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(54) Title: NANOPARTICLES, IONIZING RADIATION AND INNOVATIVE THERAPEUTIC COMBINATIONS THEREOF

(57) Abstract: The present invention relates to the field of human health and advantageously offers therapeutic solutions to cancer patients up to now considered by multidisciplinary (oncology) teams (considering guidelines standards) as unable to undergo a standard-of-care treatment involving radiotherapy or at high risk to undergo a standard-of-care treatment involving radiotherapy. The invention more particularly relates to nanoparticles and/or aggregates of nanoparticles for use in the treatment of cancer in such a patient, wherein the nanoparticles and/or aggregates of nanoparticles preferably comprise more than 30% by weight of at least one chemical element having an atomic number (Z) between 20 and 83. The treatment of cancer typically involves a step of administering the nanoparticles and/or aggregates of nanoparticles to the patient, and a step of exposing the patient who has been administered with the nanoparticles and/or aggregates of nanoparticles to a total dose of ionizing radiations that is equal to or less than 85 of the total dose delivered in the standard-of-care treatment. The present description in addition discloses new compositions comprising such nanoparticles and/or aggregates of nanoparticles as well as uses thereof.

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