# Hawaiian Company Uses Insects to Produce Improved Vaccines

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The world is still struggling with the ongoing COVID-19 pandemic, which has resulted in more than 600 million confirmed cases and over 6 million deaths worldwide. The development of safe and effective vaccines helped curb the spread and fatal impacts of the viral pandemic, but some scientists wonder what more can be done. "mRNA COVID-19 vaccines have met the immediate need," says David Clements, Director of Vaccine Research at Hawaii Biotech, "but when we start talking about needing four or five doses, it begs the question—how can they be better?"

The Honolulu-based biotech, founded in 1982, has spent decades refining a platform to develop vaccines for a variety of infectious diseases, including dengue fever, Ebola, malaria, West Nile Virus, and COVID-19. The platform relies on insects to produce proteins that closely resemble the native structure on viruses. These proteins can then be used in vaccines for people. "It was like magic," says Clements. "We were able to generate proteins that could induce higher quality immune responses."

Support from Small Business Innovation Research (SBIR) grants have been pivotal for the development and expansion of Hawaii Biotech's vaccine platform to develop vaccines for a variety of infectious diseases. In just the past five years, Hawaii Biotech secured SBIR funding to use the platform to develop vaccines for tick-borne flaviviruses, filoviruses, and Chikungunya, an alphavirus disease spread by mosquitos.

In August 2020, Hawaii Biotech was awarded supplemental SBIR funding

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to focus on developing a safe and stable vaccine for SARS-CoV-2. The COVID-19 S1 subunit vaccine developed has been shown to induce robust

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**Project Details from NIH RePORTER**
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and durable immune responses after two doses. These programs have demonstrated the utility of the expression platform and led to vaccine candidates that are being advanced to clinical trials.

Along with vaccine projects, funding from the SBIR program paved the way for the company to develop small molecule drugs to treat infectious diseases, including anthrax and botulinum toxin. “The SBIR program is the lifeblood of small biotechs in the U.S.,” says Clements, adding that these grants can then be leveraged to secure additional funding and, ideally, bring a product to the market.

Clements says that two of Hawaii Biotech’s biggest successes are their programs to develop vaccines for dengue and West Nile Virus. Both programs started with SBIR funding, and both vaccines have advanced to the clinic for human safety testing. “There’s a real need for a West Nile vaccine to protect the elderly and immunocompromised in areas where the virus circulates. It would have huge economic benefits in terms of hospitalization cost and save thousands of lives,” says Clements. “We now have the technology to develop this vaccine, but we would never be here without the SBIR program.”