

Program: Purdue's Research Focus: Basic Research to Clinical Application

Speaker: Timothy Ratliff, PhD, Director of Purdue University Center for Cancer Research **Introduced by:** John Rathman

Attendance: 138

Guests: Zach Grigsby, Tom Wilson, Jeff King

Scribe: Jerry Kurlander

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There are 70 National Cancer Centers for basic sciences

(<https://www.cancer.gov/research/ncirole/cancer-centers/find>) For the past 40 years the Purdue Center has had this NCI designation.

Nineteen departments and six colleges participate in this center's activities. The key to the center's success is the engagement of faculty in collaborative research.

A goal is to move basic discoveries toward innovative solutions. They have worked with the Endocyte company to study metastatic castration-resistant prostate cancer. This resulted in a treatment for this condition which is in Phase 3 in the approving process.

One of the graduate students, in addition to other faculty, developed a universal Chimeric Antigen Receptor (CAR) T Cell immunotherapy. With treatment (CAR) T cells can attack different molecules on the surface of the cancer cells and kill them. This method has been used in the treatment of a malignant bone tumor most often seen in children.

At the Purdue Center 31 small molecules are in development and there are 11 clinical trials taking place. New target inhibitors are in development for liver, prostate, breast and other solid tumors. Since 2015, 125 patents have been issued plus 244 submissions. In October 2018 the Endocyte company working closely with Purdue was sold to Novartis for \$2.1 billion.

At the center they have been moving basic discoveries toward innovative solutions. They have developed a method of automated continuous synthesis of several of these substances. DESI-MS has been used for imaging brain cancer in cooperation with the IU Simon Cancer Center.

They are working on automated drug synthesis producing up to two grams per hour of a drug, as an alternative to the original, which recently experienced a 1400 per cent price increase. This is important in view of the rapidly rising drug prices.

They are also working on the chemo sensitivity of cancers from biopsy or surgical specimens before the patient is ever dosed, instead of after the first course. This is very important to know before beginning cancer treatment. This has been used with ovarian cancer and osteosarcoma. Also in the works is a way to biochemically predict that the response is durable and will not fade.

At the Center it is important to move basic discoveries toward innovative solutions. This has been very helpful in the treatment of liver cancer, small cell lung cancer and others.

Currently the main focus of the Center is to understand immune regulation and the development of alternative approaches to treating urologic cancers, primarily bladder and prostate cancer, through the modulation of anti-cancer immunity.

The success of the Center results from the cooperation of multiple scientific disciplines working together to find solutions to current pressing problems in cancer therapy.



Dr. Timothy Ratliff