

Innovative Tight Junction Modulation Technology

ID: 2017-072

Executive Statement:

A groundbreaking approach to modulating tight junction functions for therapeutic and commercial uses.

Technology Overview:

This technology introduces a novel method for modifying the functions of tight junctions (TJs) through the development of soluble tight junction membrane proteins, or chimeras. These chimeras, incorporating elements from key tight junction proteins such as claudins and occludin, are designed to transiently open or strengthen tight junctions. This approach has vast implications for improving drug delivery systems, particularly through barriers like the blood-brain barrier, and for enhancing tissue integrity in various medical conditions.

Key Advantages:

- Enables transient modulation of tight junctions without compromising cell viability
- Facilitates enhanced delivery of large molecule therapeutics across the blood-brain barrier
- Strengthens tight junctions, offering potential treatments for gastrointestinal and skin-related conditions
- Employs a larger portion of tight junction proteins, improving function and interaction with native proteins
- Has broad utility in medical, cosmetic, and tissue engineering applications

Problems Addressed:

- Improves drug delivery across traditionally impermeable barriers like the blood-brain barrier
- Offers new therapeutic approaches for diseases associated with tight junction dysfunction
- Provides a method for enhancing skin hydration and integrity, applicable in cosmetic formulations

Market Applications:

- Pharmaceuticals: Enhancing drug delivery systems, particularly for brain-targeted therapies
- Medical Treatments: Therapies for gastrointestinal diseases, skin conditions, and in tissue

engineering

- Cosmetics: Formulations aimed at improving skin hydration and barrier function