

Light it up

Reflexion looks to make splash with platform designed to turn cancer against itself

By Liz Hollis, Staff Writer

Hayward, Calif.-based [Reflexion Medical](#), which is looking to exploit each cancer's unique biology to destroy it, is trumpeting research to back its approach that will be presented at the American Society for Radiation Oncology (ASTRO) annual meeting in San Antonio, taking place between Oct. 21 and 24. "Reflexion's presence at the ASTRO meeting is the culmination of a 10-year journey that began with a simple question: if a cancer cell emits a signal, can we shoot right back to destroy it?" asked founder and CTO, Sam Mazin. "Using biology to guide radiotherapy, we hope to have the means to turn cancer on itself."

Mazin told *BioWorld MedTech* that the company is slated to have four abstracts presented at the event. "Essentially, you can think of these as our first real feasibility studies of our treatment-planning system that show our application in various areas," Mazin explained. He noted that one of the presentations aims to demonstrate that the technology can do what current treatment approaches do with radiotherapy. Currently, radiotherapy uses CT imaging to enable treatments in cancers involving the head and neck and prostate, which are localized – as opposed to metastatic – diseases. "We wanted to demonstrate that our system can do those types of conventional approaches," Mazin said.

Another presentation will focus on metastatic diseases, with an emphasis on lung cancer. In addition, data will be offered on tracers beyond the most common one used, known as Fludeoxyglucose, with an emphasis on one for prostate cancer, known as PSMA.

Every stage of cancer

"We're essentially building a machine to treat every stage of cancer, and particularly metastatic disease," an area that represents a huge need, Mazin said. Specifically, Reflexion is developing a biology-guided radiotherapy system that uses the cancer itself to guide radiation delivery, even in tumors that are moving. The technology uses positron emission tomography (PET) to guide personalized radiotherapy. In addition, the platform permits the treatment of multiple tumors in the same session. "Essentially, cancer is signaling itself to the machine, and the machine shoots back at it," said Mazin.



Reflexion PET radiotherapy system; Reflexion Medical

'Lighting up' cancer

"PET imaging is standard in oncology; so, you use it to try to see where the cancer is in the body," Mazin added, noting that such imaging helps to determine whether the patient is metastatic. "What we're doing for the first time is combining that biological imaging modality with radiotherapy, which is one of the most effective ways of locally treating cancer, but is fundamentally limited in being able to treat many targets in the body because of the challenges of seeing where the cancer is. We use PET to 'light up' the cancer in real time, to be able to treat it in real time with radiation, so that we can deliver focused radiation to multiple sites of disease in the body." In this way, the company hopes to move radiotherapy as an option for patients beyond early-stage cancer.

Mazin noted that the same mechanism that permits the treatment of multiple sites could also help in reducing the overall toxicity to the patient. "As tumors signal their location in real time, that allows the machine and the radiation

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oncologist to target more precisely and limit the amount of radiation that actually is delivered to cover the tumor.”

Traditionally with radiation therapy, margins are added around the tumor to address the uncertainty of where that abnormal growth is at any given point in time. “We can effectively reduce these margins – essentially shrink wrap the radiation around the tumor sites – so that you can deliver the same dose you want . . . to the tumor, but minimize the dose to surrounding healthy tissue.”

Prominent backers

Earlier this year, Reflexion raised more than \$100 million in its series C round of funding and is backed by TPG Growth/The Rise Fund, GT Healthcare Capital Partners, Kck Group, Sofinnova Partners, T. Rowe Price Associates Inc., Venrock, Pfizer Venture Investments and Johnson & Johnson Innovation, JJDC Inc. (See *BioWorld MedTech*, April 5, 2018.) The company also received grant funding from the National Cancer Institute Small Business Innovation Research Program.

Todd Powell, the company’s president and CEO, broke down the different financing rounds, noting that series A in 2014 helped in terms of proof-of-concept, adding that it backed connecting PET visualization and radiation therapy with a prototype. The subsequent series B round backed building an actual machine, while the latest round boosted the creation of the company around the machine. Specifically, that entails “everything from purchasing, to supply chain management through operations and manufacturing, to building a level of service and support that is expected to be in place with a system of this level of sophistication,” Powell told *BioWorld MedTech*. To back these efforts, the company is building a factory to scale up and help meet the demand of the marketplace.

Going public?

Powell noted that going public is possible in the next several years. He added “the proceeds of which would really fuel the road map further and provide for ex-U.S. expansion, which we would expect to take on after really getting our feet wet with an appropriately managed ramp here in the U.S.” When asked specifically about other markets, Powell highlighted China, where lung cancer is prevalent among men. Lung cancer could be a top target for this technology, he noted, while adding that western Europe also is an attractive region.

The company is pursuing a 510(k) pathway for its biology-guided radiotherapy system, with a submission expected by the end of the calendar year.

Others in the space

One company that is in the market is Viewray Inc., which received FDA clearance for the MRIdian Linac system, reported in early 2017. (See *BioWorld MedTech*, March 1, 2017.) That technology allows clinicians to visualize in real time the movement of tumors and organs during radiation treatment. However, that company’s technology, which also has CE mark approval, combines MRI guidance with linear accelerator radiation.

Viewray reported this week that the MRIdian and MRIdian Linac systems will be featured at ASTRO. In addition, Viewray is scheduled to hold a meeting for investors and analysts Oct. 22. In addition, Varian Medical Systems earlier this year scored clearance for its Calypso anchored beacon transponder, used in conjunction with Varian’s medical linear accelerators, to create precise targeting of lung tumors. (See *BioWorld MedTech*, April 23, 2018.) The transponder can identify minuscule movement of the tumor while stereostatic body radiotherapy is being administered, and allow a practitioner to readjust and ensure the tumor is accurately attacked. ♦