

Project Title	Importance of the Forces of the Heart During Embryonic Heart Development
Supervisor	Dr Choon Hwai Yap
Theme(s)	Biomechanics and Mechanobiology Computational and Theoretical Modelling
Project Type	Desk based
Project Description	<p>Congenital Heart Malformations affects about 1% of pregnancies and can be devastating. There are evidence that abnormal biomechanical forces and subsequent abnormal mechano-biology expressions could be responsible for the malformations. For example, fetal aortic stenosis can prevent normal contractions of the heart, and the lack of deformational stimuli may lead to underdevelopment of the ventricle.</p> <p>In this project, we will perform analysis of 4D microscopy images of zebrafish embryonic hearts and develop a finite element model for this embryonic heart, so that we can characterize the stresses and strains within the embryonic heart.</p> <p>We will study the normal zebrafish embryonic heart and compare it to disease models, and correlate the mechanical environment to their biological expressions, to understand the importance of proper mechanical stimuli on embryonic heart growth.</p> <p>The project will be co-advised by Dr. Yap on the mechanics part, and Dr. Vermot on the biology part.</p>