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Functional Medicine

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### BACTÉRIES CUTANÉES COMMENSALES POUR SOIGNER LA DERMATITE

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#### First-in-human topical microbiome transplantation with *Roseomonas mucosa* for atopic dermatitis.

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#### Abstract

The underlying pathology of atopic dermatitis (AD) includes impaired skin barrier function, susceptibility to *Staphylococcus aureus* skin infection, immune dysregulation, and cutaneous dysbiosis. Our recent investigation into the potential role of Gram-negative skin bacteria in AD revealed that isolates of one particular commensal, *Roseomonas mucosa*, collected from healthy volunteers (HVs) improved outcomes in mouse and cell culture models of AD. In contrast, isolates of *R. mucosa* from patients with AD worsened outcomes in these models. These preclinical results suggested that interventions targeting the microbiome could provide therapeutic benefit for patients with AD. As a first test of this hypothesis in humans, 10 adult and 5 pediatric patients were enrolled in an open-label phase I/II safety and activity trial (the Beginning Assessment of Cutaneous Treatment Efficacy for *Roseomonas* in Atopic Dermatitis trial; BACTERIAD I/II). Treatment with *R. mucosa* was associated with significant decreases in measures of disease severity, topical steroid requirement, and *S. aureus* burden. There were no adverse events or treatment complications. We additionally evaluated differentiating bacterial metabolites and topical exposures that may contribute to the skin dysbiosis associated with AD and/or influence future microbiome-based treatments. These early results support continued evaluation of *R. mucosa* therapy with a placebo-controlled trial.

**KEYWORDS:** Allergy; Dermatology; Immunology; Skin

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*“La pathologie qui sous-tend la dermatite atopique comprend : une fonction altérée de la barrière cutanée, une susceptibilité aux infections cutanées par *Staphylococcus aureus*, un dérèglement immunitaire et une dysbiose cutanée. Notre étude récente sur le rôle potentiel des bactéries cutanées Gram négatif dans la dermatite atopique a révélé que des isolats d’une bactérie commensale particulière appelée *Roseomonas mucosa*, recueillis chez des volontaires sains, améliorent les résultats thérapeutiques tant chez les souris que dans les cultures cellulaires servant de modèle à la dermatite atopique.*

*Le traitement par *Roseomonas mucosa* a été associé à une baisse significative de la sévérité de la maladie, des besoins en stéroïdes topiques et des infections par *Staphylococcus aureus*. On n’a pas observé d’effets indésirables ou de complications liés à ce traitement.”*