Personalized Cancer Treatment: How Colorado State University Is Changing The Future Of Care

Colorado State University

In 2024 alone, the American Cancer Society expected more than 2 million new cancer diagnoses in the United States, with more than 19,000 women facing ovarian cancer—one of the leading causes of cancer deaths among women. Amid these concerning statistics, faculty at Colorado State University (CSU) are dedicated to creating a solution. CSU startup PhotonPharma, which licensed the Innocell™ technology, is developing a revolutionary immunotherapy approach that may bring renewed hope to cancer patients.

Using a patient's immune system to target and eliminate the cancer, the technology aims to "wake up" the immune system and create a response that targets and eliminates the tumor. PhotonPharma utilized equipment and disposables from Terumo Blood and Cell Technologies Mirasol® Pathogen Reduction System in developing this new application. Photon's innovation entails extracting a portion of a patient's tumor tissue, adding vitamin B2, and then exposing tissue cells to UV light in the Mirasol machine. The treated cells are combined with an adjuvant, an agent that stimulates an immune response, then reintroduced into the patient to stimulate their immune system to attack the cancer cells.

This personalized immunotherapy can potentially make a critical difference for patients with difficult-to-treat cancers like ovarian cancer. PhotonPharma received its first Investigational New Drug (IND) clearance from the FDA in February 2024. The first human clinical trial focuses on patients with relapsed ovarian cancer.

"Early results from research at the CSU Research Innovation Center labs of PhotonPharma and Flint Animal Cancer Center proved this approach useful in multiple tumor types. We believe that the animal models may translate into treatment of many types of human cancers based on the promising results observed early on," said Steve Foster, Director of Licensing at CSU STRATA, the technology transfer office for the Colorado State University System.

PhotonPharma's therapy aims to provide a targeted, effective, and patient-tailored solution.

The first clinical trial, set to take place in collaboration with the City of Hope in California, will evaluate the safety of PhotonPharma's therapy while monitoring its ability to trigger an immune response strong enough to attack the cancer. With time, the goal is not just to slow disease progression but potentially to shrink tumors and stop the cancer from growing or spreading, offering patients more hope in addressing their cancer treatment needs.

At the forefront of PhotonPharma's technological advancements is Raymond Goodrich, former executive director of the CSU Infectious Disease Research Center and now a professor in the Department of Microbiology, Immunology, and Pathology at CSU. Behind PhotonPharma's breakthrough is the essential support of CSU STRATA.

"CSU STRATA fulfills the mission of a land grant institution such as CSU to deliver products and services that meet a public need," said Goodrich. "They do this by helping to partner the best of academic research with the best of private sector development and commercialization that is needed for great ideas to become meaningful and impactful realities of products and services for people in Colorado and across the nation."

By protecting the intellectual property of PhotonPharma's platform and facilitating the licensing needed to launch the company, CSU STRATA played a pivotal role in bringing this therapy to its current stage. These resources equipped the founders with the tools to turn an academic innovation into a commercially viable product that may one-day impact patient lives in a meaningful and significant way.

For the women who will be diagnosed with ovarian cancer this year, PhotonPharma's treatment represents a possible future of cancer care—one in which treatment is more personalized, efficient, and accessible. By focusing on the individual's unique cancer profile and stimulating their immune system to fight back, PhotonPharma hopes to bring precision and a personalized approach to treatment in cases where patients may benefit the most.

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