

The history of radiation biology essay

[Science](#), [Biology](#)



Brenna Delcambre Informative Essay Chemistry H1st Block Radiation!

Radiation! Radiation! The process in which energy is emitted as particles or waves is called radiation. Radiation is naturally occurring in the earth and can be found all around us. It can be in multiple places including the air, water, and soil. Radiation is also emitted from the sun in the form of electromagnetic waves. Throughout history there has been many discoveries of the beneficial uses of radiation as well as the dangers of radiation. As scientists explore more into this field, they have discovered medical, industrial, and archeological uses for radiation. Nuclear medicine allows doctors to look at the anatomy and functioning of the body in discovering the diagnosis and treatment of the patient. Radioactive substances are used to image the body and treat diseases. For instance nuclear materials are used to make radioactive tracers that can be injected into the bloodstream. This observation allows clots and other blood vessel abnormalities to be detected. An example, radioactive phosphorus 32 isotope is injected into the bloodstream to detect tumors by their increasing radioactivity (Freudenrich, 2013.) When a patient has their thyroid removed and is diagnosed with thyroid cancer, an I-131 whole body scan is done to determine if all of the thyroid tissue has been removed. When a positive uptake in the area where the thyroid was, it lets the doctor know that the patient is able to take an oral dose of I-131 ablation in pill form to cure the cancer up to 99% (Clarissa Delcambre, Radiation Oncology Nurse, 2013.) Additionally, PET (Positron Emission Tomography) scans detect radiation emitted from radioactive substances and produce images of the body. The substances that are injected into the body are usually tagged with a radioactive atom. The scan

then provides images of blood flow or other functions in the body. It can show images of the rapid changes in the activity of certain parts of the body and images of glucose metabolism (insulin) in the brain (Freudenrich, 2013.) Other techniques in nuclear medicine include cardiovascular imaging and bone scanning. Cardiovascular imaging uses radioactive substances to outline the blood flow through the blood vessels and heart. The imaging is useful in detecting block arteries in the blood vessels and heart. Bone scanning detects radiation from a radioactive substance that was injected into the body. It is helpful in detecting tumors, which light up from the radioactive substance that was injected. In nuclear medicine, image testing and injecting radioactive substances do not harm the body because it is too low of a dose. As a result, the patients' abnormalities will be discovered with the use of nuclear medicine. Once the abnormalities are discovered the patient will go into further treatment to improve their health. Another use of radiation is industrial radiation which can benefit human beings. Radiation can be used to remove toxic pollutants. For Example, dangerous sulfur dioxides and nitrogen oxides are removed from our environment by using electron beam radiation (ncr. gov, 2012.) Radiation is also used in the agricultural industry to improve food products and packaging. Certain food products like the plants we eat are exposed to radiation to become stronger and more durable. Packaged food is wrapped in a polyethylene shrink-wrap that can provide a protective covering and allow for the food to be heated over its usual melting point. Majority of the frozen vegetables we buy from the store are wrapped in the shrink wrap. More importantly, radiation is used to produce electricity. Our country is dependent upon electricity in our

everyday lives. Without radiation in the industrial field our world would not be the same. Scientists determine the age of objects by using radioactivity through carbon-14 dating. They use carbon-14 dating to determine the age of archaeological artifacts such as, bone, cloth, wool, and plant fibers. The half life of carbon-14 is 5,700 years so scientists can only date objects up to 60,000 years old (Brian, 1998-2013.) Carbon dating can only be used on matter which was once living. Scientists figure out the age of artifacts by measuring the radioactive emissions from once-living matter and comparing its activity with living things. However, in the future it will be hard to precisely date artifacts after the 1940's because of the interference of nuclear reactors and nuclear testing. Although radiation is naturally occurring in the earth it can be dangerous. The most common cause for skin cancer is long exposure to UV radiation from the sun. The UV radiation causes abnormal cell growth called melanocytes. Melanocytes can develop into a form of cancer called Melanoma (Barrymore, 2013.) Furthermore, radiation can be used negatively in the environment. Scientists have warned nuclear weapons pose the greatest threat to the earth's environment. Nuclear weapons such as nuclear bombs detonate and release nuclear radiation. The radiation can kill nerve cells, small blood vessels, cause nausea, vomiting, bloody diarrhea, and reduce blood cell count causing susceptibility to infection (AJ Software & Multimedia, 1998-2013.) As a result of UV radiation exposure, precautions can be taken to reduce skin damage by applying sunscreen and wearing hats or sunglasses to protect your face. Consequently, there is little someone can do to protect themselves from nuclear bombs. The safest thing to do if a nuclear bomb were detonating

near you is evacuate or stay inside your home. The beneficial uses of radiation are limitless. Scientist will continue to discover the uses of radiation for medicinal, industrial, and archaeological purposes. The threat of radiations more destructive properties will always be evident. Therefore, the development of its uses should be taken with precaution. Barrymore, J. (n. d.). Discovery Health " Dangers of UV Radiation". Discovery Health " Health Guides". Retrieved April 1, 2013, from <http://health.howstuffworks.com/skin-care/beauty/sun-care/uv-radiation2.htm> Brain, M. (n. d.). HowStuffWorks " How Carbon-14 Dating Works". HowStuffWorks " Science". Retrieved April 1, 2013, from <http://science.howstuffworks.com/environmental/earth/geology/carbon-14.htm> Effects of Radiation on the Human Body | Effects of Nuclear Weapons | atomicarchive. com.(n. d.). atomicarchive. com: Exploring the History, Science, and Consequences of the Atomic Bomb. Retrieved April 1, 2013, from <http://www.atomicarchive.com/Effects/rade>Freudenrich, C., & Ph. D.. (n. d.). HowStuffWorks " How Nuclear Medicine Works". HowStuffWorks " Science". Retrieved April 1, 2013, from <http://science.howstuffworks.com/nuclear-medicine.htm> Fuller, J. (n. d.). HowStuffWorks " How Fallout Shelters Work". HowStuffWorks " Home and Garden". Retrieved April 1, 2013, from <http://home.howstuffworks.com/home-improvement/household-safety/tips/falloutshelter.htm> Nuclear bombs pose threat to environment, scientists warn | Environment | guardian. co. uk . (n. d.). Latest US news, world news, sport and comment from the Guardian | guardiannews. com | The Guardian . Retrieved April 1, 2013, from <http://www.guardian.co.uk/environment/2>Product Material. (n. d.). NRC:

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