



Cyclotron Fact Sheet

What is a cyclotron?

A cyclotron is a type of particle accelerator that moves protons, one kind of charged particle comprising atoms, along a spiral path to strike a target.

What does it do?

Particle/proton accelerators have multiple applications. At the University of Alabama at Birmingham (UAB), the TR24 cyclotron will be used to make medical imaging agents for clinical and research applications. The cyclotron is also capable of making agents for therapy.

What will this material (or medical isotopes) be used for?

Following extensive safety reviews and with FDA approval, the relatively short-lived radioactive elements will be used to make various radiopharmaceuticals that are injected into a patient in order to diagnose and determine effective treatment of cancer and other diseases. UAB's clinical and research programs in cancer will be significantly enhanced, as will programs in cardiology and neurosciences.

What is the benefit to patients?

The cyclotron's ability to make a wide variety of agents allows physicians to identify, diagnose and monitor treatment of cancer and other diseases with greater sensitivity and specificity. The proximity of the cyclotron, adjacent to the imaging facility, allows immediate use of the transient agents in patients.

With the cyclotron, UAB will be able bring cutting-edge premium cancer care directly to patients. Research that was not previously possible will allow for new advances to be made that will also benefit patients. Many pharmaceutical companies, for example, are already conducting research on making radiopharmaceuticals for diseases to identify methods of treatment.

What is the benefit to researchers?

Since the TR24 cyclotron is on site, it enables UAB to produce numerous agents that are not commercially available to UAB researchers because they must be produced and used locally. In depth, detailed research can be conducted in a variety of interdisciplinary ways to retrieve information that would not be available from other sources. For example, the TR24 cyclotron will allow researchers in evaluating drug delivery to cancer, as well as changes in metabolism of cancer that indicated effective therapy at an early time after starting therapy.



How does it work?

UAB's TR24 cyclotron moves protons at about 16 percent the speed of light, accelerating the protons outwards from the center of the machine along an expanding spiral path. A nuclear reaction occurs and transforms the target into the desired radioactive element. The resultant material is then transported from the cyclotron to a special box where chemical reactions convert it into a radiopharmaceutical.