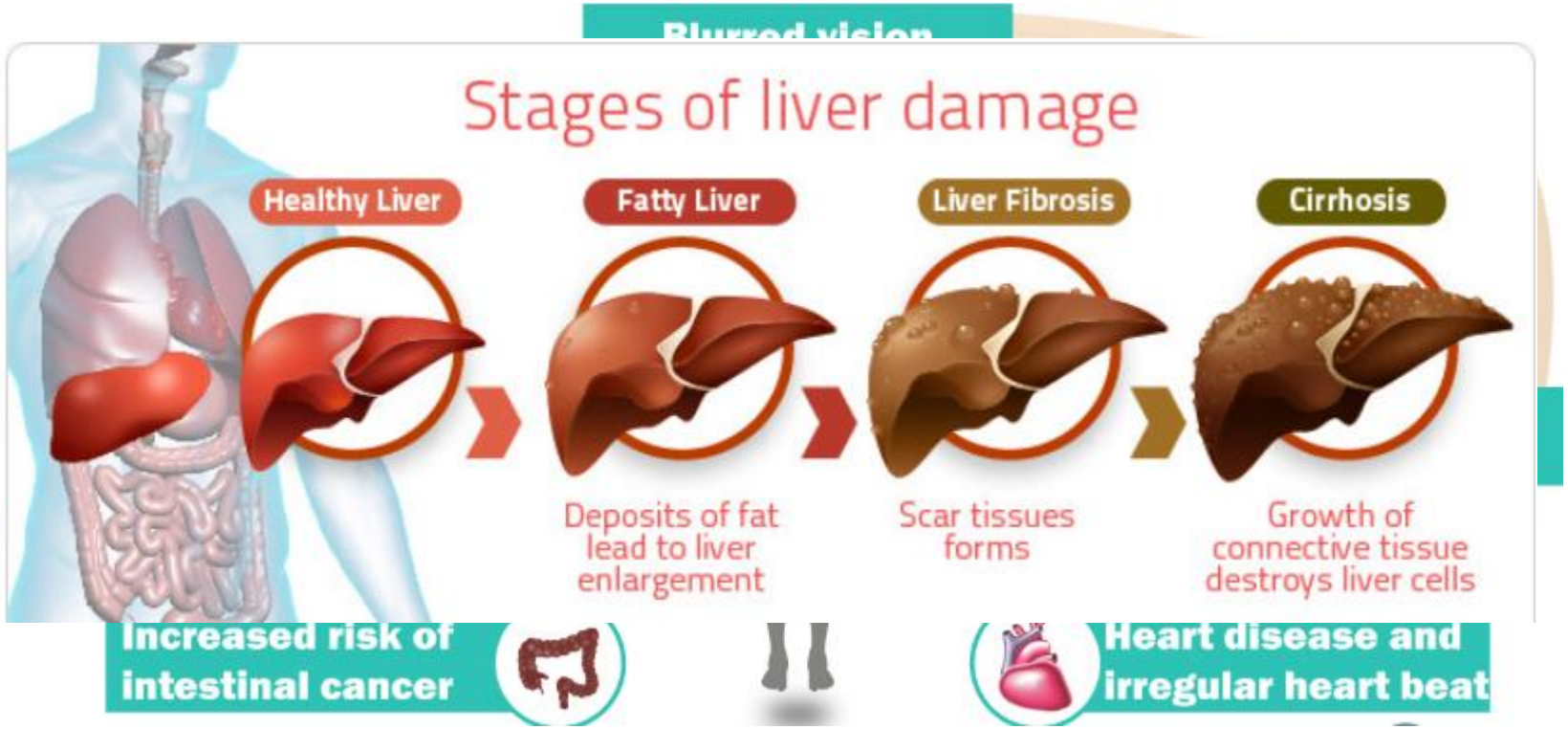




Effect of alcohol to body

Long-term Effect

- mental health of suicide
- diabetes and weight gain
- Cancers
- Alcoholic cardiomyopathy



Hangover - Introduction

Hangover - Introduction

Stiff drink

Fruit soju

Makgeoli

What is Hangover? Why it happens?

What is it?

Why it happens?

Hangover - Definition

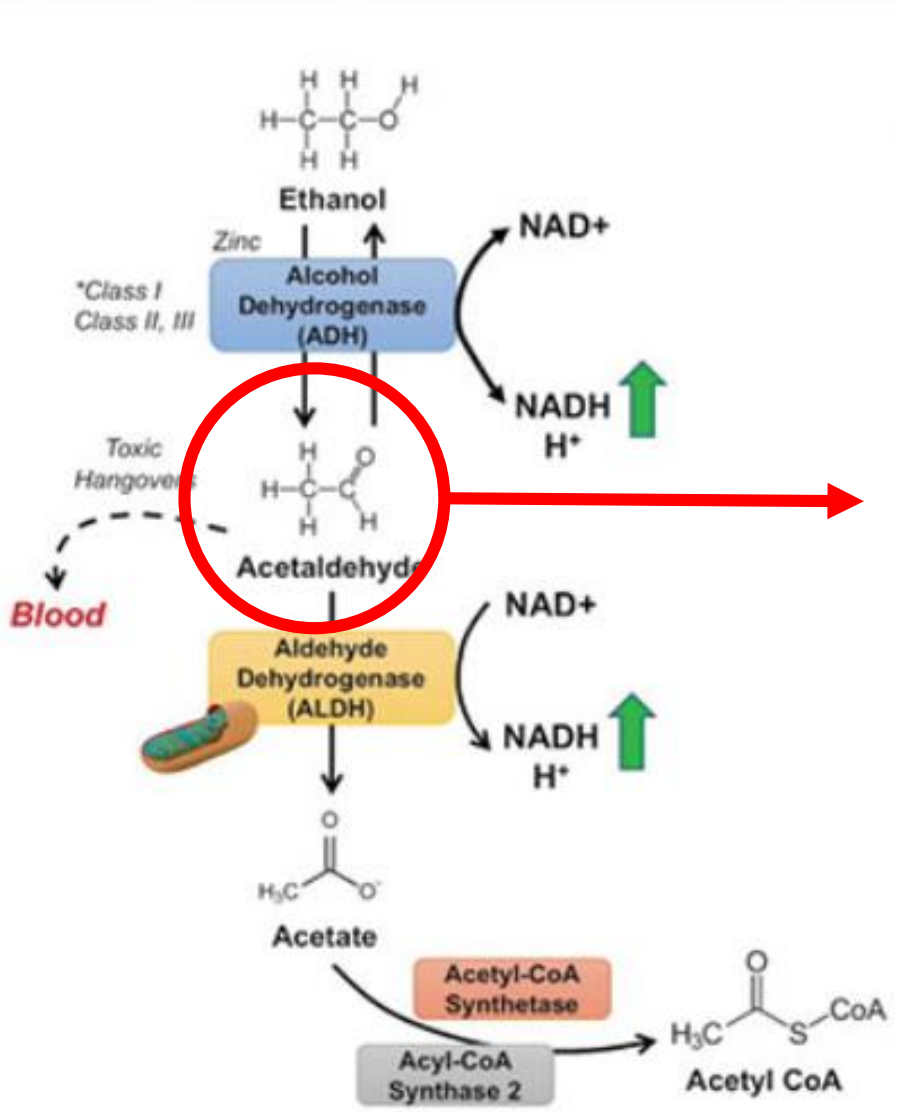
Discomfort

Headaches

Deterioration of work ability

All symptoms

Reason - Alcohol Metabolism



Acetaldehyde

$$CH_3-C(=O)-H$$

Acetaldehyde

Factory waste water

Polluted air

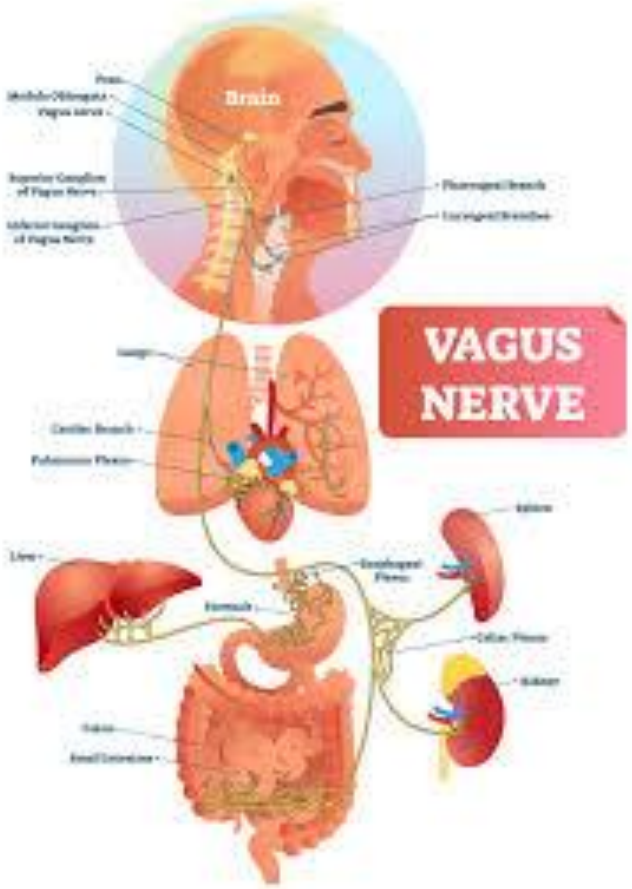
Acetaldehyde

World Health Organization

WHO : second-group B, cancer-causing substance

Voluntarily

Reason – Action of Acetaldehyde



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Vagus nerve

: function of exercise, perception, and gut.

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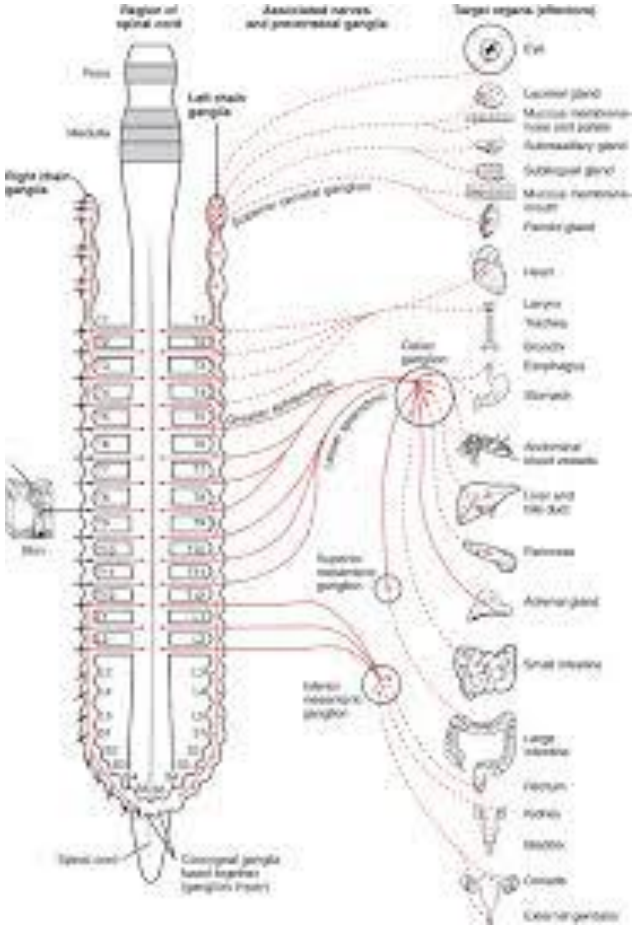
Sympathetic nerve

: when the body is stressed from the external environment.



Additional Information & Conclusion

Total amount of alcohol

And

Individual processing power

- Excessive amount
- Brought it at once
- Not processed in time
- Leaving alcohol Stimulate nerve

Controversy - Inflammatory response hypothesis

Inflammatory response hypothesis

: Not Acetaldehyde?

Cytokine

: all the proteins that immune cells produce

- Interleukin10
- Interleukin12
- Interferon Gamma

Controversy - Inflammatory response hypothesis

Healthy person + Hangover > Cytokines Rise

Healthy person + Cytokines > Hangover

To get rid of hangovers

~~Acetaldehyde~~

Liver function

Alcohol & Acetaldehyde Decomposition enzyme

To get rid of hangovers

1. Hindering the activity of alcohol dehydrogenase

2. Promote the activity of acetaldehyde dehydrogenase

1. Alcohol =x=> Acetaldehyde

*** 2. Acetaldehyde >> Acetic Acid**

Reference

About effect of alcohol & alcohol metabolism

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About Hangover

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Wrap-up

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QnA