

February 24, 2016

Toray Industries, Inc.

Nanotheta Co., Ltd.

Taiho Pharmaceutical Co., Ltd.

## **Toray, Nanotheta, Taiho to Accelerate Business of Antiadhesive Material Based on Nano-scale Polymer Thin Film Technology**

Toray Industries, Inc. (headquarters: Chuo-ku, Tokyo; President: Akihiro Nikkaku; hereinafter referred to as "Toray") today announced that it has been jointly developing a novel antiadhesive material used in surgery such as intra-abdominal procedure (hereinafter referred to as the "Material") employing the nano-scale polymer thin film based on polylactic acid based polymer (hereinafter referred to as the "Nano Sheet") developed by Nanotheta Co., Ltd. (headquarters: Shinjuku-ku, Tokyo; President: Shinya Otsubo; hereinafter referred to as "Nanotheta"), a venture business started at Waseda University. The Material was developed with focus on its convenience and effectiveness, where it can be easily handled like gauze and is expected to prevent adhesion serving as a barrier film after operation. Toray and Nanotheta signed a basic agreement for commercialization of Nano Sheet in October 2012 and have been jointly developing the Material.

Furthermore, in March 2015, Toray signed an exclusive option agreement regarding the Material's joint development and sales in Japan with Taiho Pharmaceutical Co., Ltd. (headquarters: Chiyoda-ku, Tokyo; President: Masayuki Kobayashi; hereinafter referred to as "Taiho").

The companies will accelerate their efforts for commercialization of the Material now that the three companies have completed the groundwork for the cooperation, and as the preparation of equipment related to the manufacture of the investigational material and the basic specifications of the Material have been finalized.

The Material has two layers - an antiadhesive layer and a supporting layer -, with Nano Sheet applied to the antiadhesive layer. Nano Sheet is made of polylactic acid based polymer, which is biodegradable, and is degraded and absorbed in the human body. The supporting layer is made of water-soluble resin and has a gauze-like structure and strengthens the antiadhesive layer, which is only several hundreds of nanometers in thickness and hard to handle. The supporting layer dissolves in water after reaching the surgery site and there is no need to remove it afterwards. The Material has such a unique structure and is expected to improve operability during operations.

Toray hereafter will establish the manufacturing technology of investigational material towards the implementation of clinical trials of this Material, aiming to obtain approval as a medical device after clinical trials and for commercialization thereafter. Taiho may exercise its option based on the results of non-clinical trials carried out by Toray to jointly implement clinical trials and market the material in Japan.

Toray, Nanotheta and Taiho aim to contribute to treatment of patients through provision of the Material.

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### **[Nano Sheet]**

Nano Sheet is a sheet-type material with strong adhesive properties. It is a nano-scale polymer thin film based on polylactic acid based polymer developed by Nanotheta for use in applications such as DDS\*, medical device and cosmetics. The flexibility and adhesive power of the film increased by limiting its thickness to several hundreds of nanometers, enabling attaching the sheet physically to organs or surgery site with complex shapes without using adhesives.

\*Drug Delivery System: technology that delivers medicines to the required place at the required time in required quantity

### **[Antiadhesive material]**

When sewing organs together in an operation, normally the organs stick together and heal naturally, but in some cases some organs originally not connected may end up sticking to each other, which is called post-operative adhesion. Some of the known complications due to post-operative adhesion include blockage in the intestine, secondary infertility and chronic pelvic pain. Antiadhesive material is stuck to surgery site after an operation to prevent post-operative adhesion.

### **(Reference) Company profiles**

#### ● Toray Industries, Inc.

Established: January 1926

Address: 1-1, Nihonbashi-Muromachi 2-chome, Chuo-ku, Tokyo

Capitalization: 147,873 million yen (As of March 31, 2015)

Employees: 45,789 (Consolidated, as of March 31, 2015)

President and CEO: Akihiro Nikkaku

Business: Manufacture and sales of the following products, among others: fibers and textiles, plastics and chemicals, IT-related products, carbon fiber composite materials, environment and engineering and life science.

#### ● Nanotheta Co., Ltd.

Established: December 2007

Address: Waseda University Incubation Center, Nishi Waseda 1-22-3, Shinjuku-ku, Tokyo

Capitalization: 20 million yen (As of November 30, 2015)

Employees: 4 (As of November 30, 2015)

President and Representative Director: Shinya Otsubo

Business: Manufacture and sales of pharmaceuticals, medical instruments, drug prototypes for research, cosmetics and raw materials, and health food and raw materials.

#### ● Taiho Pharmaceutical Co., Ltd.

Established: June 1963

Address: 1-27 Kandanshiki-cho, Chiyoda-ku, Tokyo

Capitalization: 200 million yen (As of December 31, 2014)

Employees: 2,554 (As of December 31, 2014)

President and Representative Director: Masayuki Kobayashi

Business: Manufacture, sales, export and import of pharmaceuticals, quasi-drugs and medical equipment