Targeted Bifunctional Fusion Proteins for Biomedical Treatments

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Technology description

Delivers Therapeutics or Diagnostics to Targeted Cells or Tissues to Treat Disease, Suppress Inflammation, Promote Wound Healing or Aid in Diagnoses to Modify Localized Cellular Metabolism

This bifunctional fusion protein binds to carbohydrates to deliver targeted therapeutic or diagnostic agents to cellular hosts, which can suppress inflammation, promote wound healing and treat disease. The targeted therapeutics and diagnostics markets are estimated to generate well over $100 billion annually; the market should reach $150 billion by 2021. Available treatments to suppress inflammation, treat cancer or promote wound healing are systemic, affecting unintended tissue and causing unwanted side effects. Targeting specific cells with an effector domain eliminates those problems. Researchers at the University of Florida have developed a bifunctional fusion protein with a carbohydrate binding targeting domain linked to an effector domain to deliver therapeutics or diagnostics to specified cells. Modifications to the identity of the effector domain can create targeted therapeutics with a broad range of functions, such as catalysis, receptor binding or activation as well as create localized biomedical diagnostics. Likewise, varying the identity of the targeting domain could enable fusion protein binding to carbohydrates to target specific tissues or tissue in a specific state of health or disease.

Technology

This bifunctional fusion protein binds to a carbohydrate to deliver therapeutics or diagnostics to targeted cellular hosts. The fusion protein has both a targeting domain with carbohydrate-binding properties and an effector domain that has either therapeutic or diagnostic properties. By modifying the effector or targeting domains, researchers have demonstrated in in vitro and in vivo experiments the ability to create targeted therapeutics with a broad range of functional capabilities as well as the ability to selectively bind to carbohydrates that target specific tissues or tissue states (such as diseased tissue vs. healthy tissue).

Application area

Bifunctional fusion protein to deliver targeted biomedical therapeutics or diagnostics

Advantages

Therapeutics or diagnostics target specific cells, reducing side effects to bystander tissues during treatment
Targeting and effector domain identities can be modified, creating additional biomedical applications
Can be administered as a single water-soluble entity or as a component of a more complex formulation, broadening treatment possibilities

Institution

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