pump.science: The Tokenized Prediction Market for Longevity Regimens



Life is the ultimate multiplayer game. We're all logged in, whether we choose to be or not. Some of us are grinding for XP, increasing the skill and resources of our character. Others are watching from the sidelines as our avatar slowly loses health. There is one universal truth for all of us in this game: it will end.

Let's face it, death is the final boss. It's the *game over* screen nobody wants to see. But what if you could develop your own infinite health cheat code? What if we could keep playing the game indefinitely?

Enter the world of longevity research, where science can potentially unlock the secret to extended playtime — a.k.a. lifespan.

The Longevity Trilemma

Finding this cheat code isn't easy. If it were, we would have found it already. To change how our bodies interact with time, we need better potions (supplements), better gear (drugs), and better strategies (regimens). But like any cheat code, it's only good if you know it actually works. When it comes to longevity, having proof-of-cheat-code is a must — after all, we only have one "life" in this game. So how do we know what works?

Human trials? Too slow. Testing on mice? Still too slow. Consider this, there are more potential drug compounds than atoms in the universe! When it comes to longevity, you don't want to settle for any option—you want the best.

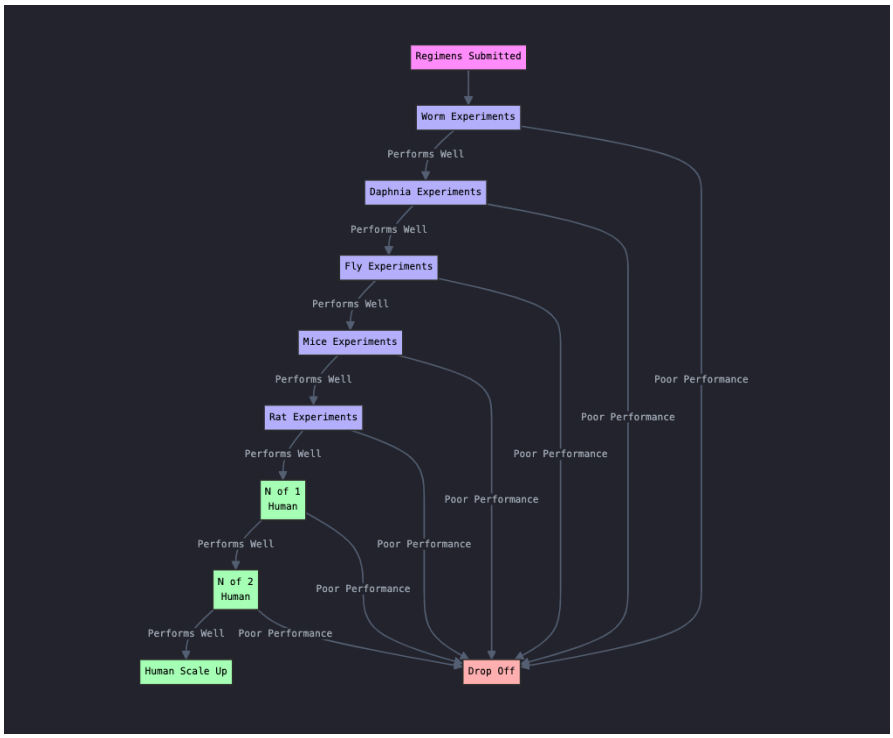
These dynamics create a Longevity Trilemma, and longevity research must balance three key factors:

1. **Speed:** We need results fast. Time is ticking.
2. **Cost:** It can't break the wallet. We have to efficiently use resources to test the large chemical space.
3. **Quality:** The data must accurately predict how drug candidates will impact the lifespan of humans.

AI can help, but it needs lots of top-notch training data to propose potential life-extending treatments. So, how do we strike the perfect balance?

The Longevity Drug Testing Protocol

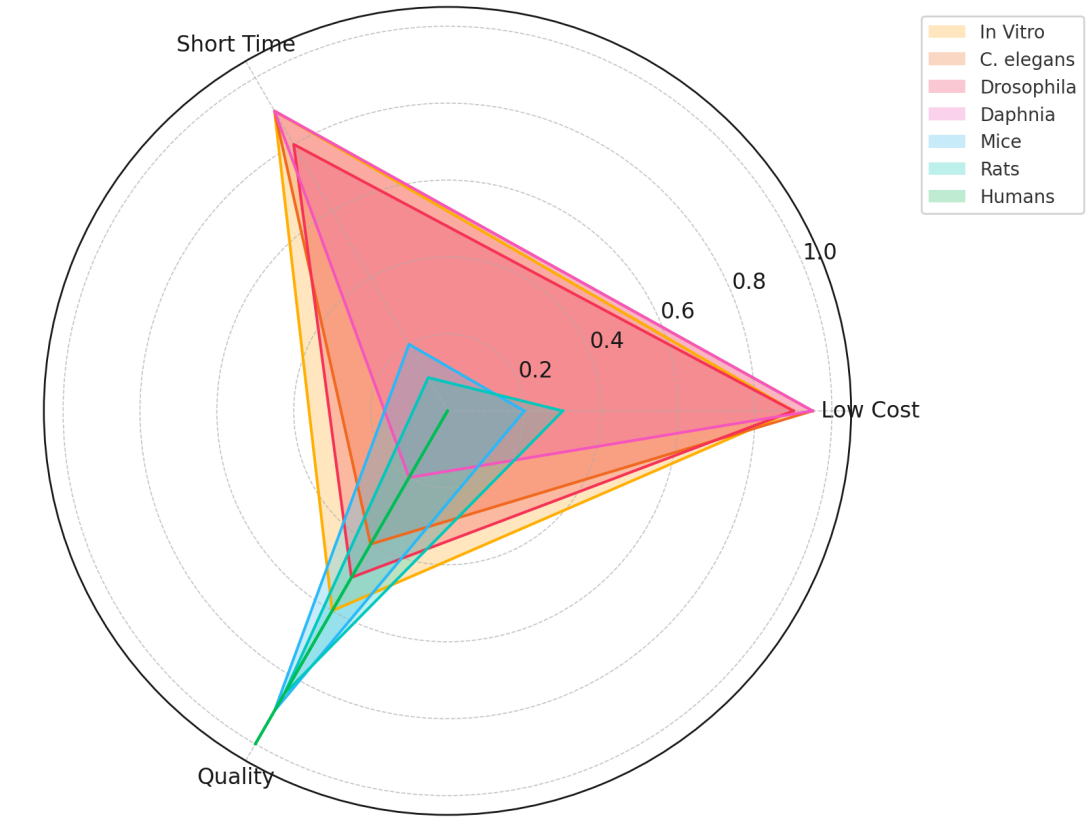
Based on all available information, we believe a protocol to test new combinations to optimize human lifespan is as follows.



Inspired by Rapamycin Longevity Lab LOOP Pipeline.

Testing compounds in *C. elegans* (worms) → *Daphnia Magna* or *Drosophila Melanogaster* (fruit flies) → mice → rats → 1 human → 2 humans → n + 1 humans → broader public. This protocol ensures that data is generated on the least expensive organisms with the shortest lifespan before taking on more risk to cost and health.

MODEL	COST	TIME	QUALITY	LIMITATIONS
In Vitro Mammalian Cell Screening	$3,000	1.5 weeks	Moderate	Limited to cellular-level data; may not fully translate to organism lifespan outcomes.
C. elegans (Nematodes)	$500	2.5 weeks	High for initial screening; low relevance to humans	Simple biology; easy genetic manipulation but lacks complexity of human systems.
Drosophila (Flies)	$2,000	2 months	Moderate	Metabolic differences from humans; small organism size limits some insights.
Daphnia magna	$1,250	2.5 weeks	Low	Limited insight into complex mammalian biology; low relevance to human lifespan.
Mice	$60,000	2.5 years	High	Expensive, long experiments, ethical concerns, lifespan ≈ 2-3 years.
Rats	$30,000	3 years	High	Similar to mice but larger and more expensive; longer lifespan ≈ 3-4 years.
Humans (Longitudinal Studies)	$500,000	40+ years	Very High	Time-consuming, expensive, ethical challenges; requires long-term commitment.



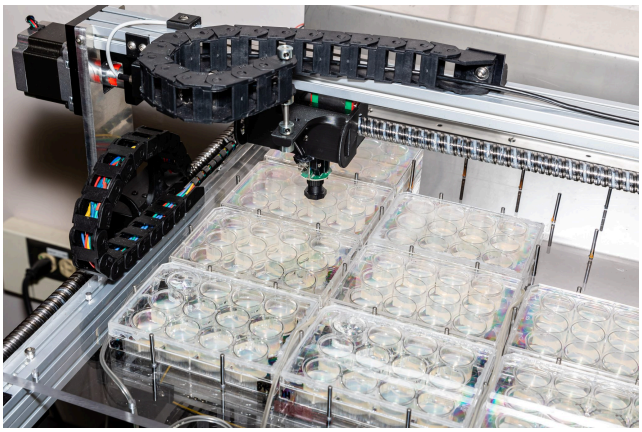
If a regimen proves effective on *C.elegans*, further experiments can be run on flies or mice, with live data streamed to users. The goal is to eventually bring online testing on worms, and other organisms as well, letting the market decide which regimens and experiments should be performed among the menu of options.

Of course, regimens can enter at any point in the protocol (e.g. “mouse” instead of “C elegans”) based on the proposed mechanism of action and the financial and personal health risk profile of those funding or taking the regimen.

Minimizing cost and health risk is what makes *C elegans* the ideal first experiment.

Enter the Wormbot: The Unlikely Speedrunner

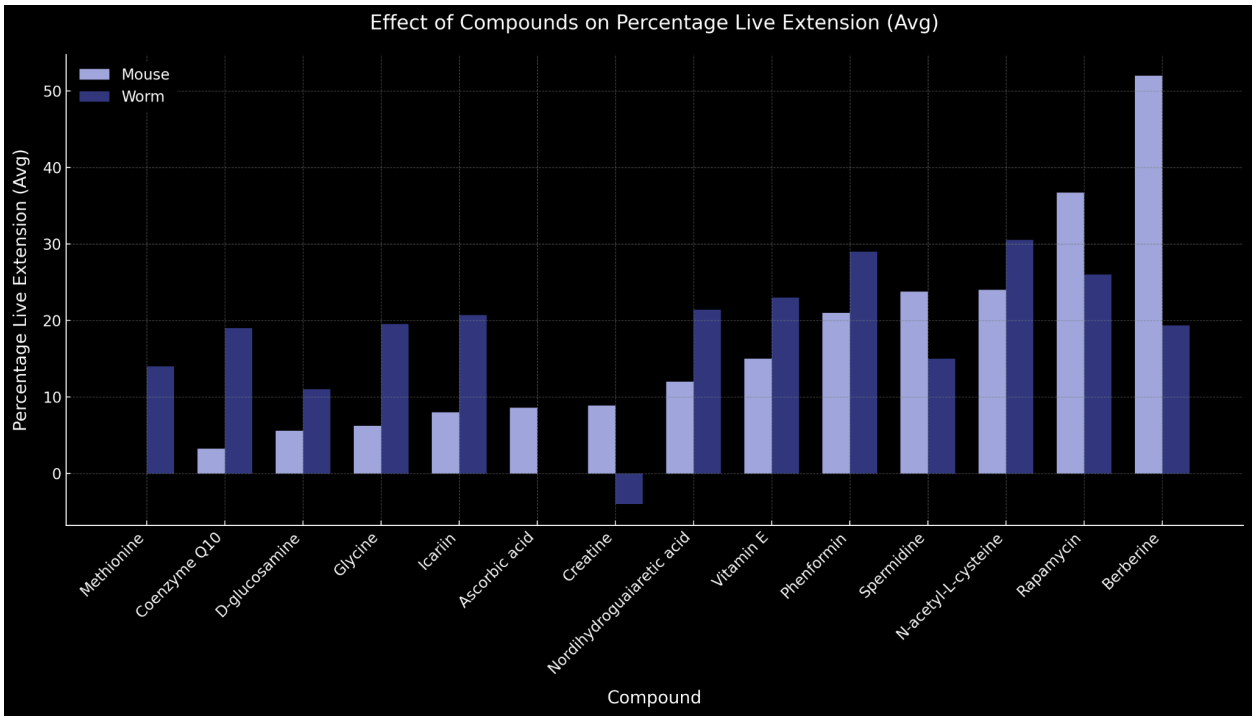




Meet Wormbot, our unlikely hero in our quest for immortality.

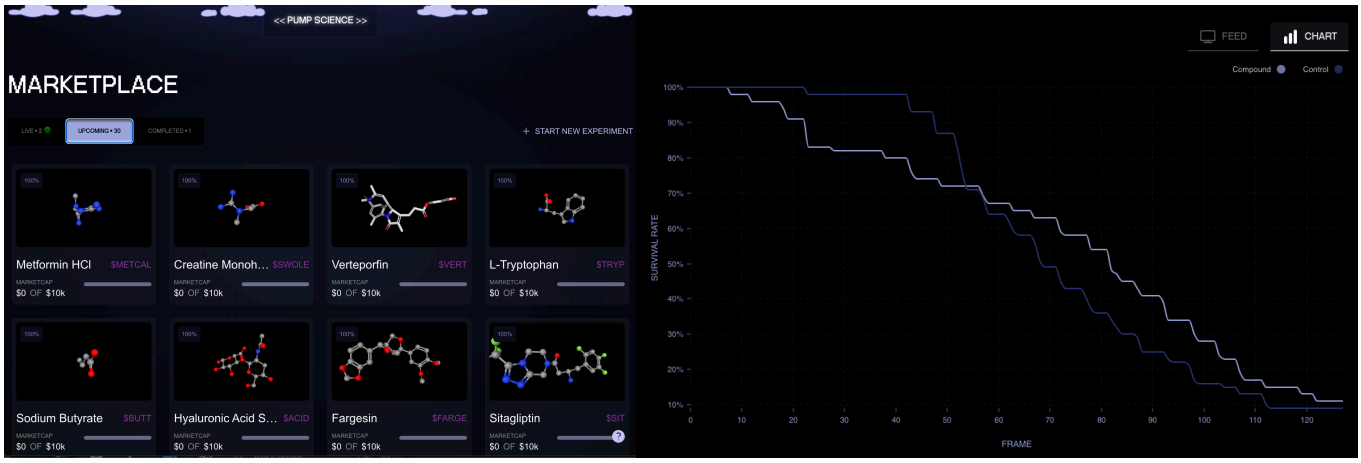
The Wormbot is a low-cost, rapid experimental platform developed by Ora Biomedical, founded by Matt Kaeberlein and Mitchell Lee to inexpensively test a large number of potential longevity regimens on *C. elegans*, a worm with a lifespan of 20 days.

Why worms? Well, 40% of their proteins are similar to ours. They're like the tutorial level for human biology. Plus, they've shown an impressive correlation with how treatments affect mice's lifespans. It's not a 1:1 match for humans by any means, but it's a great starting point. The data from the chart below shows that compounds extending life in mice also extend life in the worms.



Regimens are cultured with ~30 worms per well, monitored by a camera recording the worms' movement and lifespan. This platform can be used to inexpensively test whether regimens may increase the lifespan in larger organisms (mice and humans).

Pump.Science: Where Crypto Meets Immortality



This is where you come in. Pump.science is a platform that lets anyone submit longevity regimen ideas (drug strategies) to be tested on the Wormbot (and soon - other experiments), own the intellectual property (IP), and stream the results. It's like gladiators in the Coliseum, if the Coliseum were a petri dish, the gladiators were microscopic worms, and their weapons were experimental longevity cocktails. Are you not entertained?



Here's how it works:

1. Submit a regimen idea or back someone else's by buying tokens
2. Once the regimen reaches a certain market cap, the Wormbot experiment is run
3. Watch the experiment data stream as the regimen is tested on **real** worms
4. Buy tokens if you think the compounds can extend life and the regimen is valuable

The goal? Predict which treatments extend human lifespan. We're swapping financial yield (APY) for "time yield" – Percentage Life Extension (PLE).

Gamifying the Longevity Game

Pump.science gamifies the Wormbot. The objective of the game is to predict whether a longevity regimen will increase lifespan in humans using the worm experiments as a signal. The higher the PLE, the greater the chance of winning.

To play, users either submit a regimen for testing, which launches a new token, or fund others' regimen ideas by purchasing their regimens' tokens.

To submit a regimen for testing, users can select from a list of available ones.

To buy tokens in an existing regimen, users can choose live tokens from the marketplace of all the regimens currently being tested.

For each regimen's market, users see a stream of the latest images taken by the Wormbot and some raw data (movement, growth) that can serve as leading indicators for whether the regimen is increasing lifespan.

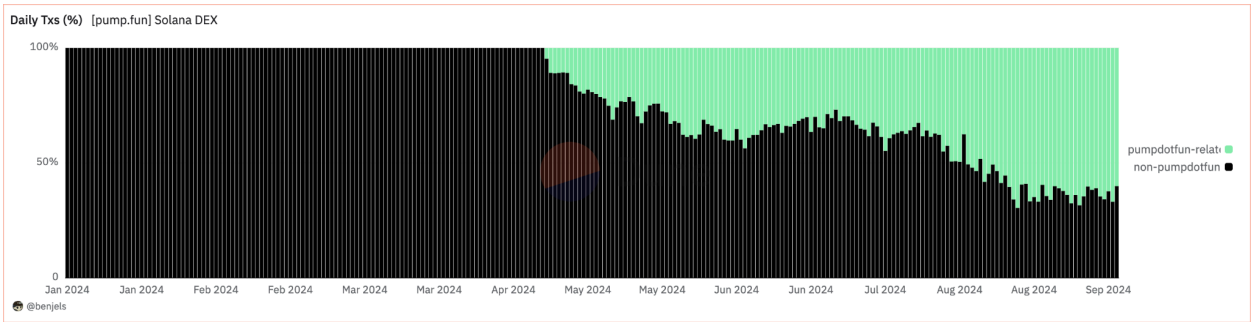
In other words, pump.science turns Wormbot into a tokenized prediction market for longevity regimens with a goal of increasing PLE in humans.

Why is the platform called pump.science?

Pump.fun is a token launchpad on the Solana blockchain that launched in January 2024 and amassed well over 100 billion USD in volume in a period of months, and is now responsible for the greatest number of transactions on the Solana blockchain. The key innovation of pump.fun is enabling the creator economy for meme tokens, lowering the cost of creating a new coin to $2.

Pump.science is built on top of pump.fun, so we called it pump.science. The key innovation of pump.science is enabling a creator economy for science tokens, starting with longevity regimens, by lowering the barrier to entry to fundraise and execute lifespan experiments while streaming the data for maximum transparency on the performance of each regimen. In other words, it's pump.fun for science.

We want to lower the friction to submitting, supporting, and justifying the products that will increase the duration of our lives.



This kind of *stadium science*, scientific research with live, open-sourced data and real-time speculation, has not been sufficiently explored. Traditional biotech markets release data once experiments (typically clinical trials) are completed. Real-time data readouts in stadium science provide more opportunities for odds to change and enable continuous speculation by market participants. Participants can look at the data and make educated guesses on a continuous basis - either based on their *a priori* scientific understanding or by watching the experiment run. To propose a new regimen will likely require a deeper level of scientific understanding, but anyone can speculate on the regimen's experiment. That means anyone can bet on the next longevity breakthrough on pump.science.

Why is this something people want?

Finding ground truth data on longevity regimens is hard. Many advocates (marketers) for particular regimens have a financial interest in doing so. It is also commonly argued that longevity is a 'problem for rich people,' but time is the most valuable asset for all of us. We want to democratize not only the funding discovery of longevity breakthroughs but also their supporting evidence and products because those should be available to everyone. With pump.science, we hope to create a fair and open system for longevity and a new blueprint for science at large.

Come play with our worms. It's the only game that isn't wasting time - it's creating it.

Acknowledgements

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