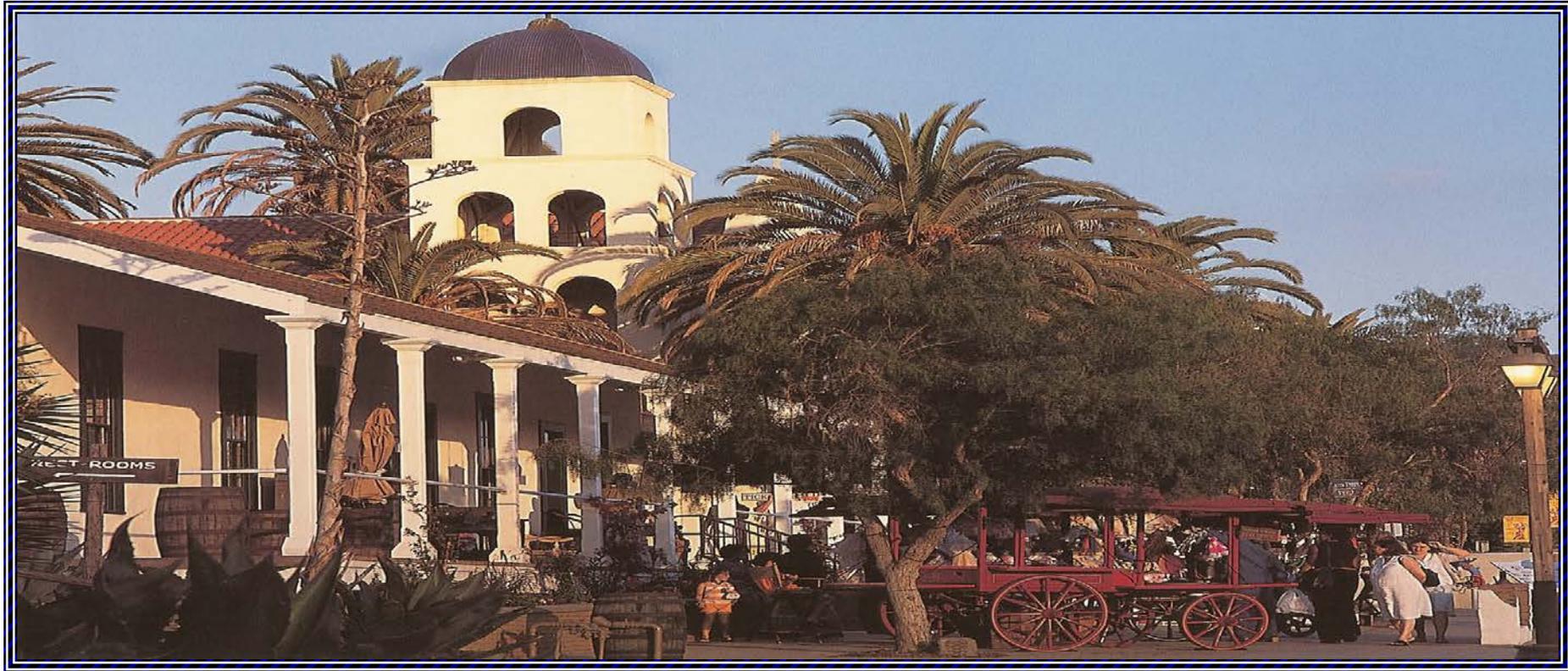
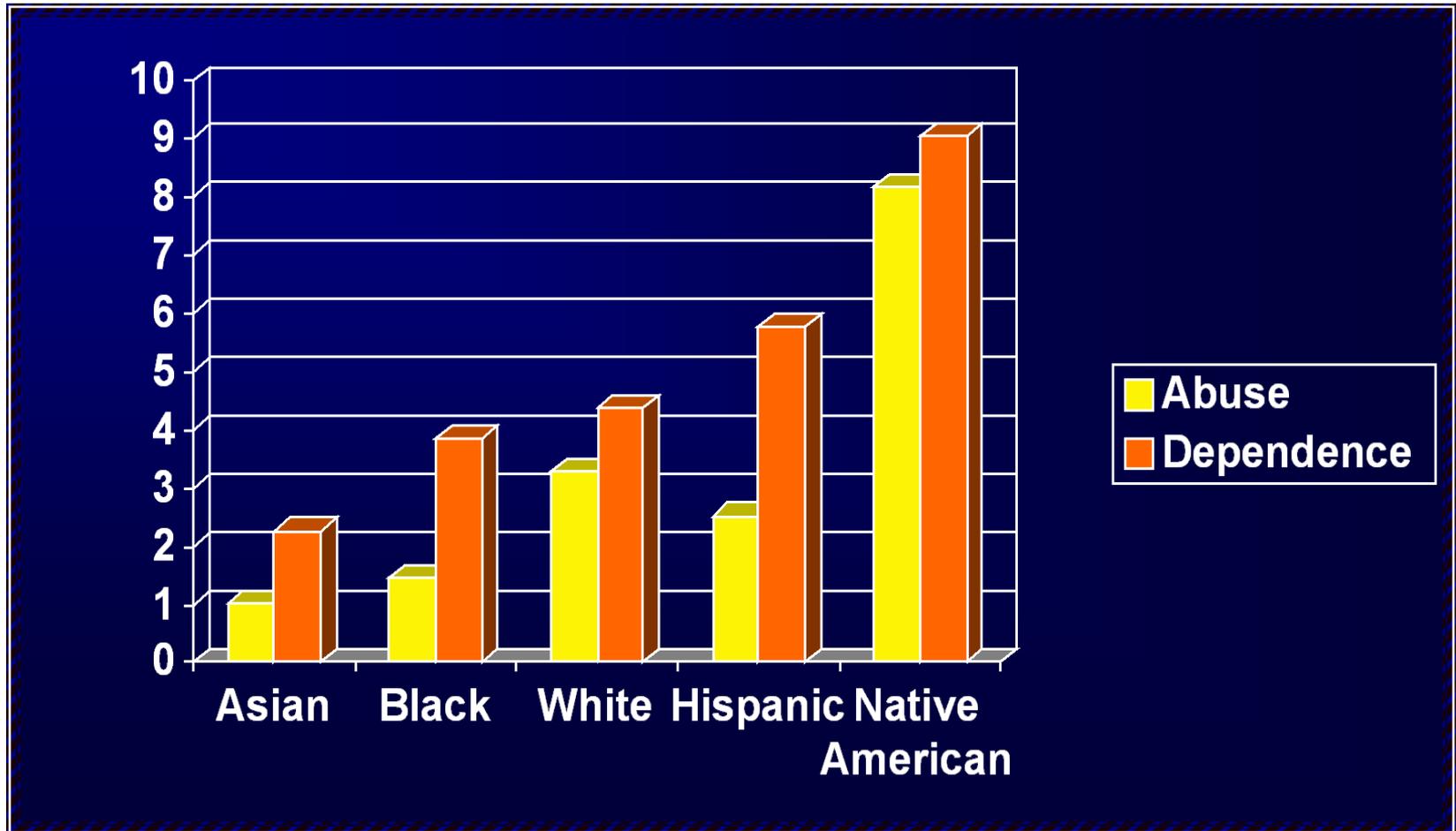


Genetic and Environmental Determinants of Alcoholism Risk in Different Ethnic Groups



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12 month prevalence of DSM-IV alcohol abuse and dependence by race-ethnicity from the National Longitudinal Alcohol Epidemiologic Survey (NLAES)



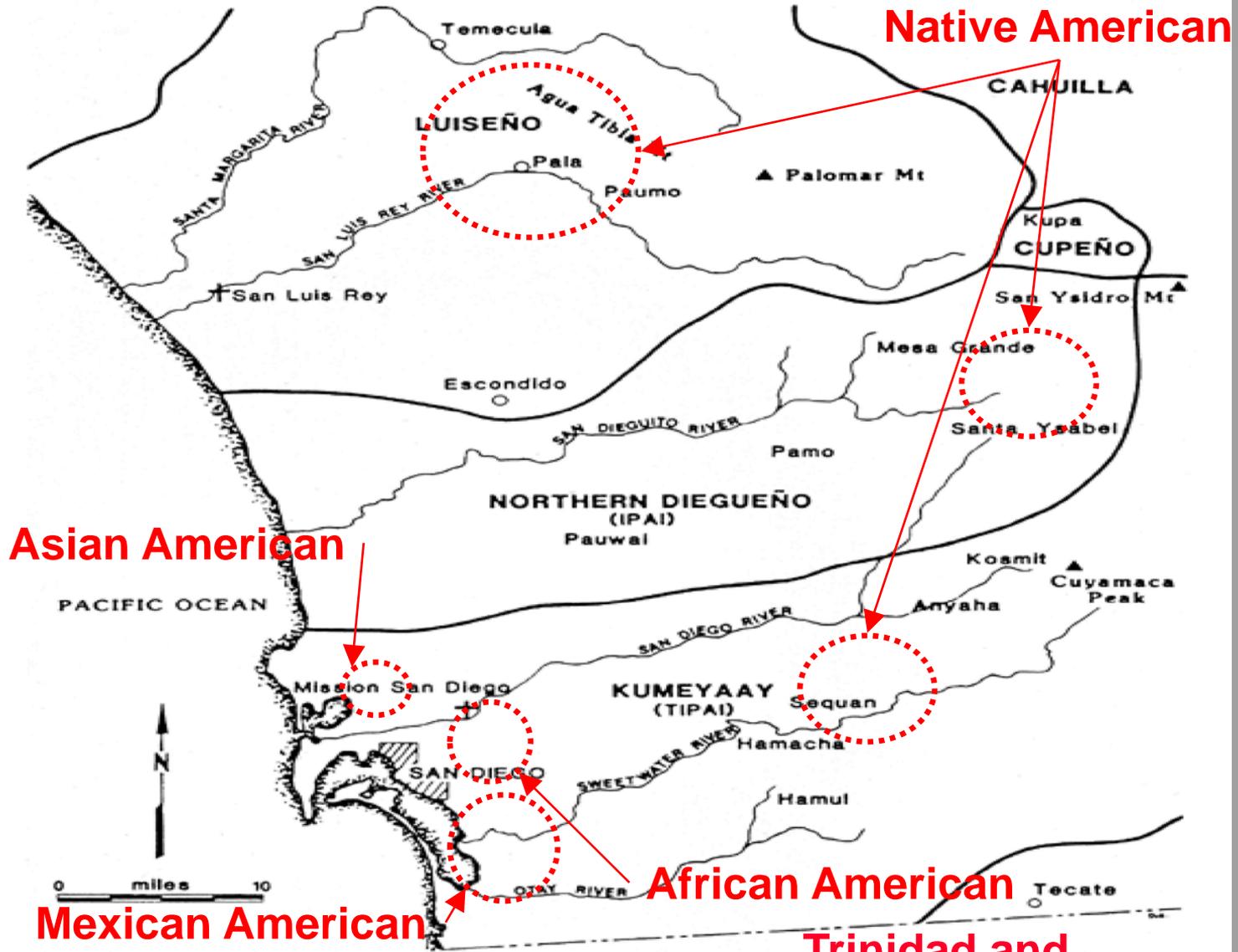


Figure 1
American Indian Groups Inhabiting the Region Circa 1769

Risk factors for alcohol dependence in Different ethnic groups may be:

Genetic/biological

Twin and family and adoption studies demonstrate that alcohol dependence is significantly associated with a first degree family history (FH) of alcohol dependence ($h^2=0.5$).

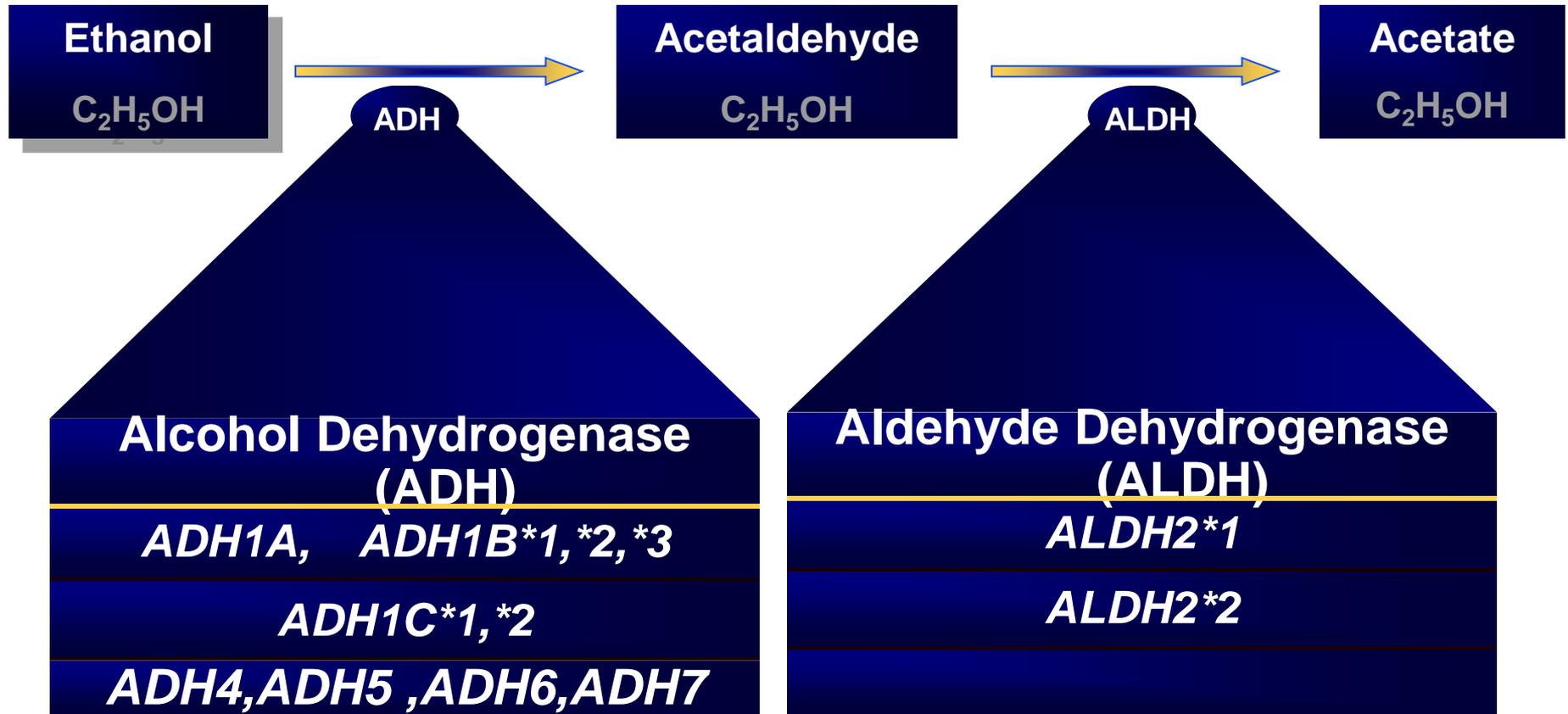
Psychosocial/environmental

Social Norms, religion, availability, early experience with drinking, employment, and certain types of traumas can influence the development of alcohol dependence

Alcohol dependence in ethnic populations: research questions

- Do ethnic differences in the genes that code for the enzymes that metabolize alcohol significantly influence risk for the development of alcohol dependence?
- Are there identifiable environmental/cultural differences that significantly influence risk for alcoholism in different ethnic groups?

Metabolism of ethanol

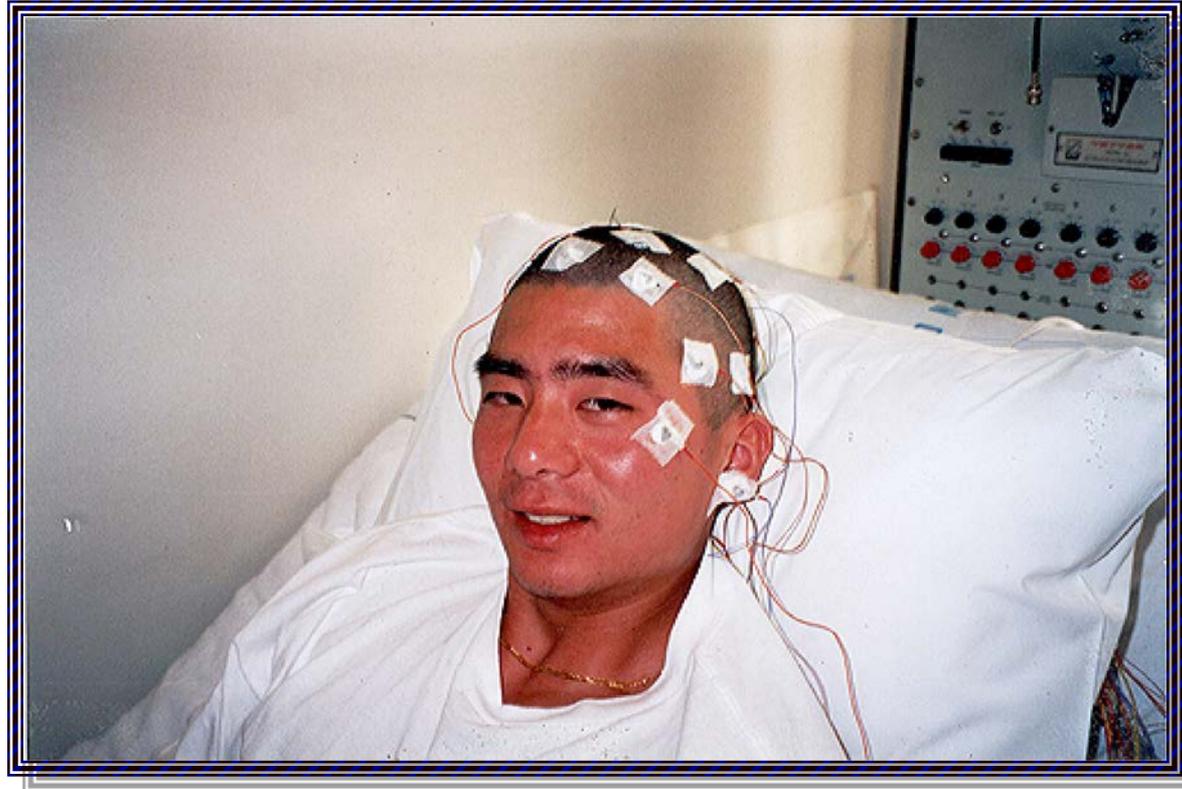


Before alcohol



21 year-old Japanese American man with ALDH2*1/2*2 genotype

30 Minutes Following 0.75 ml/kg Alcohol



21 year-old Japanese American man with ALDH2*1/2*2 genotype

Risk factors for alcoholism in Asian Americans

- *ALDH2**2 is highly protective against the development of alcoholism.
- Social obligations, availability and the presence of conduct disorder can modify the protective effect of *ALDH2**2, causing people to “drink through the flush.”
- Asian women have traditionally had societal sanctions against drinking.

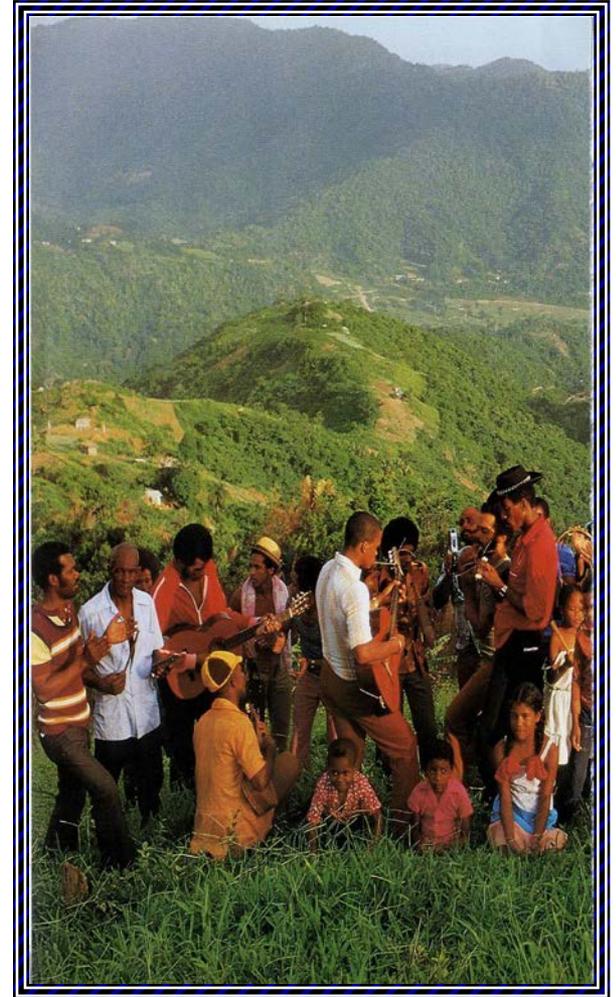
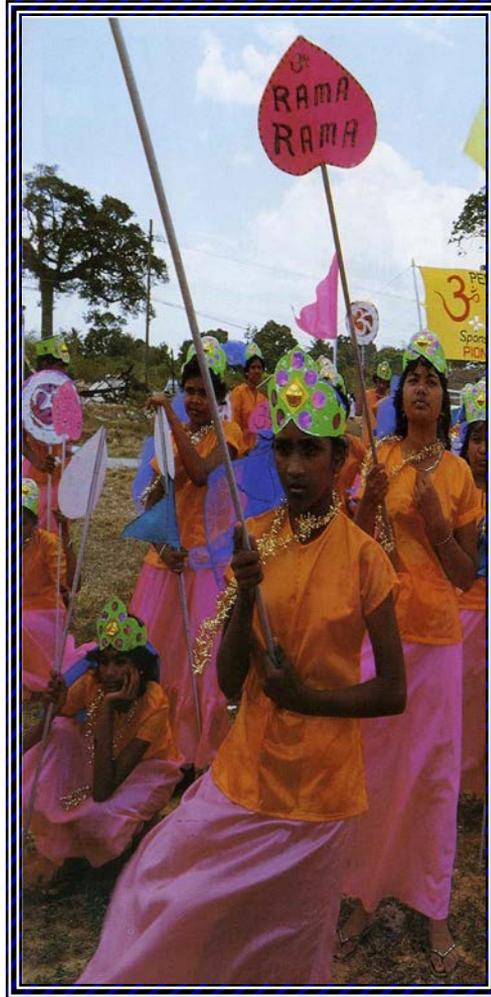
Young African American men (18-25 yrs) men and women are recruited from the community and assessed for psychiatric diagnoses including substance dependence using the SSAGA.

Subjects were genotyped for *ADH1B*3*.



AfroTrinidadian and Indo Trinidadian men are recruited from the community and treatment centers and are assessed for psychiatric diagnoses including substance dependence using the SSAGA.

Subjects were genotyped for *ADH1B*3* and *ADH1C*2*



ADH alleles in Individuals of East Indian and African Ancestry

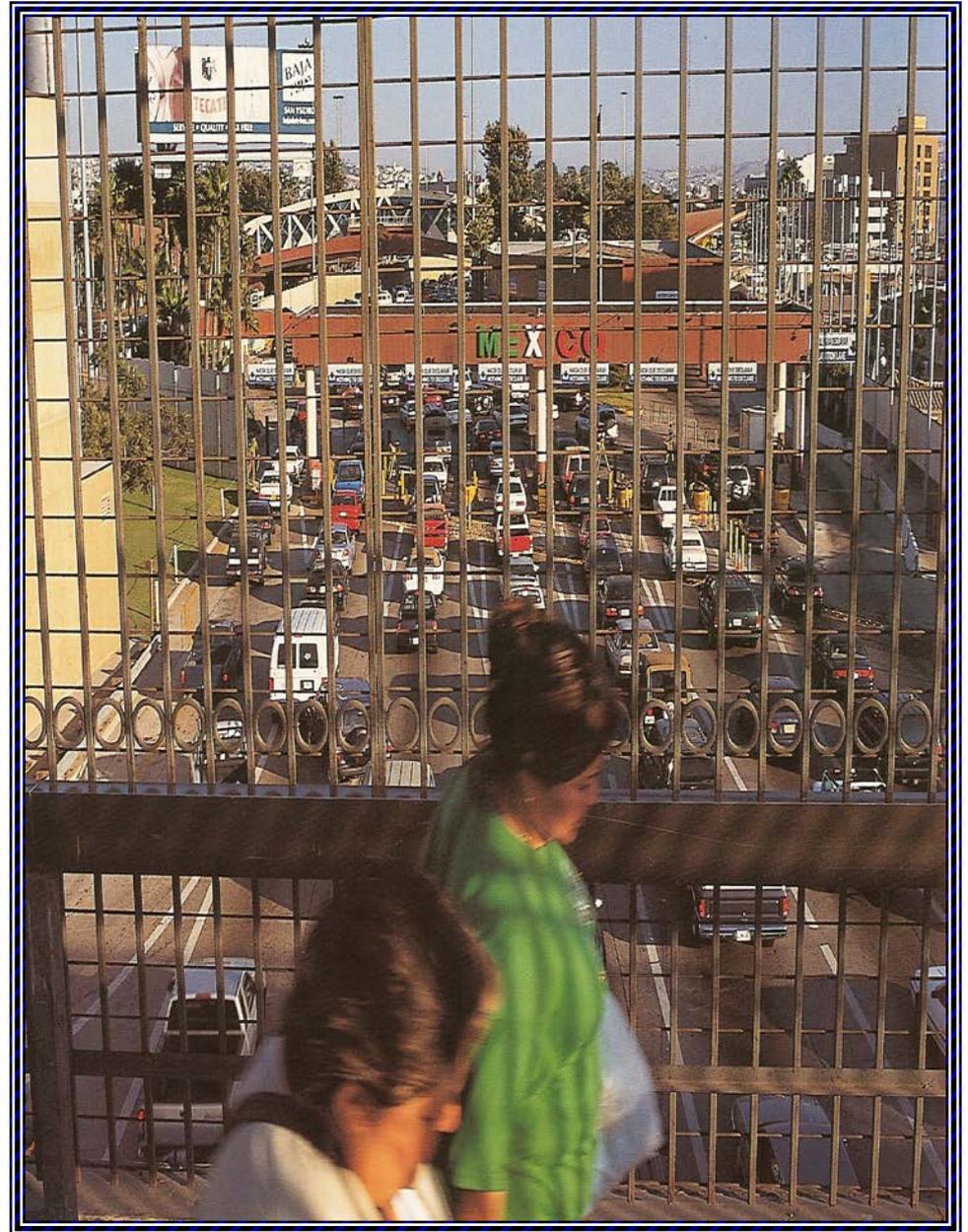
- ❖ *ADH1B*3* is associated with a family history of alcohol dependence a more intense response to alcohol, less drinking and protection from alcohol dependence in individuals of African Ancestry but is associated with signs of liver disease in individuals who do decide to drink heavily.
- ❖ *ADH1C*2* is associated with alcohol dependence and signs of liver disease in individuals of East Indian ancestry.

Risk and protective factors for alcoholism in individuals of African Ancestry

- ❖ Both Muslim and certain protestant religions have sanctions against drinking.
- ❖ In Trinidad although alcohol dependence is lower in Africans, marijuana and cocaine use are higher.
- ❖ Preliminary findings suggest that “supertasters” among Afro-Trinidadians may be protected against drinking.

Male and female Mexican Americans (18-25 yrs, n=340) and Native American (n=740) are recruited from the community and assessed for psychiatric diagnoses including substance dependence using the SSAGA.

Subjects were genotyped Using microsatellites by UNC and/or the “addiction array” developed at NIH.



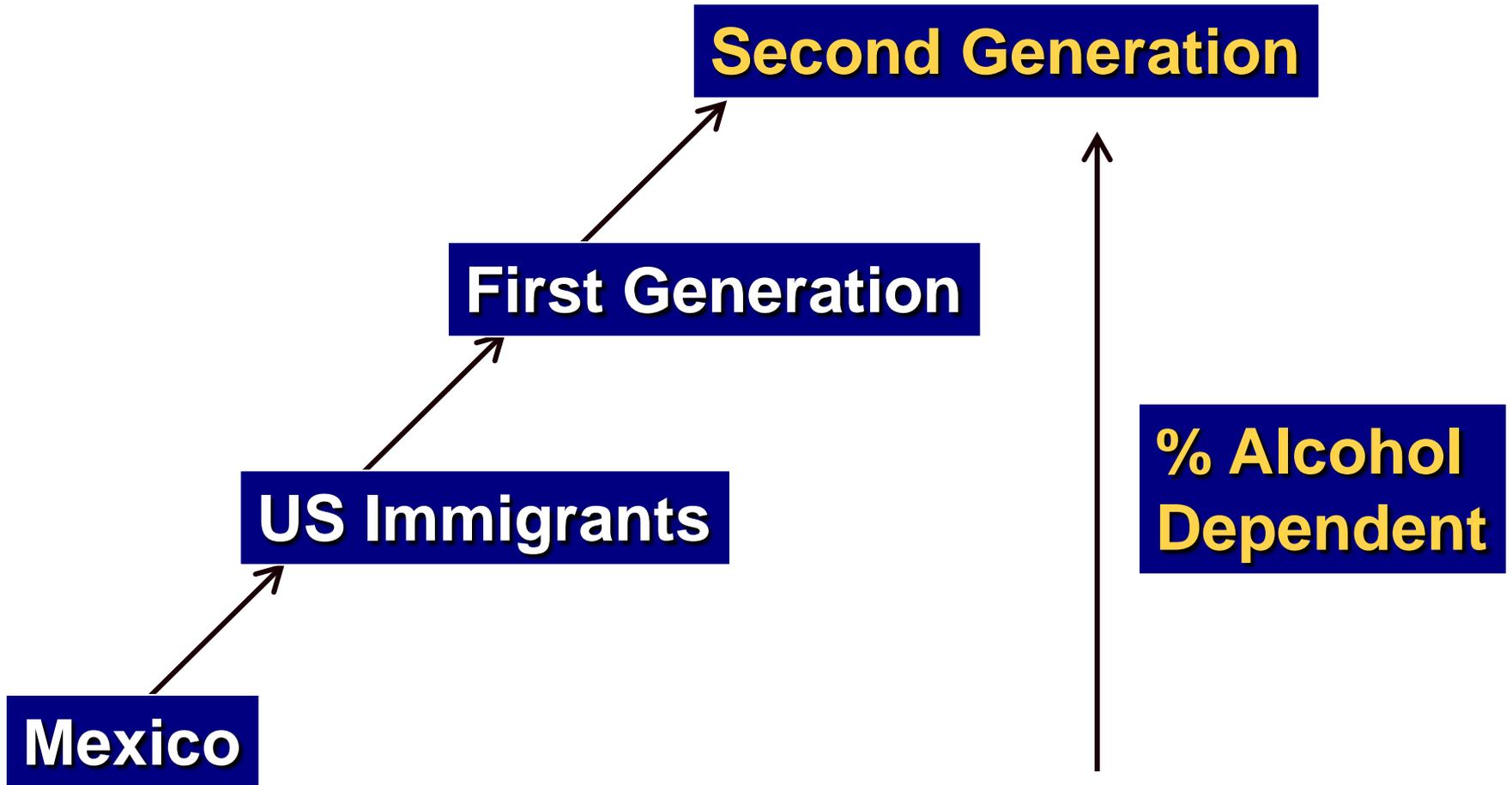
ADH alleles in Native and Mexican Americans

- Mexican Americans in San Diego county have 2-3 times the national rate of alcohol dependence. Native Americans have 5-6 times the rate of alcohol dependence. Both groups also report high rates of medical problems associated with alcoholism.
- Mexican Americans and Native Americans lack protective genes (ADH, ALDH2) associated with a lower risk for alcohol dependence seen in Asians and African Americans.

Genetic risk factors for alcoholism in Mission Indians

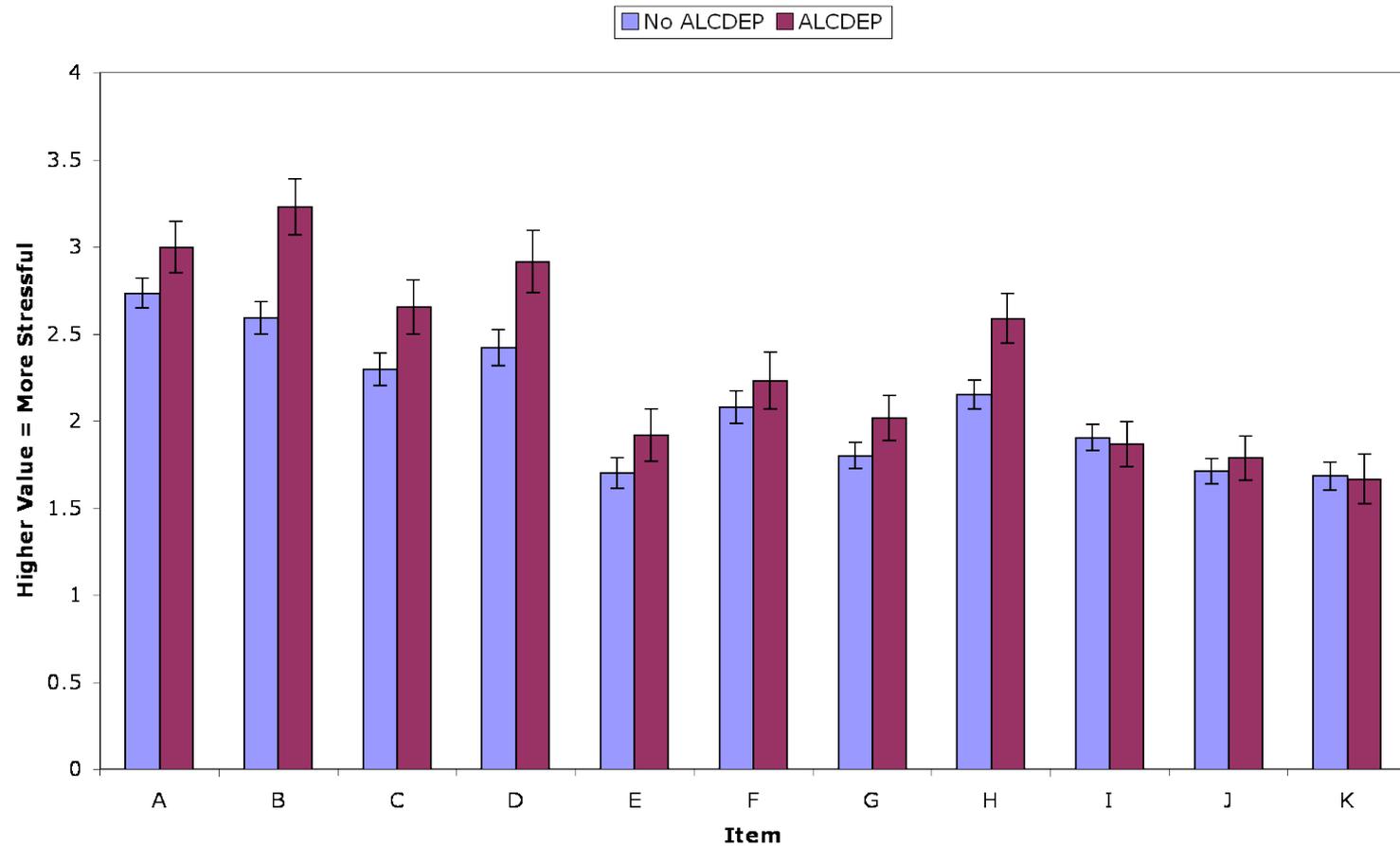
- Several alcohol and drug-related traits have been identified and have been found to be heritable in Mission Indian families such as: alcohol withdrawal, craving, drug dependence, binge drinking, ASPD, BMI.
- Some evidence for linkage to severity of alcohol dependence, drug addiction, craving, consumption (BMI), response to alcohol, ASPD and withdrawal phenotypes have been found on chromosomes: 2,3,4,5,6,12,15,16.

Immigration and Alcohol Dependence



Alcohol dependence and acculturation stress in Mexican Americans

Acculturation Stress Scale



Endorsing thoughts about Historical losses is associated with alcohol dependence in Native Americans

- ❖ Loss of our family ties because of boarding schools
- ❖ Loss of families from the reservation to government relocation
- ❖ Loss of self respect from poor treatment by government officials
- ❖ Loss of trust in whites from broken treaties.

Percent of participants developing alcohol dependence based on the first time they were ever “DRUNK”

	NLAES	Nat Am	Mex Am
Before 13	10%	85%	52%
Before 15	5%	50%	41%
Before 17	4%	42%	20%
Before 19	2%	30%	15%
Before 21	1%	15%	7%

Age of onset of drinking accounts for a large part of the variance in alcohol dependence

- Multinomial logistic regression reveals that 18% of the variance in alcohol dependence/abuse is accounted for by: sex, % native heritage, age over 30, completing high school, ASPD/CD, FH, marital status, “any anxiety or affective disorder.”
- Adding age of onset of first intoxication add an additional 15% of the variance to the model.

Risk factors for alcoholism in Native and Mexican Americans

- Early age at first drink is associated with increased risk for Alcohol dependence in Native and Mexican Americans in San Diego county.
- Acculturation stress, anxiety disorders and conduct disorders are associated with Alcohol dependence in Mexican Americans, historical trauma and ASPD are associated with alcohol dependence in Native Americans.
- Neither depression nor PTSD is associated with alcohol dependence in either group.

Ethnic differences in alcohol metabolism

some conclusions

- ❖ Asian American men with one *ALDH2**2 allele display a more intense response to alcohol that may confer partial protection from the development of alcohol dependence.
- ❖ *ADH1B**3 is associated with a more intense response to alcohol, less drinking and protection from alcohol dependence in individuals of African Ancestry but is associated with signs of liver disease in individuals who do decide to drink heavily.
- ❖ *ADH1C**2 is associated with alcohol dependence and signs of liver disease in individuals of East Indian ancestry

Ethnic differences in alcohol dependence: some conclusions

- ❖ Young adult Mexican Americans and Native Americans in San Diego county have high rates of alcohol dependence, and also high rates of medical problems.
- ❖ Early age of onset of drinking is associated with alcohol dependence in all populations studied.
- ❖ Acculturation stress, is associated with alcohol dependence in young adult Mexican Americans. Historical losses are associated with alcohol dependence in Native Americans.



Thank you for your attention!