

# Three NSF Vehicles for Funding

- Programs, such as Molecular and Cellular BioSciences (**MCB**) & Physics of Living Systems (**PoLS**)
- Early-Concept Grants for Exploratory Research (**EAGER**)
- Research Experiences for Undergraduates (**REU**)

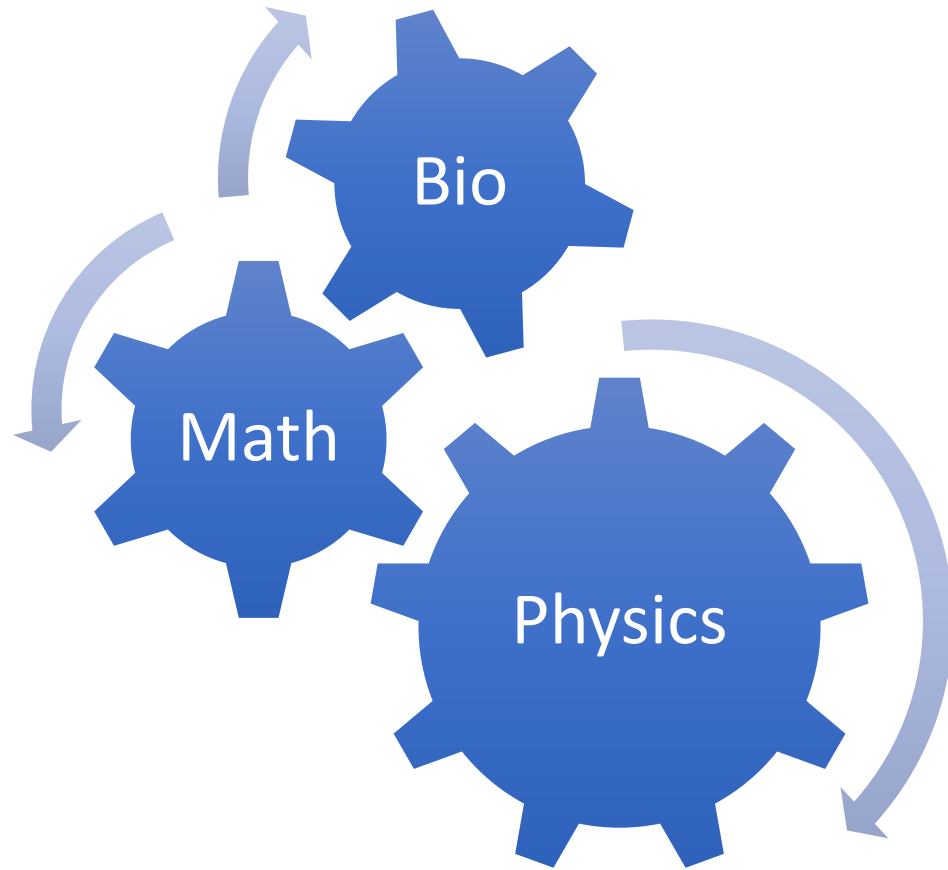
# MCB/PoLS

Molecular and Cellular BioSciences (**MCB**) & Physics of Living Systems  
(**PoLS**)

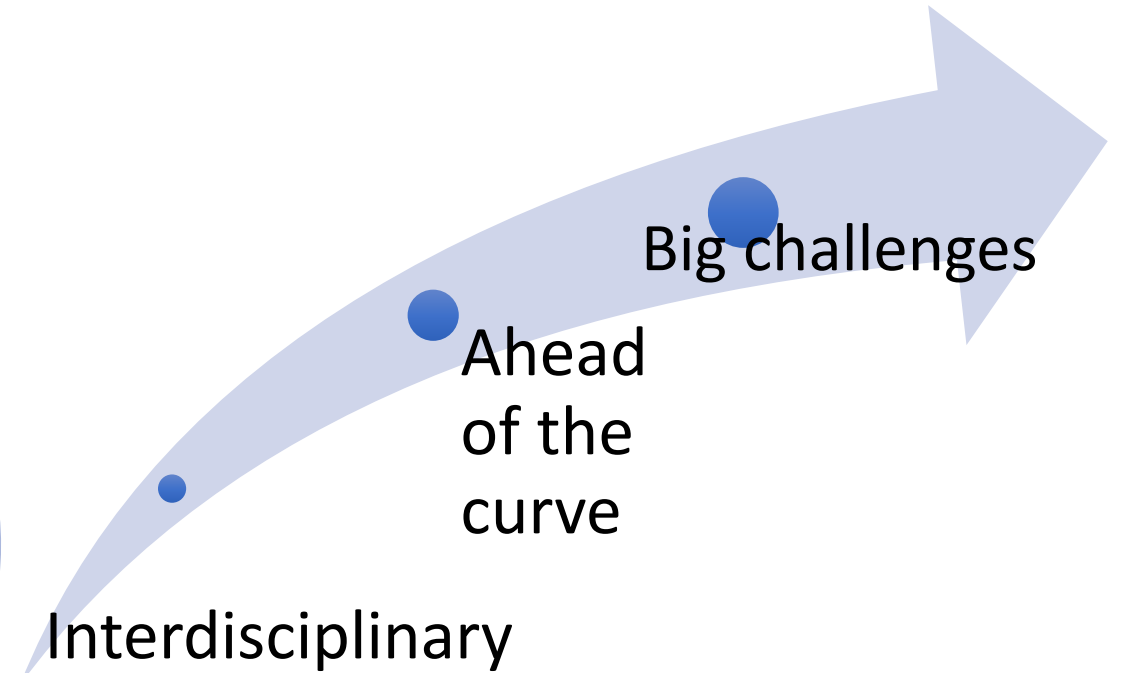
# What matters with NSF

- Being Interdisciplinary
- creative new approach (“ahead of the curve”) as **intellectual merit**
- Preliminary results in a publication with high impact
- Ahead of the curve – What is the panel receiving? – right now microbiomes
- Strong team
- **Broader impact** – ALICE – a new teaching approach and REUs
- Integrate Broader impact with research
- 3 aims
- If truly interdisciplinary, may be able to break up to 2 directorates
- Know your audience

# Interdisciplinary



# Creative



# Being ahead of the curve

- 1989 – do genomics
- 2004 - do systems biology
- 2017 – do single cell approaches
- 2018 - do single cell omics and metabolomics

# Creative Integrated\* Broader Impact

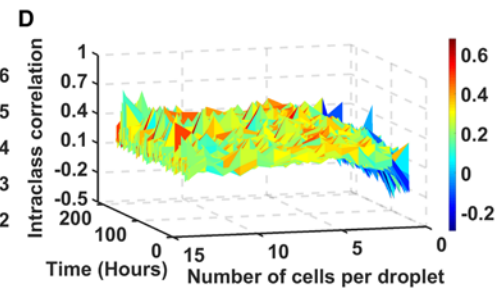
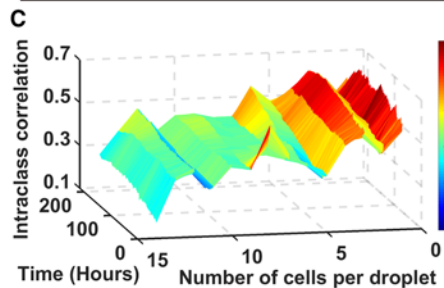
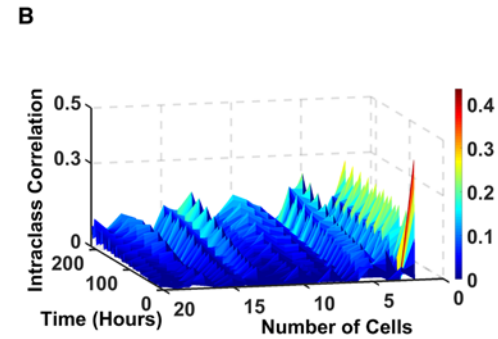
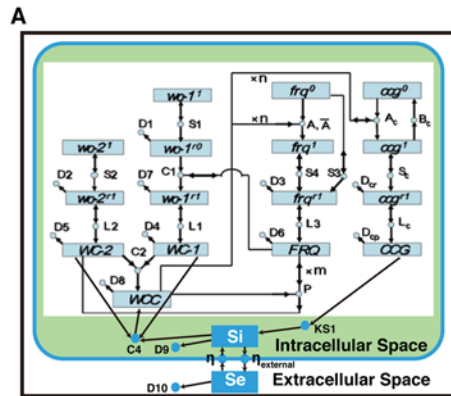
- **ALICE** – new teaching approach\*
- Partnerships with museums on science outreach
- Several REUs
- Involvement with INCLUDES and AGAPE
- Involvement with LSAMP
- Partnerships with companies for student internships\*
- International partnerships with UL\*

# Unpacking Interdisciplinary

- Arnold (Genetics)
- Schuttler (Physics)
- Mao (Engineering)
- Edison (Biochemistry)
- Big challenges tend to require an interdisciplinary approach
- You need experts in each field; you cannot do it all!
- You may not fit it all into one grant –consider multiple directorates
- NSF likes interdisciplinary proposals!

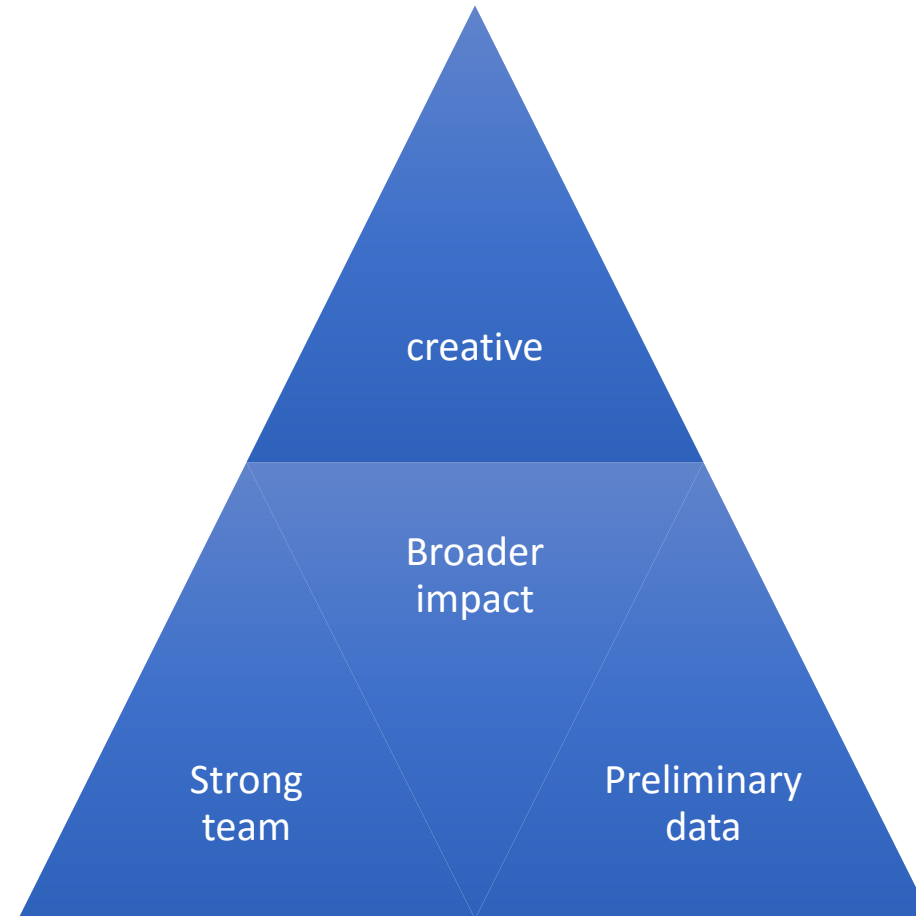
# Breaking the project up

- PoLS, a physical explanation
- MCB, a biochemical explanation





# What matters with NSF



# Know your audience



# Frequent Mistakes

- Lack of an original idea (in either research **OR** broader impact)
- Lack of an acceptable rationale (why do it – what is the big challenge?)
- Questionable reasoning in experimental approach
- Uncritical approach (be up front on the limitations of approach)
- Diffuse, superficial, or unfocused research plan (crystal clear)
- Lack of sufficient experimental detail (limits yourself to three aims)
- Lack of knowledge of relevant literature
- Unrealistically large amount of work
- Uncertainty concerning future directions

# Some Examples of Mistakes

- Insufficient collaborators to cover interdisciplinary problem
- very large budget (see what level is funded on NSF Web site)
- Lack of prior results and interdisciplinary expertise
- Lack of awareness in limitations of approach
- Outreach is not original
- Not aware of what has been done and published
- Lack of clear strategy to answer the question posed
- NO Assessment of broader impact of proposal
- Questionable experimental approach

# EAGER

Early-Concept Grants for Exploratory Research (**EAGER**)

# EAGER

- Novel approach
- Helps to meet the program director in a wider context
- Fits what they want – Quantitative Biological Sciences (QBS) in MCB

# Examples for EAGER

- New physical mapping algorithm in 1995
- New approach to education in ALICE in 2016

# REU

Research Experiences for Undergraduates (**REU**)



# REU

- Pilot program for a year
- Need sign of university support – a lot at UGA
- Integrate activities of other REUs on campus
- Get a copy of a successful REU application from one of 7 REUs at UGA
- Have an evaluation plan of the program using URSSA rubric
- Select mentors wisely – be sure to get those committed to undergraduates and with a proven track record