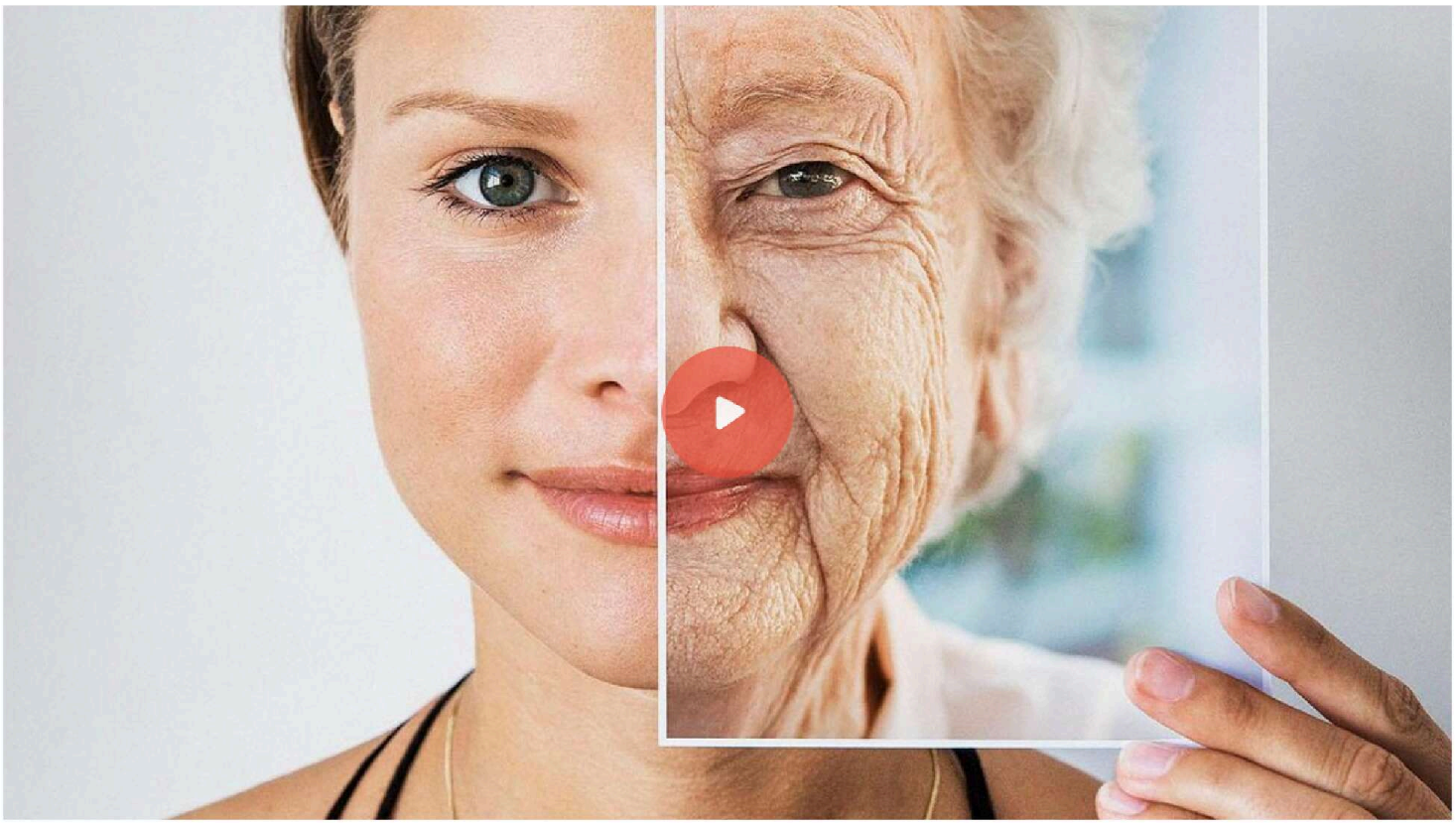

BIOPHYSICAL THERAPEUTICS, INC.

# Trying to develop a Drug to Slow Aging

## Highlights

**Regular Updates**

Founders have a strong track record of investor updates.

1. HAVE PATENTED DRUG THAT SLOWS METABOLIC RATE (at least in mice).
2. SLOWING METABOLIC RATE SLOWS AGING (at least in mice).
3. Professor George Church (of Harvard Medical School) is Advisor.

4 Reinforced Ventures is an investor.

5 Everyone ages and no one wants to.

6 A drug for aging revolutionizes cosmetics. And medicine (many diseases are caused by aging).

## Team

**Dr. Michael Forrest** Drug Inventor | CEO

Cambridge University biochemistry graduate with Ph.D. computer science. A computational biology expert and a drug inventor.

if1.skin

## Computational Biology Platform Company with a Pipeline of Experimentally-Validated New Drugs

Biophysical Therapeutics is a drug discovery platform company that leverages computational biology. Primary targets are cancer, the diseases of aging (e.g., Alzheimer's disease), and aging itself.

Its founder, Dr. Michael Forrest, is a Cambridge University biochemistry graduate with a Ph.D. in computer science. Renowned biotech entrepreneur, Professor George Church (of Harvard Medical School), is an advisor to the company.

Professor Bruno Conti of the Scripps Research Institute (La Jolla, California) is also an advisor. In 2006, Professor Conti and his team reported an exciting result in the prestigious journal Science. They showed (in female mice) that slightly reducing the metabolic rate by slightly reducing metabolic heat generation (decreasing body temperature by 0.34°C) increased lifespan by **20%**. Perhaps relatedly, calorie restriction, which is well known to extend the lifespan of (at least) mice, causes a slight decrease in body temperature in mice and humans. Moreover, different humans can vary in resting metabolic rate (per unit mass) and resting body temperature, wherein those with lower values live significantly longer. **Making metabolic rate less can extend the lifespan of worms, flies, wasps, fish, mice, and probably many other species**.

> Dr. Forrest explains: "This fits a thesis in which metabolic rate [oxygen consumption rate] enables life but causes damaging byproducts and accumulating damage, which is aging, that ultimately takes life away."

In mammals, the majority of metabolic rate is for metabolic heat generation to maintain the body temperature at around 37°C. Professor Conti and team slightly reduced the metabolic heat generation of mice by genetic manipulation in the brain. Dr. Forrest has since discovered the chemical reaction mammals use to metabolically generate heat and a drug to inhibit it (**WORKING IN MICE**). How much metabolic heat generation and (thereby) metabolic rate decrease depends upon the administered drug dose. By Professor Conti's extended lifespan result, and other data, the company predicts this drug can slow aging and extend lifespan.

"Body temperature can be the same with less metabolic heat generation by proportionally greater bodily insulation [wearing more/better clothing] or conducive ambient temperature. A human, in typical clothing, is most comfortable at an ambient temperature of 20°C. But much of the world is hotter, at least for part of the year, especially when close to the equator [43% of the world's population lives in the tropics]. This drug, dose-dependently reducing metabolic heat generation, might increase thermal comfort in hot places, possibly slowing aging. To illustrate: a relatively small drug dose might increase a clothed person's preferred ambient temperature to 23°C, a higher dose to 27°C, an even higher dose to 32°C, and so on. When metabolic heat

generation is low, the preferred ambient temperature is close to 37°C. When the ambient temperature is 37°C or more, no metabolic heat generation is needed for the body to be at 37°C. Incidentally, the drug's effect dissipates over time as the drug clears from the body, if not prolonged by another dose," says Dr. Forrest.

> "Biophysical Therapeutics has discovered something fundamental, how mammals metabolically generate heat. And a drug to inhibit it, shown to work in mice," Dr. Forrest says.

He adds: "This drug will allow us to investigate further the inverse relationship observed within, and across, mammal species between metabolic rate per unit mass and lifespan. What happens to lifespan if a mouse's metabolic rate per unit mass is drug reduced to that of a whale? When the mouse's ambient temperature is 37°C [meaning any metabolic heat generation is superfluous because the mouse's body temperature can be 37°C merely by equilibration with the ambient temperature]. We might reveal - if greatly extending a mouse's lifespan thereby - that the lifespan difference between mice and whales is [at least in part] because a mouse performs more metabolic heat generation per unit mass, as it is smaller, so [by the square-cube law of geometry] has a larger surface-area-to-volume ratio, meaning it loses metabolically generated heat more readily."

Across a set of mammal species, the company has shown that maximal lifespan is inversely proportional to the use (per unit mass) of its newly discovered reaction for metabolic heat generation. And believe that drives the inverse proportionality between metabolic rate per unit mass and maximal lifespan (that causes the inverse proportionality between heart rate and maximal lifespan) observed in the same set of mammal species.

> Dr. Forrest predicts: "When this drug is applied topically to a small body part [e.g., to the face in a cream]: it will reduce metabolic heat generation there, reducing metabolic rate there, and thereby slow aging there. Wherein heat transfer from the rest of the body [via blood flow] maintains this body part at around 37°C because topical use can't reduce body temperature at any ambient temperature."

Firstly, the company's focus is cosmetic applications, aiming to license cosmetic use of its patented drug to a cosmetics company for profit share. For this, a key milestone is testing if this drug can slow human tissue aging, which (once commenced) should take less than six months and is a relatively cheap experiment. The aim of this investment raise is to conduct this experiment. Consumer desperation is so great that many spend a lot of money on products with little to no efficacy. Cosmetics containing an anti-aging compound that works much better might capture much of the market. And possibly grow it.

> Reflecting the present consumer desperation, cosmetics billionaire Kim Kardashian said in 2022: "If you told me that I literally had to eat poop every single day and I would look younger, I might, I just might."

Greater scientific detail is here.

Recently, the company had its first press; and first investment (from Reinforced Ventures).

> *Forward-Looking Statements: This presentation contains forward-looking statements, which are generally statements that are not historical facts. Forward-looking statements can be identified by the words "might", "may", "predicts", "prediction", "hypothesis", "wants", "aim", "aiming", "should", "could", "possibly", "expects", "think", "anticipates", "believes", "intends", "estimates", "plans", "planned", "pursuing", "will", "can", "outlook", "conceivably", "plan", "teaching", "next", and similar expressions. Forward-looking statements are based on management's current plans, estimates, assumptions and projections, and speak only as of the date they are made. We undertake no obligation to update any forward-looking statement in light of new information or future events, except as otherwise required by law. Forward-looking statements involve inherent risks and uncertainties, most of which are difficult to predict and are generally beyond our control. Actual results or outcomes may differ materially from those implied by the forward-looking statements as a result of the impact of a number of factors.*

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