# Accelerators: Key to Radiation Research & Providing Groundbreaking Solutions for Medical Challenges

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Radiation is a two-edged sword; when used correctly, it has revolutionized medicine in the modern era. Radiation can be broadly classified into non-ionizing radiation (e.g., visible light) and ionizing radiation (e.g., X-ray and charged particles). While large particle accelerators, like the Large Hadron Collider, are busy unraveling mysteries of the universe, small accelerators serve various fields such as semiconductor technology, energy and environment, medicine, etc. To maximize the benefit of radiation, we must understand how it affects us and our surroundings. My recent endeavors at the University of Louisiana at Lafayette Louisiana Accelerator Center (LAC) and the Columbia University Radiological Research Accelerator Facility (RARAF) have focused on using accelerator-produced charged particles for interdisciplinary research. In addition to a brief overview of the RARAF, the presentation will describe instrumentation development and the use of charged particles in radiological research, using ion beam analytical techniques for elemental imaging in biomedicine, and my vision for the LAC.