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REU: A BALANCING ACT

Our experience managing conflicting needs for a summer Research Experience for Undergraduate program ***NFL Draft style***

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CONFLICTING GOALS?



TEXAS BIOMEDICAL ENGINEERING

REU FUNDING AGENCY VS. DEPARTMENT GOALS

- **Agency goals:** more research opportunities to students who otherwise may not get them.
- **Department goals:** “preview” top future graduate students for recruitment.
- Seemingly conflicting goals **can be synergistic!**



Source: Roanoke Sports

BALANCING GOALS!



TEXAS BIOMEDICAL ENGINEERING

OUR APPROACH

- Offer the REU experience to **rising sophomores**
- **Challenge:** may not have had **mentoring experiences** yet so early in college
- **Benefit:** Have time to follow REU with home **institutional research experience** and **graduate school applications**



Source: NY Times, 2016

IMPLICATIONS FOR APPLICATION PROCESS



TEXAS BIOMEDICAL ENGINEERING

SELECTING SOPHOMORES AS SUMMER SCHOLARS

- **Challenge:** assessing potential fit with a the **very short track record of a sophomore**
- **Benefit:** must seek out **characteristics & skills** needed for research, rather than prior research success

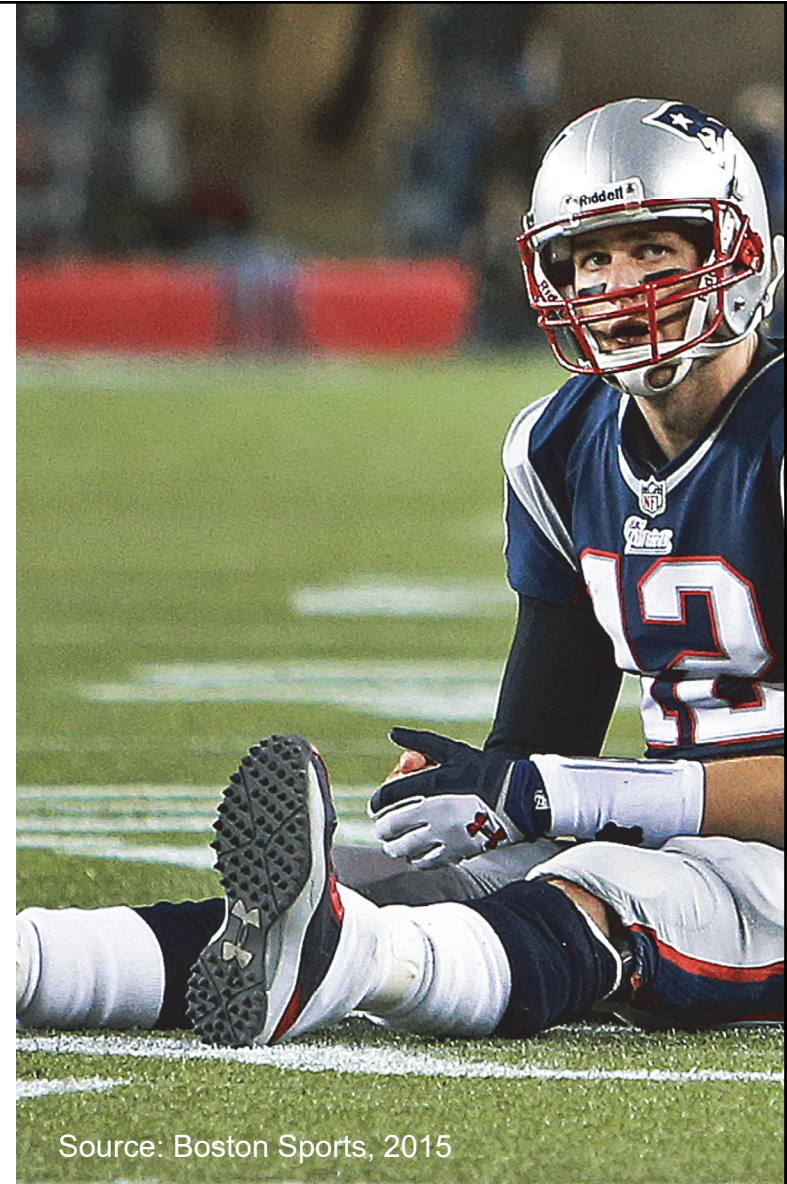


Source: Stanford University, 2012

TEXAS BIOMEDICAL ENGINEERING

CHARACTERISTICS & SKILLS

- Comfort with and skills for **effective non-classroom learning**
- Ability to **stick with things that are hard** and learn from failure
- **Enthusiasm** for science

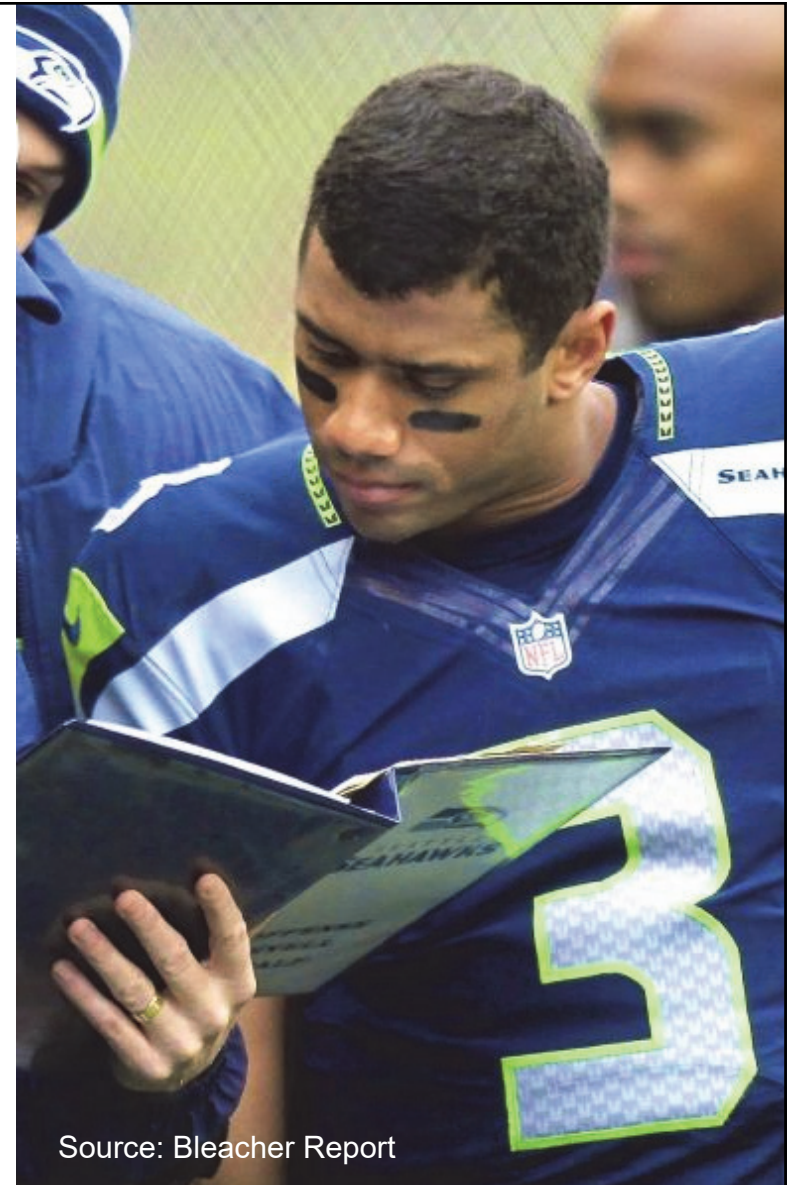


Source: Boston Sports, 2015

TEXAS BIOMEDICAL ENGINEERING

ESSAY PROMPT 1

- "Tell us about how you learned something **outside of a formal classroom environment**. What impact did this experience have on you?"

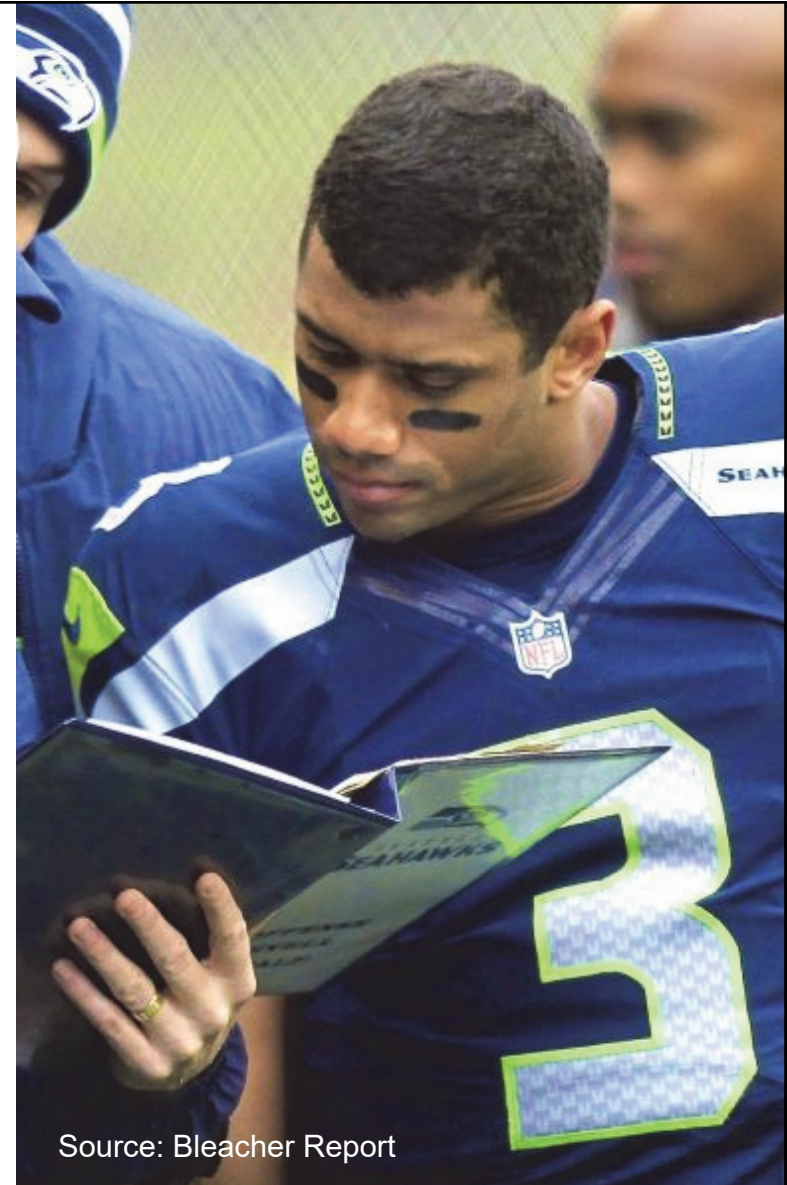


Source: Bleacher Report

TEXAS BIOMEDICAL ENGINEERING

ESSAY PROMPT 2

- "Tell us about a challenge that you were faced with and how you were able to overcome this adversity. What was your **strategy** to **persevere** and what did you learn?"

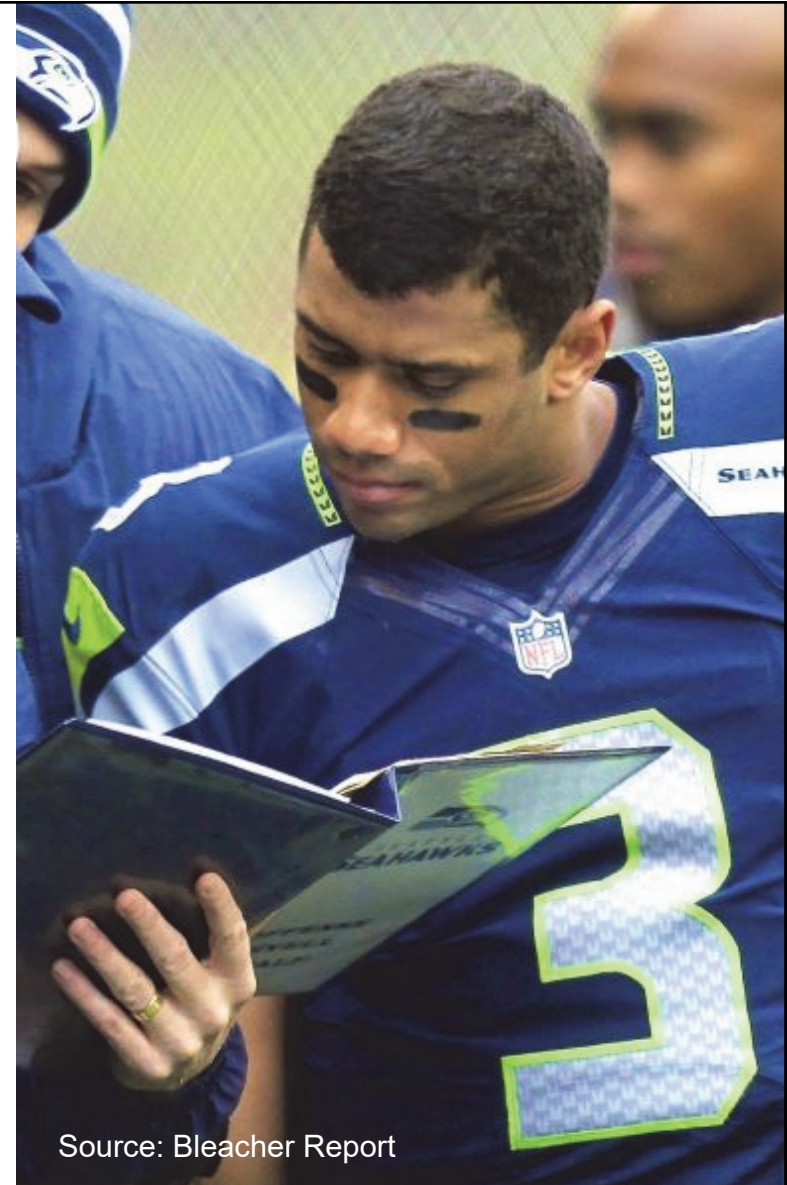


Source: Bleacher Report

TEXAS BIOMEDICAL ENGINEERING

ESSAY PROMPT 3

- "Tell us about a scientific topic or topics that you have been exposed to in your coursework that excite you. Why are they of particular interest to you?"



Source: Bleacher Report

TEXAS BIOMEDICAL ENGINEERING

LETTER WRITERS FOR FRESHMEN

- First-year undergraduates may not have good choices for letter writers yet.
- Provide them with direct guidance on selecting more relevant letter writers for their REU application.



Source: Oregon Live, 2018

IMPLICATIONS FOR APPLICATION REVIEW



TEXAS BIOMEDICAL ENGINEERING

NFL DRAFT PICK APPROACH

- Two reviewers, each focusing on one of the “opposing” two goals to pick their top candidates.
- Both goals are considered and neither dominates the review process.



Source: Tiger Net

TEXAS BIOMEDICAL ENGINEERING

CREATING AN REU TEAM

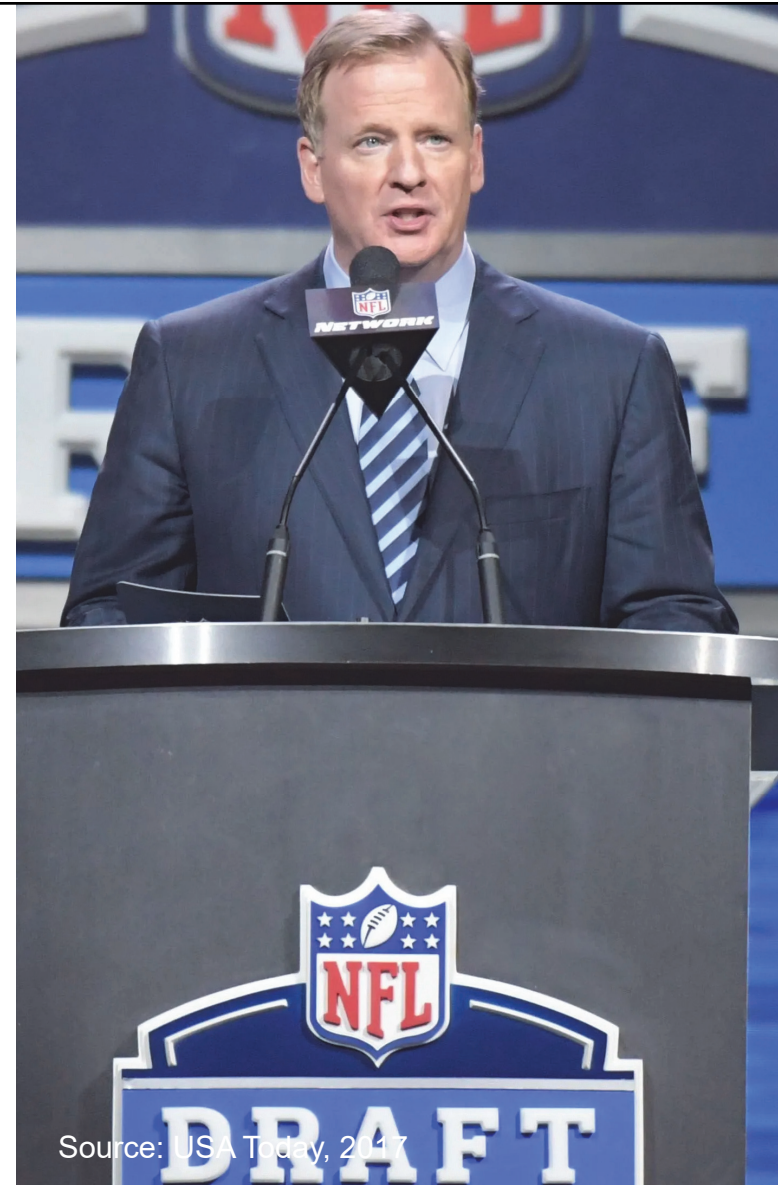
- We add 3 cohort criteria to make the team:
 1. Differing schools and regions
 2. Plausibly fit with a range of research projects
 3. Diversity of life experiences



TEXAS BIOMEDICAL ENGINEERING

REU DRAFT PICK PROCESS

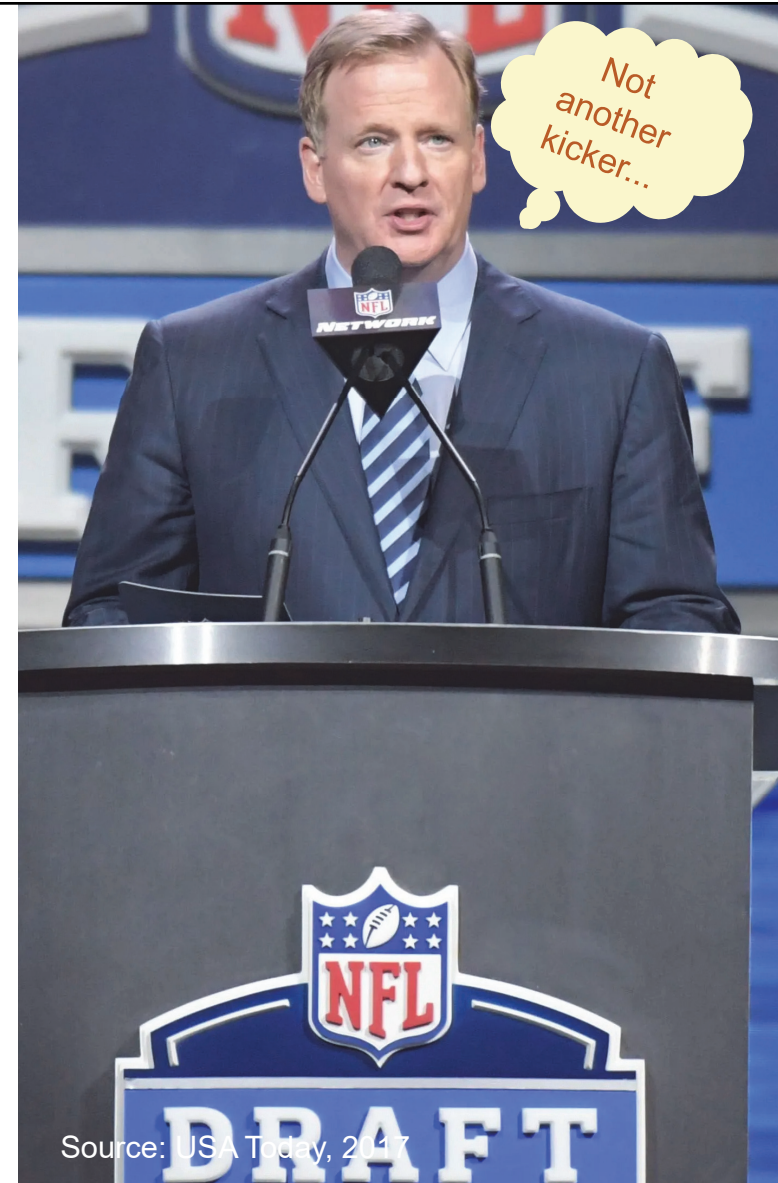
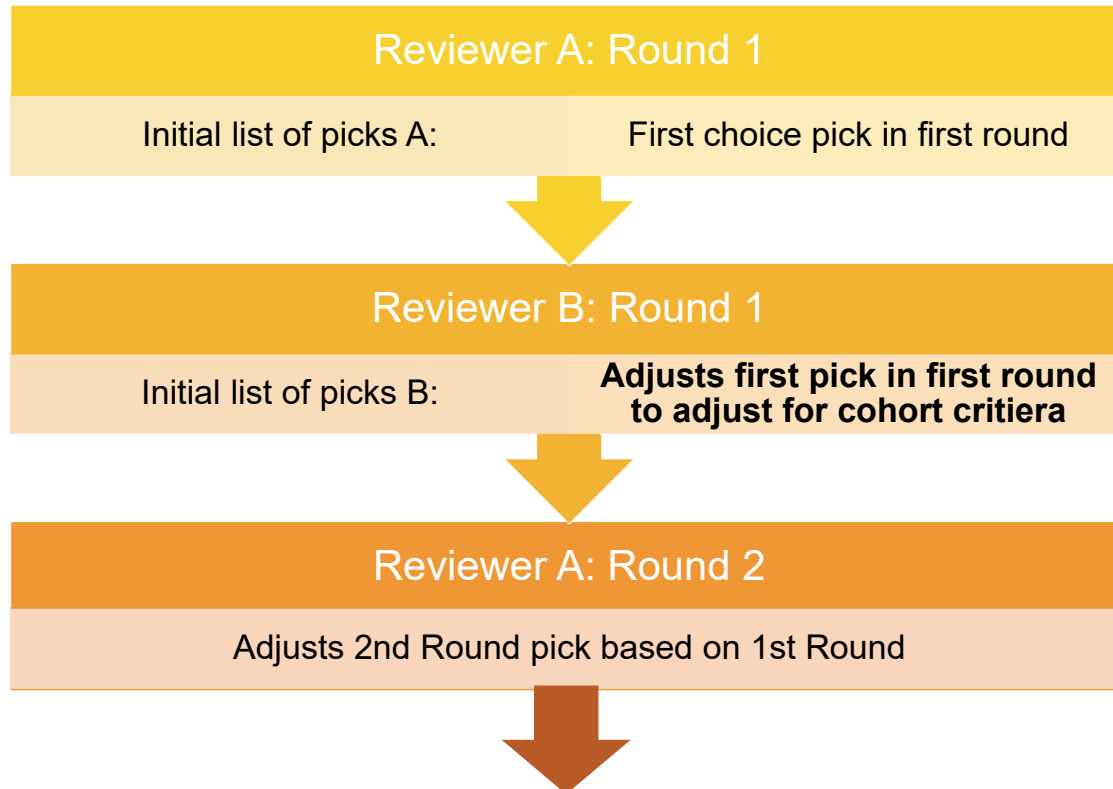
- Reviewers take turns in **five or six sequential “rounds”** selecting one student at a time
- Sequentially building the team, **pick-by-pick**
- Allows reviewers to select candidates that **combine individual characteristics to meet the cohort criteria**



Source: USA Today, 2017

TEXAS BIOMEDICAL ENGINEERING

REU DRAFT PICK PROCESS



IMPLICATIONS FOR SITE ACTIVITIES



TEXAS BIOMEDICAL ENGINEERING

RESEARCH ACTIVITIES FOR SOPHOMORES

- **Challenge:** scholars need for more mentorship, and program needs more **mentor training**
- **Benefit:** young scholars offered more **comprehensive & consistent support structure**
- **TIP:** Don't reinvent the mentor training wheel!
 - **Entering Mentoring** curriculum¹

¹ Entering Mentoring (Pfund, Branchaw, and Handelsman, 2014) developed with support from HHMI.
<https://cimerproject.org/entering-mentoring/> (accessed 2020)



Source: CNBC, 2020

TEXAS BIOMEDICAL ENGINEERING

RESEARCH BOOT CAMP

- **Challenge:** scholars have little or no experience in a lab
- **Benefit:** quickly introduce skills and practice common methods used in research
- **TIP:** leverage on-campus resources and other REU Sites' "boot camp" experiences!

2 M Cousins, SR Young, E Dolan, LK Gonzales, MK Markey, LJ Suggs (2016). A "Boot Camp" as in-laboratory introduction to research methods for a research experiences for undergraduates program. Proceedings of the Biomedical Engineering society Annual Meeting 2016, Minneapolis, Minnesota.



Source: Stripes

TEXAS BIOMEDICAL ENGINEERING

PLAN FOR ASSESSMENT

- **Challenge:** most program evaluation designed for outcomes with more experienced scholars, such as publications
- **Benefit:** allows us to assess outcomes related to identity and skill development of life-long researchers
- **TIP:** Leverage on-campus partnerships

3 C Crosby, M Cousins, L Suggs, M Markey, A Patrick (2020). Scientific Skill Acquisition and Identity of Visiting Scholars in a Research Experience for Undergraduates (REU) Site. Proceedings of the 2020 ASEE Gulf-Southwest Annual Conference, Virtual.



CONCLUSION



DRAFT PICK REU COHORT BUILDING:

BALANCING SYNERGISTIC CONFLICTING GOALS

- Synergistic solution to balance seemingly conflicting goals between agencies and institutions
- Benefits summer cohorts, program overall, and development of individual scholars



THANK YOU.

- **Mia K. Markey**, Professor and REU Co-Director
- **Laura J. Suggs**, Professor and REU Co-Director
- **Margo Cousins**, Coordinator

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