

Hope for new heart treatment: OU researcher partners with Israeli company for magnetic targeted therapy

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Kenneth Dormer, physiology professor at the College of Medicine at the University of Oklahoma Health Sciences Center. (Maike Sabolich)

OKLAHOMA CITY – A magnetic targeted therapy that could treat heart arrhythmia more effectively and less expensively with nanotechnology than the current standard has captured the skill and resources of researchers in Oklahoma City and Israel.

For nearly 20 years, an exchange between Oklahoma and Israel has fostered potential collaborations ranging from business to agriculture. One of the latest results of that relationship is NanoMed Targeting Systems, which pairs the work of a University of Oklahoma researcher with a private company in Israel.

Kenneth Dormer, Ph.D., a physiology professor at the College of Medicine at the University of Oklahoma Health Sciences

Center, has long had interest and experience with magnets. As the co-founder of the Hough Ear Institute, Dormer played a role in the development of a cochlear implant, which includes a magnet. He helped develop another implantable hearing device that featured a magnet about a third the size of a grain of rice.

When nanotechnology came onto his radar about a decade ago, Dormer began thinking of it for his other medical interest, the heart.

"I learned that there are magnetic nanoparticles," he said. "They're so small that you can't see them."

Dormer had the idea that magnetic nanoparticles could be used to develop a better way to treat atrial fibrillation, one of the most common abnormal heart rhythm conditions that is increasingly affecting an aging population.

The current treatment – radio frequency ablation – makes small burns at the site of the arrhythmia to stop the abnormal pattern. However, that process is expensive – from \$20,000 to \$100,00 for a treatment – and the patient is often under anesthesia for up to 14 hours, Dormer said. It also doesn't enjoy the best success rate, he said.

A few years ago, when Dormer noticed that an Israeli life sciences delegation was stopping in Oklahoma, he saw that one of the companies made electromagnets for clinical use. That began the relationship between them.

Their collaboration aims to create a medical device – a less expensive path to the commercial market than a new drug – that can direct medicine to a small area of the heart, about the size of a nickel, to prevent and suppress atrial fibrillation.



"If we deliver a magnetic nanoparticle to this area of the heart with an external magnetic field, which is harmless to the body, we will substantially reduce the costs," he said. "You're only taking the medicine to where it's needed, and we think it can be done in an hour using a drug that's already been approved. We're planning on it being as successful or better than stopping the arrhythmia, and it will be less risky."

NanoMed is based in Oklahoma and the Israeli company has an equity interest. Dormer said he plans to do clinical trials in Oklahoma, working with other experts at the Heart Rhythm Institute in Oklahoma. Their goal is to make significant progress in four to six years, he said, but the looming challenge is financing. Dormer estimates it will take \$6 million to \$8 million to get the device through Food and Drug Administration approval. He said he's hoping to tap into Oklahoma angel support first.

Alex Harel of Israel was in Oklahoma last week to meet with potential investors. Harel said he has been pleasantly surprised to learn about the level of scientific research and resources in Oklahoma.

"The cost here is obviously lower than what it would cost you to do the same thing on the East or West Coast, and the level of medicine and science here is compared to everywhere I know," he said. "It's a good match."

Susan Robertson is executive director of the Oklahoma Israel Exchange, which facilitated the life sciences delegation from Israel several years ago and continues to provide support. She said the partnership between Dormer and Harel is gratifying because it proves that medical treatments can cross cultures.

"When you're moving into international trade, it's a whole different ballgame because you have different mindsets of how people operate and do business," she said. "So when you cross those barriers and people work together for the greater good, it's very exciting to see."

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