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Polyphenol Containing Compositions for Upregulating Camp Gene Expression

Researchers from Stanford developed methodologies for restoring or preventing the disruption of the integrity of tight junction barriers (e.g. blood brain barrier and epithelial layers) through administrating compounds that regulate CAMP gene expression (LL-37 protein) and suppressing proinflammatory cytokines, and assessing tight junction integrity.

CAMP gene expression is critical for maintaining tight junction (TJ) barrier integrity throughout the body. TJ barrier disruption is central to numerous disease pathologies, making its prevention or restoration essential for human health. However, CAMP gene upregulation alone may be insufficient or even harmful, as it can increase proinflammatory cytokines and is associated with certain autoimmune diseases such as multiple sclerosis and psoriasis. There is thus a need for treatment of TJ barriers through use of compositions like polyphenols, which upregulate CAMP gene expression, while maintaining low levels of inflammation. Additionally, incorporating methods to assess TJ barrier integrity remain crucial to assess treatment safety and efficacy.

To address these issues, the inventors developed a method that comprises assessing TJ integrity through measuring specific biomarkers, administering a non-polyphenol compound that induces CAMP gene expression and a second non-polyphenol containing compound that suppresses inflammatory responses, and again reassessing TJ integrity through biomarkers. While dietary supplements containing polyphenols are commercially available for modulating tight junction integrity, the present method provides a novel feedback system using biomarkers associated with TJ degradation to quantify and gauge treatment efficacy in individual patients.

Applications

- Diseases implicating tight junction integrity
- Autoimmune and inflammatory diseases

Advantages

- Feedback system to quantify and gauge treatment efficacy
- Lower inflammation

Patents

- Published Application: WO2024216192
- Published Application: 20260232624

Innovators

- John Fortkort
- Annelise Barron

Licensing Contact

Hyunjin Kim

Licensing Manager, Life Sciences

Email