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CD44-high alveolar type II cells show stem cell properties during steady-state alveolar homeostasis

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The alveolar epithelium is composed of type I cells covering most of the gas-blood exchange surface and type II cells secreting surfactant that lowers surface tension of alveoli to prevent alveolar collapse. Here we have identified a subgroup of type II cells expressing higher level of cell surface molecule CD44 (CD44^{high} type II cells) that comprised ~3% of total type II cells in 5-10 week old mice. These cells were preferentially apposed to lung capillaries. They displayed a higher proliferation rate and augmented differentiation capacity into type I cells and the ability to form alveolar organoids compared to CD44^{low} type II cells. Moreover, in aged mice of 18-24 months old, the percentage of CD44^{high} type II cells among all type II cells was increased but these cells showed decreased progenitor properties. Thus, CD44^{high} type II cells likely represent a type II cell sub-population important for constitutive regulation of alveolar homeostasis. Since CD44 is considered as a marker for cancer stem cells in lung cancer, it is important to further characterize the signaling of CD44^{high} type II cells in lung homeostasis, regeneration and aging, as dysregulation of the CD44^{high} type II cells is likely to contribute to the cancer initiation.

Biography

Yuru Liu has completed her PhD from John Hopkins University School of Medicine and Post-doctoral studies from Duke University. She is an Assistant Professor in Department of Pharmacology, School of Medicine, University of Illinois at Chicago. She has established her own research group and uses state-of-the-art genetic models to identify the signaling mechanisms of alveolar regeneration after lung injury. She has published 15 papers in reputed journals and has been serving as Councilor in American Society for Pharmacology and Experimental Therapeutics, the Great Lakes Chapter.

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