Doxorubicin-loaded EGFR-targeting Nanocells

National Cancer Institute

Source

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A nanocell formulation targeting the epidermal growth factor receptor (EGFR) using bispecific antibodies (bsAb) against EGFR and containing the antineoplastic anthracycline antibiotic doxorubicin, with potential antineoplastic activity. Upon administration of doxorubicin-loaded EGFR-targeting nanocells, the nanocells are stable in the bloodstream and the anti-EGFR bsAb moiety targets and binds to EGFR-expressing tumor cells. Upon binding, the nanocell allows for specific delivery of doxorubicin to tumor cells overexpressing EGFR. Upon endocytosis by the tumor cells, the nanocell is broken down and releases doxorubicin, which intercalates into DNA and interferes with topoisomerase II activity, thereby inhibiting DNA replication and RNA synthesis. Compared to doxorubicin alone or liposomal doxorubicin, targeted delivery of doxorubicin improves efficacy while lowering the toxicity profile. EGFR, a tyrosine kinase receptor, is overexpressed in many cancer cell types. The nanocell is a bacterially derived nanosphere; the bacterial components are unlikely to induce an immune response in the immunosuppressed tumor microenvironment.