

# Irons status affects non-alcoholic fatty liver disease through the gut microbiome

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## Video Byte

**Keywords:** systems medicine, ferritin, iron status, gut microbiome, non-alcoholic fatty liver disease, NAFLD, shotgun sequencing, metagenomics, obesity, metabolomics, transcriptomics, Microbiome

**Posted Date:** October 15th, 2021

**DOI:** <https://doi.org/10.21203/rs.3.rs-969956/v1>

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# Abstract

Non-alcoholic fatty liver disease (NAFLD) is a common metabolic disease that can progress to cirrhosis and hepatocellular carcinoma. Iron level is a known factor in the development of NAFLD, but the details of its involvement are unclear. To elucidate the mechanisms at play, researchers applied an integrative systems medicine approach. They examined the fecal metagenome, plasma and urine metabolome, and hepatic transcriptome in three human cohorts, confirming the findings in vitro and using mice. Serum ferritin levels, a marker of hepatic iron stores, was linked to liver fat accumulation and a decrease in gut microbial gene richness. Elevation in ferritin was also associated with changes in the abundance of several bacterial families. Those families were strongly correlated with iron-related liver genes. This iron-related microbiome signature was also associated with the degree of liver fat accumulation. Fecal microbiome transplantation from human “high-ferritin donors” into mice also showed alterations to genes related to iron metabolism and fatty acid accumulation. These results show a significant interplay among iron levels, the gut microbiome, and liver fat accumulation. which may aid in the development of future therapies.