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Detecting Ionizing Radiation Dose using Composite Hydrogel-based Sensors

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INTRODUCTION

Radiation exposure can be internal or external and can be obtained through various routes of exposure [1]. Internal exposure to ionizing radiation occurs when radionuclides are inhaled, ingested, or otherwise enter the bloodstream (eg, from injections or wounds) [2]. Internal exposure ends when the radionuclide is eliminated from the body either naturally (such as by excretion) or as a result of therapy. External exposure can occur when airborne radioactive material (dust, liquids, aerosols, etc.) comes into contact with skin or clothing [3]. This type of radioactive material can be removed from the body simply by washing. Exposure to ionizing radiation is defined in Medical radiation exposure to X-rays. External radiation stops when the radiation source is blocked or when the person leaves the radiation field [4]. People can be exposed to ionizing radiation in a variety of settings, including at home and in public places (public exposure), at work (occupational exposure), and in medical settings (patients, caregivers, volunteers, etc.) [5]. Exposure to ionizing radiation can be divided into three exposure situations.

DESCRIPTION

First, a planned exposure situation is the intentional introduction of a radiation source with a specific purpose, as in the medical use of radiation for the diagnosis or treatment of patients, or the use of radiation in industry or research [3]. The second type of situation, pre-existing exposure, is when exposure already exists and decisions need to be made to control it. For example exposure to radon at home or at work or exposure to natural background radiation from the environment [5]. The final type, emergency exposure situations result from unforeseen events that require immediate response, such as nuclear accidents or malicious acts. The potential harm from absorbed dose depends on the type of radiation and the sensitivity of various tissues and organs [1]. Effective dose is used to measure the potential for harm from ionizing radiation. Ionizing radiation penetrates the human body, and radiation energy is absorbed by tissues. This can have harmful effects on humans, especially at high levels of exposure [4]. Natural sources of ionizing radiation typically emit only small amounts of ionizing radiation. This also means that less radiation is usually absorbed by our bodies. Natural sources of ionizing radiation include radioactive elements that occur naturally in our bodies [2]. For example, a small portion of potassium in the body is radioactive.

CONCLUSION

However, radon is a naturally occurring radioactive gas found in rock formations that can emit high levels of radiation that can pose health risks. It is the second most common cause of lung cancer in the United States. The radon level in your home or building depends on many factors. Your home or building can be tested to determine if you or your family are at increased risk of being exposed to radon. Ionizing radiation is enough to affect the atoms of living cells. It has such high energy that it damages the genetic structure. Luckily, our body's cells are very efficient at repairing this damage. However, if the damage is not repaired properly, cells can die and eventually cancer. For example, exposure to very high levels of radiation near a nuclear explosion can cause acute health effects such as skin burns and acute radiation syndrome. It can also lead to long term health effects such as cancer and cardiovascular disease. Exposure to low levels of radiation in the environment does not have immediate health effects but has only a small impact on overall cancer risk.

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CONFLICT OF INTEREST

The author declares there is no conflict of interest.

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