LICENSING OPPORTUNITY

NIST NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY U.S. DEPARTMENT OF COMMERCE

Ref No. 17-017

Non-Resonant Electron Spin Resonant Probe and Associated Hardware Patent 11,294,075

Description

Problem

The motivation behind this invention is to generate a method to rapidly triage patients in the aftermath of a mass casualty radiation exposure event. Currently, blood tests or conventional electron spin resonance measurements of extracted tooth enamel are the only known avenues to derive a personal retrospective radiation dose. Existing systems and processes that attempt to use retrospective physical dosimetry fail to provide a practical device or system meeting the stringent requirements necessary for field deployment, pre-or post-massive catastrophic nuclear or radiological mass casualty events.

Invention

This invention allows citizens to assess themselves (at the 2 Gy ± 0.5 Gy exposure level) using a dosimeter embedded in commercial and non-commercial identification cards. Patients can then seek appropriate action without the need for first responder and/ or public health official intervention.

The technology involves the integration of a non-resonant electron spin resonance probe into an identification card. This probe is complemented by an optimized electron spin resonance spectrometer designed specifically for the detection of specific radiation-sensitive material spectra. This optimized design drastically reduces the physical weight and footprint of the electron spin resonance spectrometer and facilitates incorporation in a highly deployable package.

Contact

Technology Partnerships Office (TPO)
National Institute of Standards and Technology Gaithersburg, MD 20899
licensing@nist.gov

Benefits

Commercial Application

This technology also provides:

•long-term surveillance and monitoring of first responders, healthcare workers, and persons in the area of radiation incidents

•critical data for medical research to determine the effectiveness, timing, dosing, and administration of medical countermeasures

Competitive Advantage

This novel technology will have a disruptive impact on multiple applications currently utilizing conventional electron spin resonance. The novelty is primarily based on the miniaturization of the measurement system, no requirement for a resonant (cavity) detector, decreased power requirements, and utilization of permanent magnets (instead of electromagnets). The highly sensitive measurements, in a handheld application, far surpass any currently existing technology and thereby allow the use of minute materials that allow for applications of high urgency that include public safety and security.

Accurate and rapid initial sorting can lead to efficient triage, screening, administration of medical countermeasures, evacuation, decontamination, supportive care, and personal protective actions. Early and medically precise therapy can save countless lives and minimize the severity of acute radiation illnesses.