Xylose Operon Converts Xylose to 1,4-butanediol

Technology #20160097

1,4-butanediol from Lignocellulosic Biomass

A newly discovered xylose operon converts xylose from lignocellulosic biomass into TCA compounds, which can then be further converted to 1,4-butanediol (BDO). A new synthetic pathway in *E. coli* produces 1,4-butanediol in only six steps, making it more efficient than previous pathways used in current industrial methods (which require 20 steps). The technology combines previous pathways, where sugars derived from lignocellulose are converted into compounds in the tricarboxylic acid (TCA) cycle through the conventional metabolic routes, and further characterizes an alternative metabolic pathway in order to use *E. coli* to biosynthetically produce BDO and other chemicals such as succinate, glutaconate and amino acids.

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<th>MN-IP Try and Buy</th>
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<tr>
<td><strong>Try</strong></td>
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<tr>
<td>• Trial period is six months</td>
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<td>• Trial fee is $5,000</td>
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<td>• Trial fee is waived for MN companies or if sponsoring $50,000+ research with the University</td>
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<td>• No US patent expenses during trial period</td>
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<td><strong>Buy</strong></td>
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<td>• $25,000 conversion fee (TRY to BUY)</td>
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<td>• Royalty rate of 3% (2% for MN company)</td>
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<td>• Royalty free for first $1M in sales</td>
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Xylose Operon has Much Higher Activity

Current methods to produce chemicals from renewable sources (e.g., microbes or inedible lignocellulosic feedstock) instead of petroleum face disadvantages in yield, efficiency and costs. This new xylose operon (genes) has much higher activity and converts xylose into TCA compounds, such as BDO, more efficiently than current methods.

**BENEFITS AND FEATURES:**

- Converts xylose to 1,4-butenediol (BDO)
- Requires only six steps
- More efficient; higher activity
- May also produce succinate, glutaconate and amino acids

**APPLICATIONS:**

- Synthesis of compounds in the tricarboxylic acid cycle
- Conversion to 1,4-butenediol (BDO)
- Synthesis of TCA compounds and other desirable products

**Phase of Development** - Working prototype

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IP: UM Docket 20160097

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