Liberton High School pupils helping to fight lung disease

Pupils from Liberton High School have helped to advance a £11.5 million research project by designing a microfluidic system to help fight lung disease.

The Liberton pupils were first introduced to microengineering last year as a part of the “Small Plumbing!” project, led by Dr Maiwenn Kersaudy-Kerhoas and Dr Helen Bridle from Heriot-Watt University and funded by the Royal Academy of Engineering.

University researchers visited the school and described to pupils a current challenge related to their research. Together, the teams designed a microfluidic solution to the problem. Microfluidics, or “lab-on-a-chip”, allows for the manipulation of fluids in channels the size of a human hair.

Since fluids behave very differently at this scale, entirely new types of systems can be designed and these “labs-on-a-chip” are predicted to revolutionise healthcare in the coming years.

Liberton High School teacher, Bill Harris said: “We have been delighted to work with the Small Plumbing project on engineering solutions to real science problems. The pupils have gained a tremendous insight into the work of engineers and how many disciplines have to work together in science. To hear the pupils talking to the engineers about microfluidics was a joy. They quickly grasped the possibilities and came up with their own ideas.”

A team of students from the school – named The PROCAPS – won a special award for their chip design and report.

The PROCAPS took inspiration from a large interdisciplinary

research collaboration called PROTEUS involving the Universities of Edinburgh and Bath, and Heriot-Watt University. The project, which isfunded by The Engineering and Physical Sciences Research Council(EPSRC), aims to build a medical device to help to improve diagnosis of lung disease in critically ill patients.

The PROCAPS team designed and tested a chip which will allow chemical sensors to be developed and used in the PROTEUS medical device.

Holly Fleming, a PROTEUS postgraduate chemistry student at the University of Edinburgh, is delighted that PROTEUS' work has inspired and enthused school students to design a microfluidic chip that can be used in her scientific research and may help shape how the medical device is developed. She was presented with the award winning chip yesterday.

'It is great that all of the students have engaged so well with the Small Plumbing Project and are so excited about engineering and how it can be applied. The fact that I will actually use the chip the students have designed in my research, as part of a £11.5 million funded project (PROTEUS) is amazing and a real testament to how beneficial schemes like Small Plumbing can be for everyone involved'.

Holly looks forward to meeting the students at the PROTEUS laboratories at the Queens Medical Research Institute, University of Edinburgh, where students will present Holly with their award winning chip and find out how Holly will use it in her research.

The "Small Plumbing!" project ran in collaboration with Heriot-Watt University as part of the Ingenious! Scheme, an engineering initiative sponsored by The Royal Academy of Engineering. The project aimed to introduce school pupils to the world of microengineering and challenge stereotypes about engineering.