Abstract

Nuclear medicine is an imaging modality that utilizes the use of radiopharmaceuticals to evaluate the function of various structures in the body. These procedures introduce radioactive isotopes into the body via injection, inhalation, or ingestion. One specific procedure performed in nuclear medicine is white blood cell scintigraphy. During this exam, a patient’s blood is drawn and labeled with a radioactive isotope before being reinjected back into the patient. The white blood cells are tagged because their function is to fight infections, and thus they will travel to any infected or inflamed areas of the body. This capstone project studies the various ways radiolabeled pharmaceutical Tc99m-HMPAO tags white blood cell samples to detect areas of infection and inflammation. Articles published in various journals, such as *Blood Cells, Molecules and Diseases* and *The Journal of Nuclear Medicine Technology* provide evidence of the importance of white blood cell scintigraphy in nuclear medicine. This project discusses the process of tagging the patient’s white blood cells, and also discusses the importance of the gamma camera that is required. This capstone project then focuses on three different case studies that support both the significance and accuracy of white blood cell scintigraphy.

*Keywords*: ceretec, leukocyte scan, infection, Tc99m-HMPAO, blood cell labeling, diagnostic accuracy