The race to find a party-friendly replacement for alcohol

Want the buzz of booze but without the drawbacks? Alternatives to traditional drinks are a potential goldmine and competition is hotting up

Lauren Shirreff
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There are mad inventions, such as weight-loss drugs or the contraceptive Pill, that come out of the blue and change the world forever. Then there are the much heralded “breakthroughs” that never come to much. Along with flying cars and lab-grown steaks, the lifelong dream of Prof David Nutt has always been the stuff of science fantasy. We’re here in the Commonwealth Building of Imperial

College, London, a tall and unlovely structure in the outskirts of the city, because Prof Nutt believes that is about to change.

When Prof Nutt was a medical student at Downing College, Cambridge, in 1969, doctors believed the odd drink was good for you. Now alcohol consumption is blamed for diabetes, heart disease, depression and dementia alike. That consensus has emerged gradually over the 50 years Prof Nutt has been working to rid the world of alcohol, by replacing the ethanol in our drinks with another, more well-behaved molecule. Down the road is Wormwood Scrubs prison where, according to Government estimates, two thirds of inmates will be alcohol-dependent. Next door is Hammersmith Hospital. “About three people a week in Britain die of alcohol poisoning,” Prof Nutt points out. “They just drink so much that they stop breathing.”

It’s a serious matter, but Prof Nutt is friendly and optimistic, with a jolly West Country accent, and the practised stage manner of a celebrity academic. He is the world’s most famous psychopharmacologist – “That means I study the effects of drugs on the brain,” he explains – and at 74, he is still ambitious and determined. As a graduate student in the 1980s, he thought he was in line for a Nobel Prize when he found a chemical “antidote” to alcohol that could sober up a rat. That didn’t come to pass because, as his supervisor pointed out, “blocking the brain effects wasn’t going to stop the toxicity”. Instead he made his name as an expert in psychedelic drugs, namely LSD and psilocybin “magic” mushrooms, and in the early 2000s he became an adviser to the government on drug policy.

Prof David Nutt's alcohol-free spirits range Sentia has sold more than 300,000 bottles Credit: Lee Thomas

Prof Nutt was very publicly forced to resign from that post in 2009 after claiming in a research paper that alcohol was far more dangerous than both LSD and the clubbers' drug MDMA. It would have ended any ordinary scientist's career, but the fiasco drew the attention of investors, who were keen to bring his solution for the world's drinking problem to market. Months later, The Telegraph reported Prof Nutt's renewed efforts to create a "synthetic alcohol" that was non-addictive and non-toxic. It took a decade, but then it was announced: his team had successfully produced a safe but otherwise identical stand-in for alcohol. Prof Nutt had tried it out on himself. He called it Alcarelle, and it would be on shelves by 2026.

That is not going to happen, Prof Nutt admits – though "maybe we will be able to [sell it] by 2027". He is currently preparing to take Alcarelle through food safety testing in the US, in the hopes that it might then be rolled out in Britain, too, and across the world. That process, including safety testing in human trials, will cost at least £3m. "It's such an important thing to do," he says. "It would be crazy if people didn't invest, but you certainly can't count your chickens."

Proof of concept

Credit: Sam Nicklin

If Prof Nutt succeeds in bringing Alcarelle to market, will anyone want to drink it? Alcohol is a special sort of drug, not only because it is legal in most of the world. We've been chasing its high, despite the harm and addiction it causes us, for 10 million years at least. Our ape ancestors sought out rotted fruit to booze on long before they made fire. It has a pull on us because it is the perfect social crutch, says Prof Nutt – we human beings "desperately need to socialise, but often need help doing it".

Alcarelle is designed to give a happy, two-drinks kind of tipsiness. "I'm not trying to get anyone drunk," he says. "Most people, they drink in social situations, and they just want to relax."

Bans on alcohol have never worked. The 1920s roared in America despite prohibition laws, and in much of the Muslim world, alcohol consumption has always been relatively common "despite Islam's best efforts", says Prof Rudi Matthee, a historian who studies drugs as forces in history. But in the West, alcohol consumption "is now going down dramatically". It's a pattern driven by young people: a third of under-25s in Britain now don't drink at all, some surveys suggest.

For the past five years, Prof Nutt has also worked on a "proof of concept" product aimed at people who want to drink less. Sentia, his range of three mock-spirits, is made with a blend of exotically named plants – including magnolia bark, passionflower and ashwagandha – to give drinkers a relaxed, happy buzz. It works by "stimulating the GABA receptors in your brain to mimic the pleasant effects of alcohol," Prof Nutt says – GABA being a neurotransmitter, like serotonin or dopamine, that disinhibits behaviour. He has sold more than 300,000 bottles since Sentia's official launch in 2021.

Alcohol works on this same GABA system. Prof Nutt proved that when he sobered up his lab rats, achieved by "blocking" that system's effects. But whereas alcohol is a "complicated" drug that impacts GABA throughout the whole brain as well as many other systems, Sentia instead works on specific "targets", and is therefore hangover-free and non-addictive, he says.

Alcarelle will work in the same way but is "much stronger", and would be licensed to existing drinks companies as an additive. Three major drinks companies have already approached Nutt because they "want access to our

technology", he claims. "We're not giving it to them yet, because we're slightly concerned that they might just buy it to destroy it. But I think it's almost past that now. It would be self-defeating to destroy something that could keep them profitable."

Prof Nutt and his team initially experimented with benzodiazepines, a class of strong anti-anxiety drugs that are known to work on the brain's GABA system. In recent years their tactics have changed, and the molecule set to be tested in the US is a different sort of compound, the specifics of which are, as yet, undisclosed.

How it makes consumers feel may not actually matter. While drinking is in decline, young people are happily replacing alcohol with other drugs of all kinds. British charities and rehab clinics report that the use of ketamine by under-30s has risen, along with benzodiazepines such as Xanax and Valium. Nearly 3 per cent of people under 25 admitted to using psychedelic drugs last year. The use of mephedrone, a newer drug that has been compared to both cocaine and MDMA, appears to be having a second boom in clubs and bars in London, despite its ban in 2010.

Mephedrone emerged from Israel in the early 2000s. It was sold legally at first, by an enterprising chemist called Ezekiel Golan, 55, who, after a stint on the Human Genome Project, was working as head of bioinformatics for a leading plant genetics company. He was studying the molecule octopamine, a neurotransmitter in the brains of smart invertebrates such as octopuses, when he noticed a "funny-looking" cluster in the bottom of its chemical diagram. "I wondered what that felt like," says Dr Golan. After creating it in his laboratory and road-testing it on himself, he released mephedrone to the world.

A 'just right' feeling of mild drunkenness

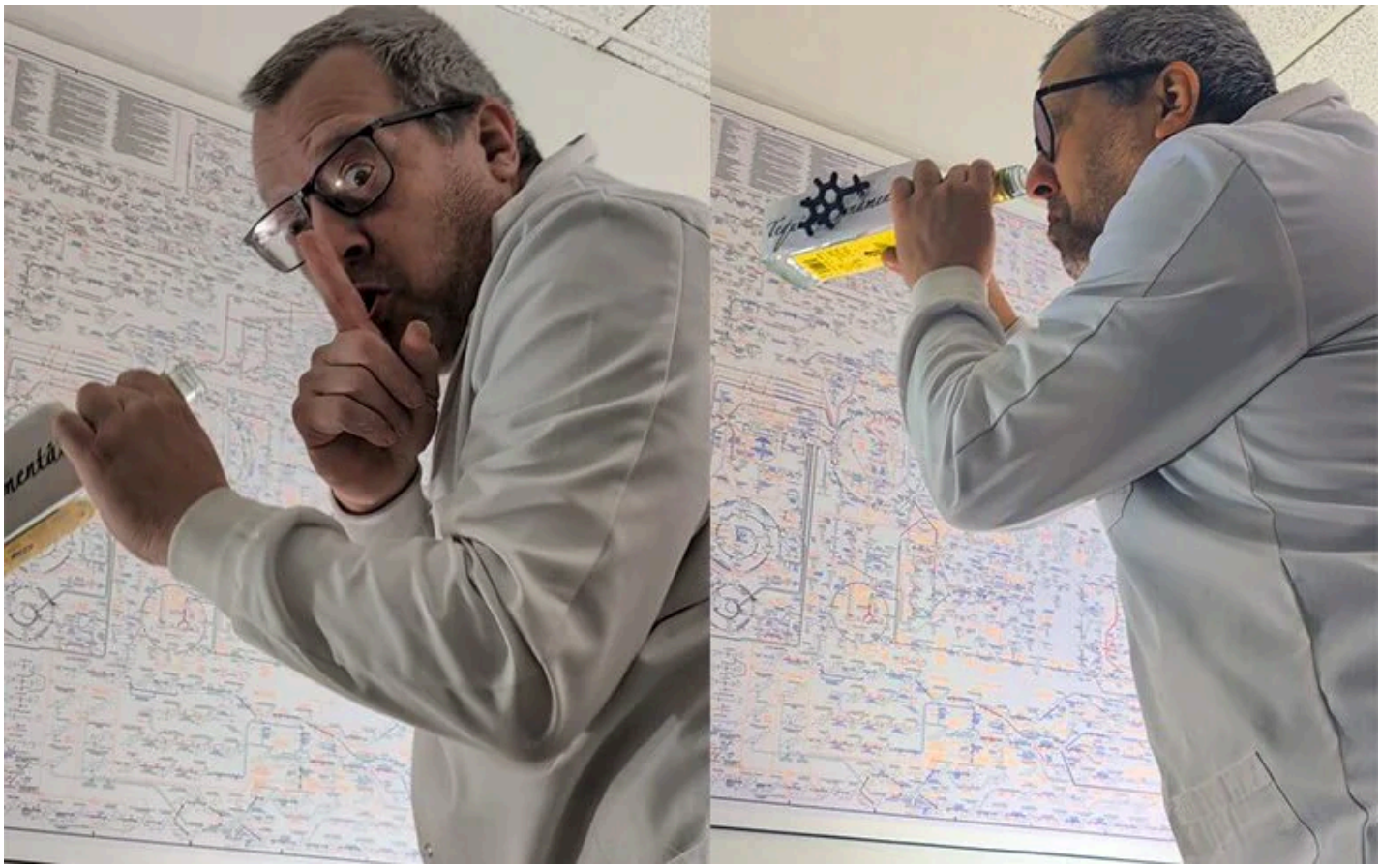
Credit: Sam Nicklin

Dr Golan bills himself as the world's foremost inventor of new legal recreational drugs. Where Prof Nutt has sought the Nobel Prize, Dr Golan had "always envied

Albert Hofman", the accidental inventor of LSD. "I've made things that take you through Aldous Huxley's doors of perception, up the stairs and all the way to Australia," he boasts. In 2005, he made "a molecule that was so extremely bland that I put it in my drawer and forgot about it". Then, in 2009, Dr Golan heard about Prof Nutt's sacking as a government advisor, and his plan to "invent his way around the alcohol problem". Dr Golan realised then that he had "something that would fit the bill."

For several years, Prof Nutt and Dr Golan worked together in "the war against alcohol", as they put it. In 2017, they co-wrote a research paper on the effects and safety of Dr Golan's new compound, called MEAI. Rather than influencing the brain's GABA system, MEAI worked on its serotonin receptors, they found. There was also some more (legal) hands-on testing. Members of Prof Nutt's department at Imperial College were invited to "Friday afternoon MEAI" sessions over the course of several months, a sort of end-of-week party, Dr Golan says. Prof Nutt insists that there was only ever a single "sampling session".

Either way, enough people had tried MEAI for Dr Golan to be sure that it reliably gives a "just right" feeling, a wash of happy, mild drunkenness. It is "incredibly one-directional," he says, being free of trippy visions and spiritual breakthroughs. Crucially, users do not feel inclined to binge on it. At very high doses, MEAI feels "like the scene in Harry Potter where he actually meets Voldemort – totally white, quiet and serene". In 2014, Dr Golan patented the compound, and he planned to give it to Prof Nutt to develop as a binge drinking mitigator. But the two had a falling out. "David's advisers didn't get along with my advisers from a business point of view," Dr Golan says. It was "neither my fault nor his".



After a stint on the Human Genome Project, Dr Ezekiel Golan has turn his time to hunting for alcohol's replacement Credit: Dr Ezekiel Golan

Dr Golan's "advisers" were the predecessors of a novel medicines company called Clearmind, incorporated in Canada and led by Dr Adi Zuloff-Shani, an Israeli businesswoman. Dr Golan sold the patent family for MEAI to Clearmind in 2021, in return for shares, which he expects will one day be extremely valuable. In December, Clearmind signed a deal with a separate biotechnology company to commercially produce MEAI. Like Prof Nutt, Dr Zuloff-Shani expects her alcohol replacement to be on shelves within the next two years. Clearmind is currently going through a regulatory approval process itself, in an undisclosed country that is "not in North America".

MEAI has been licensed for testing in human trials in Israel and the US, putting it a step ahead of Prof Nutt's Alcarelle. So far the safety profile of MEAI is "very good", Dr Zuloff-Shani says. There is real-world evidence for its feasibility as a replacement for alcohol, too: it has already been sold in Canada. Tens of thousands of Canadians bought $10 bottles of Pace, billed as an alcohol alternative as well as an alcohol enhancer (they can be drunk together) and a binge drinking mitigator, before it was ruled against at the end of 2018. Canada's health authority released warnings not to use Pace on the grounds that it was an

unregulated substance, but they "never found a case where MEAI had caused someone physical harm," Dr Zuloff-Shani says.

Health Canada confirmed this in an email, though it also pointed out that MEAI is "similar in structure to amphetamines" such as MDMA (the inventor of which, incidentally, described it as a "low-calorie martini" on first try).

Prof Nutt cut ties with Dr Golan in 2019, "for reasons we do not wish to go into," he says. His erstwhile partner in the mission to end drinking has since had "no visibility of our molecule development." Dr Golan maintains a "great respect" for Prof Nutt, but he does not believe that the professor has an "active compound" ready to sell as Alcarelle. "I'm a discovery scientist. All credit goes to David for his pioneering vision, but he does not have that kind of methodology in mind."

Is the future synthetic or botanical?

Credit: Sam Nicklin

After I spoke to Prof Nutt about his dream, I was left thinking it would be a personal disaster for him if someone else arrived at it first. But he has seen this coming. While he was in their good books, Prof Nutt authored a paper for the Labour government called Drug Futures 2025. Scientists could already "produce

a recreational substance with similar effects to alcohol but fewer harms", he wrote in 2005. Within the next two decades, rogue chemists would also create "new synthetic recreational substances", or legal highs. Some of them might feel like alcohol, Prof Nutt predicted, and they could even stand in as safer alternatives.

I couldn't try Alcarelle for myself because, under the Psychoactive Substances Act of 2016, new recreational drugs – what were once legal highs – are illegal to produce, sell or supply. Alcohol itself is only exempt "on the grounds of precedence", says Prof Nutt. The law was brought in to stop the proliferation of drugs like mephedrone, and it had the side-effect of knocking on the head Nutt's road-testing with willing participants at Imperial Colleg. International conventions on medical research mean that it remains legal for him to experiment on himself – a practice he keeps up to this day, at his lab in Hemel Hempstead.

MEAI can't be tried either, outside of clinical trials, as it is "not yet approved as a medicine or product in any jurisdiction", says Yael Stav, the head of programme management at Clearmind (and Dr Golan's wife, as it happens). The Home Office has no plans to assess whether Alcarelle or MEAI should be made exempt from the Psychoactive Substances Act, or indeed be covered by it in the first place, a source said. Such legal knots are why there is "a debate playing out over whether the future of alcohol is synthetic or botanical", says James Jacoby, the co-founder of Sentia, Prof Nutt's plant-based spirit brand.

Jacoby's own foray into devising a replacement for alcohol began with an ayahuasca trip in 2002, after which he developed "a very intense sensitivity to nature", he says. Over 20 years he "honed that sensitivity and applied it" to the creation of non-alcoholic drinks with an edge. Prof Nutt approached Jacoby and his wife, Vanessa, to collaborate in 2019. The couple's drink blends were then sold as Sentia, Jacoby claims (which Prof Nutt refutes), while Prof Nutt provided his "worldwide celebrity status". Raising enough funds to bring Alcarelle to market abroad, and then to try to get it approved here in Britain, "was the explicit end goal", says Jacoby.

Jacoby lost hope in that prospect. He left Sentia and has since set up a new venture, called ON Beer. His new lagers contain ginseng, a berry with energising properties, along with a lot of pepper and liquorice, and a handful of other plants.

You can taste them, but that's why "we're the only company with a clinical trial to support the fact that we provide an alcohol-like effect", Jacoby says. NuWave, meanwhile, an alcohol-free beer made by a former consultant for Sentia called Brendan Williams, has won international awards for its taste but has no proven ability to make you tipsy. (Sentia launched a beer alternative, called GABYR, this summer.)

Alcohol with guard rails

Credit: Sam Nicklin

Jacoby and Prof Nutt face stiff competition from other modern-day apothecarists. In May, the country's first high-end alcohol-free bar opened in London, at a wellness club called Shoreditch &Soul. It's run by 33-year-old Karma Campbell, who, like Jacoby, has created plant blends with a punch through personal experimentation. Campbell grew up as part of the new-age traveller community "where people use legal plants for their different effects as a part of everyday life", he says. He studied western herbal medicine at the University of Westminster, during which time he began trial-running his own concoctions at festivals.

His big break came at Glastonbury in 2024, after the Daily Mail spotted him selling “vegan cocaine” (a liquid mix including liquorice, damiana, ashwagandha and chilli) to revellers. “I woke up to hundreds of orders, phone calls and texts,” Campbell says. Its official name is Turbo Tonic, and it’s “meant to get you buzzing, helping you stay up all night”, he explains. Campbell’s London bar is stocked with Turbo Tonic and three other tinctures, which are mixed into mocktails along with convincing non-alcoholic versions of any spirit or aperitif you could want: vodka, gin and rum, but also mescal, chartreuse and Campari.

Customers “do a lot of socialising”, Campbell says. Observers would think they were tipsy. At the bar’s launch night, I saw Cambell squirting a syringe of Turbo Tonic into a woman’s mouth.

I tried all of Campbell’s tonics on the night, too, and while they certainly did something – the other guests agreed – I wouldn’t say I was drunk. Turbo Tonic, Sentia’s spirits, ON Beer and the dozen other products I’ve tried all have much the same effect, in that they give a hint of familiar fuzzy drunkenness without ever introducing you to the real thing. Alcohol can make you feel happy, sad or angry by turns; it gives plausible deniability for bad behaviour and secrets shared, and a headache to bond over in the morning. These inventors want to give us alcohol with guard rails, where “every night is a geek’s night out that ends at 11pm”, as Dr Golan puts it. In that way, the future of drinking is already here.

Dr Michael Mascha, an Austrian-born food anthropologist who made his fortune in the dot-com boom, has something for those who are done chasing alcohol’s effects entirely. He has spent the past 20 years trying to make water “a legitimate substitute for alcohol” in high-end restaurants. After becoming rich, Dr Mascha retired early from his post as a university professor, and then spent much of his time in California’s finest eateries. He never drank heavily, but when he developed a heart condition in his 50s, his doctor informed him that he could “either give up wine or give up living”.

Dining out became a humiliation. The wines he was accustomed to “were served in a very fine sommelier glass, with a very beautiful stem” and the first time he ordered water at a restaurant, he “was given a child’s tumbler”. Dr Mascha has since designed a new water flute for use in restaurants, and has set up a training academy for water sommeliers. His collection includes a mist bottled from the air in Tasmania, and a 15,000-year-old water from the last Ice Age, mined in the

Czech Republic and flecked with gold. The “clever” restaurants are now “realising that alcohol is dying” and are beginning to offer extensive water lists, he says. When he brings a fine water to a party, “no one is interested in wine anymore”.

What does Prof Nutt make of that? “If you want to go to the pub and drink water, then you can, but it’s a different experience,” he says. He acknowledges that alcohol might never go the way of cigarettes, locked up behind counters and stamped with labels warning that it kills. He still enjoys a glass of wine with his wife, and their daughter owns a (traditional) bar in London. He simply wants to “give people more choice”. His hope is that Alcarelle will replace 25 per cent of all alcohol consumption worldwide by 2050. If that gets people to stop drinking altogether, he would “save more lives than you would by curing cancer”, Prof Nutt believes. “I want that to be my legacy.”

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