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Summary

TISSUE FOLDS ORGANISE COLON LYMPHATICS TO CHANNEL INTERSTITIAL OUTFLOW AND PROMOTE RESILIENCE AGAINST INFLAMMATORY SWELLING

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UEG Week Barcelona 2026 | Presentation

Gut Microbiota | Mechanisms & Personalised Medicine | Immunology | IBD

October 18, 2026

Whole-organ imaging reveals that tent-like tissue folds in the colon organise lymphatic vessels, macrophages, and blood vessels into integrated drainage reservoirs, and these folds are lost at the sharp boundaries of inflamed versus healthy tissue in human ulcerative colitis.

KEY POINTS

- Colonic initial lymphatic vessels developed postnatally beneath epithelial crypts, which were embedded in a macroscopic landscape of tent-like folds creating prominent interstitial pockets.
- Interstitial fluid outflow was not uniform but followed geometry-dependent drainage pathways defined by these folds, demonstrated by tracking exogenous and endogenous tracers through the colon.
- Colon folds spatially coordinated lymphatic vessels, blood vessels, macrophages, and lymphoid tissue to form integrated stromal-vascular-immune reservoirs positioned to receive and concentrate interstitial cargo.
- Human ulcerative colitis tissue showed focal loss of folds at sharp boundaries between inflamed and adjacent healthy regions.
- During DSS-induced colitis in mice, folds widened in an accordion-like manner over an expanding submucosa, indicating that fold geometry dynamically adapts under inflammatory stress.
- Disruption of this structural framework during inflammation may compromise interstitial drainage and immune positioning.

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