Clay Swackhamer

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Education

UC Davis — **Davis, CA**
Ph.D. candidate in Biological Systems Engineering — *2016-present*
Specialization: Food Engineering — GPA: 3.94

Penn State University — **University Park, PA**
Schreyer Honors College — *Class of 2015*
B.S. in Biological Engineering, Food and Biological Process Option — GPA: 3.92
Passed Fundamentals of Engineering Exam, certified engineer in training
Minor: Spanish

University of Alicante — **Alicante, Spain**
Completed 15 credit semester of courses taught in Spanish — *August 2014-December 2014*
GPA: 4.00

Experience

LignoLink, INC. — **Innovation Park, PA**
Engineering intern — *January 2016-August 2016*
- Conducted aqueous ammonia pretreatment and enzymatic hydrolysis reactions on 98 biomass samples
- Designed, constructed, and validated custom HPLC assay for 5 sugar monomers in hydrolyzed biomass samples
- HPLC development included equipment purchase, installation, calibration, and development of automated data analysis routine using MATLAB
- Created the first logo and website for a faculty-led, NSF-Small Business Innovation Research program startup company

McCormick & Company INC, Materials Process Engineering Group — **Baltimore, MD**
Engineering intern — *May 2015-August 2015*
- Helped create plan to realize $160,000 annual cost savings by eliminating overblending and reducing overfill losses
- Benchmarked physical properties of dry seasoning mixes using 5 instruments in food powder technology platform
- Conducted over 300 experiments; processed data using descriptive statistics and modeling
- Quantified link between blend time and product bulk density
- Collaborated with McCormick engineers in 3 countries

Microbiological Engineering, Course Biological Engineering 468 — **University Park, PA**
Team member — *January 2015-May 2015*
- Team received "Best in Class" award for design of industrial amino acid production system by fermentation
- Presented at Northeast Agricultural and Biological Engineering Conference; won undergraduate paper competition

International Genetically Engineered Machines (iGEM) Competition — **University Park, PA**
Undergraduate researcher-Penn State team — *May 2014-October 2014*
- Redesigned gene for fluorescent protein at codon level using original MATLAB scripts
- Presented at iGEM international research conference; team won gold medal from independent panel of judges

Penn State Department of Agricultural and Biological Engineering — **University Park, PA**
Undergraduate researcher-biomass densification project — *August 2012-May 2013*
- Quantified the impact of process variables and feedstock composition on quality of renewable pellets from switchgrass
- Presented research poster at Penn State undergraduate research exposition; won third place in engineering division

Peer-reviewed publications

- A. Hayes, **C. Swackhamer**, Y. Mennah-Govela, M. Martinez, A. Diatta, G.M. Bornhorst. B. Hamaker. "Pearl millet (*Pennisetum glaucum*) couscous breaks down faster than wheat couscous in the Human Gastric Simulator, though has slower starch hydrolysis." 2020. Food & Function. 11: 111-122. 10.1039/C9FO01461F. **Selected as cover article.**
- **C. Swackhamer**, Z. Zhang, A.Y. Taha, G.M. Bornhorst. "Fatty acid bioaccessibility and structural breakdown from in vitro digestion of almond particles." 2019. Food & Function. 10: 5174-5187. doi: 10.1039/C9FO00789J
- **C. Swackhamer**, G.M. Bornhorst. "Fracture properties of foods: Experimental considerations and applications to mastication." 2019. Journal of Food Engineering. 263: 213-226. doi: 10.1016/j.jfoodeng.2019.07.002
- D. Ciolkosz, R. Hilton, **C. Swackhamer**, H. Yi, V. M. Puri, D. Swomley, G. Roth, "Farm-Scale Biomass Pelletizer Performance for Switchgrass Pellet Production." 2015. Applied Engineering in Agriculture. 31(4): 559-567. doi: 10.13031/aea.31.10803