Rodent bone notching device

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Project description:

Bone fragility is usually studied in mouse and rat models. The preferred mechanical test to assess bone fracture resistance is notched fracture testing of the femur. This method requires that a precise notch is placed on the femur. The goal of this project is to create a device to clamp rodent femurs and create sharp notches of precise depth.

The student team will need to create a fixture to hold the dissected femur so that the notch is created at a consistent location and without rolling. Then, the team will need to devise a strategy for precisely notching the bone with a fine blade to a consistent, specified depth. The device will need to work with mouse and rat bones, which have substantially different sizes. It is expected that the team will test their apparatus using 3D printed femurs.



Figure. Upper: Schematic of bending test on notched femur. Lower: cross-section at the location of the notch, following fracture. From Ritchie et al.,2008, Bone.