

“Epithelial Stem Cells in Lung Cancer and COPD”

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Funding Category: A

Abstract: Conventional chemotherapy and radiotherapy treat cancer, but cures are rare. Prior approaches have pursued a logic aimed at using cytotoxic treatments that kill tumor cells in preference to normal cells, but the severe adverse effects of these therapies are a testament to the collateral damage inflicted on normal cells and tissues. A new concept in cancer therapy holds that the focus of therapy should be cancer stem cells (CSCs), not the highly proliferative tumor cells that arise from CSCs. To develop therapies targeted at CSCs, a better understanding of the biology of the CSC is needed. This proposal describes a plan to develop a better understanding of the CSCs that lead to lung cancer and to determine how those cells are different from the normal stem/progenitor cells that give rise to normal airway epithelium. This proposal will also seek to understand why individuals who smoke cigarettes and, in particular, individuals who have developed chronic obstructive pulmonary disease (COPD), as a group, have an elevated risk of developing lung cancer. By understanding smoking-induced changes in lung epithelial stem/progenitor cells, rational therapies targeting CSCs might be developed.