Another Transformational Breakthrough?

Lieping Chen, MD, PhD

He may have done it again. Lieping Chen, MD, PhD, United Technologies Corporation Professor in Cancer Research, Professor of Immunology, Dermatology, and of Medical Oncology and Co-Director of the Cancer Immunology Program, believes he has found another transformational key to treating cancer.

The first original twenty years ago when Dr. Chen discovered that cancer cells emit signals that trick the immune system into shutting down. He identified one culprit: a protein named PD-L1 that bound to PD-1 in a tumor’s microenvironment, disabling the immune system. When he blocked that pathway with an antibody, the T-cells in the tumor regained and started killing cancer cells.

Using drugs to hone the body’s own immune system against cancer is called immuno-oncology, and Dr. Chen is one of its foremost pioneers. Since his original discovery, the FDA has approved six drugs that target the PD-1/PD-L1 pathway to fight more than a dozen different cancers, with more approvals expected soon.

Dr. Chen is quick to add, “One thing—that’s a key point—quickly as you can. This antibody is the first example to prove this drug can save lives, so you want to bring it to the clinic as fast as you can.”

But not every tumor expresses PD-L1, so the drugs that block it are effective only about 30 percent of cancer patients. That other 70 percent is now Dr. Chen’s focus. He knew that in order to cure cancer, we have to deal with them differently. “We’re still trying to figure out biochemically what kind of signal this is. Different tumors develop different weapons, so we have to deal with them differently.”

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