Identifying Immune-Signature for Peritumoral Tonsil

The molecular modifications occurring at the tonsillar tissues associated with lymphatic spread are critical in anti-tumor immune response as well as disease progression in oropharyngeal carcinomas (OPCs). By gene expression profiling of peritumoral lymphoid regions, Wakisaka et al (Am J Pathol 2023, 1006—1012) explored the unique microenvironment of secondary lymphoid organs involved in OPC. The analysis identified transcriptional programs associated with metastasis as well as potential patterns of anti-tumor immune response, and may aid in patient stratification for treatments. Further studying peritumoral tonsils may help elucidate targetable immune mechanisms associated with the lymphatic spread of the disease in OPCs.

Modeling Intestinal Fibrosis

Our understanding of intestinal fibrosis is limited by the lack of appropriate preclinical models. Steiner et al (Am J Pathol 2023, 1013—1028) therefore characterized TNF-ARE ileal inflammation mouse model to explore their use in studying intestinal fibrosis. Many clinically relevant outcomes were studied to evaluate fibrosis over different age ranges. TNF-ARE mouse model may help study the pathogenesis of intestinal fibrosis to develop potential treatments.

Targeting Pelvic Pain in Endometriosis

Identification of neuroinflammatory pathways can aid in developing new interventions for endometriosis. Using hysterectomy specimens, peritoneal fluids from women with and without endometriosis, and cultured endometrial cells, Yu et al (Am J Pathol 2023, 1046—1058) studied the role of neurotrophins in the pathogenesis of endometriosis. Nerve fiber and neurotrophins and their receptors were observed in histological assessment. In vitro, the effects were found to be mediated by IL-1β and c-Jun N-terminal kinase (JNK) pathway. The use of JNK inhibitors may help reduce neuroinflammation in women with endometriosis.

Studying Steatosis in Preclinical Mouse Model

Novel methods are needed to study nonalcoholic fatty liver disease and to test drug efficacy in preclinical models. Mairinoja et al (Am J Pathol 2023, 1072—1080) therefore developed a deep neural network—based model to quantify the type and extent of steatosis in the mouse liver tissue. Hematoxylin and eosin—stained whole slide images and a commercial cloud-based platform were used. Image analysis results aligned with the evaluation by trained pathologists as well as other chemical and established imaging analyses. This novel tool may help study and quantify steatosis in preclinical studies using mouse models.

Treating Primary Lymphoma of the Central Nervous System

Strong CXCR4 expression is a hallmark of primary lymphoma of the central nervous system (PCNSL); however, its function is unclear. Using cultured cells and a PCNSL mouse model, Montesinos-Rongen et al (Am J Pathol 2023, 1101—1115) studied the effect of inhibiting CXCR4 using AMD3100. Inhibition resulted in significant differential expression of 273 genes encoding a variety of proteins, including CD200, a regulator of CNS immunological activity. The results were replicated in in vivo studies. AMD3100 may act as a therapeutic tool in the treatment of PCNSL.