

SME Innovation: Collaboration among Industry, Academia, and Government

- Focusing on the Nanotechnology Field -

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**(Executive Councilor, Tokyo Chamber of Commerce and Industry;
Chairman, Urban Social Issues Committee; Vice Chairman, Environmental Committee)**

Overview of the Tokyo Chamber of Commerce and Industry

of Commerce and 

The Tokyo Chamber of Commerce and Industry (TCCI)

1. Founded: 1878; First Chairman: Shibusawa Eiichi
2. Chairman (20th): Okamura Tadashi (Adviser to the Board, Toshiba Corporation)
3. Members: 137
4. Office: 2-1-1, Marunouchi, Chiyoda-ku, Tokyo



Support for small and medium-sized manufacturing companies

Survey: "Survey on Innovation in Small and Medium-Sized Manufacturers"

Survey of the kinds of innovation undertaken and how innovation is achieved in small and medium-sized manufacturers (Nov. 2008; 299 companies responding)

⇒ Findings showed that the day-to-day efforts of SMEs such as accurate inventory control, employee education and *kaizen* result in innovations.

Exchange Event: "TOKYO Industry-Academia-Government Collaboration and Innovation Forum"

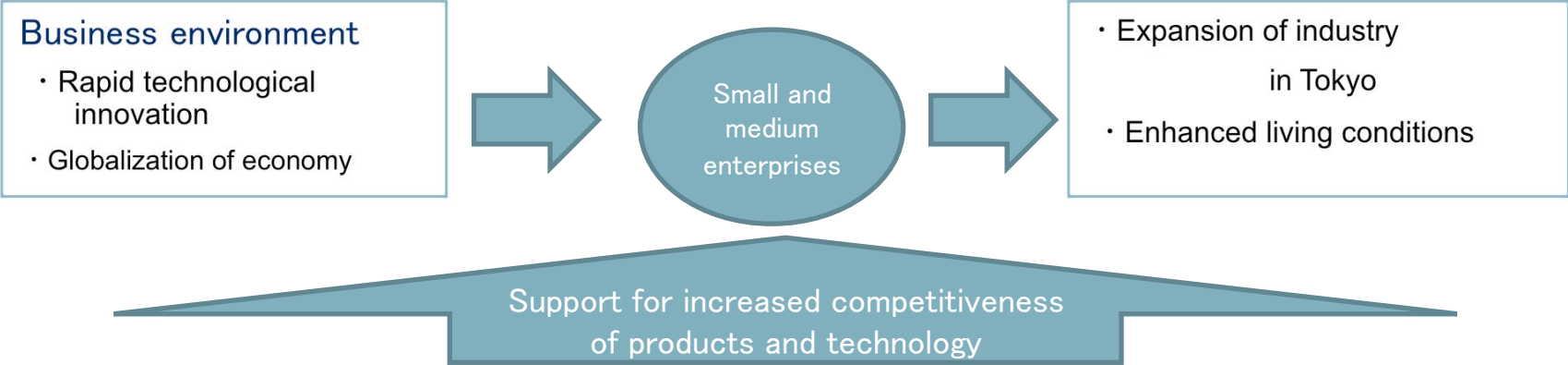
Provided basic know-how for small and medium-sized manufacturers to get involved in industry-academia-government collaboration. Served as venue for universities, public agencies and companies to make connections and exchange information. (March. 2009)

⇒ 5 public agencies, 7 universities and about 200 companies participated.

"I now know what kind of support exists for industry-academia collaboration."

"I was pleased to speak directly with officials from universities and public agencies."

Collaboration among industry, academia, and government promoted by the Tokyo Metropolitan Government



Tokyo metropolitan industrial technology research institute

- ① Needs-oriented business operation
- ② Strategic enhancement of technical capability
- ③ Technical assistance focused on commercialization

Technical assistance	Support for product development	Research and development	Industrial human resource development	Cooperation and collaboration for industry	Support for technology management	Provision of information
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Support for SMEs in the nanotechnology field by the Tokyo Metropolitan Government

The Nanotechnology Center of the Tokyo Metropolitan Industrial Technology Research Institute uses high-performance nanotechnology-enabled equipment, and supports the development of technology and products.

«Major equipment at the Nanotechnology Center»



【Electron beam lithography system】

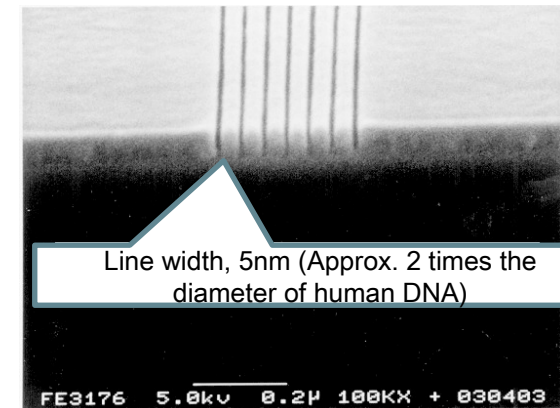
This system transmits electron beams onto wafers covered with resist film. An electron beam 5 nanometers in diameter enables production of biochips or nanopatterns.

Case 1: Companies that utilize industry-academia- government collaboration

« Elionix Co., Ltd. »

Grand Prize Winner, 6th Entrepreneurial SME Grand Prix

Manufacturer of ultrafine fabrication and analytical devices that use applied particle beam (electrons, ions etc.) and electromagnetic ray (light, X-rays, etc.) technology. Elionix's core product is its electron beam lithography device which can etch the thinnest lines in the world (5 nanometers). With its reputation as the highest-end device, this lithography device is a must for nanotechnology research and dominates the market share.

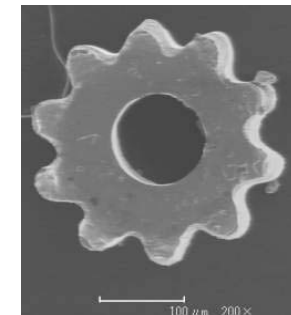


○ Example of Elionix's Research

via Industry-University Collaboration

“Research on techniques to cast MEMS in metal materials”

We examined the potential of mold materials, ultrafine mold design, surface processing and integrated casting systems for components of microunits that can auto-assemble within the mold in order to apply conventional mold processing technology to components for microelectromechanical systems. This joint research with SMEs and universities in the Tama district of Tokyo was selected for funding under the Organization for Small & Medium Enterprises and Regional Innovation's Initiative to Advance Strategic Fundamental Technologies.



Microcomponent 1: Microgear

Material: SUS304, t 0.1mm

Outside diameter: ϕ 0.24mm,

Teeth: 10, Center hole: ϕ 0.1mm

Case 2: Companies that utilize industry-academia- government collaboration

<<IDEA Consultants, Inc.>>

Conducts designing, survey, analysis, and evaluation dealing with social infrastructure development and environmental conservation, as an integrated consultant firm.

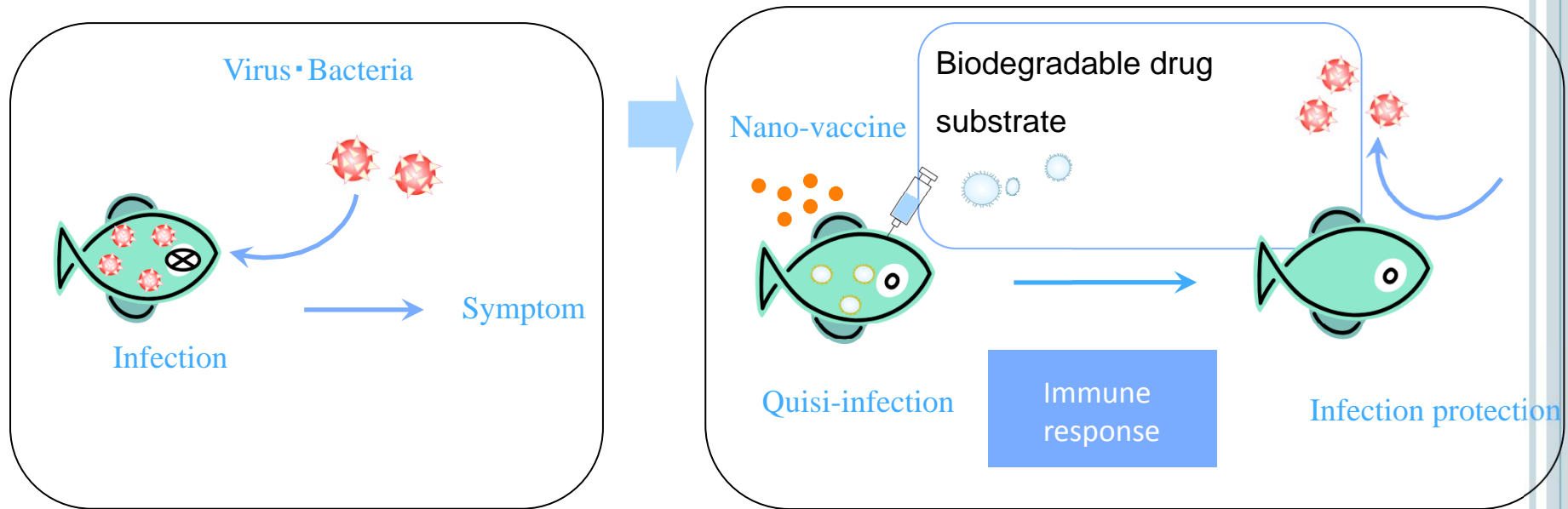
○ Approach to the field of nanotechnology

- Synthesis of biodegradable polymer nanoparticle (core-corona type) and its application to environmental field, through collaborated research with Osaka University.

This particles consist of hydrophobic core and hydrophilic corona, particle size controllable within the range of several nm to several μm , and is monodisperse. The particles could be stored for a long time, by dispersing particle by particle in water and freeze drying to powder. Also, a variety of functions could be given by designing the molecules on the surface of these particles.

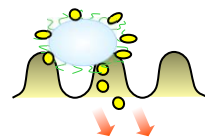
- ① Development of environmental assessment testing method using nanoparticle
- ② Development of animal (cultured fish) vaccines
- ③ Development of DDS and virus capturing materials by molecular surface design

Polymer nano-vaccine

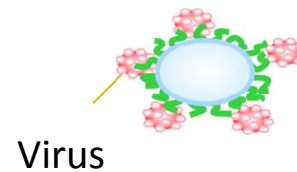


Application example

Oral DDS substrate



Virus capture



Thank you for your attention.

