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An Imaging Centre for Mouse Phenotype*

**M.Henkelman , J.Chen, J.Cargill, N.Bock, B.Nieman, N.Lifshitz, S.Foster, A.Duckett, J.Sled,
J.Dazai, N.Kovacevic, G.Hamarneh, Colin McKerlie, Janet Rossant, J.Walls**

Medical imaging techniques adapted to the scale of a mouse are able to provide very rich data for phenotypic screening of ENU- mutagenized mice and for time course studies of development, disease progression and response to experimental treatments.

We have set up the Mouse Imaging Centre (MICe) in Toronto that includes a spectrum of imaging technologies:

Magnetic resonance imaging (MR) with a 7-Tesla 40 cm magnet with the capacity to image 16 mice simultaneously achieving 100 μ m images of the whole mouse in approximately 2 hrs.

High Frequency Ultrasound (US) using a single scanned transducer, with a frequency up to 75 MHz, achieving 35 μ m resolution in fetal development, Doppler measurements of blood flow, and image guidance for genetic intervention in fetal development.

Micro-computed tomography (CT) with an isotropic resolution of 10 μ m in high contrast samples excised organs due to high radiation exposure dose.

Optical techniques (OT) including multiphoton co-focal microscopy, and recent interest in optical projection tomography.

Computer assisted image analysis targeting anatomical registration in whole body mouse with corrected postural variation and automated segmentation of organs with size and shape characterization.

Example images of mice will be presented with particular focus on MR of brain tumors and three dimensional vascular anatomy with CT. Feasibility for high through put screening will be discussed.

