Developing Imaging techniques and novel animal models to answer research questions.

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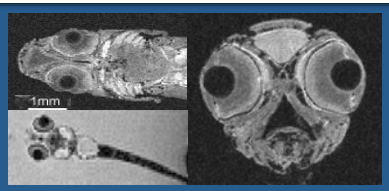
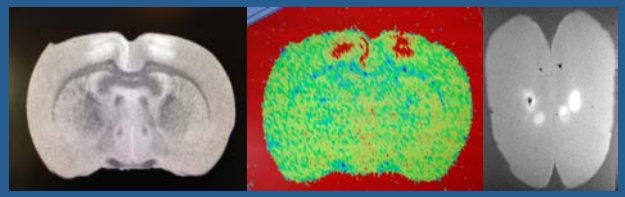
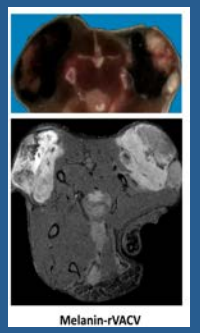
Developing Imaging techniques and novel animal models to answer research questions.

- - Microimaging of zebrafish models,

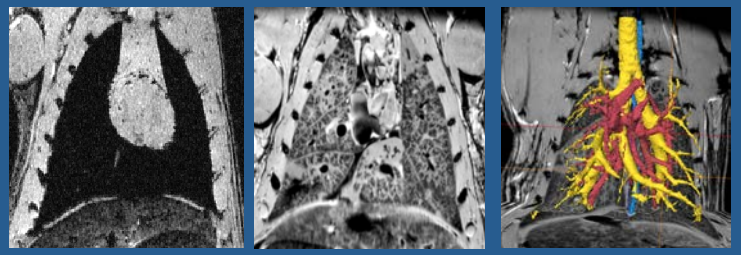


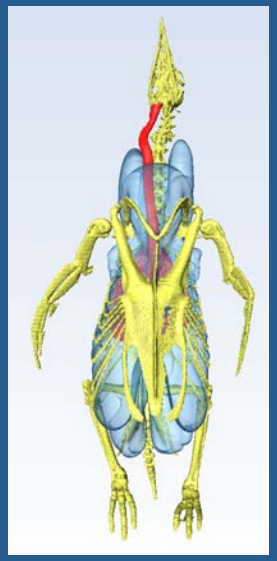
- - Development of melanin as an endogenous MRI reporters for stem cell and tumor and oncolytic virus tracking





- - Methods for murine lung MR imaging by removing tissue/air susceptibility



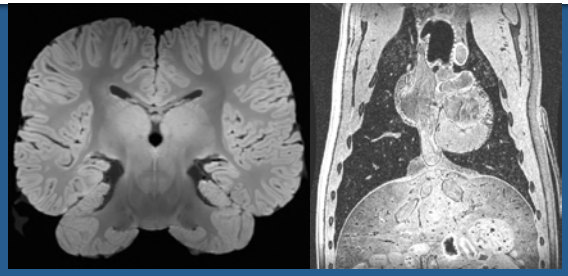


- - Penguins lung and airsac morphology in understand prevention of barotrauma

- - Barheaded geese (fly over the Himalayas) to understand hypoxia tolerance and efficient gas exchange design

Move away form rodent models to more relevant species

- Dolphins are large complex animals much like human.
- US Navy identified gene that switches on metabolic syndrome
- Potential to control type2 diabetes



Imaging Brain inflammation

- Extracellular fluid from the CSF space flushes the brain of metabolic debris, amyloid.
- Occurs largely during sleep.
-This is reduced in many neurodegenerative diseases: Alzheimer's disease, TBI, HIV, drug abuse, and as we age.
- Likely due to elevated neuro-inflammation: neurotransmitter and calcium accumulation resulting in neuronal excito-toxicity.

- Imaged this in guinea-pig model.
- Developing new MR based techniques to visualize this process in rats, humans, and also in dolphins and bird models which are unique as they demonstrate uni-hemispheric sleep.

Medical Education

- Basic and advanced radiology electives for medical students
- 3D virtual human project