

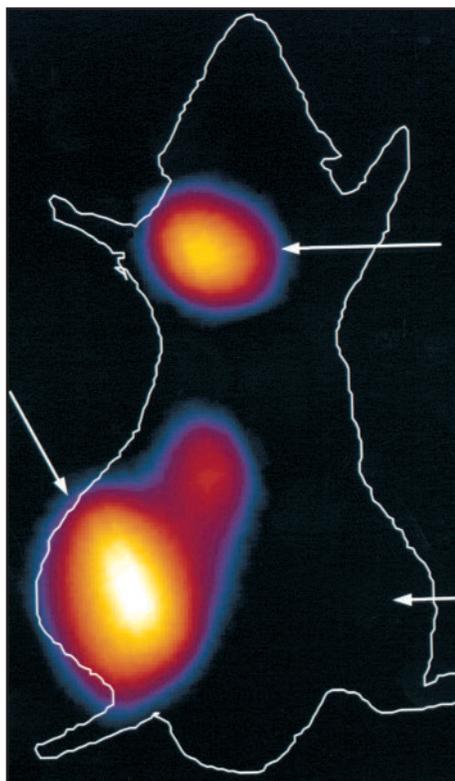
Memorial Sloan-Kettering Cancer Center, New York

Since the 1940s, the quest for better cancer treatment at Memorial Sloan-Kettering Cancer Center has included **BER** radiopharmaceutical research. The nuclear medicine group here has developed more than 30 radiopharmaceuticals—with important research in both the radionuclide and carrier molecule components.

BER scientists at Sloan-Kettering carry out pioneering work in the use of “monoclonal antibodies” as carrier molecules that target specific molecules (called “antigens”) on the surface of **cancer** cells. These antibodies can carry either a diagnostic radionuclide (for imaging small tumors) or a more powerful therapeutic radionuclide (for selectively killing cancer cells).

The **BER** research group here has also discovered novel ways to produce a variety of radionuclides, including a bismuth-213 generator system. Bismuth-213, which emits alpha particles with greater potential to kill cancer cells, was first used here experimentally to treat patients with **lymphoma**, **leukemia**, and **prostate cancer**.

Tumor Targeting



According to Nobel Laureate Harold Varmus, president and CEO of Sloan-Kettering, medicine is moving beyond the era of chance discoveries of partially effective treatments for **chronic diseases**, such as cancer. We're entering an exciting new era with “systematic discoveries of more powerful therapies, based on detailed pictures of the molecular events by which such disorders arise,” said Dr. Varmus. Nuclear medicine, led by **BER** research, will provide many of these detailed pictures.

BER researchers at Sloan-Kettering created iodine-124 FAIU, a highly specific radiopharmaceutical that provided the first nuclear medicine images that showed the expression of certain genes in tumors in a live animal. This rat (left) had two types of tumors, with different genes, transplanted within the left and right sides of its body. The PET scan shows that iodine-124 FAIU designed to target specific genes in the left-side tumors, worked successfully since the right-side tumors do not appear on the image.