Society for Pediatric Research

CONNECT. COLLABORATE. CATALYZE RESEARCH.

Jain, Ajay

Our lab focuses on research to evaluate preventative strategies for Parenteral Nutrition (PN) associated liver and gut injury. PN involves, providing all nutritional needs via the intravenous route, in the clinical setting where enteral nutrition is not possible. PN therapy is used worldwide for both pediatric and adult patients. Such therapy has grown enormously over the past several decades especially in the NICU babies.

Despite being a life saver, PN causes several complications, including life threatening and potentially fatal liver disease as well as gut atrophy. We believe that PN related pathologies are a result of an altered entero-hepatic circulation. This results in decreased stimulation of gut Farnesoid X receptor (FXR) and in turn circulating Fibroblast Growth Factor 19 (FGF19). Our studies also suggest that during PN infusion there is a decrease in the level of circulating, gut growth promoting, Glucagon like Peptides (GLPs). Since GLPs are modulated via the G protein-coupled receptor TGR5, our research focuses on therapeutic strategies targeting the FXR-FGF19 axis, the TGR5-GLP axis as well as bile acids which serve as gut receptor agonists. Recent data also suggests that during PN therapy gut Bacteroidetes clonal expansion disrupts gut integrity leading to increased serum endotoxin and inflammatory cytokines which are additionally modulated by FXR and TGR5. Our lab has thus also been evaluating the role of the gut microbiota and bile acids in PN related injury.