

**TECH OFFER**

## Virus-binding Protein Technology Derived from Beans



### KEY INFORMATION

**TECHNOLOGY CATEGORY:**

Chemicals - Bio-based

Healthcare - Diagnostics

Personal Care - Cosmetics & Hair

**TECHNOLOGY READINESS LEVEL (TRL):** TRL6

**COUNTRY:** SOUTH KOREA

**ID NUMBER:** TO174956

### OVERVIEW

Norovirus is a highly contagious non-enveloped virus responsible for causing >90% of viral gastroenteritis, and >50% of all gastroenteritis outbreaks worldwide. According to the WHO, norovirus causes an estimated 685 million cases of infection and 200,000 deaths per year. Its resilience poses challenges for eradication through altering pH, heat exposure, or common disinfectants. Notably, alcohol-based hand sanitisers are not as effective against this virus, according to the US CDC.

To address this, a biotech company has successfully developed a novel virus-binding protein technology derived from jack beans or sword beans. This patented lectin protein exhibits antiviral properties and has demonstrated the ability to neutralise not only norovirus, but also coronavirus and Hepatitis A virus. It has also demonstrated activity against *Escherichia coli* bacteria.

By utilising this innovative technology, viral outbreaks can be prevented. This versatile lectin protein can be incorporated as an active ingredient into various product formulations. The technology owner is especially interested to work with companies from

health service sectors, and personal care product manufacturers.

## TECHNOLOGY FEATURES & SPECIFICATIONS

**Anti-viral technology:** The lectin protein derived from jack or sword beans exhibits the ability to bind to the antigen sites of both norovirus and coronavirus, effectively neutralising these viruses.

**Versatility:** Hand soap enriched with this jack bean or sword bean extract has been scientifically proven to possess 99% anti-coronavirus activity and 99.9% anti-*Escherichia coli* activity.

**Effectiveness:** A comparative study based on the American Society for Testing and Materials (ASTM E 1838-02) standard finger pad method has shown that hand soap formulated with this lectin protein demonstrates higher anti-norovirus activity when compared to regular hand soap, significantly enhancing the cleaning performance of formulated products (90.48% vs. 27.41%).

**Certified product:** The anti-norovirus and anti-coronavirus properties of the hand soap were certified by independent test institutes, such as Korea Conformity Laboratories under the Korea Laboratory Accreditation Scheme (KOLAS).

## POTENTIAL APPLICATIONS

This novel lectin protein extracted from jack or sword beans may be used as an active ingredient in a wide range of products for applications such as:

- Personal care, e.g. hand soap, oral hygiene products, hand disinfectants, etc.
- Health care services
- Surface disinfectant

The virus-binding property of the lectin protein also offers the potential for the development of virus testing kits, diagnostic devices and medical devices for clinical collection of oral viruses.

## MARKET TRENDS & OPPORTUNITIES

According to Global Market Insights, the global liquid hand soap market crossed over US\$3.0 billion in 2022, and is expected to grow at a CAGR of >7.5% from 2023 to 2032.

## UNIQUE VALUE PROPOSITION

- **Effectiveness:** Unlike the abundantly available alcohol-based sanitiser, which is a less effective against norovirus, the lectin-enriched hand wash is effective in neutralising the virus.
- **Non-toxic:** Based on in vivo test in C57BL/6 mice, the bean extract has no effect on the survival rate, and does not cause hepatotoxicity nor toxicity of lung and spleen tissues.
- **Non-allergic:** A dermatological test confirmed that it is safe for use, even on sensitive skin.
- **Versatility:** The technology can be effective at reducing norovirus, coronavirus, hepatitis A virus and *E. coli* by 90-99%.
- **Eco-friendly:** The technology serves as a safer alternative to conventional synthetic disinfectants.