

The University of Queensland - IIT Delhi Academy of Research Joint PhD Project

Project title	Pollen and its contribution to respiratory outcomes in subtropical regions
Project code	UQIDAR 00185
Project description	<p>Air quality is a strong predictor of respiratory health. In comparison to traditional sources like industry, transport, open burning, bushfires, power plants, the contribution of plant pollen is not so well studied in the subtropical/arid climate. Residents in the subtropical regions show higher allergic sensitivity and subfamily-specific immunoreactivity with pollen of Chloridoideae and Panicoideae grasses, compared with temperate grass pollen. Therefore, knowledge of species and amount of pollen in air column is essential to preparing more accurate predictions of episodes when respiratory disease burden would be high and focusing public health efforts. We plan to examine what biologics are in the air column in Delhi and Brisbane as currently there is very little knowledge. Aerial dispersion of pollen gives an important snapshot of the biodiversity of the surrounding environment. New environmental DNA (eDNA) techniques allow samples of plant pollens and fungal spores to be collected and analysed using stored data (œDNA barcode library) or other sequencing techniques allowing sapling of all genes in all organisms present in a complex sample via high-throughput molecular methods. This information, when combined with the next generation air quality models provides a variety of tools to examine the release, dispersion and transformation of bioaerosols and how it affects the environment. Further we expect to analyse the respiratory morbidity data from the two cities to understand the health risk of exposure to pollen. We will collect pollen at different times of year. Using eDNA techniques and light microscopy we will ascertain diurnal and seasonal fluctuations in pollen genera and species, and their relationship to human health outcomes.</p>
Project outcomes	<ol style="list-style-type: none"> 1. Understand the contribution of pollens to inhaled burden of air pollutants 2. Examine how the burden changes in time and space 3. Comparative assessment of the health risk due to pollen with other urban sources (e.g. industry, transport, open burning) 4. Compare the Indian and Australian environments and public health burden due to pollen exposure
Advisory team	<p>UQ Principal Supervisor Associate Professor Nicholas Osborne Public Health n.osborne@uq.edu.au https://public-health.uq.edu.au/profile/4316/nicholas-osborne</p> <p>IITD Principal Supervisor Professor Sagnik Dey Atmospheric Sciences School of Public Policy sagnik@cas.iitd.ac.in www.web.iitd.ac.in/~sagnik</p>
Type of student	Applications are open to: I or q students who meet eligibility criteria .
Discipline background of student	Ideally, this project requires students with a background in: environmental science biological science public health epidemiology

Ideal candidate

Essential Capabilities: Experience in data analysis in Matlab and/or R and/or Python.

Desirable Capabilities: Background in this field with essential experience and prior work experience in air pollution research, particularly air pollution measurement. Experience working with large health data sets and/or epidemiological studies is highly desirable.

Expected qualifications (Courses/Degrees etc.): M.Tech/MSc/BTech/MPH (with GATE/NET/DST-INSPIRE) in a relevant discipline (atmospheric science, epidemiology, biotechnology, environmental science, public health, statistics and/or biostatistics).

Application
process

Apply online by the due date: <https://www.uqidar.org/students/how-to-apply/>