

Improving Colitis Symptoms via an IL-12/23 p40 Neutralizing Antibody: Using the iNSiGHT Dual Energy X-Ray Absorptiometry (D(E)XA) System to Measure Changes in Body Composition

In this recent study, Jung, Y.K. and co-workers demonstrated the potential of inflammatory cytokines-neutralizing antibodies to protect against sarcopenia – the loss of muscle mass and function – which affect ~40% of patients suffering from inflammatory bowel disease (IBD) and other chronic disorders of the gastrointestinal (GI) track. Using the established dextran sulfate sodium (DSS)-induced murine model of colitis which effectively recapitulate sarcopenia, the authors demonstrate that treatment with Interleukin-12/23 (IL-12/23) p40 neutralizing antibodies significantly reduce muscle mass loss as evidenced by both higher lean tissue mass and higher fibre cross-sectional area of gastrocnemius and tibialis anterior muscle fibres on histology in the treated cohort. In addition, treated mice also demonstrated significantly better muscle function as measured using forelimb grip and fatigue during distance running compared to IgG-treated controls.

In this study, the authors used the iNSiGHT D(E)XA system to rapidly and noninvasively monitor body composition, including bone mineral density (BMD, g/cm^2), fat tissue (g) and lean tissue mass (g) and to demonstrate i) the loss of lean tissue and fat tissue mass following daily oral administration DSS, validating DSS-treated mice as a robust model of colitis-associated sarcopenia and ii) the partial recovery of the lean tissue mass during neutralizing antibody treatment, corroborating the recovery in total body weight (**figure 1**).

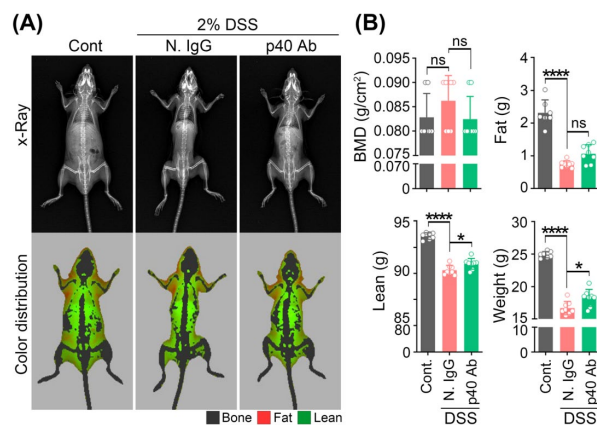


Fig 1. A) Representative D(E)XA images captured on the iNSiGHT system in a mouse model of colitis treated with either IgG or IL-12/23 p40 antibody. B) Body mass index measurements ((bone mineral density (BMD in g/cm^2), fat mass (g), lean mass (g), and total weight (g)) of mice treated with either IgG or IL-12/23 p40 antibodies.

In summary, this study demonstrates that IL-12/23 p40 neutralising antibodies have a protective effect and alleviate both muscle atrophy and loss of muscle function in a murine model of colitis. The iNSiGHT D(E)XA is an effective and efficient imaging system to monitor treatment-induced changes in body composition and help accelerating novel treatment for debilitating conditions such as sarcopenia.

References:

- Jung, Y. K., Lee, S., Yoo, J. I., & Baek, K. W. (2023). The protective effect of IL-12/23 neutralizing antibody in sarcopenia associated with dextran sulfate sodium-induced experimental colitis. *Journal of Cachexia, Sarcopenia and Muscle*.

Author:

Yann Jamin PhD, Product Manager at Scintica