

# **Teaser Memorandum**

BIOCOATS Co., Ltd

Title(Name of Technology) :

Alginate microcapsule encapsulated extract of horseradish and preparation method



Executive Summary		Compa	ny Description	
Established in Fab. 17, 2003, Biocoats Co., Ltd ("Biocoats" or "the Company"), a bio technology venture company which develops and manufactrers biopolymer-related products and functional health food. Biocoats's major technology is health supplement food, foodstuff and environment-friendly substances. And R & D focus on the field of biopolymer as next generation environment-friendly substance. Biocoats succeeded in making wasabi(Japanese horseradish, <i>Wasabia japonica</i> Matsumura) scrapped so far available widely by offering alginate microcapsule encapsulated extracts(hereinafter referred to as 'Alginate microcapsule') as small as 100-200 nm from stems and leaves of wasabi		CEO: DONG SU, CHA Established: February, 17, 2003 Business Item: Biopolymer-Related Developments, Products, Trade, Mail-Order Sale, Health Food Main Product: Glucosamine-Processed Foodstuff, Chitosan-Applied Products, Chunggukjang Products		
The Company intends to enter into a technology transfer or licensing transaction with regard to Alginate microcapsule. Terms of the transaction are not set, and interested parties may further discuss the details if they wish to enter into an agreement.           Industry Sector:           1. Academic/Research: Biotech, 2. Animal health: Health & Hygiene 3. Biotech: Nanotechnology, 11. Service		Patent Tit encapsulat preparation Registered Registered Expiration	Registration: le: Alginate microcapsule ted extract of horseradish and n method d Country: Korea d Date: January, 04, 2007 Date: May. 2025	
Therapeutic Target:		Company History		
Development phase:	[ ,	July 2001	Established as Biocoats Co.	
Type of business relationship sought (including licensing availability): development collaboration, or non-exclusive or exclusive licensing agreement		July 2001 Aug. 2001	Selected as TBI Partnership with BIOTECH	
Key Technology Highlights <ul> <li>Safety and evironment-freindly extraction method</li> <li>Unlike extraction method using hazardous organic solvent such as ethanol</li> </ul>		Jan. 2002	Partnership with KBP Co.,	
and ether etc. Biocoats extracted by distillation extraction using water	F	Feb. 2002	Application for venture firm certification	
<ul> <li>and ether etc, Biocoats extracted by distillation extraction using water.</li> <li>Anti-oxidation effect of wasabi extract (Allyl isothiocyanate, AIT) by microcapsule technology</li> <li>Due to wasabi extract with oxidation possibility and volatility, anti-microbial activity of wasabi extract allowed to be maintain by encapsulating with alginate salt.</li> </ul>	F F	Feb. 2002 Feb. 2003 Mar. 2003	Application for venture firm certification Established as Biocoats Co., Ltd. Changed into a legal person	
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# **Technology Overview**

#### Technology Platform

The technology overview of Biocoats is to provide (i) dietary supplements materials from biologica polymers, (ii) functional and healthful foodstuffs through discovery of metabolism improving substances from various biological resources (plant/animal/microorganism), (iii) substitute fuels and extraction of functional substances by using wastes and scraps, (iv) wasabi extracts through encapsulation and micro-carrier technology and (v) the materials of hard capsules made of vegetable polymers.

Among the technology, the core technology of Biocoats is to provide alginate-salt microcapsule encapsulated extract from Wasabia japonica as environment-friendly substances.

#### Background and unmet needs:

Eye-opening development of science and technology and consequent increase of national incomes have changed a main item of dietary patterns into meat, which increases various adult diseases like cancers. The generation of such diseases is supposed to be linked to foodstuffs or changing dietary patterns through numerous surveys. The demand for health-oriented foodstuffs has recently been increasing, while functional materials from the nature are spotlighted in the food industries. For instance, wasabi has been scrapped except its roots, even though its usefulness has recently been recognized.

#### Discovery and Achievements:

(1) Preparation of alginate-salt microcapsule encapsulated extract from Wasabia japonica

Biocoats succeeded in making wasabi scrapped so far available widely by offering alginate-salt microcapsule type of extracts as small as 100~200 nm from stems and leaves of wasabi with the use of AIT (Allyl isothiocyanate).

Fig. 1. Alginate-salt microcapsule image encapsulated wasabia extract(left: magnified image)



(2) Anti-microbial effect of microcapsule encapsulated AIT extracted from Wasabia japonica

# Fig. 2. Antimicrobial effect on pathogen



As shown above, the alginate-salt microcapsule encapsulated AIT extracted from Wasabia japonica has anti-microbial effect on both gram positive and gram negative bacteria, particulary high anti-microbial activities against *Streptococcus mutans*(plaque bacteria), pathogen *E-coli* 0157, *Vibrio parahaemolyticus* and *Vibro vulnificus*.



# (3) The expiration date extension of a packaged bean curd

As represented in Fig. 3 below, Biocoats added alginate-salt microcapsule encapsulated AIT to the packaged bean curd, stored for 14 days at 4°C and measured total viable bacterial count. As a result, a general bean curd went bad in 5-8 days under cold storage(5-10°C), but in the case of the bean curd added with 300 ppm AIT, expiration date was more extended 6 day than the general bean curd.



(4) The application of alginate-salt microcapsule to various products

The soap, toothpaste and hand cream added with alginate-salt microcapsule with AIT have anti-microbial activities against pathogen *E-coli* 0157, *Vibrio parahaemolyticus* and *Streptococcus mutans*(plaque bacteria).

Therefore, wasabia extract encapsulated by alginate-salt has synergy effects.

# Patents and Publications

Biocoats has patent granted for application in korea with regard to alginate-salt microcapsule encapsulated extract from Wasabia japonica.

#### TABLE 2. List of Patent for Alginate-salt microcapsule

Country	Patent No.	Status	Description
Korea	10-0666830	Granted	Alginate microcapsule encapsulated extract of horseradish and preparation method