Dr Siew Yeen Chai

Head, Insulin-Regulated Aminopeptidase (IRAP) Laboratory

Monash Biomedicine Discovery Institute
Neuroscience Program

OTHER PROGRAM AFFILIATIONS

Cardiovascular Disease

Metabolic Disease and Obesity

EMAIL siew.chai@monash.edu

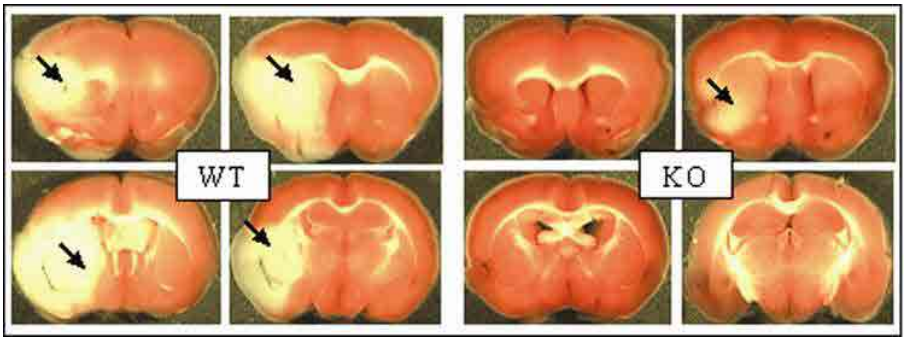
TELEPHONE +61 3 9905 2515

WEB med.monash.edu/physiology/staff/chai.html

Metallo-peptidases cleave amino acids from either the N- and C-termini of peptide hormones to either generate or degrade bioactive peptides. These enzymes play important roles in the body and alterations in their activities can impact on a diverse range of physiological processes in both healthy and diseased states. Our research is focussed on insulin-regulated aminopeptidase (IRAP) particularly in diseased states. Our findings have revealed previously unsuspected roles for IRAP particularly its involvement in memory processing, glucose homeostasis, cardiovascular function and water and electrolyte balance. We have a drug development program targeting IRAP and have identified specific inhibitors that await development into clinically effective drug therapies.

Research Projects

1. **Role of IRAP in the pathogenesis of Alzheimer's Disease**
2. **IRAP contributes to the neuro-inflammatory response in ischemic damage**
3. **Does IRAP regulate glucose and fat metabolism?**



Selected significant publications:

1. Mountford S, Albiston AL, Charman W, Ng L, Holien J, Parker MW, Nicolazzo J, Thompson P and **Chai SY**. 2014. Synthesis, structure-activity relationships and brain uptake of a novel series of benzopyran inhibitors of insulin-regulated aminopeptidase. *Journal of Medicinal Chemistry* 57(4):1368-1377.
2. Albiston AL, Fernando RN, Yeatman HR, Burns P, Ng L, Daswani D, Diwakarla S, Pham V and **Chai SY**. 2010. Gene Knockout of Insulin-Regulated Aminopeptidase: Loss of the Specific Binding Site for Angiotensin IV and Age-related Deficit in Spatial Memory. *Neurobiology of Learning and Memory* 93(1):19-30.
3. Albiston AL, Morton CJ, Ng HL, Pham V, Yeatman HR, Ye S, Fernando RN, De Bundel D, Ascher DB, Mendelsohn FAO, Parker MW and **Chai SY**. 2008. Identification and characterization of a new class of cognitive enhancers based on inhibition of insulin-regulated aminopeptidase. *FASEB Journal* 22(12):4209-17.
4. Fernando RN, Albiston AL and **Chai SY**. 2008. The insulin-regulated aminopeptidase IRAP is co-localised with GLUT4 in the mouse hippocampus - potential role in modulation of glucose uptake in neurons? *European Journal of Neuroscience* 28:588–598.
5. Albiston AL, McDowall SG, Matsacos D, Sim P, Clune E, Mustafa T, Lee J, Mendelsohn FAO, Simpson RJ, Connolly LM and **Chai SY**. 2001. Evidence that the angiotensin IV (AT4) receptor is the enzyme insulin regulated aminopeptidase. *Journal of Biological Chemistry* 276(52):48623-48626.