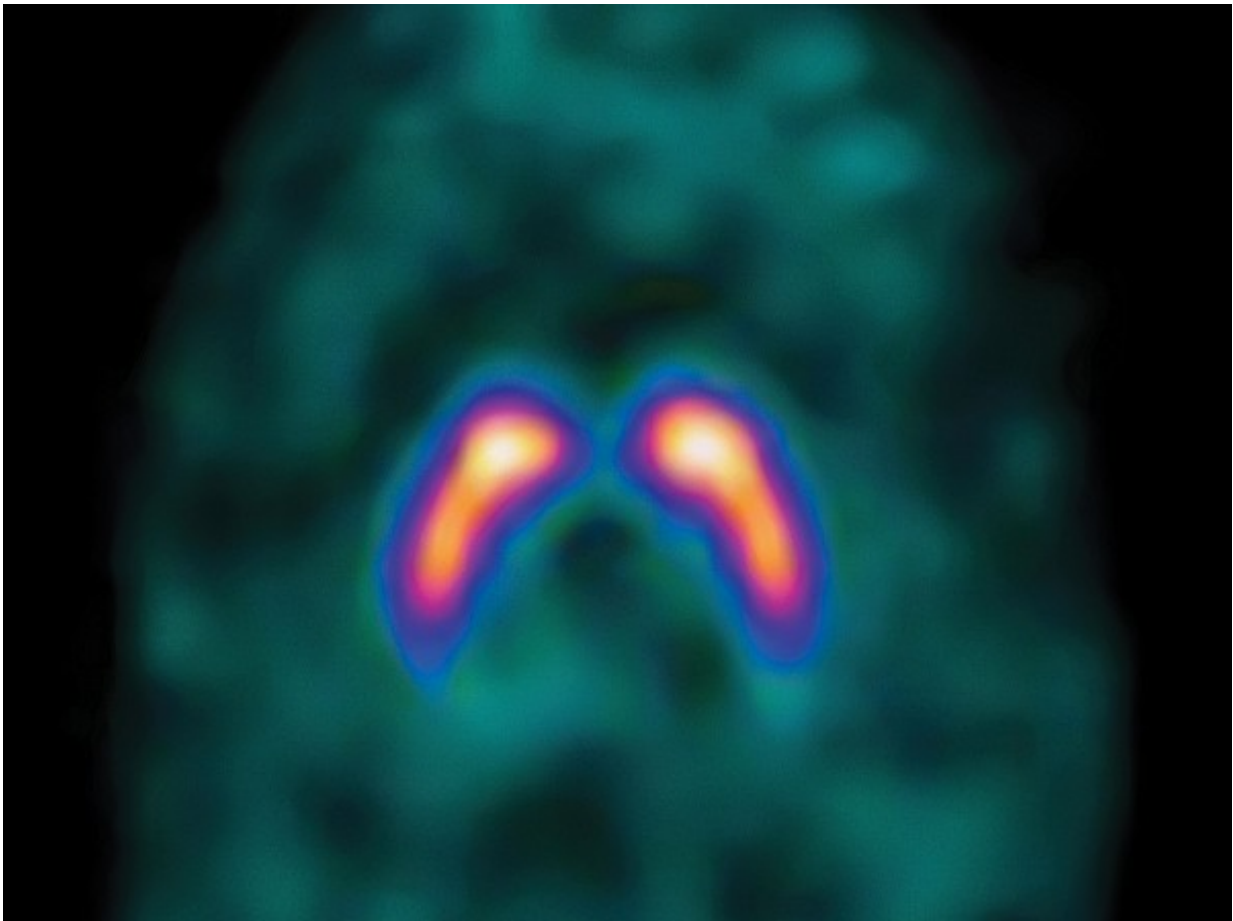


Researcher to test blood pressure medication in clinical trial for cancer

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A DaTscan image, showing normal dopamine activity in the brain. Nira Ben-Jonathan has found that a receptor in dopamine is linked to breast cancer. Credit: University of Cincinnati

Our bodies are intricate machines with millions of processes, many of which are interconnected, to keep us functioning.

Sometimes, the way those processes are related causes trouble, leading to illness. And other times, as in the case with Nira Ben-Jonathan's research, those relationships may lead to solutions for major health concerns.

Ben-Jonathan, PhD, professor in the Department of Cancer Biology at the University of Cincinnati College of Medicine and a member of both the Cincinnati Cancer Center and UC Cancer Institute, and her team have found that a receptor in dopamine could potentially be a targeted therapeutic for late-stage, treatment-resistant breast [cancer](#), and a medicine that helps control [high blood pressure](#) could be the key in doing that.

Now, she's working with clinicians at the UC Cancer Institute and with pharmaceutical companies to transform these findings into a clinical trial that could one day help patients overcome disease.

Dopamine is a neurotransmitter that helps control the brain's reward and pleasure centers and helps regulate movement and emotional responses.

"Dopamine receptors are associated with multiple diseases and disorders including addiction, schizophrenia and Parkinson's disease," she says.

"However, in past studies, we discovered the expression of dopamine type-1 receptors in breast cancer, which could be potential therapeutic targets in the disease. In fact, we found that this receptor was overexpressed in 30 percent of 751 primary [breast cancer](#) tumors, both animal models and human tissue, assessed. Additionally, larger tumors, advanced stages, metastasis and shorter patient survival in this subgroup were observed."

Ben-Jonathan says that with this knowledge, researchers attempted to block or activate the receptor through various pathways—particularly the cGMP/protein kinase g (PKG) pathway—and found that cancer cell death occurred and spread of the [cancer cells](#) was prevented.

"Even more exciting was that Fenoldopam, a Food and Drug Administration-approved drug, used to treat renal hypertension, is known to activate this receptor and does not penetrate the brain, potentially reducing side effects for patients," she says.

Further studies confirmed that in animal models and in human tumor samples, Fenoldopam at relatively low dosages suppressed tumor growth and increased cancer cell death.

"These studies showed that with the drug being used non-conventionally, the receptor was modified, causing it to act properly and kill cancer cells," she says. "Another positive is that infusion of the drug only took a relatively short time, and it still continued to work after termination of the infusion. If one day patients were to receive this treatment in the right dosages, day-long infusion appointments could be a thing of the past.

"I've begun working with Trisha Wise-Draper (MD, PhD, an assistant professor in the Division of Hematology Oncology and a leader within the UC Cancer Institute's Phase 1 Experimental Therapeutics Program) and Elyse Lower (MD, professor in the College of Medicine and director of the institute's Breast Cancer Center) to see when and how we can put these findings into clinical trials. The drug is already FDA approved which will help us proceed, and the Phase I trial will help us determine acceptable dosages and possible side-effects."

Phase 1 clinical research trials are the first step in moving tested scientific concepts from the laboratory bench to clinical trials; they

typically include less than 50 people and are important for patients who may not have standard treatment options, as these therapies are novel and not widely available. The UC Cancer Institute is the only facility in the Tristate area with a Phase I program.

"The possibilities with these findings are monumental," she says. "It's exciting to think that a medication for one condition will be able to help those battling an illness that has limited treatment and could potentially improve patient outcomes."

Provided by University of Cincinnati

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