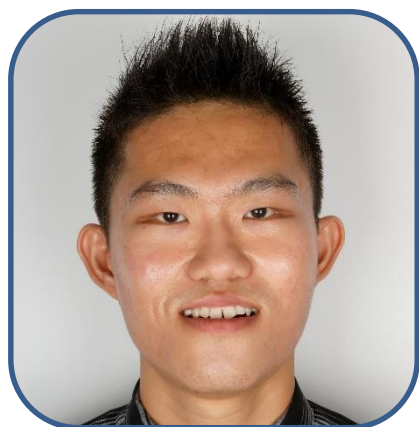


Pharmacy

Department Seminar

Date: 5th Mar 2018
Time: 5pm
Venue: S4A Level 3
Room A & B

Development of a 3D Printed Human Lung Model Assembly for Inhalation Drug Testing



Seng Han graduated with B.Sc. (Pharmacy) Hons from the National University of Singapore (NUS), in 2011. He worked as a pharmacist in Singapore General Hospital, before returning to pursue his Ph.D. in 2014. He is currently working under the supervision of Prof. Paul Ho. His present research interest is in the use of 3D printing technology to develop personalized drug delivery and testing systems.

Pulmonary route is the main route of drug delivery for asthmatic and chronic obstructive pulmonary disease patients. It offers advantages such as a quick onset of action due to its large surface area of absorption, with minimal systemic side effects. Furthermore, it can bypass barriers of therapeutic efficacy such as poor gastrointestinal absorption and first-pass metabolism in liver. However, these effects can only be experienced if the drug particles are deposited in the desired parts of our respiratory tract. Current standards to predict particle deposition in the respiratory tract relies on the measurement of aerodynamic diameter (ADD) distribution using inertial impaction based devices such as the Anderson Cascade Impactor or the Next Generation Impactor. Particles of a certain aerodynamic diameter (ADD) are largely assumed to deposit entirely at a fixed location in the respiratory tract. However, based on human adult radiological data, only a proportion of particles of a certain ADD is deposited in a specific location.

In this seminar, we will discuss the development of a 3-dimensionally (3D) printed, physical human lung model assembly to measure a direct true deposition of particles in our respiratory system. Using the morphologically accurate lung model assembly, results from the deposition studies will be compared to actual *in vivo* lung deposition data from previous radiological studies in adult human.