The Promise of Translational Science at NIAAA

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National Institutes of Health

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NIH National Institute on Alcohol Abuse and Alcoholism

Outline of Talk

- In Memoriam
- Honors and Awards
- Staff Transitions
- Budget
- Recently Issued Funding Opportunities
- Translational Research: Moving toward Improving Human Health
- Research Highlights

In Memoriam: Robert “Bob” Voas, Ph.D.

Dr. Robert "Bob" Voas, a psychologist who made notable contributions to highway safety research, passed away in March 2026, at the age of 98. His NIAAA-funded research informed significant policy developments, including the minimum legal drinking age of 21, Zero Tolerance laws, and the 0.08% blood alcohol concentration legal limit.

Dr. Voas joined the National Highway Safety Bureau (later NHTSA) as Director of the Office of Evaluation for Traffic Safety Programs in 1968. There, he evaluated enforcement tools including sobriety checkpoints and standardized field sobriety tests. In 1981, joined the Pacific Institute for Research and Evaluation (PIRE), researching underage and college drinking, drinking age laws, and fatal alcohol-related traffic crashes.

Dr. Voas remained active in his field into his nineties and is remembered as a ground-breaking researcher, public health advocate, and dedicated mentor.

Staff Honors and Awards

- **Dr. George Kunos,** NIAAA Scientific Director from 2000 to 2022, was appointed Scientist Emeritus. His Laboratory of Physiologic Studies explores the biology of endocannabinoids, focusing on their role in the regulation of metabolism, cardiovascular functions and appetitive behavior, including alcohol consumption.
- **Dr. Paule Joseph,** Senior Investigator at NIAAA, was elected to the National Academy of Medicine. Dr. Joseph is Chief of the Section of Sensory Science and Metabolism (SenSMet), which examines the neurobiology of taste and smell in obesity and addiction.
- **Dr. Malliga Iyer,** Acting Chief of NIAAA's Section of Medicinal Chemistry, Division of Intramural Clinical and Biological Research (DICBR), received a grant from the NIH Office of Research on Women's Health to study polycystic ovarian syndrome.
- **Abigail Holder**, Postbaccalaureate Intramural Research Trainee, Laboratory for Integrative Neuroscience, was selected for a U.S. National Science Foundation Graduate Research Fellowship.
- **Faith Veenker,** Postbaccalaureate Intramural Research Trainee, Laboratory of Neuroimaging, was selected for a U.S. National Science Foundation Graduate Research Fellowship.

Staff Transitions

New Staff

Dr. Blake Elliott, Post Doctoral IRTA (Intramural Research Training Award) Fellow in the Laboratory for Neuroimaging (LNI), will develop and apply advanced analytic approaches for integrating simultaneous PET-fMRI data to study brain network dynamics in both healthy individuals and patients with alcohol and opioid use disorders. His work will examine how neuromodulatory systems interact with memory-and reward-related networks.

Dr. Aurino Muhammad Kemas, Post Doctoral Visiting Fellow, joined the Section on Fibrotic Disorders (SFD). Dr. Kemas will primarily work on establishing lung organoids and assembloids to study tissue injury and fibrosis using human-based new approach methodologies. He will be using various preclinical disease models and investigating their relevance to the human disease of inflammatory and fibrotic lung diseases.

Staff Transitions

New Staff

Dr. Dawson Kropp, Post Doctoral IRTA Fellow in the Section on Clinical Genomics and Experimental Therapeutics (CGET), joined the laboratory where he will be conducting multi-omic analyses of alcohol use disorder and related phenotypes. He will use large scale genomic data sets and integrate findings with molecular analyses tools.

Dr. Mahammad Ghouse Shaik, Post Doctoral Visiting Fellow in the Laboratory of Neuroimaging (LNI), will develop advanced methods for integrating simultaneous PET-fMRI data, applying AI and statistical models to investigate brain network dynamics in healthy individuals and patients with alcohol and opioid use disorders. A key focus will be on analyzing how GLP-1R agonists like tirzepatide affect dopaminergic circuitry.

Staff Transitions

CAREER TRANSITIONS

Dr. Abhishek Basu transitioned to a Research Fellow in the Section on Fibrotic Disorders (SFD) after 5 years as a post-doctoral visiting fellow. Dr. Basu's research has focused on the role of the endocannabinoid system in inflammatory and fibrotic lung diseases including alcohol-induced lung injury.

DEPARTURES

Dr. Kirk Hines, Biologist in the Laboratory of Biophotonics and Quantum Biology, is retiring after more than 35 years of scientific service to NIAAA. Dr. Hines provided valuable support for studies using nuclear magnetic resonance to study protein and lipid structure while working with Dr. Klaus Gawrisch. He then provided expertise in protein purification, characterization and crystallization for studies of quantum coupling of fluorescent proteins.

NIAAA Budget

Fiscal Year (FY) 2026

The FY 2026 level for NIAAA is $595.3 million. This represents a flat budget compared to the FY 2025 budget level.

FY 2027

The preparation of the FY 2027 President's Budget is underway as of January 2026.

NIH-wide Notices Of Funding Opportunity (NOFOs) with NIAAA Participation

Stephen I. Katz Early-Stage Investigator Research Project Grant (R01 Clinical Trial Not Allowed), PAR-25-322.

Opportunities for Collaborative Research at the NIH Clinical Center (U01 Clinical Trial Optional), PAR-26-116.

NIH-wide Highlighted Topics (HTs) with NIAAA Participation

NIH Highlighted Topics are a curated, centralized resource from the National Institutes of Health (NIH) designed to spotlight specific, high-priority scientific research areas that align with the agency's mission. They act as a guide for researchers to identify, via the NIH website, active areas of interest for potential, investigator-initiated applications.

Strengthening Biomedical Research, Promoting Trust, and Improving Health through Bioethics Research

Lead ICO (Institutes, Centers, and Offices): Office of Science Policy (OSP)

This topic aims to advance bioethics research projects that are actionable, build trust, and enable better integration of bioethical principles into biomedical and behavioral research.

BRAIN Initiative: Advancing Human Neuroscience and Precision Molecular Therapies for Transformative Treatments

Lead ICO: National Institute of Neurological Disorders and Stroke (NINDS)

This topic encourages applications aimed at generating transformative insights into human brain circuit mechanisms, developing new platforms and technologies that bridge basic science with clinical interventions and testing next-generation devices to monitor or modulate neural circuits in early human studies.

Novel Targets, Methods, and Pharmacological Approaches to Treat Substance Use Disorder

Lead ICO: National Institute on Drug Abuse (NIDA)

This topic encourages the discovery and development of novel therapeutic agents to treat substance use disorders (SUDs).

Advancing Autoimmune Disease Research: Integrating Genetic, Environmental, and Immunological Factors to Improve Diagnosis and Treatment

Lead ICO: Office of Research on Women's Health (ORWH)

The purpose of this topic is to advance scientific understanding of autoimmune disease development, progression, and impact, and to improve health outcomes for those affected.

NIH-wide Highlighted Topics (HTs) with NIAAA Participation

Understanding Nutritional Influences on Neurodevelopmental Disorders in Children
Lead ICO: Office of Nutrition Research (ONR)
The purpose of this topic is to encourage innovative multidisciplinary research focused on the interrelationship between nutrition and neurodevelopmental disorders (NDDs) during gestation and early childhood.

Multidisciplinary Studies of HIV/AIDS and Aging
Lead ICO: National Institute on Aging (NIA)
This topic supports research on HIV and aging by aiming to enhance the understanding of the biological, clinical, social, and systemic factors associated with aging. Additionally, it aims to advance the prevention, treatment, and management of HIV and related conditions through the application of aging science.

Computational Modeling of Complex Processes Across Biological Scales
Lead ICO: National Institute of Allergy and Infectious Diseases (NIAID)
This topic encourages innovative research in computational modeling of complex processes across biological scales (i.e., to develop multiscale models).

https://grants.nih.gov/funding/find-a-fit-for-your-research/highlighted-topics
Visit this site often and stay tuned for NIAAA specific HTs

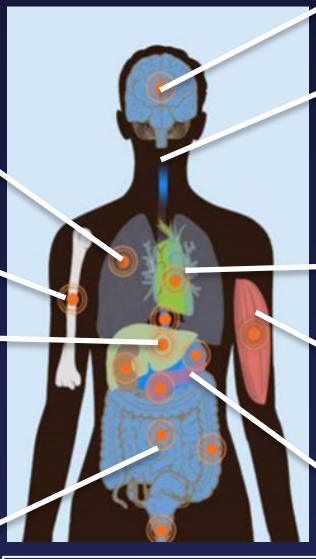
Translational Research: Moving toward Improving Human Health

Translational Research is Embedded in NIAAA's Mission:

- Translational research can be defined as the bidirectional, multidisciplinary integration of basic, clinical, and population-based research, with the long-term aim of improving the health of the public.
- NIAAA Mission: To generate and disseminate fundamental knowledge about the adverse effects of alcohol on health and well-being, and apply that knowledge to improve diagnosis, prevention, and treatment of alcohol-related problems, including alcohol use disorder, across the lifespan.

Alcohol Poses Health Risks at All Levels

Alcohol misuse is associated with more than 200 diseases & injury-related conditions



Mental Health
Alcohol Use Disorder
Co-occurring mental health conditions, sleep problems, chronic pain
Suicide risk

Neurologic
Ischemic stroke
Hemorrhagic stroke
Wernicke's encephalopathy
Korsakoff syndrome

Lung
Acute Respiratory Distress Syndrome
Pneumonia

Oral Cavity
Esophageal cancer
Oral cavity cancer

Bone
Impaired fracture repair
Reduced bone density

Cardiac
Cardiac Arrhythmias
Cardiomyopathy
Ischemic heart disease
Hypertension

Liver
Steatosis (fatty liver)
Steatohepatitis
Fibrosis
Cirrhosis
Alcoholic hepatitis
Liver cancer

Muscle
Myopathy
Wasting
Gout

Gastrointestinal
Gut leakiness
Microbial dysbiosis
GI Bleeding and inflammation

Immune System
Inflammation
Wound healing
Accelerated aging

Pancreas
Acute pancreatitis
Chronic pancreatitis

Fetal Alcohol Spectrum Disorders

Cancers
Oral cavity, breast, liver, colon, rectum

Metabolic
Diabetes

Injuries, Falls, Overdoses, Deaths

Whole Person Health – Alcohol Misuse Leads to Chronic Health Disorders

- Alcohol misuse causes 178,000 deaths per year, and almost 28 million individuals (9.7% in this age group) suffer from alcohol use disorder
- Alcohol is associated with more than 200 diseases and health conditions
  - Alcohol consumption contributes to about 6% of cancer cases and 4% of cancer deaths
  - Alcohol misuse increases risk for cardiovascular diseases
- Mental health disorders that co-occur with AUD include:
  - Depressive and anxiety disorders, post-traumatic stress disorder, and attention deficit hyperactivity disorder
- Prenatal alcohol exposure can cause lifelong neurodevelopmental deficits:
  - 11% of pregnant women report current alcohol use, and over 5% report binge drinking. There is no known safe amount of alcohol during pregnancy.

Translational Research: Definition, Types, Challenges

- Forward Translation is taking what we have learned from preclinical studies and applying that knowledge to human studies and when successful, implementation into clinical practice
- Challenges for Translational Research Include:
  - Choosing the best model – face validity, construct validity, and predictive validity
  - Balancing significance versus effect size
  - Interpreting sex differences
- Back Translation is moving the knowledge that we have from clinical studies back to model systems to identify mechanisms, off-target effects, etc.

Translational Research: Forward Translation

- Forward Translation is applying what we have learned from preclinical studies to human studies and when successful, implementing it into clinical practice. Translational success is exemplified in the treatment of alcohol use disorder (AUD).
- Preclinical Studies - Naltrexone, which blunts the rewarding effects of alcohol, resulted from forward translation of observations of decreased drinking in primates and stress-induced drinking in rodents in the 1980's. Naltrexone was approved for treatment of AUD by the FDA in 1994.
- Acamprosate, which blocks the craving associated with protracted abstinence, resulted from forward translation of observations of decreased dependence-induced drinking in rodents in the 1980's. Acamprosate was approved for the treatment of AUD by the FDA in 2004.
- A ketogenic diet blocked alcohol withdrawal symptoms and alcohol intake in rodents leading to ongoing studies of efficacy for AUD in human studies funded by NIAAA.

Challenges for Translational Research: Choosing the Right Model – Face Validity, Construct Validity, and Predictive Validity

- Face validity is often the starting point in animal models, in which animal syndromes are produced that resemble those that are found in humans to study selected parts of the human syndrome. Obviously face validity is limited by necessity (*McKinney, 1988*).
- Construct validity refers to the interpretability, "meaningfulness," or explanatory power of each animal model (*Sayette et al., 2000*).
- Predictive validity refers to the ability of a model to lead to accurate predictions about the human phenomenon based on the response of the model system.
- Predictive validity has been most used often in the narrow sense in animal models of psychiatric disorders to refer to the ability of the model to identify pharmacological agents with potential therapeutic value in humans (*McKinney, 1988; Willner, 1984*).

From: Koob GF, Arends MA, McCracken M, Le Moal M. Neurobiology of Addiction: Volume 1. Introduction to Addiction [ISBN: 978-0128168639]. Elsevier, New York, 2019.

Challenges for Translational Research: Significance versus Effect Size

Using Effect Size—or Why the P Value Is Not Enough

"Statistical significance is the least interesting thing about the results. You should describe the results in terms of measures of magnitude – not just, does a treatment affect people, but how much does it affect them." --Gene V. Glass

"*The primary product of a research inquiry is one or more measures of effect size, not P values."* --Jacob Cohen

- Effect size is the magnitude of the difference between groups.
- Absolute effect size is the difference between the average outcomes in two different intervention groups. Absolute effect size is useful when the variables under study have intrinsic meaning (such as the number of hours of sleep).
- Calculated effect size is a standardized measure of effect, which is calculated to transform the effect to an easily understood scale. Calculated indices of effect size are useful when the measurements have no intrinsic meaning, when different scales are used, and when used in the context of variability in the population under study.

From: Sullivan GM, Fein R; Journal of Graduate Medical Education, September 2012.
Cited 7984 times

Common Effect Size Indices

Index	Description[b]	Effect Size	Comments
Between groups			
Cohen's *d* [a]	$d = M_1 - M_2 / s$ $M_1 - M_2$ is the difference between the group means (*M*): *s* is the standard deviation of either group	Small 0.2 Medium 0.5 Large 0.8 Very large 1.3	Can be used at planning stage to find the sample size required for sufficient power for your study
Odds ratio (OR)	$\frac{\text{Group 1 odds of outcome}}{\text{Group 2 odds of outcome}}$ If OR = 1, the odds of outcome are equally likely in both groups	Small 1.5 Medium 2 Very large 3	For binary outcome variables Compares odds of outcome occurring from one intervention vs another
Relative risk or risk ratio (RR)	Ratio of probability of outcome in group 1 vs group 2; If RR5 1, the outcome is equally probable in both groups	Small 2 Medium 3 Large 4	Compares probabilities of outcome occurring from one intervention to another
Measures of association			
Pearson's *r* correlation	Range, –1 to 1	Small ±0.2 Medium ±0.5 Large ±0.8	Measures the degree of linear relationship between two quantitative variables
r^2 coefficient of determination	Range, 0 to 1; Usually expressed as percent	Small 0.04 Medium 0.25 Large 0.64	Proportion of variance in one variable explained by the other

[a] Adapted from Ferguson et al.
[b] Based on Soper.

From: Sullivan GM, Fein R; Journal of Graduate Medical Education, September 2012.

Challenges for Translational Research: Preclinical Sex Differences Lost in Translation?

Translation of Preclinical Sex Differences in Alcohol Addiction Measures: Animals versus Humans

Domain	Humans	Animals	Consistency
Vulnerability to damage	Greater in females	Greater in females	✅ Consistent
Hormonal modulation	Estrogen increases reward	Estradiol increases intake	✅ Consistent
Stress-induced drinking	Higher in females	Higher in females	✅ Consistent
*Overall consumption	Higher in males	Higher in females	❌ Inconsistent
Relapse/compulsion	Higher in males	Higher in females	❌ Inconsistent

*** Beware of ceiling or floor effects due to shifting baselines in the dependent variables**

Table summary courtesy of Dr. Changhai Cui, NIAAA

Need for Back Translation

Understanding what Underlies Clinical Observations – Two examples

- Clinical Studies – E. coli kpsM, a key virulence factor, correlates with mortality in patients with alcohol-associated hepatitis *(Yang, 2025)*
  - Preclinical studies to interrogate the mechanism
    - kpsM-positive E. coli exacerbate ethanol-induced liver disease in mice
    - kpsM-positive E. coli evade phagocytosis by scavenger receptor Marco on Kupffer cells
    - C7 inhibits kpsM-dependent capsules and reduces ethanol-induced liver disease
- Patient observations – Individuals taking glucagon –like peptide-1 receptor (GLP1R) - agonists for weight loss also reduced their drinking *(Reitz, 2025)*
  - Model to replicate and interrogate the mechanism(s)
    - Mendelian randomization study suggests responses to alcohol correlated with genetic variants of GLP1R and gastro inhibitory peptide receptor (GIPR) are primarily driven by calorie-sensing and metabolic regulation pathways rather than addiction-specific mechanisms

Yang Y, et al. Targeted inhibition of pathobiont virulence factor mitigates alcohol-associated liver disease. *Cell Host Microbe.* 2025 Jun 11;33(6):957-972.e6. doi: 10.1016/j.chom.2025.05.003. Epub 2025 May 28. PMID: 40441146.

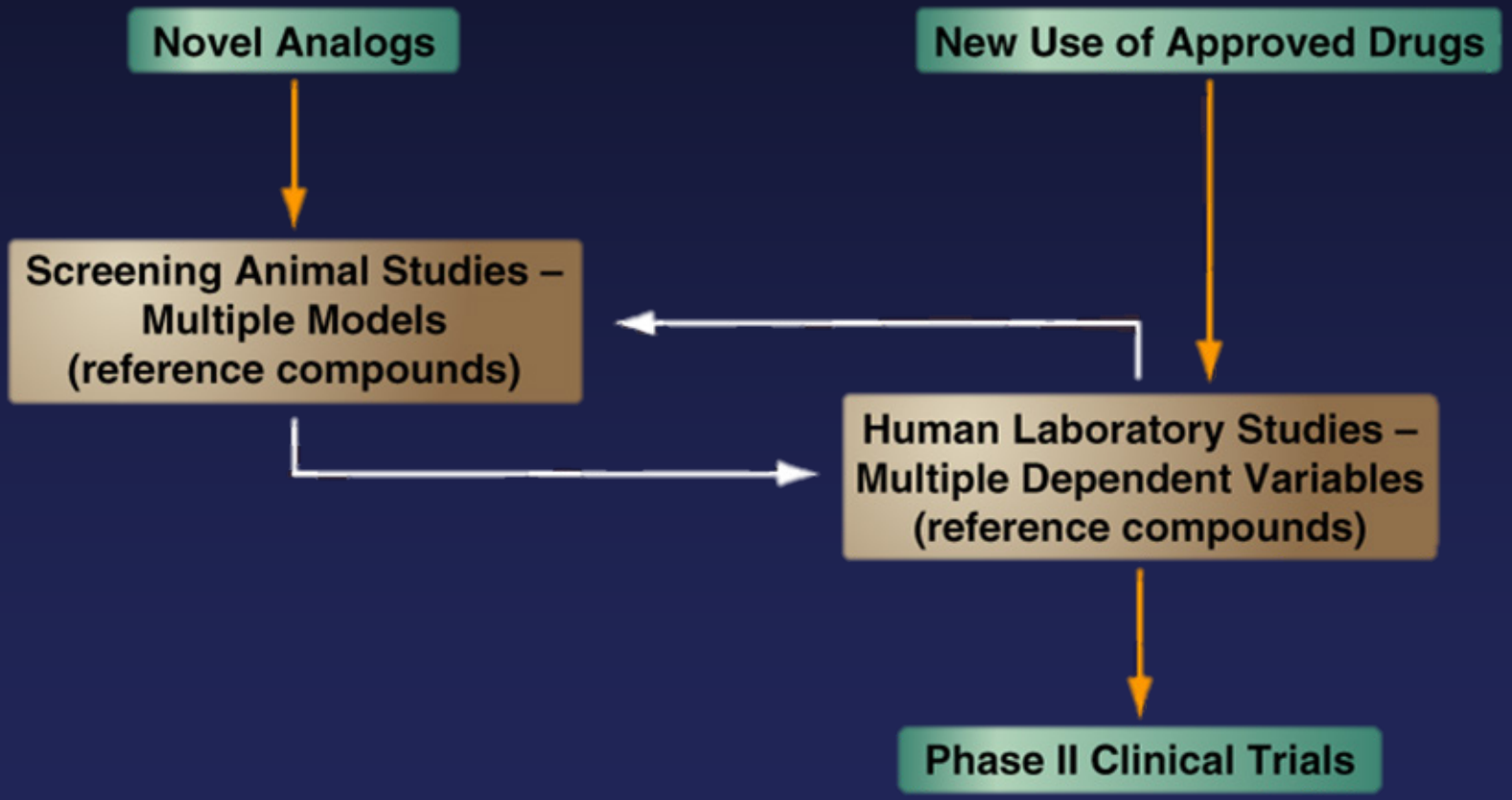
Reitz J, Rosoff DB, Perlstein T, Wagner A, Jung J, Wagner J, Reiner BC, Lohoff FW. Genetically modeled GLP1R and GIPR agonism reduce binge drinking and alcohol-associated phenotypes: a multi-ancestry drug-target Mendelian randomization study. Mol Psychiatry. 2025 Dec;30(12):6119-6133. doi: 10.1038/s41380-025-03199-3. Epub 2025 Sep 10. PMID: 40931165.

Understanding what Underlies Clinical Observations – Ongoing Challenges

- Pharmacoepidemiological studies – Mining electronic health record data to identify off-target medication effects on alcohol use
  - Preclinical models to determine their mechanism of action

- Bariatric surgery, especially Roux-en-Y gastric bypass, associated with increased prevalence of AUD
  - Testing the hypotheses of the underlying cause(s) specifically for this type of procedure

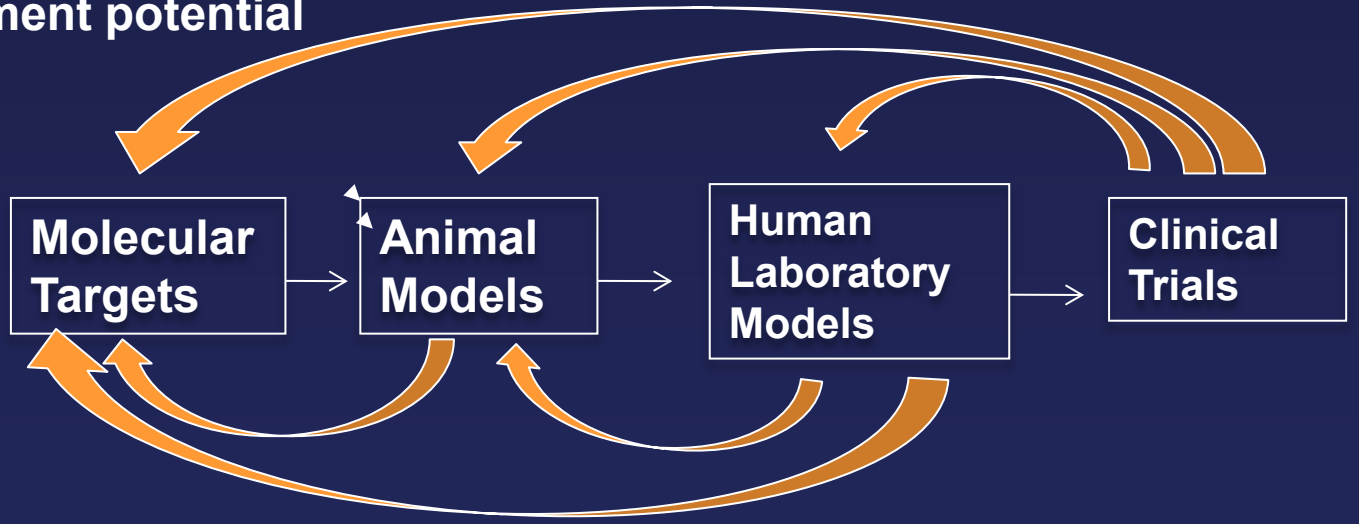
Medications Development - A Rosetta Stone Approach



From: Koob GF, Lloyd GK, Mason BJ. Nat Rev Drug Discovery, 2009, 8:500-515.

NIAAA Alcohol Pharmacotherapy Evaluation Program (APEP):

- **Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs** facilitates studies leading to FDA IND applications
- **Human laboratory screening studies** bridge gaps between preclinical and clinical trials
- **NIAAA Clinical Investigations Group (NCIG)** conducts "fast success/fast fail" phase II clinical trials with 18 month turn-around time
- **NIAAA Alcohol Interaction Program (ALC InX)** conducts alcohol-medication interaction studies
- **Intramural program** conducts clinical studies on novel compounds **with** AUD treatment potential



Back translation is a key element of this framework!

Implementing Alcohol as a Vital Sign to Improve Whole Person Health

- Approaching alcohol use as a vital sign (like pulse, respiration, and blood pressure) can open doors to prevent, spot, and treat physical and mental health issues early, which alcohol may cause or exacerbate.
- Supported by NIAAA, Kaiser Permanente Northern California introduced Alcohol as a Vital Sign (AlcVS), a systematic screening process for unhealthy drinking.
- Alcohol screening and brief intervention reduced not only alcohol use but also reduced blood pressure among patients with hypertension.
- Integrated treatment of alcohol associated liver disease (ALD) and alcohol use disorder (AUD) can improve patient outcomes.
- Integrated treatment of alcohol use disorder (AUD) and other mental health disorders remains a challenge and a current priority.

Tools and Resources to Help Researchers, the Public, and Healthcare Professionals

Rethinking Drinking

A resource to help individuals assess their drinking habits and find ways to make a change.

CollegeAIM

A resource on prevention approaches effective in college environments.

Alcohol Treatment Navigator

A resource that helps individuals understand and search for treatment options.

Healthcare Professional's Core Resource

An educational resource that covers the basics of what every healthcare professional needs to know about alcohol. It includes information on alcohol and health, and strategies for alcohol screening and interventions.

niaaa.nih.gov

Drilling Down into the NIAAA Strategic Plan: New Opportunities for Translational Science in Alcohol Research

Translational Science Aligns with NIAAA Strategic Plan

- **Uncovering Core Mechanisms**
- **Identifying Actionable Biomarkers**
- **Employing Innovative Research Methods & Technology**
- **Developing Novel Therapeutics/ Interventions**

Modified from slide courtesy of Dr. Damiya Whitaker, NIAAA

Research Highlights

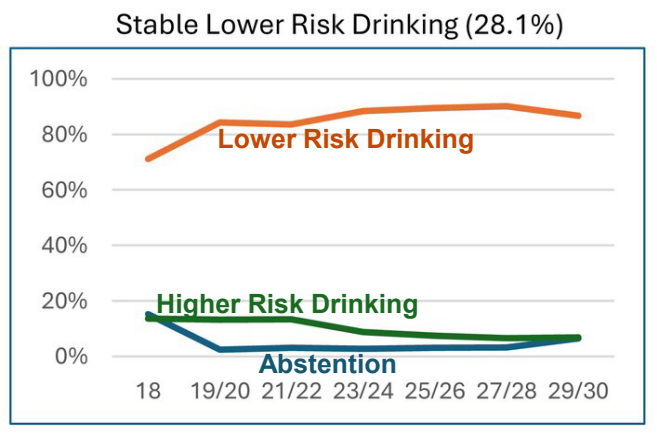
NIH National Institute on Alcohol Abuse and Alcoholism

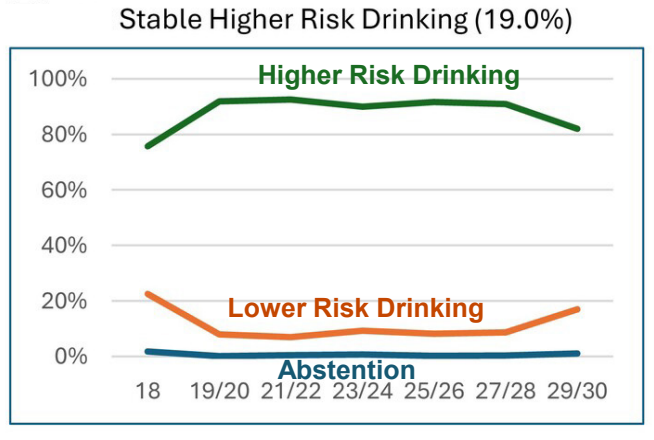
Maturing Out or In? Demographic Determinants of Young Adult Drinking Trajectories and Midlife Alcohol Use Disorder Risks

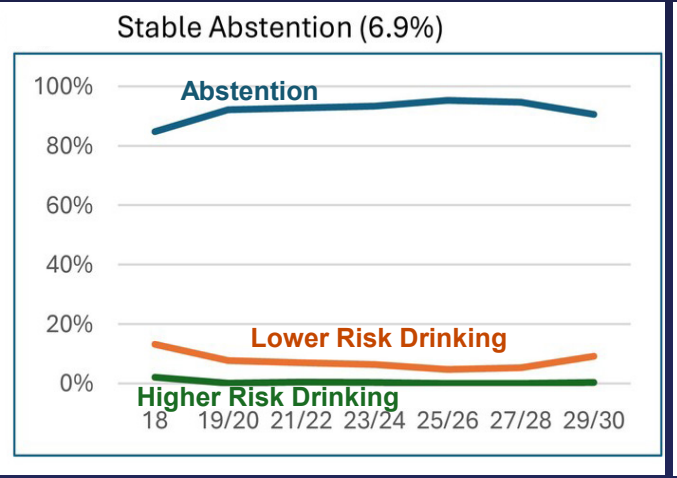
Researchers characterized trajectories of alcohol use across early adulthood (ages 18-30) by analyzing data from the Monitoring the Future study. While they identified eight latent trajectories, one broad pattern accounted for 52% of the variance: lower risk drinking, abstention, and movement toward lower intensity drinking.

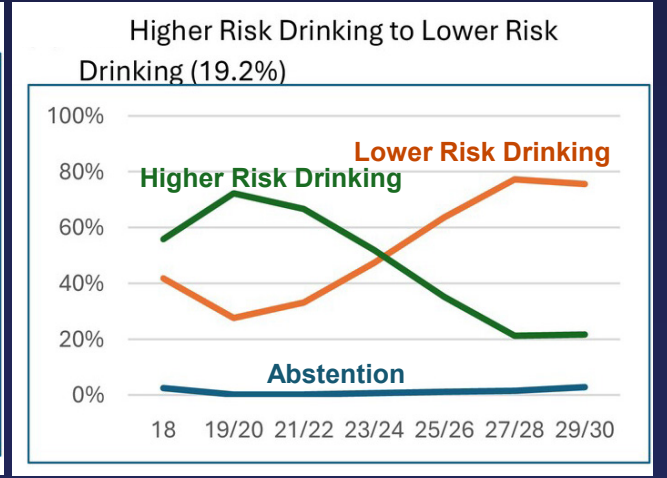
The study found novel evidence for a "maturing out" pattern, with a majority (69.4%) not engaging in higher risk use by the end of young adulthood, and among the subset of young adults who evidence nonstable patterns of higher risk drinking, a majority (64.6%) matured out of higher risk drinking by the end of young adulthood.

Regarding how these trajectories impacted AUD at age 35, AUD risk followed an apparent dose–response relationship with higher risk drinking predicting AUD.









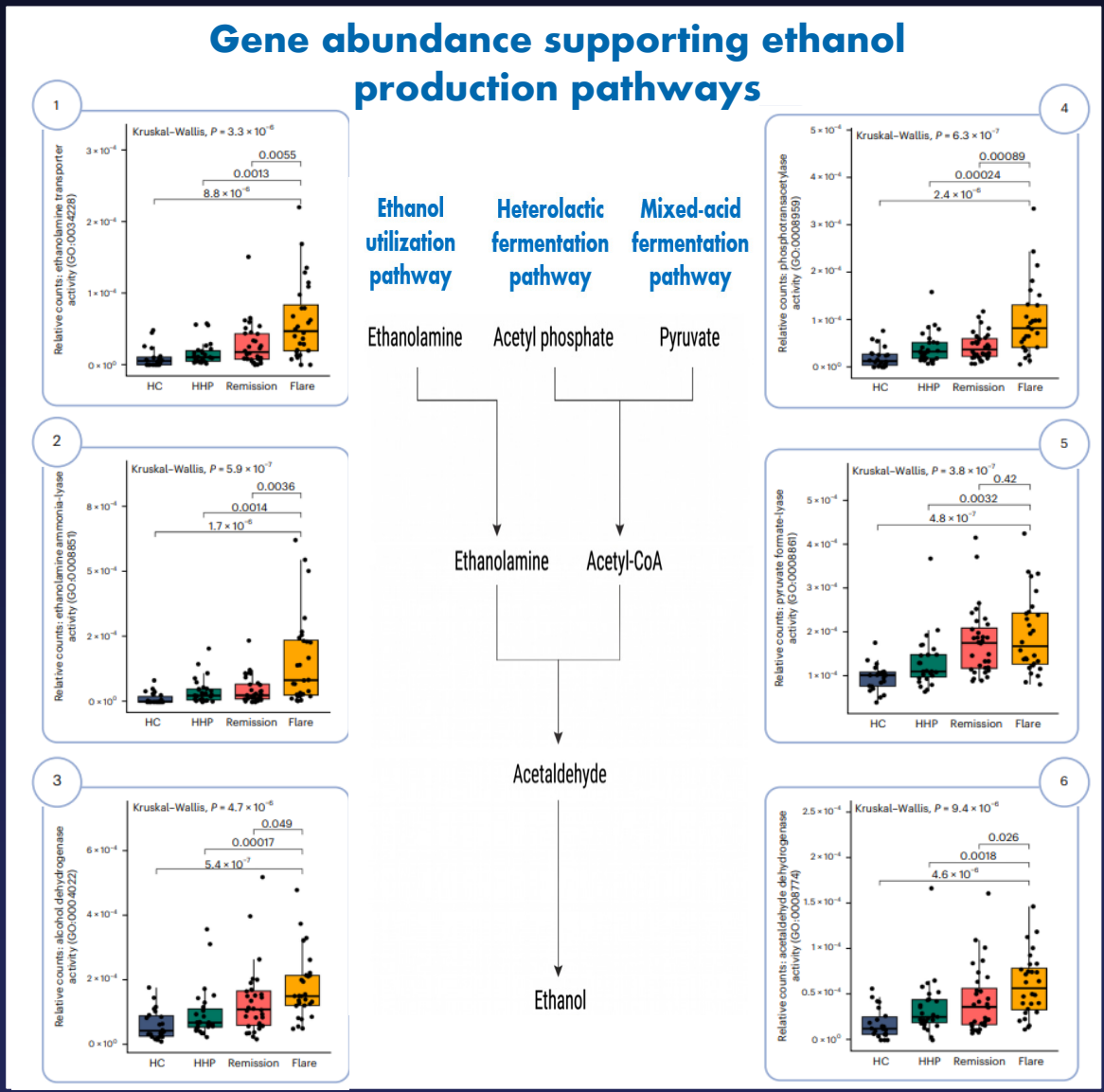
McKetta S, Espinoza P, Keyes K, Jager J. Maturing out or in? Demographic determinants of young adult drinking trajectories and midlife alcohol use disorder risks. *Alcohol Clin Exp Res (Hoboken)*. 2026 Feb;50(2):e70226. PMID: 41620974.

Gut Microbial Ethanol Metabolism Contributes to Auto-Brewery Syndrome in an Observational Cohort

Auto-brewery syndrome (ABS) is a rarely diagnosed disorder of alcohol intoxication due to gut microbial ethanol production. Researchers conducted an observational study of 22 patients with ABS and 21 unaffected household partners. The average blood alcohol concentration measured using a breathalyser during a flare was 136 ± 82 mg dl−1. The US legal driving limit is 80 mg dl-1. Fecal samples from individuals with ABS during a flare also produced more ethanol in vitro, which could be reduced by antibiotic treatment.

Gut microbiome analysis using metagenomics revealed an enrichment of *Proteobacteria*, including *Escherichia coli* and *Klebsiella pneumoniae*. Genes in metabolic pathways associated with ethanol production were enriched, including the mixed-acid fermentation pathway, heterolactic fermentation pathway and ethanolamine utilization pathway.

One patient was treated with fecal microbiota transplantation monthly for 6 months and †then showed remission for 16 months. These findings can inform future clinical interventions for ABS.



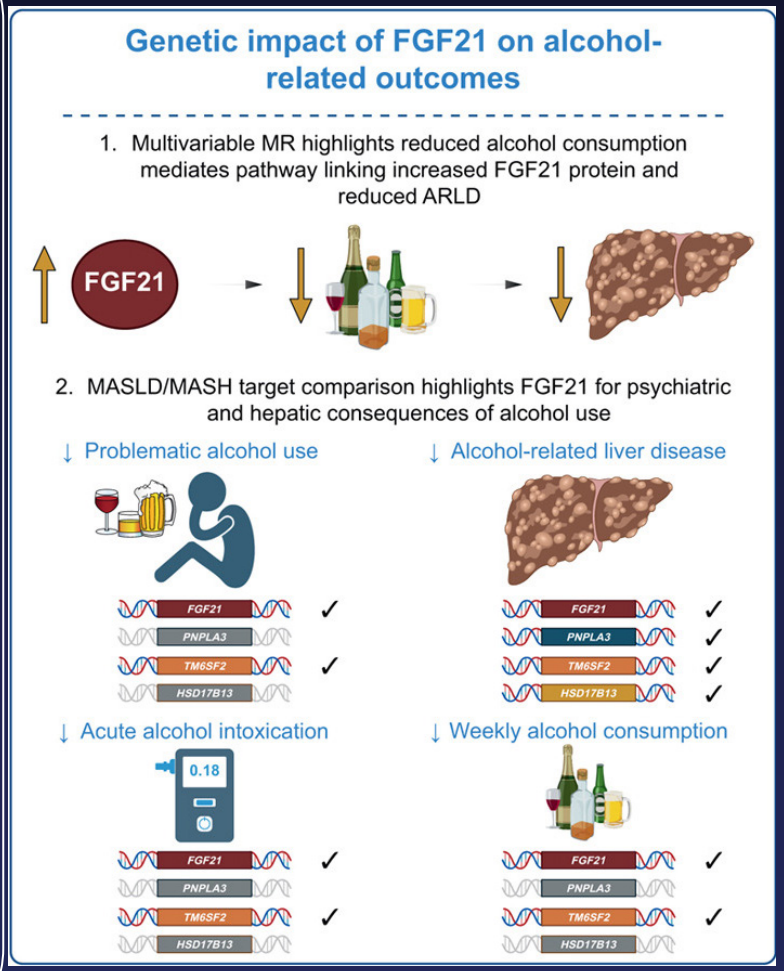
Hsu CL, Shukla S, Freund L, Chou AC, Yang Y, Bruellman R, Raya Tonetti F, Cabré N, Mayo S, Lim HG, Magallan V, Cordell BJ, Lang S, Demir M, Stärkel P, Llorente C, Palsson BO, Mandyam C, Boland BS, Hohmann E, Schnabl B. Gut microbial ethanol metabolism contributes to auto-brewery syndrome in an observational cohort. *Nat Microbiol.* 2026 Feb;11(2):415-428. PMID: 41507585.

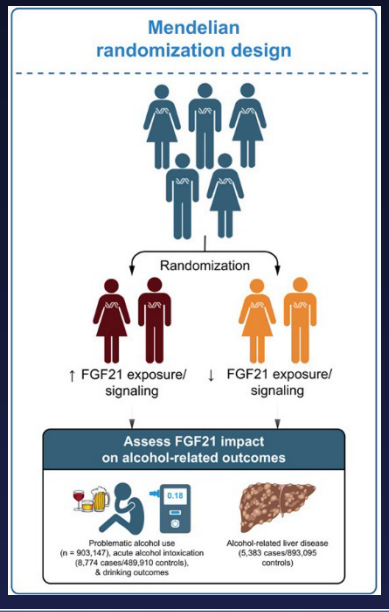
Genetic Evidence that FGF21 Signaling Reduces Problematic Alcohol Use and Alcohol-Related Liver Disease

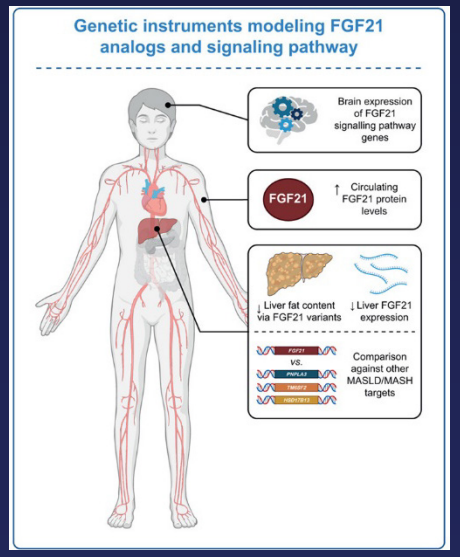
This study used genome-wide association data from multiple sources combined with a Mendelian randomization design to examine the role of human Fibroblast Growth Factor 21 (FGF21) signaling in alcohol misuse and alcohol-associated liver disease (ALD).

Results indicated that higher FGF21 levels were associated with indices of lower alcohol misuse and reduced ALD risk. Additional analyses indicated the FGF21 effects involved a liver-brain axis including brain regions such as basal ganglia and hippocampus, and behavioral outcomes including reduced drinking, improved diet, and improved metabolism.

The findings support a precision medicine strategy for treatment and the repurposing of FGF21 analogs in clinical trials of alcohol use disorder and alcohol-related liver disease and suggest that genetic stratification could optimize patient selection for therapy.







Rosoff DB, Wagner-DeTurck J, Perlstein T, Reitz J, Jung J, Blaney H, Gharib AM, Hsu C, Heller T, Koh C, Pacher P, Schwantes-An TH, Morgan T, Seth D, Christodoulides C, Davey Smith G, Ray D, Lohoff FW. Genetic evidence that FGF21 signaling reduces problematic alcohol use and alcohol-related liver disease. *J Hepatol.* 2026 Feb 24. PMID: 41747774.

THANK YOU!

NIAAA is your source for credible, evidence-based information about alcohol and health.

Alcohol's Effects on Health
Research-based information on drinking and its impact.

RETHINKING DRINKING℠
Alcohol & your health

NIAAA ALCOHOL TREATMENT NAVIGATOR
Pointing the way to evidence-based care

Visit our website
www.niaaa.nih.gov

From NIAAA
THE HEALTHCARE PROFESSIONAL'S CORE RESOURCE ON ALCOHOL
Knowledge. Impacts. Strategies.

NativeAIR
Native Communities - Alcohol Intervention Review

COLLEGE AIM
ALCOHOL INTERVENTION MATRIX

Special thanks to:

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Patricia Powell
Vicki Buckley
Drennan Lindsay

NIH National Institute on Alcohol Abuse and Alcoholism