Papillary muscle collection protocol

Materials:

* 27G needle
* Pin vise
* Wirer cutter
* Cardboard spacers
* Scissors
* Styrofoam block

Making cardboard stretcher

* Get a carder spacer (figure 1) that we have around the lab used for the cryogenic boxes
* Pull out the individual rows can cut them into strips along the dotted line (figure 2)
* These are still too wide for the cryogenic vials so cut them at the point where the top starts to slope downward to create a rectangular strip of cardboard (figure 3)
* This strip is too tall for the cryogenic vial (figure 4) so you will need to trim off about a centimeter until the top of the cardboard strip is flush with the top of the white label on the tube (figure 5)
* This creates a 1x2.5 cm cardboard stretcher which the papillary muscle can be pinned onto

Notes:

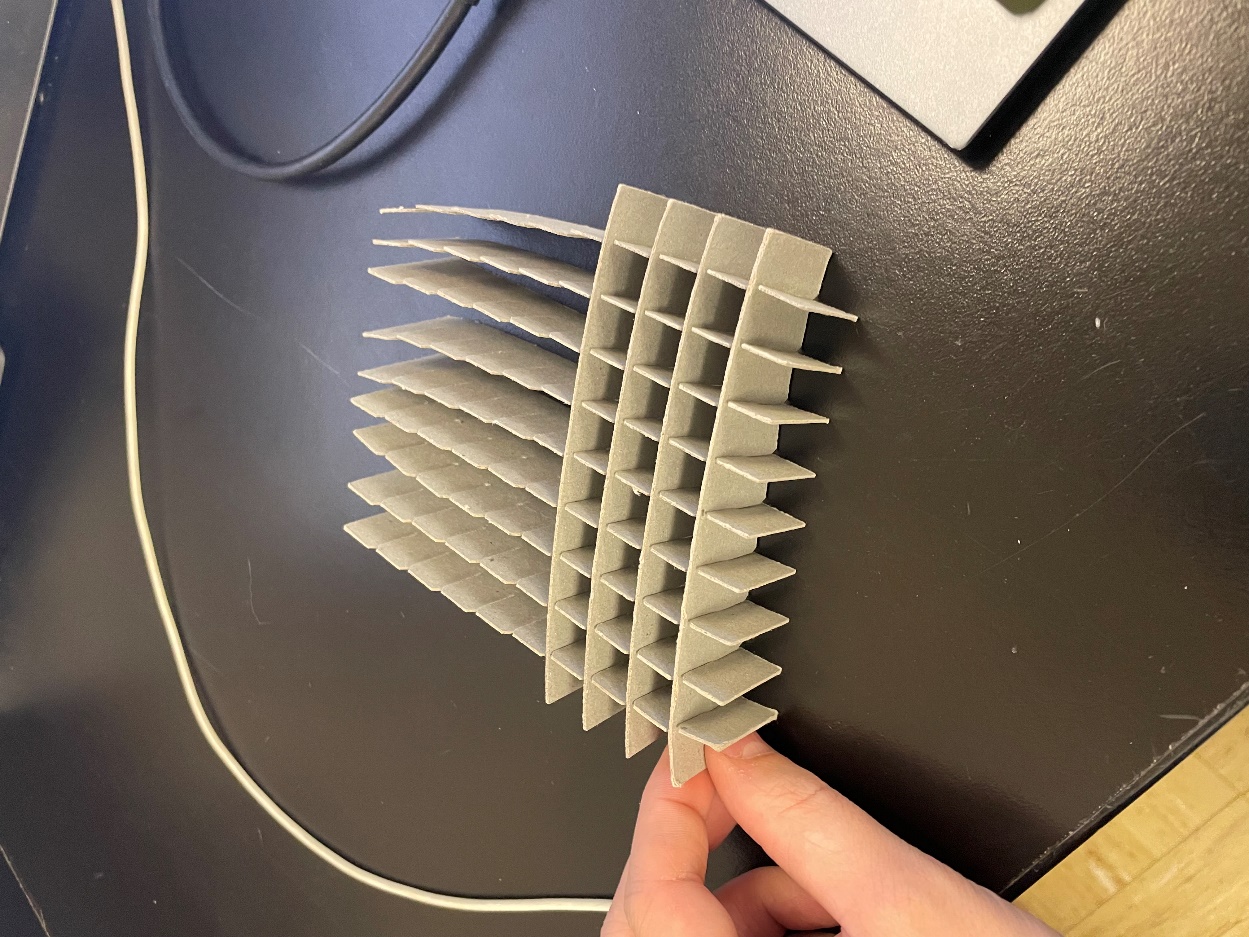
I would recommend using this stiff cardboard paper rather than traditional cardboard which is thicker and becomes flimsy when cut into smaller pieces.

Making needle pins

* Get a pin vice, wire cutters, and 27G needles (figure 6)
* Uncap the needle and pinch 50-75% of the shaft of the needle into the pin vise (figure 7)
* With the needle **FIRMLY SECURE** bend the needle to create a 90 degrees angle. This angle can be more acute if needed (figure 8)
* Cut the needle and discard the plastic bit. Store the bend needle pin in a secure plastic container for later use

Collecting papillary muscle samples

* Dissect the papillary muscle from the free wall of the LV or RV and cut the chordae tendeae off
* Cut the papillary muscle longitudinally into strips (from the free wall side to the chordea tendeae)
* Place a cardboard stretcher on the Styrofoam block and place the papillary muscle strip on top with the longitudinal orgientation of the muscle parallel with the length of the cardboard stretcher (figure 9)
* Using forceps grab a needle pin and using the forceps or your fingers carefully pin the top and bottom of the papillary muscle to the cardboard stretcher (figure 9). This will take a bit of force and the muscle is both rounded and wet so be careful not to slip. The needle will plunge into the Styrofoam block, that is okay. Just lift up when removing the attached muscle.
* Slide the cardboard stretcher with the attached papillary muscle into the cryogenic vial, cap the vial, and flash freeze like you would with any other cardiac specimen (figure 10)

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A picture containing indoor, dirty

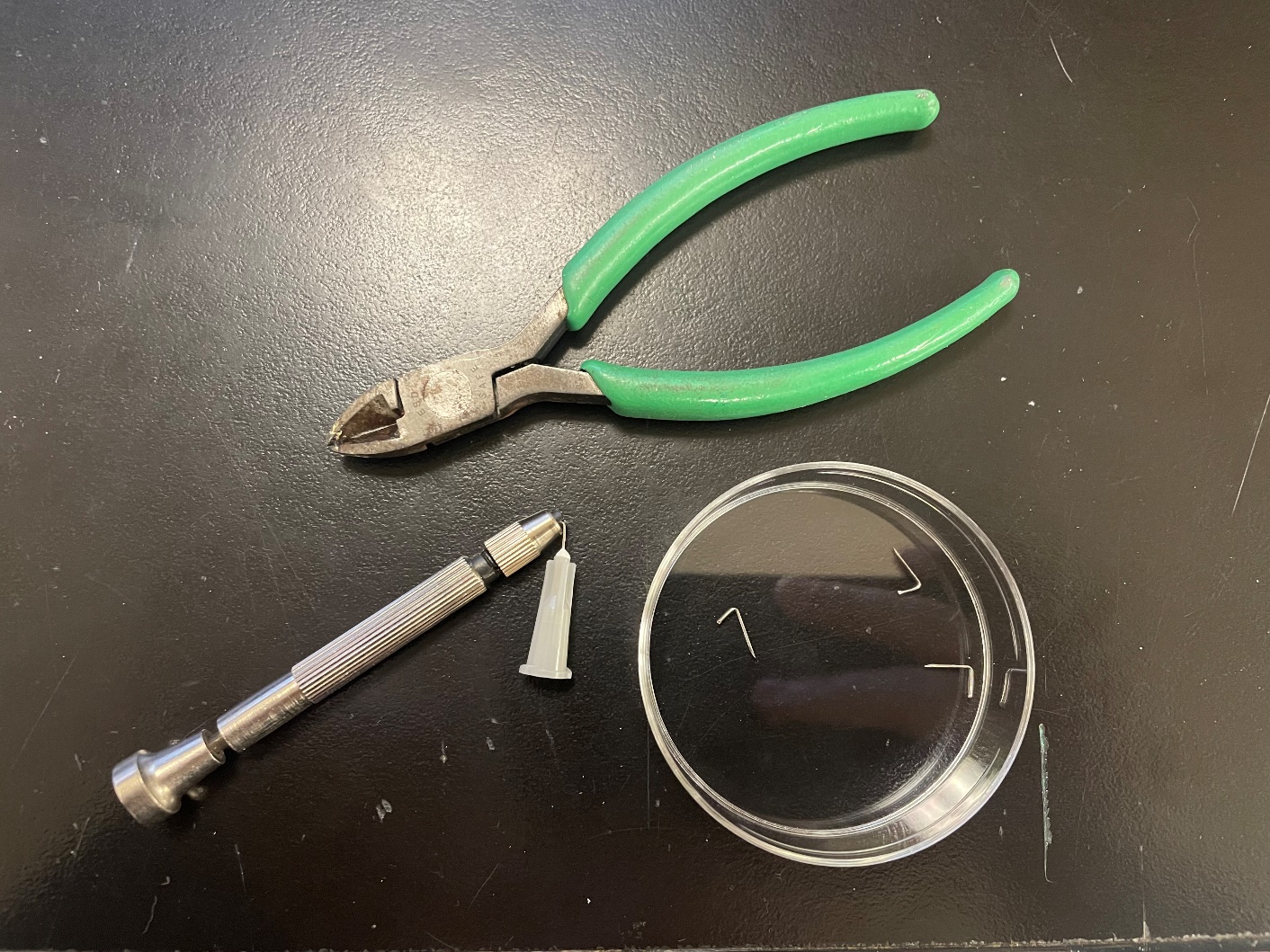
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A white rectangular object on a black surface

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