CD8+ IL-23R+ PD-1+ T cells in psoriatic skin possibly play a role in maintaining inflammation and disease recurrence

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Background

Interleukin-23 (IL-23) is a critical cytokine for maintaining pathogenic T cells in psoriasis. As IL-23 blockade is clinically effective, IL-23 receptor (IL-23R)-expressing T cells may be a pathogenic population that drive the inflammation underlying psoriasis. A recent study using a psoriatic mouse model showed that PD-1 was overexpressed by IL-17A-producing T cells. However, it remains unknown which subpopulation of pathogenic T cells co-express IL-23R and PD-1 in human psoriasis skin. Therefore, we sought to characterize PD-1 expression in T cells expanded from human psoriatic skin in relation to the expression of IL-23R and CD103 (resident memory T cell marker).

Methods

Results

1. PD-1 was expressed at a high proportion in CD8+ IL-23R+ T cells compared to CD8+ IL23-R- and CD4+

2. CD8+ IL-23R+ PD-1+ T cell tended to produce IL-17A at a higher frequency than CD8+ IL-23R+ PD-1- T cells

3. CD8+ CD103+ IL-23R+ T cell express PD-1 significantly higher than CD103- fraction.

4. CD103+ PD1+ cells were found in epidermis of psoriatic skin

Figure 4. Immunostaining of paraffin-embedded psoriasis skin specimen. CD103(green), PD1(red), DAPI(blue)

Discussion

These results suggest that PD-1-expressing CD8+ IL-23R+ T cells are an effector cell population driving inflammation in psoriasis. The IL-23R expressing T_{RM} (CD8+ CD103+ IL23R+) highly express PD-1 and could play role in disease recurrence. In addition, CD103+ PD-1+ cells were found in epidermis by immunostaining of psoriatic skin specimen which may represent the antigen-experienced T_{RM}. Interestingly, a number of case reports showed that anti-PD-1 treatment aggravates psoriasis, suggesting that activation of these effector or resident T cells exacerbates the disease.

In conclusion, PD-1 expressing CD8+ IL-23R+ and CD8+ CD103+ IL-23R+ T cells could play a crucial role in maintenance and recurrence of psoriasis.

References

- Kim JH, Choi YJ, Lee BH, et al. Programmed cell death ligand 1 alleviates psoriatic inflammation by suppressing IL-17A production from programmed cell death 1-high T cells. *J Allergy Clin Immunol*. 2016;137:1466-1476.e3.
- Petrelli A, Mijneer G, van Konijnburg DPH, et al. PD-1+CD8+ T cells are clonally expanding effectors in human chronic inflammation. *J Clin Invest*. 2018;128:4669-4681.