VIRAX

Leveraging AI and biology to create the next wave of improved energy storage.

What is Virax?

We're committed to reinventing electronic R&D's most important facet: energy storage. Current energy storage methods lack efficiency and cost-effectiveness, which leads to product malfunctions and lengthy development times. Additionally, current battery forms are environmentally harmful and contribute to a significant percent of current greenhouse gases and pollution. Leveraging unconventional thinking, we take an entirely different approach of generating and storing energy through viruses and AI instead of traditional chemicals and conductors.

The Problem

Leading forms of batteries have: **high environmental waste** (250,000 metric tons in EVs, and 14% of greenhouse gases), **low lifetime capacity** (max. lifespan of eight years), and **weak energy throughput** (avg. ~75%, possible ~90% efficiency).

Virus-based batteries offer an alternative to lithium batteries, but are ineffective for current viruses chosen by researchers, such as the M13 bacteriophage.

Virax's Solution

We plan to engineer environmentally-friendly viruses to **substitute chemically harmful lithium battery electrodes** for at least 42% slower cycle power degradation, 90% higher energy density, and 10x battery lifetime.

Through deep learning, we can determine the **optimal virus and coating** for maximal specific power, waste reduction, lifetime, and viral cycle deficiency.

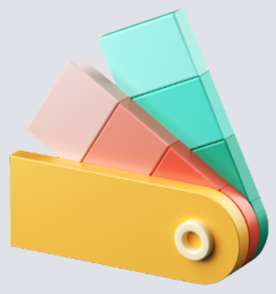
Our Process

Design (2 days)

We start off by using AI to determine the optimal virus and physical configuration to use, as well as necessary genetic modifications for specific usage and safety. The chosen virus is determined with clustering and neural network models. The inputs puts for the ML algorithms (the virus's genetic sequence and electric capabilities, environmental sustainability, the coating's chemical properties) will be based on genomic data platforms, like the preliminary viruSITE and VIPR datasets, and NGS-found sequences.

Engineering (3 days)

We then construct the virus-based battery by first genetically modifying the virus to express affinity to single-walled carbon nanotubes and iron phosphate, the coating material. Next, the virus is synthetically replicated using growth receptors. Lastly, the engineered virus is added as the anode, while a lithium or another electronically conductive material will be added as the cathode to complete the battery.



Testing (3 days)

At the end, we check for Increased carbon nanotube affinity, conductive coating materials for increased performance, and high viral reproductive rate for slower cycle degradation using our algorithm. For electronic and usage testing, we use neural networks to predict output and efficiency. Our whole manufacturing process will take ~1 week!

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