Session 3 of the Teachers in Residence programme focussed on the heart. The lecture was introduced by Sarah Gundy and the first speaker was Paolo Contessotto who spoke about healing Myocardial Infarcation (MI) using a hydrogel.

The literal meaning of Myocardial Infarcation is ‘death of the heart muscle’; this happens when the heart cells are affected by being starved of oxygen. Paolo stressed the importance of research in coronary artery diseases as they are the most common cause of death worldwide (33% mortality). Paolo’s lecture went on to discuss how injectable scaffolds made of elastin (hydrogel) repair affected heart cells with the potential to promote cell growth in the heart and reduce inflammation. Another beneficial factor for using injectable hydrogel is that it is much less invasive with less risk involved than current common medical procedures for treating MI.

Paolo explained how the research was shared between universities in Greece, Switzerland, Italy, Spain, Britain alongside NUI, Galway and two small/medium enterprises. Each research centre adds a varied element to the development of biomaterial based delivery systems for ischemic conditions while the companies involved help ‘scale-up’ the product in order to take it to market.

The following speaker was Renza Spelat who spoke about regeneration models in various animals; how they can regenerate an organ after it has been damaged. Renza gave interesting examples of how zebrafish can regenerate their heart completely. The heart cells in the human heart that are affected are not replaced by new heart cells unlike that of zebrafish. She explained how mice could also do this, but only in the neonatal stage. The research is trying to find a transferable way to regenerate heart capabilities in humans.

The third speaker of the evening was Ankit Chaturvedi of ‘Vivasure Medical’. He explained the methods and pathways used to develop a medical device for using hydrogel for use in treatment of MI. Ankit discussed the steps of developing a medical device and highlighted that it was a slow process in order to pass though the stages of user needs, identifying the problem being aided, design, risk assessment, verification and finally the delivery of the
device. In addition devices need to be passed safe for use by the Food and Drug Administration (FDA) in the United States and obtain a CE mark for use in Europe.

Finally the group had an informative question and answer session with the speakers on their innovative research. It was a very interesting evening which gave me considerable insight into the research being done in NUI, Galway and CURAM which may soon have a great impact on millions of people who suffer from coronary diseases globally.

Andrew Fogarty