The Role of IL-13 and the IL-13Rα2 Pathway in the Pathogenesis of Experimental and Human Ulcerative Colitis

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NKT Cells and IL-13 in Experimental Colitis

Heller et al Immunity 2002  
Fuss et al J Clin Invest 2004
IL-13 Can Effect Epithelial Cell Barrier Function

- IL-13 caused a dose-dependent decrease in electrical resistance of HT-29 epithelial cell monolayers.
- This was associated with an increase in the cellular apoptotic rate.
- Addition of IL-13 in vitro led to an increased expression of the pore-forming tight junction protein claudin-2.

Heller et al Gastroenterology 2005
Fichtner-Feigl et al Nat Med 2006
Specificity of Action

Cancer Cell
- IL13-PE38QQR
- Binding
- Internalization
- Cell Death

Normal Cell
- without Receptor
- No Internalization
- No Cell Death
Treatment with an IL-13 Pseudomonas Exotoxin can Ameliorate Experimental Ulcerative Colitis (Oxazolone)
Treatment of Oxazolone Colitis with a IL-13 PE leads to Decreased IL-13 Secreting Cells
Increased IL-13Rα2 Bearing NKT Cells in PBMC of Ulcerative Colitis Patients
IFA Analysis for IL-13Ra2 and CD161 in UC-2 LP sample

- IgG
- IL-13Ra2
- IgG1
- CD161
- Isotype control
- Merge
IFA Analysis for IL-13Ra2 and CD161 in Crohn Disease sample

- IgG
- IL-13Ra2
- IgG1
- CD161
- Isotype control
- Merge
Immunostaining for IL-13 (red) and IL-4 (green) in LP cells from UC-2 specimen
Immunostaining for IL-13 (red) and IL-4 (green) in CD-1 sample

- IgG for IL-13
- IgG1 for IL-4
- IL-13
- IL-4
- Merge
IL-13 Secretion From an Ulcerative Colitis Patient LPMC After Treatment with IL-13 Pseudomonas Exotoxin
IL-13 Secretion From an Crohn’s Disease Patient LPMC After Treatment with IL-13 Pseudomonas Exotoxin
Summary

Treatment of experimental ulcerative colitis with an IL-13 PE can ameliorate disease.

LPMC NKT cells from ulcerative colitis patients demonstrate an increased expression of IL-13Rα2.

Treatment of ulcerative colitis NKT cells with an IL-13 PE leads to decreased IL-13 secretion.

Therapeutic modalities that target the IL–13Rα2 pathway may be a new avenue of treatment for ulcerative colitis.
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