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### Injury and Repair in the Pulmonary Alveolus

#### Research emphasis:

Our laboratory has been focused on mechanisms that regulate repair and renewal of epithelial surfaces in the pulmonary alveolus. This has included extracellular matrix (ECM)-mediated cellular responses to growth factors that alter specific gene expression leading to proliferation and ending with differentiation or transition. Recent studies have examined signaling pathways that control cell fate decisions in stem cells in adult lung. These processes are key in determining whether epithelial injury effectively resolves, or results in irreversible fibrosis. This has involved specific cell-cell and cell-ECM interactions as they control the initiation and perpetuation of fibrogenesis in lung diseases like IPF.

#### Selected publications:

Zhang, H, D. R. Newman, J. C. Bonner and **P. L. Sannes**. 2012. Over-expression of Human Endosulfatase-1 Exacerbates Cadmium-induced Injury to Transformed Human Lung Cells *In Vitro*. *Tox. & Appl. Pharm.* Nov 15;265(1):27-42. PMID:23000194; PMCID:PMC348997

Johansson H.M., D.R.Newman, and **P.L.Sannes**. 2014. Whole-Genome Analysis of Temporal Gene Expression during Early Transdifferentiation of Human Lung Alveolar Epithelial Type 2 Cells *In Vitro*. *PLoS ONE* 9(4): e93413. doi:10.1371/ journal.pone.0093413. PMID:24690998; PMCID:PMC3972118

Newman, D.R., Sills, W.S., Hanrahan, K., Ziegler, A., Tidd, K.M., Cook, E., **Sannes, P.L.** 2016. Expression of WNT5A in Idiopathic Pulmonary Fibrosis and Its Control by TGF- $\beta$  and WNT7B in Human Lung Fibroblasts. *J Histochem Cytochem.* 64(2) 99–111 PMID: 26538547

#### Application:

- Epithelial regeneration
- Lung fibrogenesis
- Cell fate determinants
- Extracellular matrix

#### Collaboration potential:

- Human stem cell models
- Animal models of epithelial damage