PRESS RELEASE

June 7, 2016

Tanaka Precious Metals
Tanaka Holdings Co., Ltd.

TANAKA develops ZIKA virus detection kit

World's first successful use of immunochromatographic assay for direct detection of ZIKA virus in blood

Developer seeks partnerships with domestic and overseas medical manufacturers to promote practical application

Tanaka Holdings Co., Ltd. (Head office: Chiyoda-ku, Tokyo; Representative Director & CEO: Akira Tanae) announced today that Tanaka Kikinzoku Kogyo K.K. (Head office: Chiyoda-ku, Tokyo; Representative Director & CEO: Akira Tanae), which operates the Tanaka Precious Metals manufacturing business, has developed the world's first kit able to directly detect the ZIKA virus (ZIKV) *1 in blood. The kit is capable of rapid ZIKV detection in just 10 to15minutes. Tanaka Kikinzoku Kogyo plans to supply samples for clinical evaluation with a view to collaboration with domestic and overseas medical manufacturers.

■ Characteristics of detection kit

By making it possible for the first time to directly detect ZIKV in blood by immunochromatographic assay*2 , the kit realizes simpler, faster and lower cost detection than existing methods.

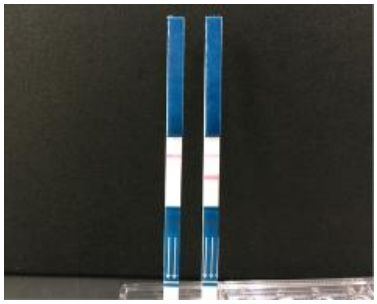
Characteristic ①: world's first kit to detect ZIKV via immunochromatographic assay

There is already an immunochromatographic assay method in practical application that detects the antibodies created in the human body following ZIKV infection, but the new kit makes it possible for the first time to directly detect ZIKV itself when present in the blood. By applying its unique antibody screening technology*3 and nano-colloidal gold*4 , Tanaka Kikinzoku Kogyo has developed the new kit using antibodies to nonstructural protein (NS1) in ZIKV, allowing ZIKV to be detected at a concentration of $10^2 TCID_{50}/mL$*5 . This detection performance equals the sensitivity of other immunochromatographic assay-based test kits for influenza and other pathogens.

Characteristic ②: simpler, faster and lower in cost than existing methods

The existing method used for detecting ZIKV in blood is PCR*6 , which requires special equipment and takes between half a day and one day to complete. With the new kit, however, the test strip only needs to be dipped into the test sample to enable ZIKV detection. Additionally, it allows detection in 10 to 15 minutes, equaling the simplicity and speed of the influenza virus detection kit already in practical application. Furthermore, unlike PCR, it does not require special equipment, thus realizing cost savings for users.

Nano-colloidal gold used in the kit



Demonstration of testing
(On the left is a negative and on the right a positive reaction. When the virus is detected, two lines appear.)

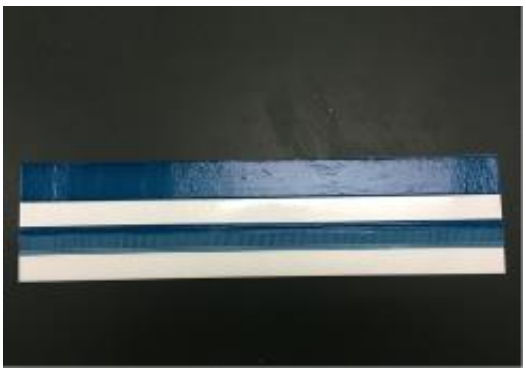
■ Background to development of detection kit

ZIKV infection has been spreading since 2015, particularly in Brazil. Infected people develop commonly Zika fever, with symptoms of fever and conjunctival congestion. If pregnant women become infected with ZIKV, there are indications that the fetus may develop microcephaly, which is an abnormal smallness of the head, a congenital condition associated with incomplete brain development. As the possibility has been indicated of infection not only through mosquitoes, but also through blood transfusions and sexual contact, a kit is required which can perform direct and specific detection in the early stage after infection using a fast and simple method. The simple ZIKV detection kit that is currently commercially available detects the antibodies to ZIKV (immunoglobulin G and immunoglobulin M) that are producted in the bodies of infected humans, and is therefore not suited to diagnosing Zika fever in the initial stage of infection. In order to make possible early identification of ZIKV infection, Tanaka Kikinzoku Kogyo applied its store of technology, its unique antibody screening technology, and the nano-colloidal gold manufacturing technologies which it has accumulated over many years to develop a kit capable of direct detection of the virus itself.

It is hoped that the development of the new kit will be highly effective in suppressing the spread of ZIKV infection.

■ Future rollout

The spread of ZIKV has become a worldwide threat, with the World Health Organization (WHO) declaring on February 1, 2016, that the Zika fever it causes represents a ‘public health emergency of international concern’. It is estimated that more than 4 million people are already infected on the South and North American continents. Specifically in Brazil, there is reportedly concern that this summer’s Rio Olympics will see a further spread of the infection.



Detection sheet delivered to customers by Tanaka Kikinzoku Kogyo
(The customer simply cuts and processes the sheet to create the finished product.)

Examples of processing into test kits

[*1] ZIKA virus: ZIKA virus is the virus that causes ZIKA virus infection. Normally, ZIKA virus infection is transmitted by the bite of a mosquito that carries the ZIKA virus, but fetal infection has also been found to occur. The possibility of infection through blood transfusions and sexual contact has additionally been indicated.

[*2] Immunochromatographic assay: An analytical method enabling visual determination of the concentration of a target molecule is above or below a specified threshold of concentration by reacting colored- particle labeled antibodies immobilized on the test strip with a liquid sample which is drawn into the test strip by capillary action. The new kit uses as its labeling dye nano-colloidal gold, which turns red.

[*3] Antibody screening technology: A technology which selects antibodies suited to the target purpose from among a range of antibodies.

[*4] Nano-colloidal gold: Colloidally dispersed particles of nano-sized gold as a means to generate visualized color of the assay signal.

[*5] $TCID_{50}$/mL: Median tissue culture infectious dose, a unit of viral infectivity titer. It denotes the virus concentration at which 50% of cultured cells are infected following inoculation with a diluted virus sample.

[*6] PCR (Polymerase Chain Reaction): An analytical technique involves the amplification of a single or few copies of a piece of DNA to generate thousands to millions copies of a particular DNA sequence through an enzymatic assembling of the nucleotides.

■Tanaka Holdings Co., Ltd. (Holding company of Tanaka Precious Metals)

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 in consolidated group: 3,511 (FY2014)
Net sales of consolidated group: 856.4 billion yen (FY2014)
Main businesses of the group:
Strategic and efficient group management and management guidance to group companies as the holding company at the center of the Tanaka Precious Metals.
Website: http://www.tanaka.co.jp/english (Tanaka Precious Metals),
http://pro.tanaka.co.jp/en (Industrial products)

■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: 1,992 (as of October 1, 2015)
Sales: 872,677 million yen (FY2014)
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

<About the Tanaka Precious Metals>

Established in 1885, the Tanaka Precious Metals has built a diversified range of business activities focused on the use of precious metals. On April 1, 2010, the group was reorganized with Tanaka Holdings Co., Ltd. as the holding company (parent company) of the Tanaka Precious Metals. In addition to strengthening corporate governance, the company aims to improve overall service to customers by ensuring efficient management and dynamic execution of operations. Tanaka Precious Metals is committed, as a specialist corporate entity, to providing a diverse range of products through cooperation among group companies.

Tanaka Precious Metals is in the top class in Japan in terms of the volume of precious metal handled, and for many years the group has developed and stably supplied industrial precious metals, in addition to providing accessories and savings commodities utilizing precious metals. As precious metal professionals, the group will continue to contribute to enriching people's lives in the future.

The five core companies in the Tanaka Precious Metals are as follows.

- Tanaka Holdings Co., Ltd. (pure holding company)
- Tanaka Denshi Kogyo K.K.
- Tanaka Kikinzoku Jewelry K.K.
- Tanaka Kikinzoku Kogyo K.K.
- Electroplating Engineers of Japan, Limited

<Press inquiries>
Tanaka Holdings Co., Ltd.
https://www.tanaka.co.jp/en/protanaka/inquiry/index.php