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Natural products from plants protect skin during cancer radiotherapy

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Radiotherapy for cancer involves exposing the patient or their tumor more directly to ionizing radiation, such as gamma rays or X-rays. The radiation damages the cancer cells irreparably. Unfortunately, such radiation is also harmful to healthy tissue, particularly the skin over the site of the tumor, which is then at risk of hair loss, dermatological problems and even skin cancer. As such finding ways to protect the overlying skin are keenly sought.

Writing in the International Journal of Low Radiation, Faruck Lukmanul Hakkim of the University of Nizwa, Oman and Nagasaki University, Nagasaki, Japan, and colleagues there and at Macquarie University, New South Wales, Australia, Bharathiar University, India and Konkuk University, South Korea, explain how three ubiquitous and well-studied natural products derived from plants can protect the skin against gamma radiation during radiotherapy.

Hakkim and colleagues discuss the benefits of the organic, antioxidant compounds caffeic acid (CA), rosmarinic acid (RA) and trans-cinnamic acid (TCA) used at non-toxic concentrations. They tested the radio protective effect of these compounds against gamma-radiation in terms of reducing levels of reactive oxygen species generated in skin cells by clinical relevance dose of gamma ray in the laboratory and in terms of the damage to the genetic material DNA, specifically double strand breaks in laboratory samples of human skin cells (keratinocytes). They found that treating the human skin cells with CA, RA and TCA can protected the cells by 40, 20 and 15 percent respectively from gamma

ray toxicity. They suggest that the protective effect arises because the compounds mop up the reactive oxygen species and chemically deactivate them as well as enhancing the body's natural DNA repair mechanisms.

The team suggests that these compounds might best be used as skin protectants during combination chemo- and radio-therapy. Further work is under way to investigate the clinical potential of mixtures of the three natural products.

More information: *Int. J. Low Radiation*, Vol. 9, No. 4, pp.305-316.

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