Team 12
Week of January 30-February 5

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Project Overview

- Transducer Fabrication
- FEA Modeling
- Mouse Tooth Extraction
Transducer Fabrication

- THREE NEW TECHNIQUES
  - Machine Press
  - Lower Binder Content
  - New Mold Design
Transducer Fabrication

- **Carver Compressor**
  - Pressed $\text{BaTiO}_3$ PEG
  - 5,000 psi
Transducer Fabrication

- Low Binder Content
  - Originally 50% weight
  - Now 1% & 2% weight
Polyethylene Glycol
Transducer Fabrication

- New Mold
  - Washer-mold
  - Steel washer
  - Allows for better pressure transfer
Transducer Fabrication

- Sintered at 1100°C
- Crystalline structure was formed
Future Work

- Create successfully sintered barium titanate
- Machine new mold based on washer-mold
  ○ Curved shape
- Discuss sintering techniques with Dr. Pamir Alpay and other faculty
FEA Model Lower Right Jaw
Future Work: FEA Modeling

- Complete Model
- Send it to company to be analyzed
- Get results on pressure and frequency
Mouse Tooth Extraction

- Practiced extraction on several mice
- Had some successful extractions
- Many crowns snapped at gum line leaving root intact
  - Will be detrimental to experiments
  - If part remains in the jaw mechanical stimulation will still be present
  - Interfere with measurements
Mouse Tooth Extractions

- Instruments still too large to extract third tooth
  - Ordered 2 pairs of smaller (8mm) Adson rat tooth tissue forceps
  - $35.00 per pair, $70.00 total
- Need to get better lighting
Future Work for Tooth Extractions

- Go to animal facility in Pharmacy Building
  - Practice tooth removal here
- Investigate possibility of practicing on live mice that have not been genetically altered to ensure procedure is sound