

Research Development Fund – Spring 2016 Cover Page**Application Title: Synthetic and Systems Biology Innovation Hub (SSBIH)****Lead contact for RDF application:****Name: Joshua S. Yuan****Department: Plant Pathology and Microbiology****Email address: syuan@tamu.edu****Phone number: 979 845 3016****Key Participating units:**At the department level: PLPM, BioBio, ChemE, Chem, ECE, P&P, VIBS, VTPBAt the institute level: Institute for Plant Genomics and Biotechnology, Office of the Texas State ChemistAt the college level: COALS, COE, COM, COS, and CVMAt the agency level: TAMHSC, Texas A&M AgriLife Research, TEES, TAMU**Anticipated Request Amount (\$): 2.2 million****Executive summary:**

With several recent major federal research grants on synthetic biology to Texas A&M University System, we propose to build a Synthetic and Systems Biology Innovation Hub (SSBIH) to promote the integration of cutting-edge science, engineering, and industry development at this important emerging field. The emerging synthetic and systems biology is taking biological and engineering research into a new era. The funding of Synthetic and Systems Biology Innovation Hub (SSBIH) will not only provide the matching funds for the incoming and future federal grants, but also distinguish us from our peer institutes in our missions for feeding the world, protecting the environment, delivering health solutions, developing new energy resources, and enhancing our economy.

Benefits to TAMUS: It is so often neglected that a successful shared facility relies not on the instruments, but on the extensive expertise and rigorous research program. SSBIH sets its mission in leveraging and integrating the existing strong expertise in bioinformatics, metabolic engineering, synthetic biology, systems biology, bioanalytical chemistry, and various biological and biomedical research disciplines to enable a world-class synthetic and systems biology research facility. Such research facility will further support, enable, and integrate the research from participating faculty members and entire campus to build stronger interdisciplinary and cutting-edge programs. With the extensive management experience and strong funding track record of the team, we expect SSBIH will become a sustainable and productive research facility to drive the research, development and commercialization at TAMUS.

Anticipated Outcome: The team has a strong record in leveraging state funding for federal grants. In particular, the PI has leveraged nearly \$10 million funding from DOE using limited funding from state biofuel initiatives. We expect SSBIH will amplify the track record to both enable world-class scientific research and leverage extensive federal funding as follows.

- Support the submission of >\$10 million federal grants each fiscal year.
- Support the research for >15 publications each year.
- Enable the emerging multidisciplinary scientific research programs by service and collaboration, and promote the submission of major interdisciplinary proposals accordingly.
- Support research to disclose >5 new technologies each year.
- Engage industrial partners for rapid commercialization of technologies.

As one of the leading public research institutes in the nation, synthetic biology are noticeably absent from our programs and initiatives. The establishment of a cutting-edge synthetic and systems biology facility and the integration of faculty expertise in the area will both keep TAMU as a front-runner in life science and engineering research, and benefit the research and enterprise development in Brazos Valley significantly.