**acidoCEST MRI Protocol (Updated 03/31/15)**

1. Prep the mouse with a catheter and a syringe for injection, and also check that the infusion line is ready. Insert the mouse into the magnet and tune & match.
2. Run a localizer sequence to determine if the mouse in in the correct position (remember to press shift traffic light)
   1. Slice orientation should be axial if mouse has a flank tumor.
   2. All slices of the tumor should be within the slices of the localizer scan

-Adjust mouse position if they are not

1. Run a RARE sequence to find image slice that you would like to perform all CEST scans on. This is really just to produce an aesthetically pleasing figure for your publication, and can also be used to measure tumor volume if needed. However, you can usually find the image slice that you want from the localizer.
2. Run CEST scans as follows:
   1. Load up your pre-acidoCEST scan and your post acido-CEST scan. Pre-acidoCEST scan should have 4 repetitions and post scan should have 7 repetitions.
   2. Load up sequence parameters for both scans and change the dB value to the value that you calculated from the magnetization transfer sequence. Other important scan information that should already be coded in the standard sequence includes:

-3.5 uT Half Gauss pulse

-5 second saturation

-10o Flip angle (FISP)

-RF Spoiling (FISP)

* 1. Pull up the geometry editor for both scans and change the isodistance to the value that you selected from your rare or localizer sequence. The slice thickness should be 2mm.
  2. Run your pre-scan. First, make sure the mouse is at the correct temperature (37oC +/- 0.2oC) and correct breath rate (30-40 bpm). If so, you are ready to begin the acidoCEST pre-scan. Remember to not inject agent during this scan. This scan will take 4 averages so the number of repetitions should be set to 4
  3. After completion of this pre-scan, inject the 200 uL bolus of isovue into the mouse and then connect the end of the small catheter line to the infusion line and start the infusion pump (400 uL/hr). Wait 5 minutes for isovue to circulate throughout mouse before starting post scan.
  4. Run your acidoCEST scan immediately after you have connected the catheter line. This scan will be a clone of your pre-scan, but the number of repetitions should be set to 7. 7 scans were chosen since the time to run 7 scans is roughly equal to amount of time isovue is in the tumor at its highest concentration.
  5. During scans, do your best to keep the breath rate and temperature constant. This is important with regards to collecting valid data as well as reducing motion artifacts
  6. Upon completion, stop the infusion pump and remove mouse from the magnet.