Mucosal Autoimmunity in Rheumatoid Arthritis: Intestinal Microbial Dysbiosis

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Background

- Rheumatoid arthritis (RA) = systemic autoimmune disease defined by inflammatory arthritis.
- Pre-clinical RA = autoantibodies (i.e. RF, anti-CCP) preceding arthritis onset in RA by several years.
- Production of autoantibodies hypothesized to occur in mucosal sites
  - One particular site = gut
  - Dysbiosis in gut microbiota linked to other systemic autoimmune diseases
- Objective of this project - Review and summarize findings on relationship between gut microbiota and RA

Methods

- Comprehensive literature review conducted using PubMed, Google Scholar, and OpenEvidence
- Inclusion criteria: paperss looking at gut microbiota in RA patients
  - Changes in composition
  - Possible mechanisms of pathogensis
  - Humans and mouse models
- Clinical trials, qualitative and quantitiave studies, other literature reviews included

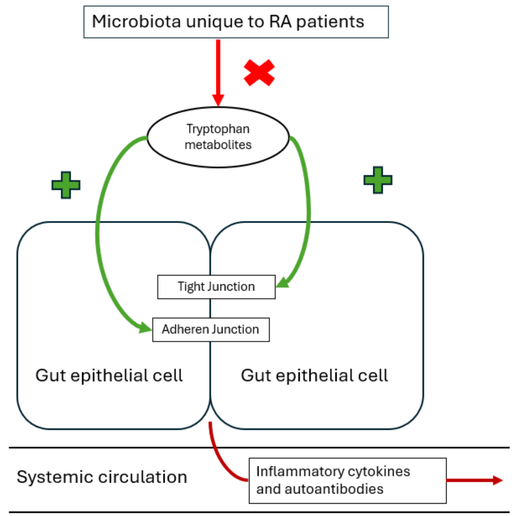

Figure 1. Proposed mechanism of tryptophan's effect on epithelial permeability to proinflammatory mediators (i.e. cytokines and autoantibodies)

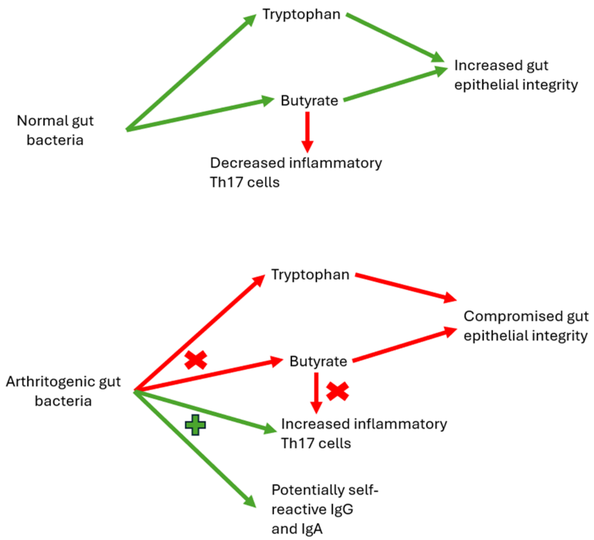

Figure 2. Summary of possible mechanisms of the role of gut dysbiosis in RA.

Results

- Gut microbiota composition between RA patients and healthy controls are significantly different, and can normalize with treatment
- Various bacterial species implicated; *Prevotella copri, Subdoligranulum* are two potential arithrogenic species mentiond multiple times
- Differences in bacterial metabolites noted between RA patients and healthy controls
- Butyrate and tryptophan specifically noted as inflammation-modulating in gut

Discussion

- Gut microbiota likely plays role in pathogenesis of RA
- Papers provide further support for mucosal origin hypothesis for RA
- Bacteria and metabolites represent possible targets for preventative medications in the future
- Gut microbiota could also provide more specific risk markers for risk of progression in pre-clinical RA
- Useful risk stratification for designing clinical trials as well as providing patients with more information