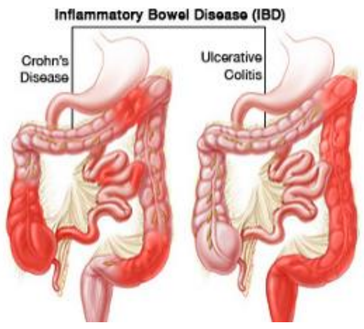
IMMUNE SYSTEM REGULATION IN INFLAMMATORY BOWEL DISEASE

Orli Cohen, Netta Tsirkin and Eleanor Tobelem
Mentor: Nisrine Lahoud Jeries, PhD candidate
PI: Prof. Nati Karin
The Ruth and Bruce Rappaport Faculty of Medicine, Technion

INTRODUCTION:

Inflammatory Bowel Diseases (IBD) are immune mediated idiopathic disorders of the Gastro-intestinal tract.

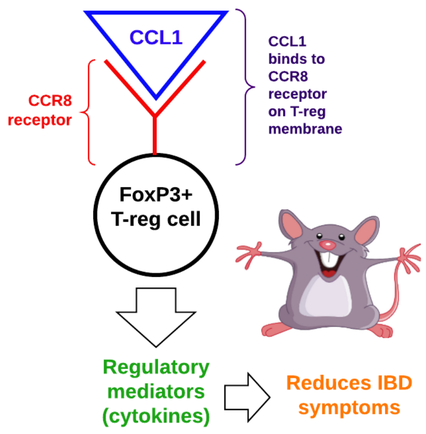


Chemokines are cell-signaling molecules and are important in immune regulation [1].

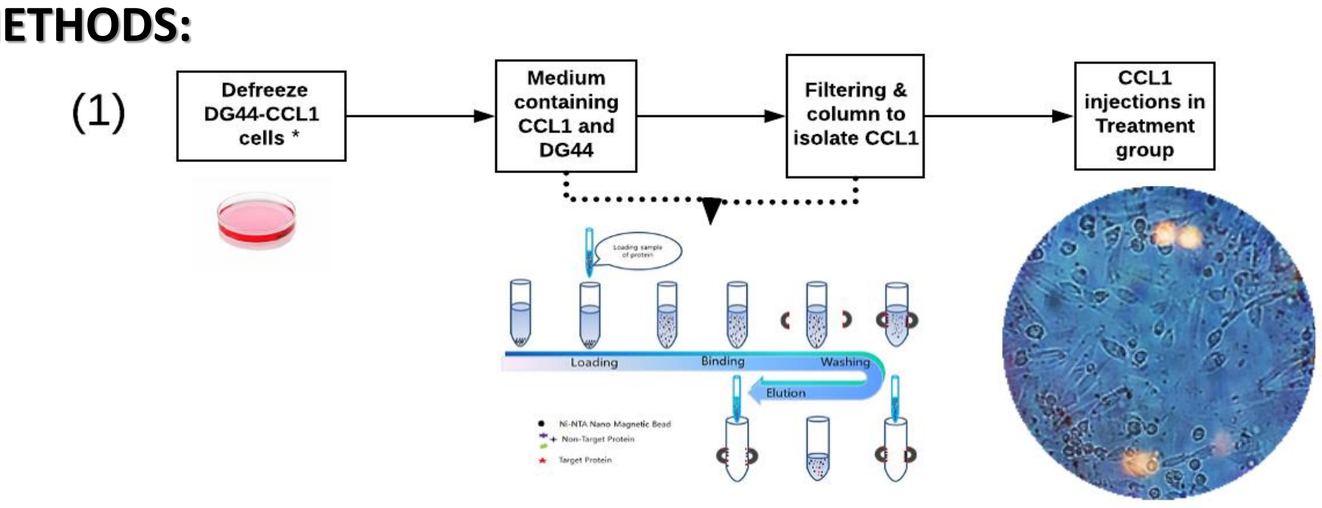
CC chemokine ligand 1 (CCL1) is produced by activated monocytes, T lymphocytes and endothelial cells. CCL1 activates the CCR8 (CC receptor 8) on T-regulatory (T-reg) membranes. CCR8 is believed to mediate T-reg cell recruitment in allergic inflammation [2].

HYPOTHESIS:

The CCL1 chemokine inhibits the progression of Inflammatory Bowel Disease.



METHODS:



1. Isolation and preparation of CCL1 injections
2. DSS model in mice: C57BL/6 mice (6 mice/group) were treated with DSS (4% dissolved in drinking water). Mice were Intraperitoneal Injection (IP) injected 24 hours post DSS administration and twice more on day 4 and 6 with either CCL1 or Phosphate Buffered Saline (PBS) [3].

*DG44 CHO dhfr-/- - Chinese Hamster Ovary cells, dihydrofolate reductase (dhfr) deficient mutant. Creating CHO-DG44 mammalian cells clones that are highly expressive for recombinant CCL1-Ig was described
**The Wallace score rates the severity of inflammations on a scale of 0 to 15. A low score indicates a healthier colon.

RESULTS:

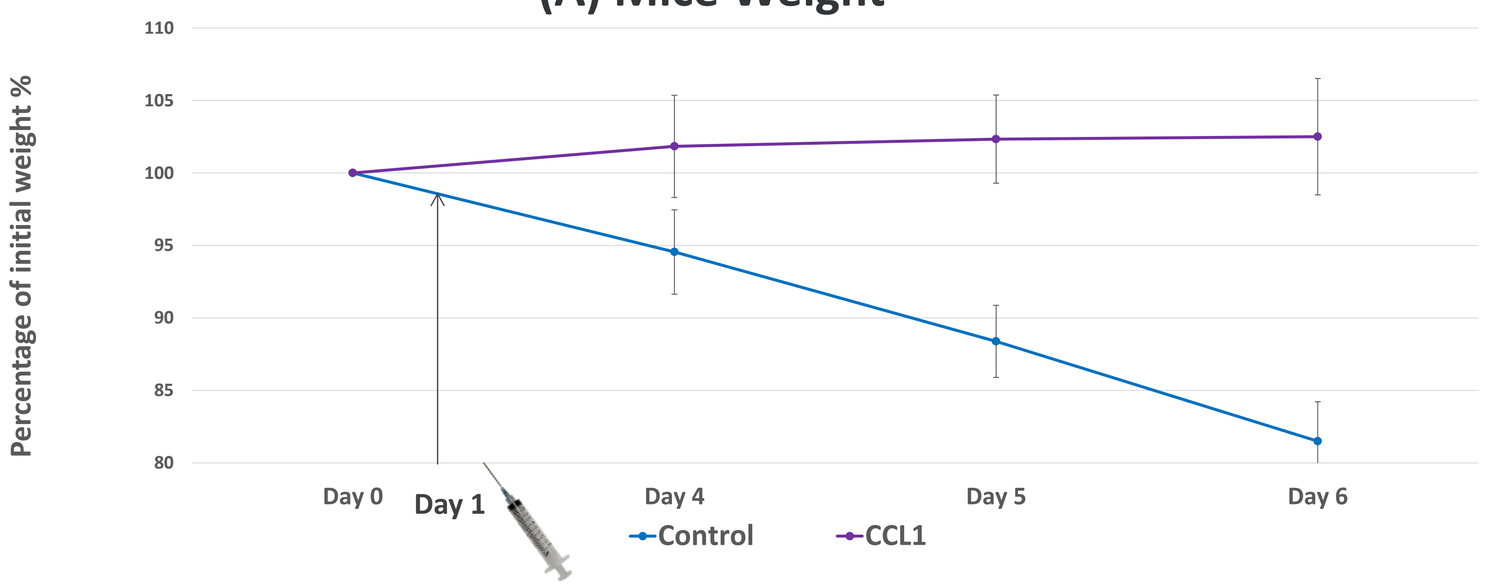
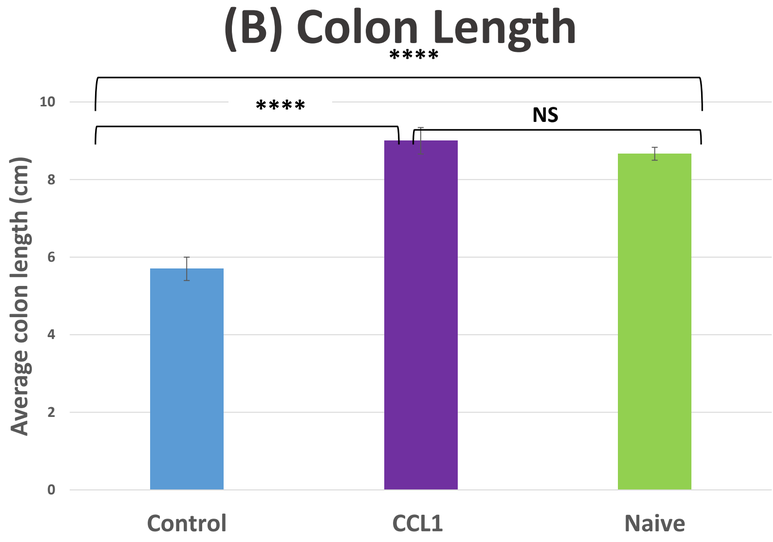


Fig. A - The percentage of initial body weight of CCL1 treated mice remains steady at around 100% while that of untreated mice decreases (**p<0.001).**



Figs. B & D - The colons of treated mice are longer and thinner, similar to those of healthy wild mice, while those of untreated mice were shorter and thicker and contained blood (**p<0.001).**

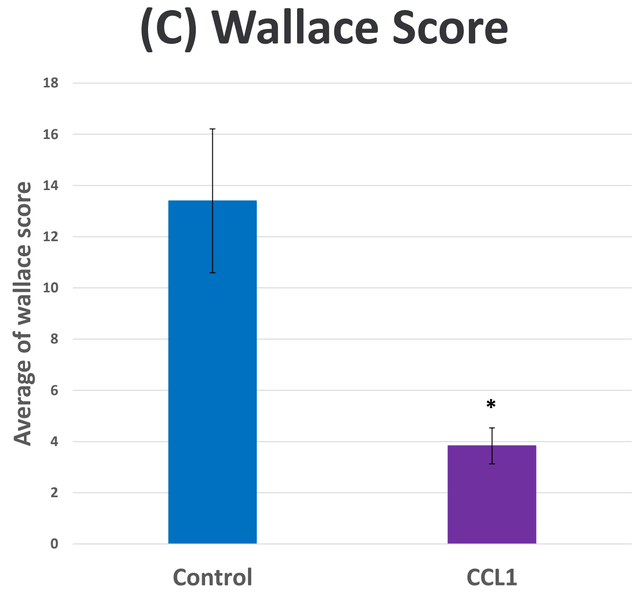


Fig. C - Wallace score of CCL1 mice was lower than that of control group (*p<0.05).

DISCUSSION AND CONCLUSIONS:

- **As the role of CCL1 has not been studied extensively, our project researched its function in the progression of IBD**
- **Injecting the chemokine CCL1 inhibits the progression of IBD**
- **There is a potential anti-inflammatory role of CCL1 in the colon in the DSS-induced model of acute colitis in mice.**

REFERENCES:

[1] Luster AD. Chemokines--chemotactic cytokines that mediate inflammation. N Engl J Med 1998,338:436-445
[2] Barsheshet, Y., Wildbaum, G., Levy, E., Vitenshtein, A., Akinseye, C., Griggs, J., Sergio, L. A, Karin, N. (2017, June 06). CCR8 FOXp3 Treg cells as master drivers of immune regulation
[3] Okayasu I, Hatakeyama S, Yamada M, Ohkusa T, Inagaki Y, Nakaya R. A novel method in the induction of reliable experimental acute and chronic ulcerative colitis in mice. Gastroenterology 1990,98:694-702

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