HMO (Human Milk Oligosaccharides) from GRAS

2′-Fucosyllactose (2′-FL) with safety and quality

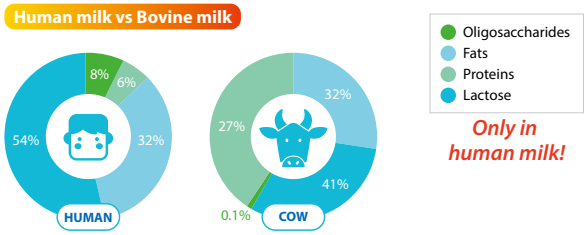
Introduction

Founded in 2001, AP Technologies Corp. is a Korean bio-tech company specialized in fermentation and metabolic engineering with 30+High-caliber R&D and production manpower. It is dedicated to developing and producing Human Milk Oligosaccharides.

- HMO production from a **GRAS host strain** using its proprietary technologies
- Holds patents related to its HMO development and production
- Large-scale GMP production of HMOs available at reasonable cost

What is HMOs?

Human milk oligosaccharides (HMOs) are a family of structurally diverse unconjugated glycans that are highly abundant in and unique to human milk. **HMO is the third most abundant component in human milk after lactose and fats contrary to less than 0.1% in cow's milk.**



*An estimate, Oligosaccharide content varies over time and individuals.

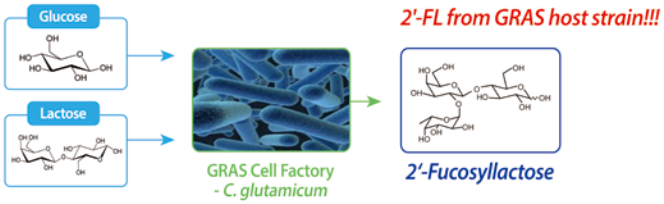
2′-Fucosyllactose (2′-FL)

The most abundant HMO is 2′-Fucosyllactose, with a concentration of about 2 grams per liter. **2′-FL as selective prebiotics** that resist digestion by human intestinal enzymes and promote growth of healthy microbiota in the gut to support baby's **developing immune system.**
2′-FL may also help **reduce the risk of inflammation with positive effects on the nervous system and cognition.**

2′-FL from GRAS

Our 2′- FL has been developed from a GRAS(Generally Recognized as Safe) host strain, *C. glutamicum* and foreign pathway enzymes are all from Biosafety Level 1 (BSL 1) microorganisms.

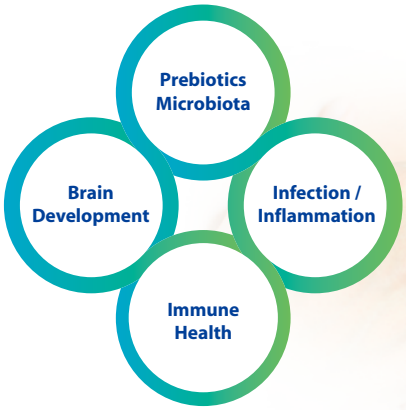
- Safest production method available to produce 2′-FL
- Free from unnecessary regulatory issues in far east Asian countries
- Commercial level of large production capacity



3-FL (3-Fucosyllactose) from *C. glutamicum* will be available in 2019!

Beneficial Effects of 2′-FL

Human milk oligosaccharides (HMOs) acts important roles to help support infant's digestion and immune health.



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曼生泰
Momstamin

符合GRAS标准的HMO（母乳低聚糖）

安全优质2’-岩藻糖基乳糖（2’-FL）

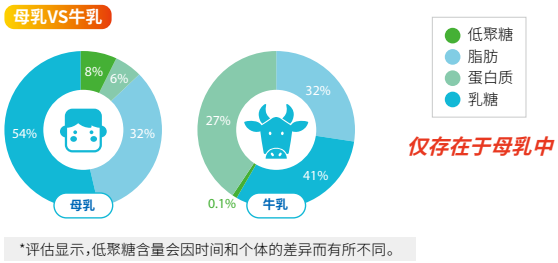
高级蛋白质技术公司

高级蛋白质技术公司成立于2001年，是一家专注于从事发酵与代谢工程的韩国生物科技公司，旗下拥有高素质研发生产人员30余名。公司致力于母乳低聚糖的开发与生产。

- 利用公司专利技术从符合GRAS标准的宿主菌中生产HMO
- 拥有HMO研发与生产专利
- 按照药品生产质量管理规范低成本大规模生产HMO

母乳低聚糖

母乳低聚糖（HMOs）是一系列多样式结构 的非共轭聚糖，仅在母乳中大量存在。HMO在母乳中含量仅次于乳糖和脂肪，是第三大营养物质，而在牛乳中HMO含量不到0.1%。



*评估显示，低聚糖含量会因时间和个体的差异而有所不同。

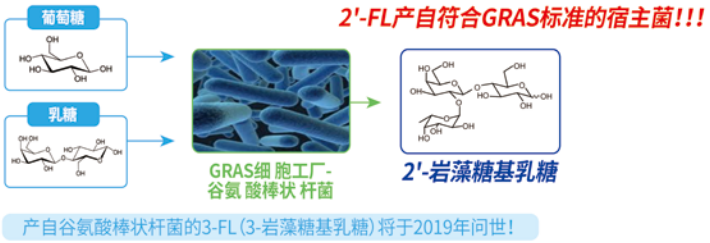
2’-岩藻糖基乳糖

母乳低聚糖含量最丰富的是2’-岩藻糖基乳糖，其浓度可达每公升约2克。作为一种选择性益生元，2’-FL可以抵制人体内肠道酶的消化，促进肠道有益菌群的生长，从而促进宝宝免疫系统的发育。2’-FL还可以帮助降低炎症发生的风险，对神经系统与认知产生积极影响。

符合GRAS标 准的母乳低聚糖

我们的2’-FL提取自符合GRAS标准（通常被认为 是安全的）的宿主菌，谷氨酸棒状杆菌和外源途径酶 均提取自符合生物安全等级1级（BSL1）的微生物。

- 最安全的2’-FL生产方法
- 免于亚洲远东国家不必要的监管问题
- 拥有大规模生产能力的商业化水平



产自谷氨酸棒状杆菌的3-FL（3-岩藻糖基乳糖）将于2019年问世！

母乳低聚糖的有益影响

母乳低聚糖（HMOs）在辅助助婴儿消化和婴儿免疫健康方面发挥重要作用

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