NEWSLETTER3 | EuroNanoMed II

DiamESTar

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



Partner countries:









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 panocarrier 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.

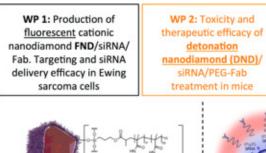
WP 2: Toxicity and

detonation

siRNA/PEG-Fab

treatment in mice

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



Size < 30 nm Functionalized Fluorescent nanodiamond

WP 3: Pharmacokinetics & Biodistribution in mice of Radioactive [3H]DND/PEG-Fab versus Fluorescent nanodiamondpolymer-Fab

