

**Design and modelling of a lung-on-a-chip airflow system for studying particle inhalation and deposition in airways (\*New - Winter 2019\*)**

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Chronic lung diseases (CLDs) such as asthma and chronic obstructive pulmonary disease (COPD) are major global health problems, and are made significantly worse by environmental factors such as air pollution. To study the effects of air pollution on the biological response of lung airway cells and tissues, the Young Lab has recently developed an airway-on-a-chip device that accurately models the structure and physiology of airway tissue. To further advance this device for air pollution studies, a custom airflow system is required to deliver air pollutants and other particles into the airway-on-a-chip device in a physiological manner. The objective of this project is to design and model a suitable airflow system that can be integrated with the airway-on-a-chip platform. The project will involve designing the system, sourcing the parts, and modelling the airflow generated in the airway-on-a-chip, with potential to work in collaboration with members of the Young Lab to test and implement the airflow system.

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**Research Area:** Microfluidics; biofluid mechanics; microscale cell-based systems; cellular microenvironments; microfabrication; cell biology; cell imaging and microscopy; biomedical engineering; and cancer.