FIRST PRINCIPALS
Technology Transfer & Commercialization

COST-EFFECTIVE, MARINE-DERIVED GLYCONUTRIENTS

Researchers at the National Institute of Advanced Industrial Science and Technology (AIST) *have developed and patented two distinct and useful biochemical compounds from marine byproducts with efficient and highly favorable economics. Each opportunity is described below.*

Chondroitin Sulfate

This method enables the preparation of chondroitin sulfate ***from waste fish scales***. Any kind of fish can be used; e.g., both freshwater and saltwater fish.

Chondroitin sulfate is a major constituent of cartilage and consumed by some for its presumed ***benefit in easing joint pain***.

Patented Technology

Current U.S. patent protection includes:

US Patent	Features
6,342,367	• Method for the preparation of chondroitin sulfate compounds. • Fish scales are enzymatically decomposed in the presence of a protease to isolate the chondroitin sulfate compounds and by-product polypeptides.

Sialic Acid Compounds

Sialic acid is a generic term for the N- or O-substituted derivatives of **neuraminic acid**, a nine-carbon monosaccharide. This opportunity provides an efficient and economical preparation of N-glycolyl neuraminic acid from echinoderms such (*Cucumaria echinata)*, which are typically discharged as waste from fisheries.

N-glycolyl neuraminic acid is found in certain cancer cells and is useful as a potential ***cancer biomarker***.

The method replaces the current approach of isolating and recovering the neuramininc acid from tissues of vertebrate animals such as horses, cattle, pigs, and dogs.

Marine Sources

Echinoderms are any marine animal of the invertebrate phylum *Echinodermata*, which have a radiating arrangement of parts and a body wall stiffened by calcareous pieces that may protrude as spines and include the starfishes, sea urchins, and sea cucumbers.

Patented Technology

Current U.S. patent protection includes:

US Patent	Features
6,143,533	• Method for the preparation of N-glycolyl neuraminic acid from Cucumaria echinata. • One common echinoderm is "gumi", a nuisance to the Japanese fishing industry.

For More Information

AIST is seeking to license this technology and provide assistance with its commercialization success to qualified organizations. Consideration will be provided to a range of financial, strategic, and commercial investment options.

Certain circumstances will warrant consideration for nominal funding from AIST.

AIST (National Institute of Advanced Industrial Science and Technology) is Japan's extensive public research organization established in 2001. AIST and its predecessors have advanced technology and supported Japanese industries since 1876. Although not specifically a government institution, AIST is largely funded by the Japanese government. To learn more, see the AIST Home Page at: www.aist.go.jp/aist_e/about_aist/index.html.

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