



ENGINEERED JUST FOR YOU: PHARMACEUTICAL-GRADE YOGHURT

Forget popping pills: patients could get better by eating yoghurt. Richard Yu, an investigator at the Molecular Sciences Institute, Berkeley, is a yoghurt hacker. He describes the dairy product as a “scalable drug-distribution system”. By splicing DNA into the genes of *Lactobacillus bulgaricus*, a bacterium used to make yoghurt, he believes personalised medicines could be delivered in a palatable format. “If you send someone a packet of dried yoghurt powder that’s been engineered, and you have milk and a plastic tub, you can make this stuff,” Yu says. “You don’t need a fermenter, you don’t need a standard molecular biology lab: you need a kitchen counter.”

Yu is a cofounder of Yovivo! Probiotic. The team’s first project involves cutting and pasting the four genes responsible for turning amino acids into resveratrol – a substance that has been linked in human trials to moderating blood sugar levels and improving circulation in adults.

The DIY-bio approach could be applied to more than health: production of MDMA, say, or other more dangerous drugs could be democratised by the method. “The barriers to entry are very low,” Yu says. As a result, his team is taking a cautious approach: “Unleashing designer organisms inside your cells, you have to be very careful,” he says. “We want to do it properly. We’re not cackling scientists, bubbling cauldron and whatnot.” **TC** @yovivoyogurt

Other yoghurt hacks we like

1 Replacing toothpaste

In 2008, MIT created a *Lactobacillus bulgaricus* that makes a tooth-decay-preventing peptide.

2 Midnight snacking

Indie Biotech, an open-source biotech site, created a recipe for fluorescent yoghurt in 2011.

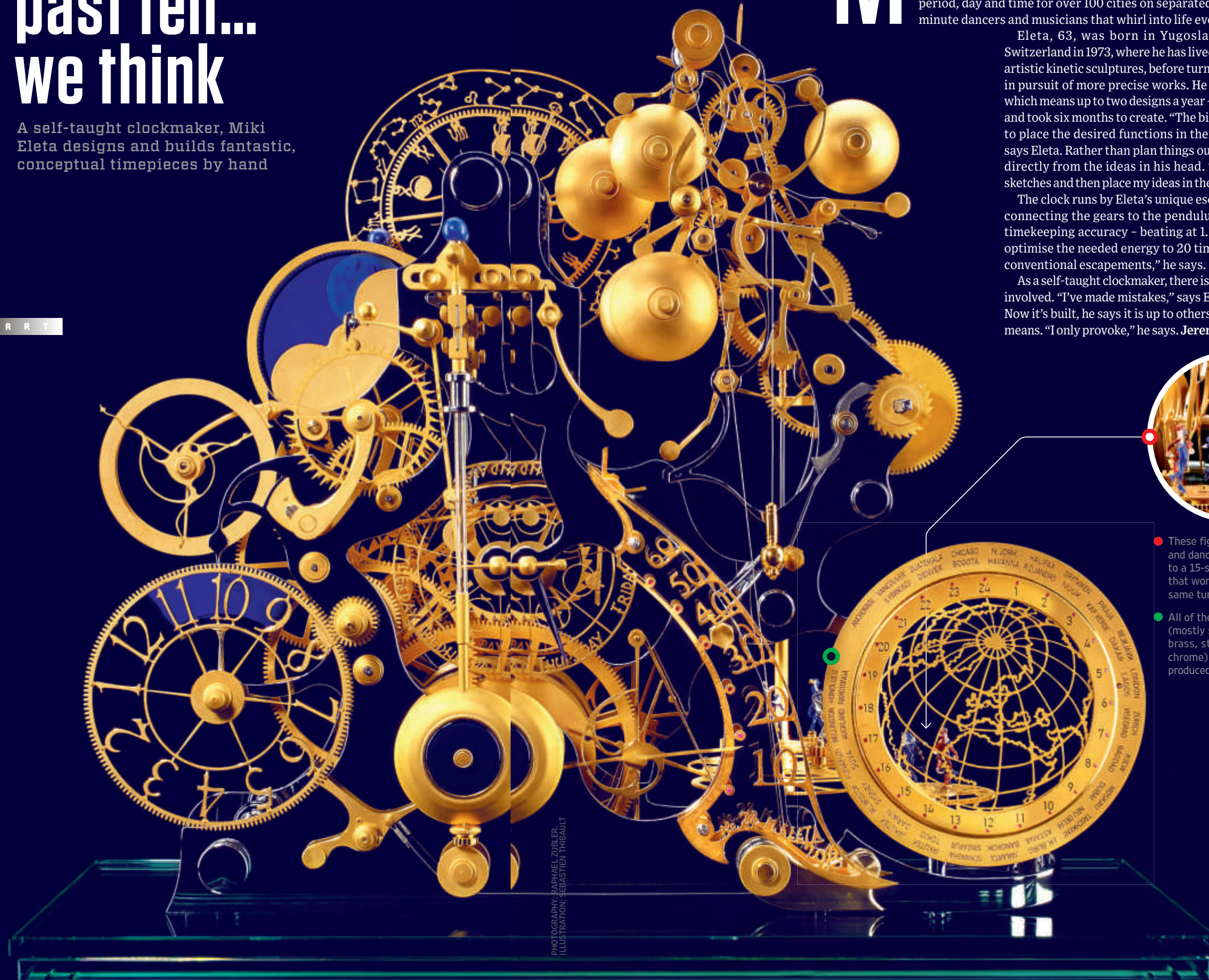
3 Relieving depression

In 2009, London-based designer Tuur van Balen demonstrated how yoghurt might produce Prozac.

It’s quarter past ten... we think

A self-taught clockmaker, Miki Eleta designs and builds fantastic, conceptual timepieces by hand

S T A R T



PHOTOGRAPHY: RAPHAEL ZUBLER
ILLUSTRATION: SEBASTIEN THIBAUT

Miki Eleta is a self-taught clockmaker who builds seemingly impossibly complex, otherworldly timekeeping sculptures. It is an effort, he says, to question the meaning of time by representing it in unique ways. His latest design, “Horologium Tres Caracoles” (pictured), stands half-a-metre tall and during its elaborate operation tells the Moon phase, astrological period, day and time for over 100 cities on separated dials, and features minute dancers and musicians that whirl into life every hour.

Eleta, 63, was born in Yugoslavia and moved to Switzerland in 1973, where he has lived ever since, making artistic kinetic sculptures, before turning to watchmaking in pursuit of more precise works. He is a prolific creator, which means up to two designs a year – this one is his 28th, and took six months to create. “The biggest challenge was to place the desired functions in their destined places,” says Eleta. Rather than plan things out in detail, he works directly from the ideas in his head. “I start from rough sketches and then place my ideas in the piece as it unfolds.”

The clock runs by Eleta’s unique escapement – the part connecting the gears to the pendulum, determining its timekeeping accuracy – beating at 1.13Hz. “I was able to optimise the needed energy to 20 times less than that of conventional escapements,” he says.

As a self-taught clockmaker, there is some trial and error involved. “I’ve made mistakes,” says Eleta. “I always will.” Now it’s built, he says it is up to others to interpret what it means. “I only provoke,” he says. **Jeremy Kingsley** eleta.ch



● These figures of musicians and dancers are synchronised to a 15-second musical piece that won’t repeat the same tune for 200 years

● All of the clock’s components (mostly steel, with gold, brass, stone crystal and chrome) are designed and produced by Eleta himself