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ALA-PDT inhibits skin squamous cell carcinoma (cSCC) via regulating formation of tertiary lymphoid structures

Q Song 1,2, G. Yuan 1,2, P. Wang 2, and S. Wang 1,2

Introduction: Topical ALA-PDT (ALA-PDT) is a popular treatment for squamous cell carcinoma. However, the underlying mechanisms remain unclear. We have previously shown that ALA-PDT inhibits squamous cell carcinoma cell growth and maturation in vitro. The objective of this study was to investigate the role of ALA-PDT in regulating the formation of tertiary lymphoid structures (TLSs) in vivo.

Methods: Female BALB/c mice were treated with ALA-PDT, and their tumors were excised and subjected to histological analysis. The expression of key molecules involved in TLS formation, such as CXCL13, CXCR4, and CD31, was evaluated using immunohistochemistry.

Results: ALA-PDT treatment led to a significant reduction in the number of TLSs in the tumor tissue. The expression of CXCL13, CXCR4, and CD31 was significantly reduced in the ALA-PDT-treated group compared to the control group.

Conclusion: Our findings suggest that ALA-PDT inhibits the formation of TLSs, which may contribute to the anti-tumor effect of ALA-PDT. Further studies are needed to elucidate the underlying mechanisms.

026

CXCR4+ skin-resident natural killer T cells participate in cutaneous allergic inflammation in atopic dermatitis

W. Zhang 1,2, Z. Zhao 1,2, J. Zhang 1,2, S. Ding 1,2, Y. Shi 1,2, H. Kim 1,3, J. Kim 1,2, K. Lee 1,2,3, T. Kupper 4, and C. Park 1,2,3

Introduction: CXCR4+ skin-resident natural killer T cells (NK-T cells) have been implicated in the pathogenesis of atopic dermatitis (AD). However, the role of CXCR4+ NK-T cells in the regulation of cutaneous allergic inflammation remains unclear.

Methods: We used Rag1−/− mice, which do not have adaptive immunity, to investigate the role of CXCR4+ NK-T cells in cutaneous allergic inflammation. We adoptively transferred allergen-specific NKT cells into Rag1−/− mice and assessed the development of AD-like lesions.

Results: CXCR4+ NK-T cells were significantly more abundant in the lesions of adoptively transferred Rag1−/− mice compared to control mice. Furthermore, the adoptive transfer of allergen-induced NK-T cells in Rag1−/− mice led to the development of AD-like lesions, which were characterized by increased expression of pro-inflammatory cytokines and infiltration of inflammatory cells.

Conclusion: Our findings suggest that CXCR4+ skin-resident natural killer T cells play a crucial role in the development of cutaneous allergic inflammation in atopic dermatitis. Further studies are needed to elucidate the mechanisms by which CXCR4+ NK-T cells regulate cutaneous allergic inflammation.

027

Langerhans cells rely on good neighbors to overcome gene deficiencies

C. Herbel 1, A. Bouteil 2, J. Su 3, and B. Igarashi 4

Introduction: Langerhans cells (LCs) are specialized antigen-presenting cells that play a critical role in the immune response. However, LCs are prone to gene deficiencies, which can impair their function. We investigated whether LCs can acquire gene products from neighboring cells to overcome their genetic defects.

Methods: We used a conditional gene deletion model to generate LCs with specific gene deficiencies. We then administered LCs with or without gene knock-in protocols using viral vectors or electroporation.

Results: LCs with gene deficiencies were unable to mount an immune response in vitro. However, when co-cultured with neighboring cells or treated with gene knock-in protocols, LCs were able to acquire gene products and function normally.

Conclusion: Our findings suggest that LCs rely on neighboring cells to overcome their genetic deficiencies, highlighting the importance of cell-cell interactions in the immune response.

028

Use of systemic immunosuppressive treatment is not related to COVID-19 infection in a retrospective review of patients in Massachusetts

M. Murphy 1, N. Klevanov 2, V. Pahlavan 3, H. Theodosakis 4, K. Patel 2, M. Klevens 3, E. Lilly 4, A. Wang 2, and J. Eisenstein 1

Introduction: The use of systemic immunosuppressive treatment has been associated with an increased risk of COVID-19 infection. However, the relationship between immunosuppressants and COVID-19 infection remains unclear.

Methods: We conducted a retrospective review of patients prescribed systemic immunosuppressants in Massachusetts. We compared the incidence of COVID-19 among patients prescribed immunosuppressants with that of the general population.

Results: Among 14,865 (1.5%) patients prescribed systemic immunosuppressants and 80,318 (1.1%) patients prescribed systemic immunosuppressants, 218 (1.5%) patients prescribed systemic immunosuppressants and 1,368 of 80,318 patients prescribed immunosuppressants were more likely to have a COVID-19 diagnosis (OR 0.91, 95% CI 0.80-1.05, p = 0.22) after adjusting for demographics, comorbidity score, and local infection rate.

Conclusion: Our findings suggest that the use of systemic immunosuppressive treatment is not associated with an increased risk of COVID-19 infection.

029

Topical xenobiotics promote oral food allergy

A. Eisenstein 1 and A. Wang 2

Introduction: Topical xenobiotics are compounds present in the environment that are not intended for oral consumption but may be ingested through the skin. The ability of xenobiotics to promote oral food allergy remains unclear.

Methods: We used a mouse model to investigate the effects of topical xenobiotics on oral food allergy. We administered xenobiotics to the skin and assessed the development of oral food allergy in mice with and without adaptive immunity.

Results: Topical xenobiotics promoted oral food allergy in mice with and without adaptive immunity. The underlying mechanisms involved the induction of pro-inflammatory cytokines and the activation of immune cells.

Conclusion: Our findings suggest that topical xenobiotics promote oral food allergy by inducing pro-inflammatory cytokines and activating immune cells.

030

Defining adaptive and innate immune cell profiles in Hidradenitis Suppurativa

W. Yu 1, M. Marohn 1, J. Lin 1, J. Barrett 1, E. Chiu 1, and C. Li 1

Introduction: Hidradenitis suppurativa (HS) is a chronic inflammatory skin disease affecting the apocrine glands. The underlying immune mechanisms in HS are not well understood.

Methods: We used single-cell RNA sequencing to define the immune cell profiles in HS lesions. We compared the immune cell profiles in HS lesions with those in normal skin.

Results: We identified several immune cell populations, including CD8+ T cells, regulatory T cells, and natural killer cells, that were increased in HS lesions compared to normal skin.

Conclusion: Our findings suggest that HS is characterized by an inflammatory immune response involving multiple immune cell types. Further studies are needed to elucidate the specific roles of these immune cells in the pathogenesis of HS.