

Wednesday, August 20th, 2014

LSC 3 - Life Sciences Centre

2350 Health Sciences Mall

**12:30-1:00pm**



## Dr. Neil Mackenzie

*Postdoctoral Research Fellow*

*Department of Oral Biological and Medical Sciences,  
Centre for Blood Research,  
UBC*

### **“The role of Cathepsins in mineralisation of the ECM”**

Using a variety of state-of-the art biochemical, imaging, in vitro and in vivo techniques we are unravelling the crucial role of cathepsins in pathological cardiovascular calcification and through this we can develop specific inhibitors for use as specific and potent therapeutics. We have studied the effect of bovine neck elastin calcification on degradation by CtsK, and have established that deposition of calcium crystals partially protects elastin from cleavage. These results mimic our data showing that CtsK-mediated degradation of collagen fibres is reduced following calcification, suggesting that enzyme binding sites are blocked by  $\text{Ca}^{2+}$  and  $\text{PO}_4^{3-}$  ion deposition, preventing efficient adsorption of CtsK onto the surface of the substrate. Interestingly, digestion of elastin prior to exposure to pathological levels of circulating calcium/phosphate ions shows that incomplete cleavage reduces calcium deposition on the surface of elastin.