Questions (to ask, to answer, to consider):

* Why choose research or pursuit of research
* What are some characteristics of a successful researcher
* What is the potential for the biomedical field of research
  + What are possible directions for the biomedical field in the future
* Who is a researcher
  + Separating myth/ideal/TV researcher from reality of research life/career
* What does current undergraduate research experience(s) look like
  + How does a student find an experience
  + Is there any preparations prior to start of experience in lab
* What types of researchers do we need
  + How can we create/encourage/develop them
* Where is biomedical research going
* How much/little exposure necessary at the undergraduate level (is a summer enough, a year, two years, etc.)

Ideas:

* Symposium for undergraduate research
* Internships
* Complete research experience
  + Exposure to grant process, analysis techniques, journal club-how to read scientific literature, time management tips
* Community service based projects
  + Undergraduate research project designed with community need in mind; real world application to research
* Crowd sourcing research problems
  + Computational research
* Research experiences that are structured like internships or research experiences that turn into internships
* Integration of basic science (lab sciences) and computation/computer science
* Network of willing researchers with specific projects undergraduates can conduct/“own”
* Real world problems/projects
* Space for discussion philosophical/practical
* Redefine fun
* In-class lecture series with actual/real researchers guests from other institutions, industry, on-campus researchers (MCPA, etc.)
* Leverage UM assets, relationships

Notes:

* Want student to move beyond lab course was cool/okay/fun ***to*** want to pursue more detailed research project or want to do more lab work ***to*** want to pursue research as career.
* Motivating factors for undergraduates career choices
  + Money; interest in field; previous example of person in career/legacy; job opportunity potential; desired location, etc.
* Career counseling
* Job opportunity more than just a description, practical applications/examples
* Encouraging questioning/inquisitive minds
* Broad world wide impacts begin with small questions/research
* Exposure to scientific community through conferences
* Undergraduate motivations: grades, peers, graduation, self-discovery period
* Connect with UMMC/Jackson researchers
* Current Undergraduate Research Experience focused mainly on Honors College students

Articles:

* Fechheimer, M., K. Webber, P.B. Kleiber. *How well do undergraduate research programs promote engagement and success of students?* CBE-Life Science Education, *2011*, **10**, 156-163.
  + Students who participate in undergrad. Research did better as measured by GPA at UGA over a ten-year period.
* Russell, S.H., M.P. Hancock, J. McCullough. *Benefits of Undergraduate Research Experiences*. Science, *2007*, **316**, 548-549.
  + Mix of mentors good; longer (1 year or greater) research period more beneficial
* Graham, M.J., J. Frederick, A. Byars-Winston, A-B. Hunter, J. Handelsman. *Increasing persistence of college students in STEM*, Science, *2013*, **341**, 1455-1456.
  + University of Texas- Austin research course for freshmen; 3 keys to persistence, ownership of project=good.
* Summers, M.G. *Training the next generation of protein scientists*. Protein Science, *2011*, **20**, 1796-1801.
  + Very structured system, clear established level of commitment, simple technical aspects to project, training burden shared, bonding experiences outside of lab, help connect mentor to undergraduate/graduate students, huge lab.
* Kreitzer, M. A. and R.P. Malchow. *Engaging undergraduates in a unique neuroscience research opportunity: a collaborative research experience between a primarily undergraduate institution and a major research institution.* J. Undergraduate Neuroscience Education, *2013*, **12**, A85-A92.
  + Clear project with ability to ‘own’ it; video game techniques appeal to students personal hobbies, Skype lab meetings and at least one PI with direct internet connection helpful for spontaneous and useful information from internet for explanations.
* Dolan, E. L. and D. Johnson. *The Undergraduate-Postgraduate-Faculty Triad: Unique functions and tensions associated with undergraduate research experiences at research universities*, CBE—Life Sciences Education, *2010*, **9**, 543-553.
  + Good insight into burden/responsibility of URE on graduate student/post-doc, considerations about training, mentoring, expectations important prior to URE start.
* Shellito, C., K. Shea, G. Weissmann, A. Mueller-Solger, and W. Davis.  *Successful mentoring of undergraduate researchers: tips for creating positive research experiences*, 2001, 460-464.
  + Good tips, suggestions for mentors
* Vitae, Careers Research and Advisory Centre. *Diagram of Characteristics of a Researcher*
  + Helpful categories, needed skills, traits, features of a researcher

Discussions:

* Clear projects for students with beginning, middle, end
* Important work
* Network of willing researchers more in human health
* Biomedical engineering
* Boot camp: intense period of training prior to other commitment interference
* Texas example for freshman research experience
* Freshman labs train techniques and concepts for future work in lab on separate project.
* Clear procedures to follow, not too technically challenging
* Compensation for time, supplies, etc. for PI