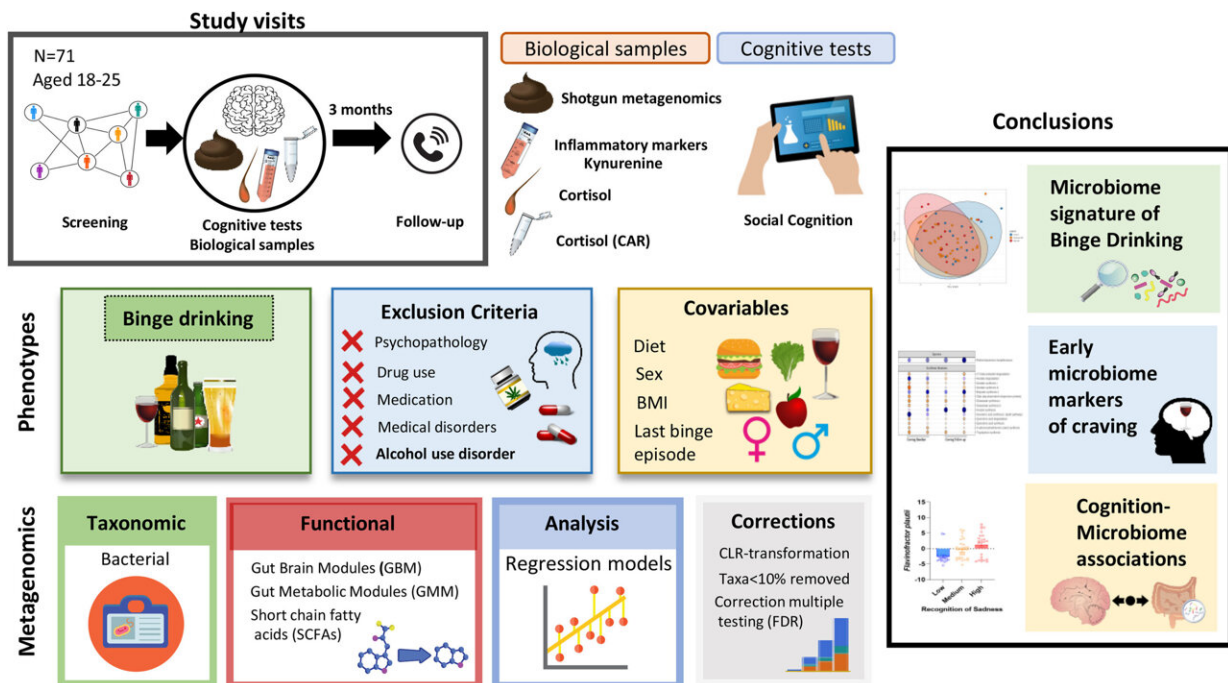


# Youth binge drinking linked to gut microbiome changes

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Study design and outline. Young binge and non-binge drinkers (N = 71) aged 18–25 were recruited. The study comprised three sessions, stool, blood and saliva samples were collected and cognitive performance was assessed. Craving levels were recorded again three months later (N = 56). Multiple regression models were used incorporating relevant covariables such as diet and correcting for multiple comparisons. Strict inclusion criteria were applied including not having an alcohol use disorder, other drug use or current medication. Findings show binge drinking is associated with a specific microbiome signature and suggest a role of the gut microbiome in regulating social cognition and craving. Biological samples provided differed (saliva N = 64; blood N = 56; hair N = 61). Credit: *eBioMedicine* (2023). DOI: 10.1016/j.ebiom.2023.104442

Youth binge drinkers show alterations in the gut microbiome, a new study finds.

The study of young people, conducted by researchers at APC Microbiome Ireland, based at University College Cork (UCC), found that alterations in the [gut microbiome](#), microorganisms that live in the human digestive system and affect health, are linked with the common practice of binge drinking in young people.

The study demonstrated that alterations in the [microbiome](#) were associated with poor ability to recognize emotions and the urge to consume alcohol.

Published in *eBioMedicine*, the findings support evidence that the gut microbiome appears to regulate brain functioning and emotional functioning.

## **1 in 3 young Europeans frequently binge drink**

Binge drinking is the most common pattern of alcohol misuse during adolescence in Western counties. One in three young Europeans engage in frequent binge drinking. In Ireland, 60% of 18- to 24-year-olds report binge drinking on a monthly basis.

Binge drinking is associated with increased risk of developing alcohol use disorder and experiencing cognitive alterations which may persist into adulthood.

## **Alcohol and gut health**

The study of 71 young people investigated the potential link between the

gut microbiome and [social cognition](#), impulsivity and craving in young binge drinkers.

Binge drinking was associated with distinct microbiome alterations and emotional recognition difficulties. Associations were found for several microbiome species linked to with emotional processing and impulsivity. Researchers found a strong link with cravings and alterations in microbiome composition and neuroactive potential over time.

These findings could help the development of novel dietary or pre/probiotic interventions directed at improving early alcohol-related microbiota and cognitive alterations in young drinkers during the vulnerability period of adolescence.

## **The gut microbiome regulates social and emotional cognition**

The study builds on growing evidence in animal models that the microbiome is an important regulator of social and emotional cognition and extends it to human subjects.

Dr. Carbia, lead author of the study, said, "By focusing on young adults, at a crucial time of both brain and gut-immune development, we identified gut microbiome alterations linked to [binge drinking](#) in [young people](#). The microbiome composition showed associations with social cognition and impulsivity, adding support to the growing evidence that the gut microbiome plays a key role in brain and behavior."

"Changes in the gut microbiome composition and the neuroactive potential were associated with higher craving over time, constituting interesting candidates for early biomarkers of dependence."

Professor John Cryan, Vice President for Research & Innovation UCC,

Principal Investigator, APC Microbiome Ireland, and the study's senior author, says "This study demonstrates that the most common pattern of alcohol misuse during early adulthood is linked with gut microbiome alterations, even before an addiction develops. Furthermore, it highlights the importance of the gut microbiome in regulating craving, social cognition and emotional functioning."

"The findings support the development of microbiota-targeted diets or interventions to positively modulate gut-brain communication during this vulnerable period of adolescence before an addiction develops."

**More information:** Carina Carbia et al, The Microbiome-Gut-Brain axis regulates social cognition & craving in young binge drinkers, *eBioMedicine* (2023). [DOI: 10.1016/j.ebiom.2023.104442](https://doi.org/10.1016/j.ebiom.2023.104442)

Provided by University College Cork

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