

Direct conversion of hemicellulose into D-xylonic acid by engineered *Corynebacterium glutamicum*전은정, 임성순, 최재웅, 이세화, 정기준<sup>†</sup>

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D-xylonic acid, one of the top 30 high-value chemicals by the US Department of Energy (DOE), has various applications, such as substrate for biosynthesis of 1,2,4-butanetriol, concrete additive, and pH regulator for food, chemical, pharmaceutical industries. To date, D-xylonic acid has been produced by microbial conversion of D-xylose, the hemicellulosic pentose sugar. To acquire D-xylose from hemicellulose, however, additional process of enzymatic hydrolysis is required, and it can significantly increase the cost and time for whole process. Here, we engineered *Corynebacterium glutamicum* for the production of D-xylonic acid directly from hemicellulose. First, xylose dehydrogenase from *Caulobacter crescentus* was introduced for the D-xylonic acid production. Next, xylose transporter was introduced for the enhanced D-xylose uptake. Finally, a xylan degradation system was also added to degrade hemicellulose into D-xylose for the direct production of D-xylonic acid from hemicellulose. To the best of our knowledge, this is the first report of developing consolidated bioprocess for the production of D-xylonic acid.