lucaric acid is a six-carbon diacid that has potential to serve as a platform chemical. In the past two decades, researchers and organizations have applied for several patents pertaining to glucaric acid. It has many uses, including:

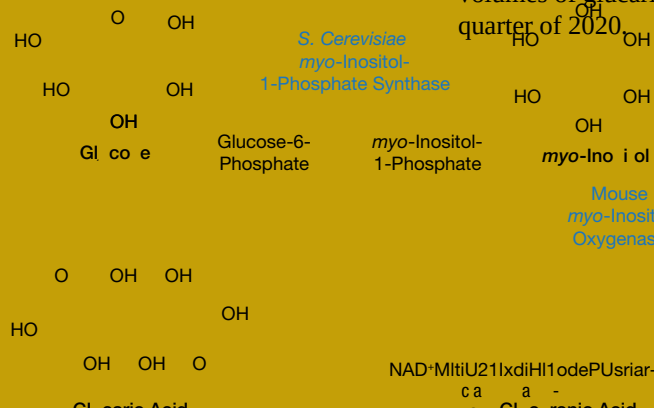
- in the production of adipic acid for renewable nylon-6,6
- as a intermediate in the production of 2,5-furandicarboxylic acid (FDCA), a high-performance renewable replacement for polyethylene terephthalate (PET) in two-liter bottles
- as a polymer additive to increase the mechanical properties of several different classes of industrial fbers including polyacrylonitrile (PAN), a

the frst-generation *E. coli* strain developed at MIT and is now developing an even lower-cost second-generation strain.

Kalion tweaked the frst-generation strain to make it more industrially robust so that it can deal with challenges rarely seen at the lab scale, such as bacteriophage contamination. The company also developed an optimized downstream process that readily delivers multiple commercially relevant forms of glucaric acid with >99% purity. For example, the process can create an aqueous formulation for water treatment customers and a calcium salt form for pharmaceutical customers. Customers in water treatment and the pharmaceutical industry have tested and validated the fnal products for commercial production. And, the aqueous glucaric acid product has received Toxic Substances Control Act (TSCA)-related approvals, which are necessary for its use in water treatment applications.

In the initial process developed at MIT, product titers were high, but the feedstock, *myo*-inositol, was 10 times more expensive than glucose. This limited the proftability of the process, and made it cost-effective to use glucaric acid only in high-purity applications. Kalion made several key modifcations in its second-generaton strain so that it can produce glucaric acid from the lower-cost substrate glucose.

The U.S. Environmental Protection Agency (EPA) recognized Kalion's work with a Green Chemistry Award for Small Business in 2019. Using the frst-generation strain, the company will produce multi-ton volumes of glucaric acid by the frst quarter of 2020.



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