

## **β-glucans immunomodulatory proprieties: clinical evidence of successful management of complex tissue wounds**

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Skin tissue wounds normally heal through an efficient process that is characterized by inflammation, proliferation, and remodeling. Many cell types, including neutrophils, macrophages, and fibroblasts, are involved in orchestrating the healing process. The inflammatory response causes these cells to secrete several cytokines and GFs that work together to induce cell migration and remodeling (Pasparakis et al., 2014). Sudden-onset wounds of unknown origin, such as pyoderma, especially in the postoperative period of breast surgery, are challenging situations that lead to prolonged and unresponsive treatment management to the usual measures, generating anguish in the medical team and among patients. The spontaneous appearance of these lesions may occur at any time during the initial or late postoperative period. Most of these wounds occur of unknown cause, inflammatory origin, mostly noninfectious due to a dysfunction of the normal healing process, of multifactorial cause triggered by surgical trauma. They are poorly responsive to the use of the mainstream current treatment with antibiotics, anti-inflammatories, antifungals, and corticosteroids.

Immunomodulatory proprieties of B-Glucan can contribute to upregulation of the inflammatory response. Pathogen-associated molecular patterns such as B-Glucan can trigger these responses upon being recognized by pattern recognition receptors such as C-type lectin receptors (CLRs) (Girardin et al., 2002; Yan et al., 2017). Besides, the evidence of a positive influence on the wound healing process with the use of b-glucans is not new and its effects in primary human dermal fibroblasts, accelerating wound closure has been recent well documented (Fusté NP et al. 2019). New evidence shows that the C-type lectin receptors such as dendritic cell-associated C-type lectin (Dectin1) triggered by b-glucan, contribute to upregulation of the inflammatory response. Recent studies

demonstrate that activation of the Dectin-1 signal accelerated the wound healing response (Yamaguchi et al., 2021).

Although it is not well-understood how CLRs contribute to wound healing, administration of bglucan was reported to improve wound healing (Palma et al., 2006). Also evidence that that Dectin-1 contributes to the acceleration of wound healing by inducing early-phase neutrophil accumulation. The aim of this observation study is to determine whether β-Glucan Immunomodulatory effects targeted to Dectin-1 - CLR receptors may induce up regulation of the inflammatory with clinical rescue for breast surgery wounds of postoperative patients. The treatment proved to be extremely promising, with total regression or amelioration of all 12 cases studied. Secondary clinical responses were also observed, from the reduction of skin dryness with improvement in the turgor of the skin of the breasts, to the reduction of recurrent vaginal discharges, unresponsive to the use of conventional antifungals. The evidence of a positive influence on the wound healing process with the use of b-glucans is not new, but use for this purpose is still infrequent and this work indicates that the benefit of its applications may be more different than imagined for the healing process in general. Future studies, with biological markers, better immunohistochemistry, will help to better report which is already observed in daily clinical practice.

### **Speaker Biography**

Guilherme Miranda de Freitas is the Head of Plastic Surgery department on Galeao Air Force hospital, Rio de Janeiro, Brazil. He is also a Full Member of Brazilian Society of Plastic Surgery -SBCP, member of International Society of Aesthetic Plastic Surgery-ISAPS and the member of American Society of Plastic Surgeons – ASPS.

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