

“Magic Bullet” Azedra Gives Hope To Patients With Rare Adrenal Cancer

University of Western Ontario



Western University Chemistry Professor Emeritus Duncan Hunter gets a little choked up when it's noted the work he began more than three decades ago will now, finally, be applied to saving hundreds of lives in the form of the drug Azedra.

“ Hunter describes Azedra as “a bit like a magic bullet” for rare adrenal tumors that can’t be surgically removed and require systemic anti-cancer therapy.

In 2018 the new compound, developed by Progenics Pharmaceuticals, became the first FDA-approved therapy for this use, offering hope to patients with rare adrenal gland tumors. It decreases the need for blood pressure medication and reduces the size of tumors in about one-quarter of patients – people who had exhausted all other medical options. Adrenal cancers affect about 1,000 people in the United States each year. Hunter developed the compound with his Western lab team 30 years ago and then, after years of further

development, applied for the patent.

The compound is highly radioactive and, once injected intravenously is specifically absorbed by, and then attacks the tumor, while the kidneys flush out the material it doesn't use. Key to Azedra's success is the use of a radioactive pharmaceutical called metaiodobenzylguanidine (MIBG), a compound designed to target only the tumor.

"Essentially, every molecule of MIBG has a radioactive iodine (iodine-131) on it. It gets absorbed where you want it to, it irradiates where you want it to and then it decays," Hunter said.

While a form of MIBG has been used for years, one of the main stumbling blocks has been to find a method to produce MIBG in which every molecule carries the radioactive isotope. The Hunter lab developed a specific resin that would hold the precursor to the radioactive material until ready to be converted into the radiopharmaceutical for use by the body.

"There were very few companies in the world that specialize in radiopharmaceuticals. It's highly specialized work," Hunter said.

WORLDdiscoveries, the technology transfer office for Western University, located in London, Ontario, helped Hunter apply for patents and coordinated license agreements with Molecular Insight and later Progenics Pharmaceuticals. At the eleventh hour, Molecular Insight, a Boston-based company, picked up the license on the patent and began development, and then clinical trials.

It is a process that requires a lot of resources, and when Molecular Insight couldn't stay financially afloat, it appeared as if the project might be over before its time. In stepped Progenics Pharmaceuticals, which secured the license and rescued the research, resuming clinical trials at several specialized centers in the US. Progenics' results confirmed the effects and benefits of the pharmaceutical, now named Azedra (mibenguane 131).

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