Background: Treatment with helminthes improves clinical findings of several autoimmune diseases. Some of the tolerogenic properties of helminthes and their ova were attributed to the phosphorylcholine (PC) moiety.

Aim: to decipher the prophylactic and therapeutic potential of Tuftsin-PC (TPC) compound in experimental colitis mice model.

Methods: 1. Acute colitis was induced in mice using Dextran-Sodium-Sulfate (DSS) for 5 days. TPC (50 μg/0.1ml PBS) prophylactic treatment or PBS was given orally for 11 days, beginning at day -2 before disease induction. 2. Chronic colitis was induced in mice using DSS for four consecutive 5-day periods. After each cycle of DSS there was a 5-day recovery period. After chronic colitis was induced TPC (50 μg/0.1 ml PBS) or PBS had been administered daily for 14 days along with two additional DSS cycles.

Disease activity index (DAI) score was followed daily and histology of the colon was performed by H&E staining. Analysis of the cytokines profile in colon lysates was performed by immunoblot. Mesenteric lymph nodes were excised and T regulatory cells measured. The effect of TPC M1 polarized RAW 264.7 cell line murine macrophages was evaluated.

Results: 1. Prophylactic treatment with TPC ameliorated the severity of acute colitis, including a reduction in the DAI score, less shortening of the colon and less inflammatory activity in histology. TPC treatment was associated with downregulation of colon pro-inflammatory IL-1β, TNFα and IL-17 cytokines expression, and enhancement of anti-inflammatory IL-10 cytokine expression. 2. TPC treatment for chronic colitis resulted in a substantial beneficial effect in all observed clinical and histologic manifestations and significantly promoted the CD4^+CD25^+FOXP3^+ Treg phenotype expansion in mesenteric lymph nodes. TPC treatment caused a shift of M1 macrophages to M2 macrophages secreting the anti-inflammatory cytokine IL-10.

Conclusion: Our results propose a new approach for natural therapy for inflammatory bowel disease.