

## **P041** MRI of the mouse pancreas

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Non-invasive beta cell imaging is essential for the development of novel anti-diabetic therapies. Magnetic resonance imaging (MRI) is a widely used clinical imaging modality; therefore, we are developing its use to image the pancreas. However, the mouse pancreas is a diffuse membrane-like organ and so its imaging is fraught with problems.

We present here a tailored magnetization-prepared rapid gradient-echo sequence (MP-RAGE) for imaging the mouse pancreas *in vivo*. This MRI experiment is insensitive to respiratory and peristaltic motion and can readily show the splenic pancreas. In our study, manganese ion ( $Mn^{2+}$ ) administration also helped to well demarcate the entire pancreas. Further,  $Mn^{2+}$  is an analogue of the calcium ion and may enter beta cells on glucose stimulation. Therefore,  $Mn^{2+}$  may be used to image beta cell function. Signal intensity increased during  $Mn^{2+}$  infusion and persisted at a maximum for a further 2 h, suggesting intracellular uptake of  $Mn^{2+}$  which may be due to diffusion, ion exchange and/or basal calcium channel activity. We postulate that glucose activation may lead to a greater  $Mn^{2+}$  uptake in the pancreas or pancreatic beta cell above basal levels.

In conclusion,  $Mn^{2+}$  enhanced MP-RAGE can delineate the pancreatic mass *in vivo* and may be developed to assess beta cell function, aiding the development of anti-diabetic treatments.