2014/2015 Summer Studentship Project Application Form

Send to: Research Office, University of Otago Christchurch, PO Box 4345, Christchurch, by 5pm on **4 July** 2014

Supervisor Information (First named supervisor will be the contact):	
Supervisor's Name(s): Mark Hampton	
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Mailing Address:	

Research Category (Choose one category only – to be used for judging the students' presentations):		
	Laboratory	

Project Title (20 words MAXIMUM):

MIF modification and the regulation of inflammation

Project Description:

Macrophage migration inhibitory factor (MIF) is a pro-inflammatory cytokine that plays a role in regulation of the immune system. It affects the function of cells by binding cell surface receptors. MIF is an unusual cytokine, however, because it also has enzyme activity. No important biological substrates have been discovered, but small compounds that dock in the active site interfere with the structure and ability of MIF to bind its receptor.

We have discovered that MIF is inhibited by isothiocyanates and epicatechins[1,2], both of which can be obtained from the diet. We hypothesize that the active site of MIF is also targeted by endogenous compounds generated during inflammation, and this either shuts down MIF or alters its activity.

In this project the student will determine the ability of selected compounds to inhibit the enzyme activity of purified MIF. Any novel inhibitors will be investigated in more detail to determine the nature of MIF modification. Modified MIF will also be added to cultured cells to determine if the pro-inflammatory properties of MIF have been blocked.

1. Brown K.K., Blaikie F.H., Smith R.A.J., Tyndall J.D.A., Lue H., Bernhagen J., Winterbourn C.C. and Hampton M.B. Direct modification of the pro-inflammatory cytokine MIF by dietary isothiocyanates. J. Biol. Chem. 284:32425-32433, 2009.

2. Dickerhof N., Magon N.J., Tyndall J.D., Kettle A.J., Hampton M.B. Potent inhibition of macrophage migration inhibitory factor (MIF) by myeloperoxidase-dependent oxidation of epicatechins. Biochem. J. in press, 2014.