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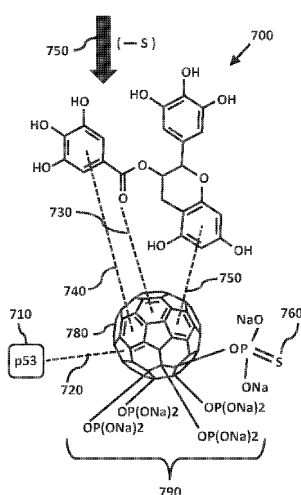


FIG. 7

(57) Abstract: A nanoparticle composition of buckminsterfullerene with at least one poly galloyl functional group such as a catechin molecule, such as epigallocatechin gallate, or a tannic acid, is provided that is both anti-bacterial and efficacious to maintain or re-establish benign healthy cellular homeostasis. In addition, the ability to penetrate hydrophobic malignant tissues via desulfurization is promoted with the addition of phosphonate pendant groups. This further enables the composition to prevent or to treat chronic obstructive pulmonary disorder (COPD), to penetrate fungal spores, and to penetrate the hydrophobic regions of uncontrolled cellular proliferation, neoplasms, degenerative malignancy, as well as to help treat chronic inflammatory diseases associated with or leading to induce cancer in susceptible cells. The composition can be produced at low temperatures through reactive shear milling. Delivery methods include ingestion, topical application, topical buccal application, inhalation, or injection when used as a medicament or as a food supplement.