Managing Age-Related Macular Degeneration

Choroidal neovascularization (CNV) may lead to irreversible vision loss in patients with age-related macular degeneration (AMD)—the leading cause of blindness in the seniors. Using a 3’ RNA sequencing approach, Schlecht and Boneva et al (Am J Pathol 2020, 1632–1642) analyzed CNV and archived control specimens to characterize global gene expression. One-hundred and fifty-eight differentially-expressed genes (DEG) that were significantly increased in CNV compared to control tissue were identified. The S100 calcium-binding protein A8 (S100A8) and S100A9 were among the top DEG and this finding was confirmed by immunohistochemical and protein analysis. S100A8/A9 are novel biomarkers that may be targeted to manage AMD.

Regulating Epithelial Restitution in the Intestine


Understanding Mechanotransduction in Cholesteatoma

The mechanisms underlying epithelial proliferation in negative-pressure–induced cholesteatoma of the middle ear are unclear. Using cell cultures, animal models, and human cholesteatoma tissues, Yamamoto-Fukuda et al (Am J Pathol 2020, 1667–1679) studied these mechanisms. The stromal and epithelial cell distribution, nuclear translocation, and the changes in expression levels were studied for some previously implicated factors that included integrin-linked kinase (ILK; an actin cytoskeletal modulator), yes-associated protein (YAP; a mechanotransduction effector), and L1 cell adhesion molecule (L1CAM; an activator of the mechanotransduction effectors). The results confirm that the L1CAM–ILK–YAP signaling pathway is critical for epithelial growth under mechanotransduction in middle ear cholesteatoma formation.

Treating COVID-19

There are no proven treatments for COVID-19 disease, which is caused by the infection with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Since convalescent plasma therapy has been used historically in the treatment of severe microbial infections with some success, Salazar et al (Am J Pathol 2020, 1680–1690) studied its usefulness in treating COVID-19. Convalescent plasma from donors with confirmed SARS-CoV-2 infection, who had recovered, was transfused in selected patients with severe and/or life-threatening COVID-19 disease. The safety and clinical status at days 7 and 14 post-transfusion was studied. Clinical improvement was assessed using established criteria. Treated patients showed improvement with no associated adverse events. Convalescent plasma therapy may be a safe treatment option for patients with severe COVID-19 disease.

Diagnosing Nasopharyngeal Carcinoma

Pathologists often report inconsistencies in reporting the pathological diagnosis of nasopharyngeal carcinoma (NPC). Diao, Hou, and Yu (Am J Pathol 2020, 1691–1700) studied the ability of a deep learning algorithm to efficiently diagnose NPC. The performance of the model was compared against three trained pathologists with variable experience. The model performed better than the junior and intermediate pathologists; however, it showed a slightly lower performance than the senior pathologist when compared on accuracy, specificity, sensitivity, area under the curve, and consistency. The deep learning model may assist pathologists by providing additional input on their NPC diagnoses.