Investigation of the roles, fate and applications of cell-derived drug delivery systems obtained through a "one pot" process

"Biomimicry" derives from Ancient Greek, and it encompasses the fusion of the word Bios (life), and mīmēsis (imitation), i.e. imitation of Nature. Cells are natural biological entities that secrete small extracellular vesicles (EVs) as a mean to transport information and biomelcules into other cells. Receiving cells are then equipped with recognition motifs that enable the selective internalization of these EVs.

The imitation of this natural process that enables cells to communicate with both neighbouring and distant cells has inspired the development of new nanotechnological strategies to improve the delivery of drugs at their site of action. Our group has recently conceived nano-biohybrid vesicles, obtained through the fusion of cell-derived components with conventional synthetic materials, which represent an unreported chimeric drug delivery system (DDS) with ideal properties in terms of nano-size, surface attributes, as well as ease of loading and functionalization, which pave the way towards new advances in the field of nanomedicine.

In this project, the student will explore innovative DDSs through *in situ*, "one pot" synthesis & loading of chemotherapeutics and RNA-based drugs and investigate their fate both *in vitro* and *in vivo*. There will also be the opportunity to collaborate with industrial partners in the form of IRP scholarship, to advance the research from the lab into a scalable and translational technological platform.

We are seeking a highly motivated student to take up this project leading up to a PhD degree. Students who have a strong background in cell biology and expertise in extracellular vesicles are encouraged to contact A/P Giorgia Pastorin (phapg@nus.edu.sg). Only shortlisted candidates will be notified.