



U.S. Department of
Agriculture
National Institute of
Food & Agriculture



Project Title

A Two-stage Reactor and Cell Recycle System for Enhanced Alcohol Production from Syngas

Dr. HASAN ATIYEH

Project Goal

A novel two-stage reactor, which leverages fermentation control developed at OSU, is proposed to address these issues. The goal is to develop a stable and efficient two-stage syngas fermentation producing at least 40 g/L ethanol with a residence time of 40 hours or less.

Objectives

- (1) Medium optimization and microbial strain adaptation
- (2) Characterization and optimization of the novel two-stage reactor with cell recycle
- (3) Process modeling of the novel two-stage reactor with cell recycle

Expected Outcomes

Successful completion of this project will result in development of a stable and efficient two-stage syngas fermentation producing at least 40 g/L ethanol with a residence time of 40 hours or less. The syngas composition will be varied within a range of output expected from various feedstocks. At the conclusion of this project, the operating parameters for the two-stage reactor that results in the highest ethanol titer and productivity will be identified. These parameters will be used in scale up of syngas fermentation.



PI: Hasan Atiyeh
Oklahoma State
University
*Biosystems and
Agricultural Engineering*

Co-PIs:
Dr. Ralph Tanner
University of Oklahoma
*Microbiology and Plant
Biology*

Funded: \$150,024
Start Date: 06/01/2017
End Date: 05/31/2019