



Supercharging the immune system to destroy tumors

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ABOUT THE LECTURE

At the cross section of immunology and cancer cell biology, Silke Paust discussed how the body's surveillance system monitors and destroys tumors and explained the limitations of this system in pancreatic cancer. She then showed how a certain group of immune cells could be enhanced in the lab to newly recognize and eradicate pancreatic tumors. The work revealed a promising path to a new immunotherapy that could one day constitute a long-term cure for this hard-to-treat cancer.

TOP TAKEAWAY POINTS

1. Pancreatic cancer has the highest mortality of all cancers, causing 50,000 deaths annually in the U.S. **Conventional therapies for pancreatic cancer are very limited**, and patients have low response rates, contributing to a poor 5-year survival rate.
2. The immune system is alert and protective against pathogens or cancerous cells. Immune T cells can recognize markers on tumors and target them for destruction, but these markers are highly specific for each tumor, and the process takes several days. **Natural killer (NK) cells, on the other hand, are “natural born killers” and can attack any cell exhibiting signs of stress.**
3. Pancreatic tumors act as cellular fortresses, blocking most immune cells from gaining access. **NK cells can infiltrate because they recognize certain stress markers present on the tumor.** Although NK cells can destroy some of these malignant cells, over time they become exhausted, and the tumor can continue to grow.
4. Paust and her team are using these known stress markers to “supercharge” NK cells and keep them active so that they can continue detecting and killing cancerous tissue. Experiments in isolated cells and in animal models of pancreatic cancer have shown **this NK cell immunotherapy can eradicate tumors and even achieve long-term remission.**
5. The Paust lab is now refining how the cell therapy is administered, studying its effectiveness against metastasized tumors and exploring possible combination therapies with engineered T cells. With encouraging findings thus far, scientists are hopeful the research could be transformed into **a clinical medicine that could dramatically improve quality of life for patients with pancreatic cancer.**

