

PRESS RELEASE

March 30, 2017

Tanaka Precious Metals
Tanaka Memorial Foundation

Tanaka Memorial Foundation Announces Recipients of Precious Metals Research Grants

Takafumi Fukushima, Associate Professor at Tohoku University, wins Platinum Award for development of technology that contributes to expanded directed self-assembly wiring generated by block polymers and gold nanoparticles

Prize won for developing technology that can enhance performance and reduce manufacturing costs of next-generation semiconductors by taking advantage of the properties of precious metal nanoparticles

The Tanaka Memorial Foundation (Representative Director: Hideya Okamoto) today announced the recipients of the FY2016 Precious Metals Research Grants.

Following a rigorous screening, the five-million-yen Platinum Award was granted to Associate Professor Takafumi Fukushima of Tohoku University, and the two-million-yen Gold Award was granted to Professor Seiji Miura of Hokkaido University. In addition, Toshinori Fujie, an assistant professor at Waseda University, and Shingo Maruyama, an assistant professor at Tohoku University, were granted Young Researcher Awards, a new award category created last year, and four other research projects received Silver Awards.

The Tanaka Memorial Foundation undertakes programs designed to foster development in new precious metal fields and contribute to the advancement of science, technology, and socio-economics so that numerous people can experience an enriching society through advances in science and technology. The research grant program was launched in FY1999 and has been conducted every year since to support the various challenges faced in the “new world opened up by precious metals.” This year, the 18th of the program, 177 applications were received in a wide range of fields where precious metals can make contributions to research and development of new technologies. A total of 16.3 million yen in research grants was awarded for 19 projects.

The recipients of the one Platinum Award and one Gold Award, their research topics, and the reasons for the awards are shown below.

■Associate Professor Takafumi Fukushima of Tohoku University

Development of technology that contributes to expanded directed self-assembly wiring generated by block polymers and gold nanoparticles

As vacuum deposition technology evolves, state-of-the-art semiconductor forming technologies have achieved remarkable scaling and low costs even more than in the past and have made Moore's Law a reality, but the miniaturization of semiconductors is approaching its physical limits and major breakthroughs in processing methods are needed.

This research makes skillful use of the directed self-assembly (DSA) of organic materials and nanoparticles to indicate a novel technique that does not use the vacuum systems currently

employed or high-cost patterning technologies. This research is a major breakthrough for future semiconductor manufacturing innovation and is highly evaluated as advanced research that skillfully makes use of the properties of precious metal materials.

■**Professor Seiji Miura of Hokkaido University**

An attempt to create precious metal-based high-entropy alloys and experimental formation of multidimensional phase equilibrium

This research is an attempt to apply material systems known as high-entropy alloys (HEA), an area in which much research is currently being conducted on Cr, Ni, and other metals, to material systems that use precious metals. This research was highly evaluated for guiding investigations on what type of material design should be created for materials that maintain high strength at high temperatures according to the desired properties using a multi-component phase equilibrium diagram

Two Young Researcher Awards, four Silver Awards, and 11 Encouragement Awards were also granted. The recipients of these awards and an overview of the Precious Metals Research Grants are indicated below. Applications for the FY2017 research grants are scheduled to open in the autumn.

List of Recipients of the 2016 Precious Metals Research Grants

Platinum Award (1 award, 5 million yen)	
Takafumi Fukushima, Associate Professor, Tohoku University	Development of technology that contributes to expanded directed self-assembly wiring generated by block polymers and gold nanoparticles
Gold Award (1 award, 2 million yen)	
Seiji Miura, Professor, Hokkaido University	An attempt to create precious metal-based high-entropy alloys and experimental formation of multidimensional phase equilibrium
Young Researcher Awards (2 awards, 1 million yen each)	
Toshinori Fujie, Lecturer, Waseda University	Development of a Wireless Power Feed Injectable Light-Emitting Device for Optogenetics
Shingo Maruyama, Assistant Professor, Tohoku University	Growth of High-Quality 3C-SiC Thin Films from Precious Metal Base Flux
Silver Awards (4 awards, 1 million yen each)	
YAMABE—MITARAI Yoko, Group Leader, National Institute for Materials Science (NIMS)	Development of High-Temperature Shape-Memory Alloys for Jet Engines
Masakazu Iwamoto, Professor, Chuo University	Development of a Precious Metal Catalyst that Exhibits High Activity in Atmospheric Pressure Plasma Technique Ammonia Synthesis
Atsushi Nakajima, Professor, Keio University	Development of Nano-Cluster Memory Devices
Haruno Murayama, Associate Professor, Kyushu University	Selective Adsorptive Desulfurization of Beverages using Silica-Supported Gold Nanoparticles, Particularly Selective Elimination of Deterioration Odors From Rice Wine
Encouragement Award (11 awards, 300,000 yen each)	
Hirofumi Miyaji, Lecturer, Hokkaido University	Masayuki Yagi, Professor, Niigata University
Hiroshi Suga, Assistant Professor, Chiba Institute of Technology	Masami Taguchi, Professor, Akita University
Yusuke Yamauchi, Group Manager, National Institute for Materials Science (NIMS)	Masako Kato, Professor, Hokkaido University
Ryota Kondo, Assistant Professor, Kansai University	Eiichi Sato, Professor, Japan Aerospace Exploration Agency(JAXA)
Yasufumi Enami, Professor, Kochi University of Technology	Hideyuki Shinmori, Associate Professor, University of Yamanashi
Tsuyohiko Fujigaya, Associate Professor, Kyushu University	

Overview of the 2016 Precious Metals Research Grants

[Subject]

New technologies, and research and development, to which precious metals can make a contribution

[Grant amounts]

- Platinum Award: 5 million yen (1 award)
- Gold Award: 2 million yen (1 award)
- Silver Awards: 1 million yen (4 awards)
- Young Researcher Awards (for researchers of up to 37 years of age): 1 million yen (2 awards)
- Encouragement Award: 300,000 yen (several awards)

* The grant amount is treated as a scholarship donation.

* Each award is given to research deemed to make a particularly large contribution to commercialization

and practical implementation, and awards may not be granted in some cases.

[Eligible candidates]

Personnel who belong to educational research institutions or public research institutes in Japan

- Applicants belonging to research institutions in Japan are eligible regardless of whether they are based in Japan or overseas.
- Young Researcher Awards are given to young researchers aged up to 37 years old as of April 1, 2016.

[Application period]

9am, September 5, 2016 (Mon) - 5pm, November 30, 2016 (Wed)

[Conditions]

- Precious metals must play an important role in commercialization and/or practical implementation of the research.
- Development related to precious metals must provide a breakthrough in the progress of the commercialization and/or practical implementation.
- When applying with joint research, the representative should apply.
- Students must obtain approval from the person responsible for their laboratory in order to submit an application.
- Clearly state if the research is being performed with other precious metal manufactures (including planned).
- Applicants may be asked to exchange information with Tanaka about product development, technology development, and guidance through the research.
- Excludes research that has already been commercialized or for which there are such plans.
- Excludes fundamental research such as analysis, evaluation and production technology.

[Inquiries concerning the research grant program]

Precious Metals Research Grants Office

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■ Tanaka Memorial Foundation

Established: April 1, 2015

Address: 22F Tokyo Building, 2-7-3 Marunouchi, Chiyoda-ku, Tokyo

Representative: Hideya Okamoto (Senior Advisor to Tanaka Holdings Co., Ltd.)

Purpose of Business: To provide grants for research related to precious metals in order to contribute to the development and cultivation of new fields for precious metals, and to the development of science, technology and the social economy.

Areas of Business: Provision of grants for scientific and technological research related to precious metals. Recognition of excellent research related to precious metals and holding of seminars and other events.

■ Tanaka Kikinzoku Kogyo K.K.

Headquarters: 22F, Tokyo Building, 2-7-3 Marunouchi, Chiyoda-ku, Tokyo

Representative: Akira Tanae, Representative Director & CEO

Founded: 1885

Incorporated: 1918

Capital: 500 million yen

Employees: 2,218 (as of March 31, 2016)

Sales: 1,005.4 billion yen (FY2015)

Main businesses:

Manufacture, sales, import and export of precious metals (platinum, gold, silver, and others) and various types of industrial precious metals products.

Website: <http://pro.tanaka.co.jp/en>

<Press inquiries>

Tanaka Holdings Co., Ltd.

<https://www.tanaka.co.jp/en/protanaka/inquiry/index.php>