08/30/2017

- **Next Steps**
    - Interview with Bailey 9/5 - 9:30am
    - Refine Customer Requirement and upload to EDGE - 9/6
    - First cut of Engineering Requirements - 9/6
    - Post Interview Notes on EDGE - 9/6
- **Today's Discussion**
    - Finalize Interview Questions
        - https://docs.google.com/document/d/1sSWRCW2-5OgH9JspR5ztJAHaa98RlpA1OBdi0hvWGaM/edit
    - Electrical Bioreactor meeting 9/7 at 10am - Emily Wood, Amanda C., Natalie N. from P18081 will attend
    - Bring recorder to interview
    - Interview Roles Defined
        - Simran S. - Notetaker/Recorder
        - ME Interviewer - Emily A.
        - BME Interviewer - Natalie N.
        - Administrative Interviewer - Emily Wood
    - Drafted Engineer Requirements
        - https://docs.google.com/spreadsheets/d/1Frtu1OESakUivU80okl5wejzTvnMr1V-Qoe2lG7gOPQ/edit#gid=0
    - Drafted Customer Requirements to show to customer during interview
    - Discussed the basics of Cell Culture

9/5/2017

- **Next Steps**
    - Research articles on project - add it to research document and write a paragraph detailing what article was about
    - Finalize Team Norms and Values and upload to EDGE
    - Start planning a project schedule
    - Take Bloodbourne Pathogens Training

- **Today's Discussion**
    - Did team building exercise
        - Simulated passing of roles to other team members
    - Came up with Team Name
        - **Team Myscle**

      Decision making: one person spoke up and we iterated on that idea until we came up with an ideal name
    - Discussed team member roles
        - **Emily Adams** - Facilitator
        - **Natalie** - Communicator/ Project Manager
        - **Amanda** - EDGE Coordinator

    - **Simran** - Sponsor Liason/Notetaker
    - **Emily Wood** - Treasurer
- Drafted set of team values/norms
    - https://docs.google.com/a/g.rit.edu/document/d/1UE6PkmUAKSU-HxFUp8ryb8H2rJfsBHsPj9PIKme6sOE/edit?usp=drive_web
- Discussed how to organize our EDGE page and best way to upload information on it
    - Take snapshots/pictures to upload our spreadsheets and various documents
- IP Discussion - Keep it open to the public domain

9/11/2017

- **Next Steps**
    - Have Design Review Agenda by Wednesday - Emily A.
    - Upload documents to Google Drive so Amanda can upload to EDGE - wednesday
    - Prepare for Design Review - Monday
- **Today's Discussion**
- Design Review Time and Location
    - TBD
- Draft Project Plan/Schedule
- Project Planning
    - https://docs.google.com/a/g.rit.edu/spreadsheets/d/15k5B0i6eouZBTc_2rwcu5f0yM1PGyyOKo19iZFw650c/edit?usp=drive_web
- Meet this weekend to work on design review
- Work on design review
- Design Review Scheule
    - Background/Scenario - Simran
    - Statement/Deliverables - Emily A.
    - Customer Requirements/Engineering Requirements - Amanda C./ Emily W.
    - Project Plan - Natalie
- Emily A. - Working on Design Review Agenda for Wednesday

9/13/2017

- **Next Steps**
    - Create powerpoint for Design Review
    - Meet to practice for design review
    - Update EDGE
    - Design Review - 9/18 5pm, Institute Hall recitation room
- **Today's Discussion**
- House of Requirements - Looks good
- Use Scenario - Looks good
- Created Agenda for Design Review and discussed roles
- Updated Project Plan

- Worked on Benchmarking and Risk Assessment Table

9/15/2017

- Meeting in Mech-e computer lab to go over Design Review taking place on Monday, September 18th
- Updated EDGE page to reflect all current documents
- Started presentation for Design Review
    - Background Current State (Simran)
    - Project Vision and Goals (Natalie)
        - Use scenario (Simran)
    - Customer Requirements (Amanda/Wood)
    - Engineering Requirement
        - House of quality
    - Benchmark/ Summary of Current Research (Emily)
        - Main Risks
    - Project Plan (Natalie)

9/13/2017

- **Next Steps**
    - Research concept designs (All)
        - https://drive.google.com/drive/u/0/folders/0Bwka9ecB7qVYRjNyMTgwdXZMYTQ
        -
    - Clean up House of Quality, Customer/Engineering Requirements (Wood, Amanda)
    - Create Functional Decomposition (Emily)
    - Email Dr. Bailey about Cell Lines (Natalie)
    - Update Project Plan (Natalie)
    - Update EDGE site (Amanda)
- **Today's Discussion**
    - Peer Evals Discussion - we like each other
    - What is a Facilitator???
    - Worked on Functional Decomposition
        - What is our system's functions not procedure
    - Worked on House of Quality, Engineering/Customer Requirements
    - Discussed research for concept design

9/25/2017

- **Next Steps**
    - Concept Generation
    - Plan next design review time w/ Bailey (Natalie)
    - Benchmarking chart (everyone)
- **Today's Discussion**
    - Went over benchmarking excel table
    - Purchasing cell line - use same cells as electric bioreactor group (cardiomyocytes), where to get them
    - Morphological Tables.
- Action Items:
    - **Morphological Chart**: Emily Wood will clean up before Wednesday.
    - **Benchmarking**: Everyone update sheet with research
    - **Functional Decomposition**: Amanda will post on EDGE
    - **Design review scheduling**: Natalie will email Bailey
    - **Cell line choice**: Ask other team and find expert on cell line choice
- Future Steps:
    - System Alternative Choice
    - Pugh Chart

9/27/2017

- **Next Steps**
    - Research concepts
    - Come up with Concept Design
    - Prepare for Systems Design Review
- **Today's Discussion**
    - Feasibility Analysis
    - How to set up morphological chart
    - Concept Selection proposals - alternatives
- Action Items:
    - **Morphological Chart**: All
    - **Cell line choice**: Ask other team and find expert on cell line choice
    - **Discuss Cell Choice with Expert** Simran
    - **Stress/Strain Analysis (MATlab)** Emily Wood
    - **Benchmarking Table** Emily Adams
    - **Create Survey for Old Students** Simran
    - **Pugh Analysis** Natalie
    - **Update Edge** Amanda

10/02/2017

- **Next Steps**
    - Benchmark membrane/motor/strain
    - Finalize Pugh Analysis
    - Prepare for Systems Design Review
- **Today's Discussion**
    - Benchmarking various independent systems
    - Work on Pugh Analysis
    - Concept Selection proposals
    - Preparation for review
- Action Items:
    - **Make we're on the same page for concept designs** (All)
        - **Membrane** (Natalie,Simran,Amanda)
        - **Strain** (Emily Adams)
        - **One Directional Motion** (Emily Woods, Amanda)
        - **Material** (Emily Woods)
    - **Send out Survey** (Simran)
    - **Go in lab and survey equipment** (All)
    - **Benchmark independent system components** (All)
    - **Finalize Pugh Analysis** (Natalie)
    - **Update Project Plan** (Natalie)
    - **Feasibility and Testing List** (Natalie)

10/05/2017

- **Next Steps**
    - Update risk assessment based on chosen system design
- **Today's Discussion**
    - **Benchmarking**
        - Membrane
        - Strain
        - One Directional Motion
        - Material
    - **Sketch System Designs**
    - **Pugh's Analysis**
        - Linked to customer requirements. Does this need to be done for other documents?
    - **Project Plan (Natalie)**
        - List of future testing: what testing needs to be done for this review?
        - What would we like to have done by next Wednesday?
    - **Survey Update (Simran)**
    - **Updates on cell type?**
- **Action Items**

- **Redraw System designs based on discussion (Natalie)**
- **Update Project Plan for Systems Design Review (Natalie)**
- **Research ASEE abstract requirements (Simran)**
- **Molding PDMS in lab - ask Bailey (Simran)**
- **Membrane Testing**
    - **Email FlexCell (Emily)**
    - **Ask Dani about PDMS example (Natalie)**
- **Research concept design problem/questions**
    - **Equibiaxial effect on cells (Natalie, Amanda, Simran)**
    - **How actuators work (Emilys''')**
    - **Application of datuum well (Emily A)**
    - **Equibiaxial stress stuff (Emily W)**

10/11/2017

- **Next Steps**
    - Begin drafting presentation
    - Define testing to be done in Phase III
- **Today's Discussion**
    - **Electrical team cell update - Shox2 (ATCC)**
    - **Schedule time for PDMS demo**
    - **Research done over the weekend**
        - **Equibiaxial**
        - **Actuators**
    - **Finalize Pugh Chart**
    - **Discuss Project Plan**
    - **Discuss Risk Assessment**
    - **System Architecture**
    - **Draft presentation responsibilities?**
- **Action Items**
    - Create new Pugh Analysis(Monday/Friday as a group)
    - Pros and cons list of uniaxial/equibiaxial strain (for meeting on Friday)
    - Create meeting with Bailey (Natalie emailed, Friday possibility)
        - Talk about outcomes of both experiments, problems that could come up
        - What does she value - what does she want the students to be able to study from this
        - Make PDMS membrane (Will Bailey make, student make, or pre-manufactured)
        - Cell line
    - Systems Architecture (Wood)
    - Risk Assessment (Amanda/Simran - Friday)
    - PDMS Kit research (Emily Adams)
    - Concept Generation (Emily Adams)

- Feasibility Analysis
    - Creating mold (.4-1mm) (Emily W)
    - Applied force (Emily W)
    - Budget analysis (Emily Adams)
- Create plans for Phase III testing (Natalie)
- Update Project Plan (Natalie)

10/13/2017 - Discussion with Dr. Bailey

- **Talk about system alternatives and experiment outcomes.**
    - **Equibiaxial**: Less obvious morphological change, protein expression differences
        - Potential Experiment: Mold PDMS, cyclically strain culture, image cells, run SDS-PAGE and perform immunoblotting on cell proteins
        - More physiologically relevant
    - **Uniaxial Hole-and-Peg**: Morphological change with cells including fibroblasts, endothelial cells, and myocytes. Simpler force analysis.
        - Potential Experiment: Mold PDMS, cyclically strain culture, image cells
        - Experiment more focused on cell culture, more appropriate for 3 week lab
        - Similar to industry product, probably inappropriate for ASEE conference

- **What does she value** - what does she want the students to be able to study from this
- **Make PDMS membrane** (Will Bailey make, student make, or pre-manufactured)
    - Video on mixing process
    - PDMS manufacturing process is not a problem
- **Cell line** (Shox2): should work for uniaxial model. Unsure of specific response for equibiaxial model.
    -

10/13/2017

- **Agenda**
    - Discuss earlier meeting with Dr. Bailey
    - Time for PDMS demo
    - Pugh Analysis
    - Risk Assessment
    - Assign presentation sections and regroup Monday?
- UPDATED ACTION ITEMS
    - If possible, come to the PDMS demo with Eric at 12:30pm next Monday. We can meet beforehand in the 3rd floor hallway of Institute.
    - Project Plan - Natalie will update, Amanda will upload to EDGE
    - EDGE - Amanda will update finalized documents
    - Systems Architecture - Wood will update
    - Feasibility Analysis - Creating mold (.4-1mm) (Emily W), Applied force (Emily W), Budget analysis (Emily Adams)

- PDMS Kit Research - Emily Adams
- ASEE Abstract - This is due Monday, October 16! Can Simran and Wood finalize and submit before then?
- Presentation - Natalie will add finalized documents to slide deck.

10/16/2017

- **Next Steps**
  - CAD drawing (Emily Adams)
  - Plan out Phase III testing
  - Determine what needs to be ordered for testing
  - Work on presentation for Friday
- **Today's Discussion**
  - Documents to be completed
  - Order PDMS kit
  - Assign parts of presentation
  - Testing plan discussion
  - Thursday meeting for practice?
  - Meeting time with 3D printing lab next week?
- **Action Items**
  - **Work on Presentation (all)**
  - **Plan a meeting with 3D printing lab (next week)**
  - **Email Material Science Lab (Wood)**
  - **Update EDGE (Amanda)**
  - **Meet Thursday at 8pm to practice presentation (All)**
  - **Systems Design Review (9am - Friday Ins Recitation Room)**

10/18/2017

- **Next Steps**
  -
- **Today's Discussion**
  - PDMS Material Testing - schedule meeting to help plan testing?
    - Does the lab have a mold for plastics testing?
    - Can we build a vacuum (Monday?) or do we need to borrow one?
  - 3-D Printing Lab: schedule meeting morning of Tuesday, 24OCT2017 to discuss culture chamber mold
  -
- **Action Items**
  - **All team members complete presentation parts**
  - **Simran will finalize format before 8pm Thursday**
  - **Next week**
    - **Wood will meet with ME professor about materials testing**
    - **Emily will meet with machine shop to discuss model (during MSD?)**

- **Questions for Bailey**
    - **Is there already vacuum equipment available for PDMS formation? Heating equipment for PDMS?**
    - **When would Shox2 cells become available?**
    - **Confirm lab access for PDMS creation and cell culture testing.**

10/23/2017

- **Next Steps**
    -
- **Today's Discussion**
    - **Construct meeting this week?**
    - **Machine shop meeting for mold feasibility**
    - **Mold for material testing**
    - **Project Plan**
- **Action Items**

10/25/2017

- **Next Steps**
    - Start Testing - ECM, FEA
    - Meet with Machine Shop
    - Create Vacuum for PDMS Curing
- **Today's Discussion**
    - **Construct update for testing mold?**
        - **Backup plan: manually cut testing samples**
    - **Machine shop meeting for mold feasibility**
    - **Materials for compatibility study**
        - **petri dishes to fill with PDMS**
        - **Cells to use?**
    - **ASTM grant submissions**
- **Action Items**
    - **Create ECM test plan-Friday (Simran)**
    - **Keep in touch with Construct (Emily Adams)**
    - **Fill out paperwork for space request once Michelle sends it**
    - **Pour PDMS for material testing and ECM testing (Natalie & Amanda)**

10/30/2017

- **Next Steps**
    - Create test plans!
- **Today's Discussion**
    - **Administrative**
        - **MSD meeting time next semester (T/H 8-11, T/H 11-2, M/W 2:30-5:30)**
        - **Lab Space Form**

        - **Order PDMS!**
    - **Material Testing**
        - **Cut PDMS demo tabs**
        - **Meet with Humphrey at 4:45pm**
    - **Molds**
        - **Construct mold for material testing?**
        - **Update on cell chamber mold**
    - **Cell Compatibility testing update**
    - **ASTM grants?**
- **Action Items**
    - **Order PDMS kits (Emily Wood)**
    - **Email Construct & possibly visit tomorrow?**
    - **ASTM Paper**
    - **Make drawing of culture chamber (Emily Adams)**
        - **Look into machining prototype**

11/01/2017

- **Next Steps**
    -
- **Today's Discussion**
    - Meet with Construct at 2:30pm
    - Meet with Michelle around 3:30pm
    - Choose MSD section for next semester
        - Fill in schedule on the drive
    - Order PDMS kits
    - Progress update for testing,
    - Test plans: discuss for remainder?
- **Action Items**
    - Fill in schedule on the drive and discuss Monday (**everyone**)
    - Send Michelle lab trainings (standard/bloodborne pathogens - **everyone**)
    - BME's create supply list and ask Michelle about vendors (**Amanda, Simran, Natalie**)
    - Fill out test plan (P18081 Test Plan) template to best of ability
        - **Amanda**: Test plan 6
        - **Natalie**: Test plans 3 and 8
        - **Simran**: Test plans 1 and 2
        - **Wood**: Test plans 4 and 7
        - **Adams**: Test plans 5
    - Talk to Gaborski about PDMS sterilization and cell culture (**Simran**)

11/04/2017

- **Natalie and Amanda molded 15:1 PDMS for material testing**

- Benchtop (clean, but not in hood)
- 10g elastomer and 0.67g curing agent mixed
- Leveled off with spatula
- Degassed 20 inHg (?) multiple times
- Cured at room temperature

11/06/2017

- **Next Steps**
  -
- **Today's Discussion**
  - Choose MSD section for next semester
  - Complete material testing for molded 15:1 PDMS
  - Discuss materials needed for lab operations
  - Project plan: Where are we going to be at the end of MSD I?
- **Action Items**
  - Update project plan (Natalie)
    - Buy actuator AFTER successful force analysis
    - Complete all material testing
    - Create more detailed systems design
  - Update risk assessment (Amanda)
  - Finalize Bill of Materials
  - Finalize test plans
  - Talk to Bailey about cell culture testing (Simran)
  - Fill in documents for Design Review (Wednesday)
  - Look for page protector/floppy plastic (everyone)
  - Talk to Michelle about supplies and vendors (Amanda)

11/08/2017

- **Next Steps**
  - Thursday
    - Cell culture refresher by Bailey
    - Material testing at 4:30pm
  - Friday
    - Mold PDMS sets
    - Prepare cell culture equipment
    - Have all documents ready for EDGE
  - Monday
    - Design review @ 2:30
    - Material testing?
  -
- **Today's Discussion**
  - Choose MSD section for next semester

        - Get cell vials from Bailey
        - Review project plan
        - Populate presentation
- **Action Items**
    - Material testing tomorrow at 4:00ish
    - Email Yilmazel about incubator calibration (Simran)
    - Test plans
        - Write test plans for 5&9 (Natalie)
        - Edit remaining test plans by Thursday
    - Cell culture update and equipment prep on Thursday and Friday (Simran sets up times)

11/12/17

- **Next Steps**
    - Monday
        - Design Review
        - 8:1 and 12:1 PDMS Testing
        - 10:1 Temperature Testing
- **Today's Discussion**
    - Finalized Presentation for Design Review
    - Discussed BOM
    - Reviewed project plans
- **Action Items**
    - Material testing tomorrow after Design Review
    - Email Yilmazel about incubator calibration (Simran)
    - Final EDGE Updates (Amanda)

11/13/17

- **Next Steps**
    -
- **Today's Discussion**
    -
- **Action Items**
    - Do peer reviews! Everyone!
    - Update team project plan (Natalie)
    - Nominate Michelle for Outstanding Staff Award
        - Make a Difference Award
            - https://rit.az1.qualtrics.com/jfe/form/SV_3ki2bclNvlE2m4R
    - Update cell chamber mold and send to Construct (Emily Adams - after test)
    - Order general lab supplies (Emily Wood). Make sure MSD office can handle academic/tax-free items purchases and is comfortable with chemicals like ethanol! If not, discuss ordering through Michelle Horan.

        - Ethanol, VWR 89125-172 (4 gal.) - $50.92?
        - VWR Light-Duty Tissue Wipers, VWR 82003-822 (Case of 2100)
        - 10 mL Serological Pipettes, LPS L311000 (Pack of 200)
        - 1000 uL Pipet Tips, LPS L152132 (840/unit)
-

11/15/17

- **Next Steps**
    - Next Monday: Salsarita's!
        - Talk about MSD II schedule
        - Create preliminary progress report
- **Today's Discussion**
    - Peer Evaluations
    - Design Review Time - December 8 at 9am?
    - Project Plan (Natalie)
    - Get dinner/ice cream on finals week?
    - Project Updates
- **Action Items**
    - Schedule gate review time during 1 hr W/H/F of finals week (Natalie)
        - Fill out finals schedule on team schedule doc (everyone)
    - Begin drafting MSD II project plan (Natalie)
        - Add actuator subsystem design steps to project plan (Emily A)
    - Ask Bailey whether Shox2 cells can be ordered for MSD II (Simran)
    - Think about testing that can be done once we have the cell chamber mold
        - Heat cure material property testing
    - Find actuator expert and potentially find an actuator to take apart?

Actuator Design
-research/ benchmarking into how to turn rotational energy into linear motion
-decide if we want 1 or 2 chambers
-decide if a custom motor assembly is better than a retrofitted actuator
-design chosen system (in solidworks)
-determine the size/ specs required for motor

11/20/17: Meeting with Dr. Thomas Smith

- **Questions**
    - Will we achieve the same cross-linking at all of the recommended curing conditions given by Dow Corning?
        - 10 minutes at 150 d Celsius
        - 20 minutes at 125 d Celsius
        - 35 minutes at 100 d Celsius

- 48 hours at room temperature
- “Temperature Range”: -45 d C to 200 d C

- Will cured PDMS be changed by sitting in 37 d C at high humidity?
  - Two types of siloxanes: hydrolytic and platinum cures. Platinum cures should not show change when 37 d C.
  - After curing, put PDMS in chamber with hexane vapor. This will cap siloxane methyl group. 1-hexene. In open air, water vapor can form Si-OH groups can form.
  - Resources: Gelest website for siloxane resins, Wacker, Momentive

Table 1. Temperature and cure duration (including heat propagation offset) for tensile and compressive PDMS Sylgard 184 test samples.

Temperature (°C)	Dow Corning recommended curing duration	Corrected tensile curing duration	Corrected compressive curing duration
25 (RT)	48 h	48 h	48 h
100	35 min	48 min	53 min
125	20 min	33 min	38 min
150	10 min	23 min	28 min
200[a]	–	18 min	24 min

[a] Dow Corning do not provide a recommend curing time at 200 °C. Experimental testing of the durations listed above were found to result in well cured test pieces.

Table 2. Variation of tensile test data with curing temperature.

Temperature (°C)	Average elongation (mm) [uncorrected]	Average failure load (kN)	Young’s modulus (MPa)	Ultimate tensile strength (MPa)
25	93.1	92.34	1.32 ± 0.07	5.13 ± 0.55
100	76.4	112.5	2.05 ± 0.12	6.25 ± 0.84
125	66.2	137.7	2.46 ± 0.16	7.65 ± 0.27
150	63.4	94.32	2.59 ± 0.08	5.24 ± 0.82
200	49.5	63.18	2.97 ± 0.04	3.51 ± 1.11

with elongation at failure, failure load and ultimate tensile strength. The Young’s modulus of the test samples was found to be linearly dependent on their curing temperature within the temperature range tested, see figure 5. However, the ultimate tensile strength (UTS) is highest for PDMS test samples cured at 125 °C.

11/20/17

- **Next Steps**
  - Create notched membrane holder for stretch testing
  - Pugh’s analysis for cell culture change
  - Pugh’s analysis for actuator designs
- **Today’s Discussion**
  - Open chamber pilot mold
    - Next iteration: new surface area, leverage tabs for opening?

- Update on PDMS curing
    - Cure in vacuum chamber to prevent Si-OH from forming with water in air
    - VWR 1-hexene for capping siloxane methyl groups
        - Added to BOM
    - Then PDMS will be unreactive to incubator conditions
    - PDMS Use spreadsheet in “Team Resources” folder
- Path forward for material testing
- Update on actuator design
- Update on cell culture studies
    - If using 3T3 cells, growth studies can happen at any time
- MSD II Project Plan discussion
- Create project update for Mike
- Go to Salsarita’s!!

- **Action Items**
    - ~~Order petri dishes and 1-hexene fluid (Emily Wood)~~
    - Update BOM
        - Cell culture materials (Natalie)
        - Actuator materials (Emily Adams)
    - Ask Bailey about potential dying/imaging of collagen to see attachment
    - Draft Pugh’s analysis for cell culture(Amanda)
    - Draft Pugh’s analysis for motor/gear system (Emily Adams)
    - Finish material testing analysis (Emily Wood)
        - Email Dr. Humphrey about slipping samples.
    - Change Media for Petri-Dish cells, passage cells in the Flask (Amanda)
    - ~~Finalize project progress report and send to Mike (Natalie)~~
        - ~~Remind Mike about design review and gate review (Natalie)~~
    - Research microcontroller (Emily Wood)
        - Ask friends about microcontroller (Simran, everyone)
    - Research ECM attachment on PDMS (Natalie, Simran, Amanda)
        - Research hexene gassing of PDMS (Natalie)

11/27/17

- **Next Steps**
    - Pugh’s analysis of motor attachment on Wednesday
- **Today’s Discussion**
    - Pugh’s analysis for cell line
    - Pugh’s analysis for strain applicator
    - BOM Updates
- **Action Items**
    - Add to motor attachment Pugh (everyone)
    - Finish material testing data processing (Emily Wood)
    - Benchmark prices for actuators and gears (Emily Wood)

        - Add to BOM
    - Feasibility of mechanical adjustment (Emily Adams)
    - Discuss purchasing of cell culture materials with Bailey (Simran)
    - Update MSD II project plan considering motor attachment development (Natalie)
    - Finalize cell culture Pugh and put on EDGE (Amanda)

11/29/17

- **Next Steps**
    - Presentation Practice will be Thursday, Dec 7, 10-12:30ish.
    - Design Review will be Friday, Dec 8, 9-10:30ish in INS 3120
    - Gate Review will be Monday, Dec 11, 2:30pm in MSD floor conference room
    - Work on presentation
- **Today's Discussion**
    - Pugh's analysis for strain applicator
    - Update on mechanical testing and cell chamber model
    - Discuss edited project plan
        - purchasing timeline for microcontroller/motor if needed
    - Should we do a mold PDMS in vacuum chamber to see any difference?
- **Action Items**
    - Continue to update project plan (Natalie)
    - Mold PDMS in vacuum, and compare incubated tabs (Natalie/Amanda)
    - Think about steps/process you will need to take for your specialty, and compare to project plan (all)
    - Create design for rack-and-pinion (Emily Adams)
    - Research actuators as alternative to rack-and-pinion (Emily Adams)
    - Process material testing data (Emily Wood)
    - Look into microcontroller compatibility (Emily Wood)
    - Track down Humphrey to talk about material testing grips (Emily Wood)

12/4/17

- **Next Steps**
    - Presentation Practice will be Thursday, Dec 7, 8pm.
    - Design Review will be Friday, Dec 8, 9-10:30ish in INS 3120
    - Gate Review will be Monday, Dec 11, 2:30pm in MSD floor conference room
    - Work on presentation
- **Today's Discussion**
    - Update on PDMS material testing (did we find Humphrey?)
    - Update on cell culture chamber
    - Update on actuator options and motor/actuator displays
    - Work on presentation
    - Test Plan: Heat Cure Testing, Cellular Response to Strain
        - What heat curing conditions will we use?

        - How will we quantify changes in cell morphology?
- **Action Items**
    - Work on presentation slides! (everyone)
    - EDGE (upload by Wednesday so we can email to Mike)
        - Updated BOM - DONE
        - Updated Risk Assessment - DONE
        - Updated Test Plan Table
            - Heat Cure Testing (Natalie)
            - Cellular Response to Strain (Simran)
    - Cure PDMS for new cell chamber
        - Update PDMS Tracker in Team Resources Folder

12/6/17

- **Next Steps**
    - Presentation Practice will be Thursday, Dec 7, 8pm.
    - Design Review will be Friday, Dec 8, 9-10:30ish in INS 3120
    - Gate Review will be Monday, Dec 11, 2:30pm in MSD floor conference room
    - Work on presentation
- **Today's Discussion**
    - Update on PD
- **Action Items**
    - Send BME Office statement about ASTM grant

12/8/17 - Detailed Design Review

- **Next Steps**
    - Gate Review will be Monday, Dec 11, 2:30pm in MSD floor conference room
    - Order items for next semester
    - Outline final MSD paper
- **Discussion Items**
    - Create bearing/support for sliding PDMS attachment
    - Have software system designed in first few weeks of MSD II
    - Write final paper throughout MSD II
- **Action Items**
    - Update risk assessment with lower actuator assembly/disassembly risk (Natalie)
    - Pour PDMS in newer printed mold (Natalie, Amanda before Monday)
    - Update budget
        - Add microcontroller to budget (break or EARLY MSD II)
        - Add trypsin to budget (Simran, by Monday for ordering?)
    - Create draft final MSD paper (Natalie, before Monday)
    - Holiday cards for Supporters
        - Mike Zona
        - Dr. Bailey

- Michelle Horan
- Renee - help with ASTM grant
- Dr. Lapizco - PDMS loan
- Prof Humphrey - material testing knowledge
- Dr. Smith - polymer knowledge
- Mike - Construct knowledge

12/11/2017 - Gate Review Notes:

- Keep all links on home page up to date (BOM,
- Detailed mechanical drawings with link from home page
- Order actuator before leaving
- Check photos on EDGE for
- MSD II Plan - mark as original and compare original to iterations during MSD II
- Put materials testing on link on home page
- **Create schematics for electrical drawings before going home for break**

- Thicken the cell chamber wall (Emily Wood)
- Create larger cell chamber (4x4)
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