

DiamESTar

Targeted delivery of therapeutic siRNA to Ewing sarcoma junction oncogene by traceable diamond nanocrystal antibody fragment conjugate



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Ewing sarcoma (ES) is a rare, primarily pediatric bone cancer. When metastatic, the prognosis for the patient is not encouraging. We will evaluate the efficacy of a new small interfering RNA (siRNA) nanocarrier complex to treat ES metastatic tumors xenografted on mice. The siRNA inhibits the expression of the EWS-FLI1 fusion oncogene, which is considered the primary cause of Ewing sarcoma. The drug will be delivered by a fragment of antigen-binding (Fab) binding to a membrane protein overexpressed in ES cells. The nanocarrier will comprise a diamond nanocrystal core with a surface chemically modified to bind siRNA electrostatically and bear the Fab delivering the drug to the targeted cells. Nanodiamonds are compelling carriers in several respects: (i) they are chemically inert and non-toxic on cell cultures; (ii) they can be made intrinsically fluorescent or radioactive, hence traceable long-term; (iii) their surface can be modified to provide cationic or anionic charges or to covalently bind biomolecules. DiamESTar should provide the foundations for therapeutic solutions ready for preclinical development.

“DiamESTar should provide the foundations for therapeutic solutions to treat Ewing Sarcoma”

