Research a passion of the heart

Dr Yi Chen looks forward to more collaborative research

W orking in collaboration with scientists in Melbourne and Seattle, cardiothoracic trainee Dr Yi Chen has not only described the role played by the protein activin A in myocardial ischaemia reperfusion injury (IRI), but has also shown that the naturally-occurring compound follistatin can reduce IRI by neutralising the effect of activin A.

As part of his PhD thesis, which he is now in the process of finalising, Dr Chen used mouse models to investigate the effects of using follistatin, an anti-fibrotic agent, as a way to reduce the inflammatory response caused by the effects of activin A during myocardial reperfusion.

Having proved the hypothesis in animal models, Dr Chen said that in the future, if follistatin could be commercially produced, it could be used either before or during heart surgery to reduce IRI.

Every time the heart stops and then blood is restored, the patient suffers some degree of ischaemic reperfusion injury, which means that even patients who have had successful heart surgery often do not get the full benefits of it,” Dr Chen said.

“Having looked at the role of activin A in cardiopulmonary bypass at the start of my research, I then wanted to see if it plays any role in myocardial IRI because the problem of IRI is so common and in severe cases can lead to a significantly prolonged stay in intensive care.

It was most rewarding to investigate follistatin and to see how it binds with activin A to neutralise its action in setting off IRI and in future, after a great many other questions have been answered, it may be possible to put it into the cardioplegia solution as a part of a myocardial protection strategy.”

Dr Chen said, however, that the science was still in a very preliminary stage now with much still to be understood both about activin A and follistatin. He said activin A had only been isolated within the past 20 years and that while it was originally understood to be primarily a reproductive hormone, subsequent research pointed to a larger role as part of the body’s defence mechanism.

He said work was now underway to determine exactly how and when activin A was released as well as the mechanisms controlling the production of follistatin.

“Dr Chen has presented his early findings at the Annual Scientific Meeting of the Australasian Society of Cardiothoracic Surgeons in 2009 and now has a number of articles awaiting publication.

He said he was honoured to have received such strong support from the College and said that even though he is now back in full-time training at the Monash Medical Centre he hoped to continue his research in the field.

“This is an interesting area of cardiac research because IRI can have potentially devastating effects on patients even when cardiac surgeons are doing everything they can to treat it,” he said.

“It happens to every patient who has a heart attack and even if the original problem can be remedied through surgery, IRI can still weaken the heart and increase morbidity and mortality.

“While I am now concentrating on finishing my cardiothoracic training, I hope to still find the time to work alongside other researchers in our attempt to answer the questions still remaining relating to both activin A and follistatin because if the science could be translated into a product, the benefits to patients could be enormous.”

With Karen Murphy

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Successful scholar