This Month in AJP

Preventing Severe Progression of COVID-19

Lymphoid depletion in lymphoid tissues and lymphocytopenia are linked with poor disease outcomes in patients with coronavirus disease 2019 (COVID-19); however, the underlying mechanisms are unclear. Using mouse models susceptible and resistant to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection, Y.J. Lee, Seok, and N.Y. Lee et al (Am J Pathol 2023, XX–XX) studied the underlying mechanisms. The murine lethality of COVID-19 was characterized by the lymphoid depletion associated with suppressed antigen-presenting cell (APC) function. Increasing APC function may prevent the severe progression of COVID-19.

Managing Diabetic Retinopathy

Systemic reduction of the primary facilitative glucose transporter in the retina, Glut1, in type 1 diabetic mice counters defects associated with diabetic retinopathy. Aiello et al (Am J Pathol 2023, XX–XX) studied if a similar systemic reduction may diminish the hallmarks of diabetic retinopathy in a type 2 diabetic mouse model. Control and spontaneously diabetic mice expressing wild-type or systemically reduced levels of Glut1 were aged and analyzed. Systemic reduction of Glut1 prevented retinal pathology in type 2 diabetic mice. Reducing Glut1 in the retina of diabetic patients may help manage diabetic retinopathy.

Healing Degenerative Rotator Cuff Injury

Aging-related tissue degradation results in rotator cuff injury among the elderly. Using primary chondrocytes and a mouse model, Xie et al (Am J Pathol 2023, XX–XX) studied the role of mitochondrial deacetylase sirtuin 3 (SIRT3) in degenerative rotator cuff injury. Aging in mice caused degeneration of the fibrocartilage layer and a decrease in SIRT3 levels in the rotator cuff. Degeneration of the fibrocartilage layer could be reversed by activating SIRT3. Activating SIRT3 may promote rotator cuff healing in the elderly population.

Reducing Nucleus Pulposus Fibrosis

Inhibiting heat shock protein 90 (HSP90) is protective in intervertebral disc (IVD) degeneration (IVDD), which is usually accompanied by nucleus pulposus (NP) fibrosis and pathologic angiogenesis. Using human tissue and various cultured cells, Zhang et al (Am J Pathol 2023, XX–XX) studied the effects of inhibiting HSP90 on NP fibrosis and pathological angiogenesis. Severely damaged human IVD tissues showed macrophage infiltration and increased levels of cell migration–inducing protein (CEMIP) and vascular endothelial growth factor A. Inhibiting HSP90 improved macrophage-induced fibrotic phenotype of NP cells by inhibiting CEMIP. HSP90 inhibitors may help manage fibrosis.

Analyzing Melanoma Growth

A series of genetic changes that drive histologic alterations within nevi and surrounding tissue lead to melanoma. By analyzing publicly available gene expression data sets of melanoma, Zia et al (Am J Pathol 2023, XX–XX) studied the molecular and genetic pathways causing early melanoma. The selected gene expression data sets included common and dysplastic nevi and early stages of melanoma. Targeting the identified pathways and/or associated genes involved in local tissue remodeling may help in drug development for melanoma.