



Alcohol Flush Reaction

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Gene 210

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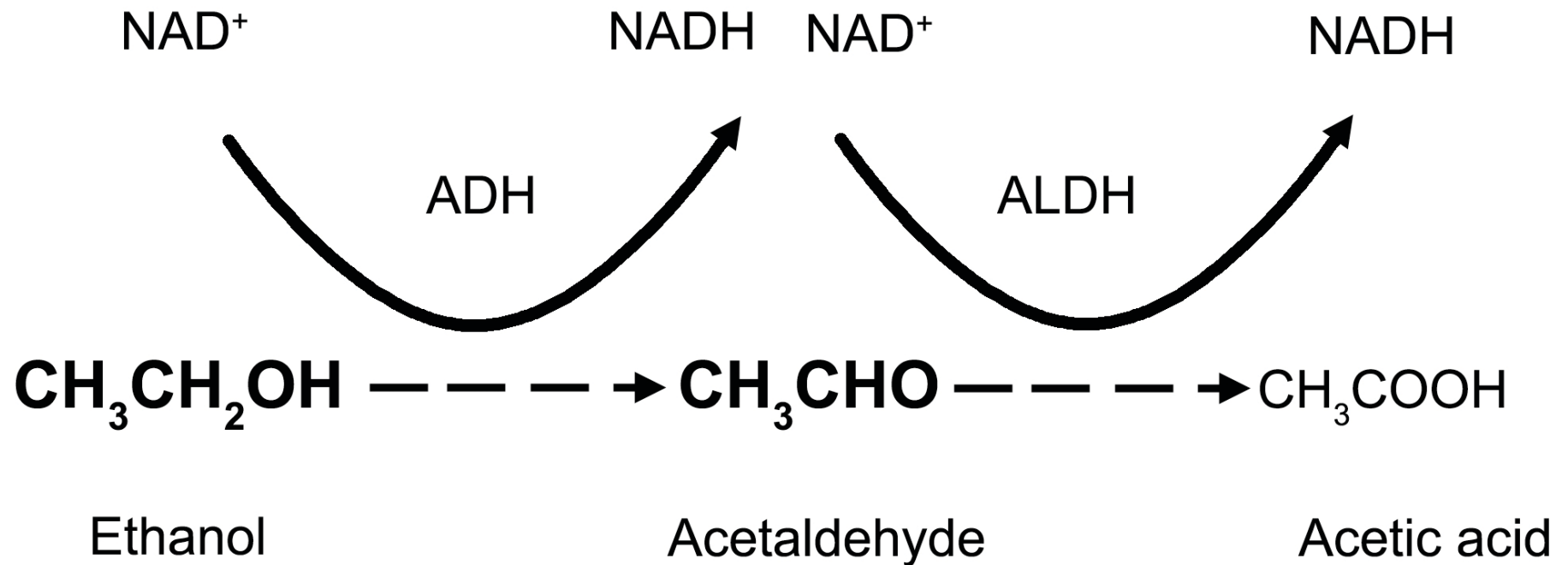
Introduction

Alcohol flush reaction (Asian flush)

Symptoms: dizzy, nauseous, headaches, face and neck turning bright red



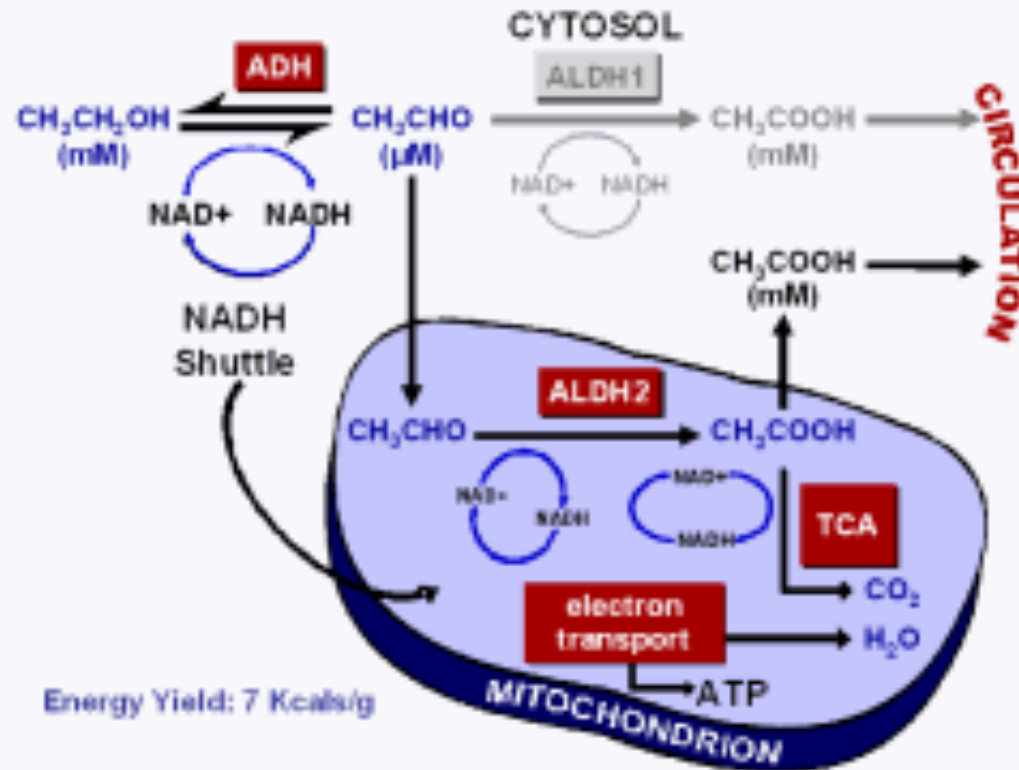
Introduction



Introduction

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Metabolism of Ethanol and Acetaldehyde in Hepatocyte



Two genes responsible for flush reactions

- ALDH2
- ADH1B

ALDH2: rs671

- A allele causes glutamine to lysine substitution
- Inactive ALDH2 enzyme, building up acetaldehyde

SNP	Chrom.	Ref	Alternative	Trait	OR	P-value
rs671	12	G	A	Flush	33.0	N.A.
				Alcoholism	0.2	<0.0001

ALDH2: rs671

ALDH2-deficiency (AA & AG) is more common in East Asians

- At least 540 million ALDH2-deficient individuals
- 8% of the global population
- 40% of the East Asian population

ALDH2: rs671

Treating alcoholics

- Commercial drug: disulfiram (trade name Antabuse)
- Chinese herbal medicine: daidzin (extracted from Kudzu root)



ALDH2: rs671

Diseases associated with rs671 (A allele)
in frequent drinkers

- **Esophageal cancer**
- Colorectal cancer
- Lung cancer
- Liver cancer
- Coronary artery disease
- Hypertension
- ...

ADH1B: rs1229984

- A allele causes arginine to histidine substitution
- Fast metabolizing ADH1B, also accumulating acetaldehyde

SNP	Chrom.	Ref	Alternative	Trait	OR	P-value
rs1229984	4	G	A	Alcoholism	7.8	8.2E-23

ADH1B: rs1229984

rs1229984 A allele is found in:

- Less than 10% of the white population
- More than 80% of the East Asian population

rs1229984 A allele protects from:

- Alcoholism
- Esophageal cancer



Thank You!

Questions?