Soluble Tight Junction Membrane Proteins

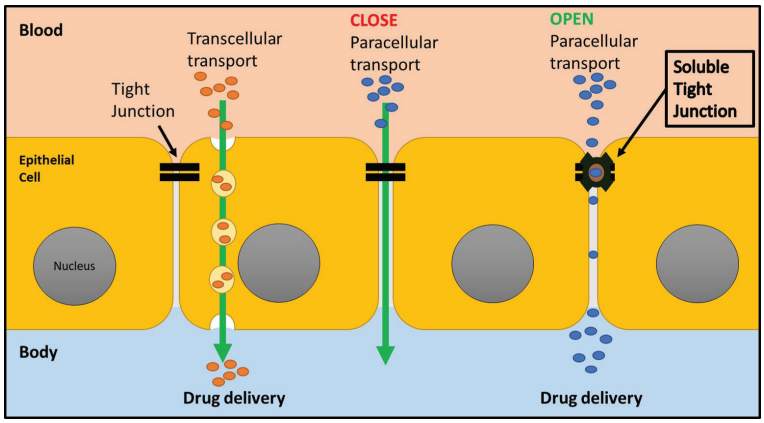
BYU #2017-072

DESCRIPTION

Researchers at BYU are developing a breakthrough technology that will allow promising therapies to be delivered, in order to treat certain maladies (e.g. brain tumors, kidney diseases, gastrointestinal disorders, skin abnormalities, etc.). For therapeutic agents to exert their pharmacological effects, they have to cross the biological membranes into the systemic circulation and reach the site of action. This invention uses protein based drugs to temporarily open or close tightly membrane barriers. Currently, there is no reagent to transiently open tight junctions (TJs), and no reagent to strengthen TJs.

PROBLEM SOLVED

Drugs cross the membranes by one or two pathways – paracellular or transcellular. Although most drugs are transported transcellularly, the paracellular route (governed by TJs) is usually the main route of absorption for hydrophilic drugs (proteins, peptides, etc.). Blood-brain barrier is the strongest of all the barriers and it is only permeable to really small molecules (e.g. antidepressants). This invention could result in therapies that will allow a number of anti-cancer drugs, already available in the market, to reach tumors and tissues in need of repair.



KEY ADVANTAGES

- *Enables available and new technologies to be developed and delivered*
- *Lowers or strengthens blood-tissue barriers*

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IP STATUS:
Patent Pending

APPLICATIONS

Possible applications include: tissue engineering designs to establish organs (e.g. skin graft) that have strong TJs and can be more resistant to infection, cosmetics creams (e.g. anti-ageing – TJ proteins can protect skin from dehydration and restore some of the properties lost with ageing), temporary modification of TJs for drug delivery, etc.

Lead Inventor

Dr. Dario Mizrachi
PhD, Animal Physiology

Mike Alder
mike_alder@byu.edu
(801) 422-6266