

One-pot deconstruction and conversion of dry and ensiled sorghum

Julius Choi^{1,2*} (juliuschoi@lbl.gov), Seema Singh^{1,2}, Blake Simmons^{1,3}, and John Gladden^{1,2}

¹Joint Bioenergy Institute, Lawrence Berkeley National Laboratory, 5885 Hollis St, Emeryville, CA 94608, USA; ²Sandia National Laboratories, 7011 East Ave, Livermore, CA 94551, USA;

³Biological Systems and Engineering Division, Lawrence Berkeley National Laboratory, Berkeley, CA 94720, USA

URL: www.jbei.org

Project Goal: Establish the scientific knowledge and new technologies to transform the maximum amount of carbon available in bioenergy crops into biofuels and bioproducts

The development of low cost and high efficiency biomass deconstruction methods is a crucial step in the commercialization of biorefinery. Ensiling is an anaerobic biomass storage method producing some acids like lactic acids and acetic acids beneficial for biomass conservation. Furthermore, these acids generated during ensiling storage could serve as an in-situ mildly acidic pretreatment leading to improved deconstruction efficiency^{1,2}. [Ch][Lys] based-one pot process has been demonstrated as an efficient method to deconstruct biomass³. The integration of the two processes is expected to improve the efficiency of the biomass pretreatment step. This approach has been investigated with different sorghum hybrids

References

- 1) Essien et al. (2018), Ensiled wet storage accelerates pretreatment for bioconversion of corn Stover, *Front. Bioeng. Biotechnol*, 6, 195
- 2) Thomsen et al. (2016) Combination of ensiling and fungal delignification as effective wheat straw pretreatment, *Biotechnol Biofuels*, 9, 16
- 3) Sun et al.(2017), One-pot integrated biofuel production using low-cost biocompatible protic ionic liquids, *Green Chemistry*, 19, 3152-3163

Funding Statement

Office of Science, Office of Biological and Environmental Research, of the U.S. Department of Energy under Contract No. DE-AC02-05CH11231