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**CLASE 8.<sup>a</sup>**

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**Centro Universitario Público  
Universidad Médica Prefectural de Nara**

**Asociación civil general con personalidad jurídica  
Consorcio MBT**

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Doña Maria Elena Hernández García, Traductora-Intérprete Jurada de Japonés, nombrada por el Ministerio de Asuntos Exteriores y de Cooperación, certifica que la que antecede es traducción fiel y completa al español de un documento redactado en japonés.

En Sant Cugat del Vallès, a 03 de junio de 2020

*Elena Hernández*

MARÍA ELENA HERNÁNDEZ GARCÍA  
Traductora - Intérprete Jurada  
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Nº 11141

Simultaneous distribution to the Nara Prefecture Government and Economy Press Club, Nara Prefecture Culture and Education Press Club, Kashihara City Administration Press Club, and Osaka University of Science Press Club

14 May, 2020

Nara Medical University, a public university  
MBT Consortium, a general incorporated association

To whom the press may concern

## **(First in World) New Coronavirus (COVID-19) Inactivation by Ozone Confirmed**

## **(First in World) Conditions for New Coronavirus (COVID-19) Inactivation by Ozone Clarified**

### **Overview**

A research group of Nara Medical University (Led by Professor Yano Juichi and Director of the Infectious Diseases Center Kasahara Kei) and the MBT Consortium (Infectious Diseases Section member companies: QOL Corporation, Sanyu Shoji Corporation and Tamurateko Corporation) confirmed the inactivation of COVID-19 by exposure to ozone gas for the first time in the world. In addition, by experimentally clarifying the conditions for its inactivation, we demonstrated its practicality from an academic point of view.

### **Background**

In order to prevent the spread of infection in examination rooms and meeting rooms, disinfection was performed manually by wiping with alcohol after use, which was labor-intensive and time-consuming. Ozone gas sterilization was proposed as one of the means to solve this problem, but there was no medical evidence for it.

A research group led by Nara Medical University conducted an experiment on the inactivation of the new coronavirus by exposure to ozone gas, and found that the new coronavirus was inactivated by ozone and that the relationship between the ozone concentration and exposure time conditions and the inactivation of the new coronavirus was clarified experimentally.

### **Experiment Procedure**

New coronavirus cell lines are cultured, and stainless steel plates are placed in an ozone-proof airtight box (acrylic) installed in a safety cabinet, and the new coronavirus to be tested is applied.

The ozone generator (PMDA-certified medical device: ozone generator) installed in the ozone-proof airtight box (acrylic) is used to control and maintain the ozone concentration in the ozone-proof box from 1.0 to 6.0 ppm.

The amount of ozone exposure is set by CT value. (The CT value of 330, which is the experimental value for medical device certification by the PMDA of the Ministry of Health, Labor and Welfare, and the CT value of 60, which is the operational value for ozone decontamination of ambulance units by the Fire Department of the Ministry of Internal Affairs and Communications.)

After exposure, the virus is inoculated into the cells to determine if the virus has infected the cells and the amount of virus is calculated. This experiment was made possible because the University has a Biosafety Level 3 laboratory and virus culture technology.

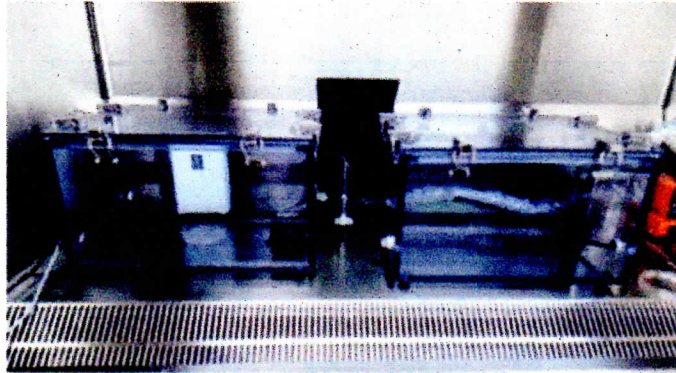
03 JUN. 2020

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## Research Results

1. Inactivation rates ranged from 1/1,000 to 1/10,000 at a CT value of 330 (55 minutes of exposure at 6 ppm ozone concentration).
2. Inactivation rates ranged from 1/10 to 1/100 at a CT value of 60 (60 minutes of exposure at 1 ppm ozone concentration).



Experimental Equipment

## Conclusion

Through the study, we confirmed that the inactivation rate could be up to 1/10,000 by ozone. This shows that the new coronavirus can be inactivated under practical conditions of ozone.

### **Nara Medical University (Kashihara City)**

Founded in April, 1945, incorporated as a local independent administrative corporation in April, 2007.  
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Founded in April, 2003, develop, design, produce and sell products related to ozone, UV and oxygen.  
(Capital: JPY 20 million-yen, Representative Director: Tamura Kozo)

## Contact Information

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Distribución simultánea del Club de Prensa Económica y del Gobierno de la Prefectura de Nara, Club de Prensa Cultural y Educativa de la Prefectura de Nara, Club de Prensa Administrativa de la Ciudad de

14 de mayo de 2020

Universidad de Medicina de Nara, universidad pública  
Consortio MBT, asociación general

A quien corresponda:

**(Primicia mundial) Confirmación de la nueva inactivación del coronavirus (COVID-19) por el efecto del ozono**

**(Primicia mundial) Identificación de las condiciones de la nueva inactivación del nuevo coronavirus (COVID-19) por efecto del ozono**

### Visión general

Un grupo de investigación de la Universidad de Medicina de Nara (dirigido por el profesor Yano Juichi y el director del Centro de Enfermedades Infecciosas Kasahara Kei) y el Consortio MBT (empresas miembro de la Sección de Enfermedades Infecciosas: QOL Corporation, Sanyu Shoji Corporation y Tamurateko Corporation) confirmó la inactivación del COVID-19 por exposición a gas ozono por primera vez en todo el mundo. Asimismo, identificando experimentalmente las condiciones de su inactivación, demostró su utilidad desde un punto de vista académico.

### Antecedentes

Para evitar la propagación de la infección en las salas de reconocimiento y en las salas de reuniones, la desinfección se llevaba a cabo a mano, limpiando con alcohol tras su uso, un procedimiento que requería mucho trabajo y tiempo. Se propuso la esterilización por gas ozono como una de las soluciones a ese problema, pero no existían evidencias médicas al respecto.

Un grupo de investigación dirigido por la Universidad de Medicina de Nara realizó un experimento sobre la inactivación del nuevo coronavirus por exposición a gas ozono, y descubrió que el nuevo coronavirus quedaba inactivo por la acción del ozono, e identificó experimentalmente la relación entre la concentración de ozono y condiciones temporales de exposición y la inactivación del nuevo coronavirus.

### Procedimiento del experimento

Se cultivan líneas celulares del nuevo coronavirus, y se introducen placas de cultivo de acero inoxidable en una caja con cierre hermético resistente al ozono (acrílica) instalada en un armario de seguridad, y se aplica el nuevo coronavirus objeto de estudio.

El generador de ozono (producto médico certificado por la PMDA: generador de ozono) instalado en la caja con cierre hermético resistente al ozono (acrílica) se usa para controlar y mantener la concentración de ozono en la caja resistente al ozono entre 1,0 y 6,0 ppm.

El grado de exposición al ozono se establece por medio del valor CT. (El valor CR de 330, un valor experimental para la certificación de productos médicos de la PMDA del Ministerio de Salud, Trabajo y Bienestar, y el valor CT de 60, un valor operativo para la descontaminación por ozono de unidades de ambulancias del Cuerpo de Bomberos del Ministerio de Asuntos Internos y Comunicaciones).

Tras la exposición, el virus es inoculado en las células para determinar si el virus ha infectado a las células y se calcula la carga viral. El experimento puede realizarse porque la Universidad dispone de un laboratorio de bioseguridad de nivel 3 y tecnología para el cultivo de virus.

JORDI LÓPEZ SANCHO  
Traductor-Intérprete Jurado de INGLÉS  
N.º 4820

04 JUN. 2020



## Resultados de la investigación

1. La tasas de inactivación oscilaron entre 1/1.000 y 1/10.000 a un valor CT de 330 (55 minutos de exposición a una concentración de ozono de 6 ppm).
2. La tasas de inactivación oscilaron entre 1/10 y 1/100 a un valor CT de 60 (60 minutos de exposición a una concentración de ozono de 1 ppm).

[Consta fotografía]  
Equipos utilizados en el experimento

## Conclusión

A través del estudio, confirmamos que la tasa de inactivación podría ser de hasta 1/10.000 por efecto del ozono.

Esto demuestra que el nuevo coronavirus puede inactivarse en la práctica por el efecto del ozono.

### **Universidad de Medicina de Nara (ciudad de Kashihara)**

Fundada en abril de 1945 y constituida como corporación administrativa local independiente en abril de 2007.

(Número de estudiantes: 1.020; rector y presidente: Hosei Yuji)

### **Consortio MBT (ciudad de Kashihara)**

Fundado en abril de 2016; desarrolla actividades del MBT con la Universidad de Medicina de Nara.

(Con 104 empresas miembro; presidente: Hosei Yuji)

### **QOL Corporation (región de Minato, ciudad de Tokyo)**

Fundada en abril de 2017; desarrolla dispensarios y lleva a cabo procesos empresariales desde I+D hasta ventas.

(Capital: 300 millones de yenes; presidente y director representante: Araki Isao)

### **Sanyu Shoji Corporation (región de Chuo, ciudad de Osaka)**

Fundada en marzo de 1972; planificación y venta mayorista de productos relacionados con la salud y la vivienda.

(Capital: 10 millones de yenes; director representante: Daimon Masayoshi)

### **Tamurateko Corporation (ciudad de Higashiosaka)**

Fundada en abril de 2003; desarrollo, diseño, producción y venta de productos relacionados con el ozono, los rayos UV y el oxígeno.

(Capital: 20 millones de yenes; director representante: Tamura Kozo)

### Datos de contacto

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## **Certificación**

*Don Jordi López Sancho, Traductor-Intérprete Jurado de inglés, nombrado por el Ministerio de Asuntos Exteriores y de Cooperación, certifica que lo que antecede es traducción fiel y completa al español de un documento redactado en inglés.*

*En Barcelona, a 4 de junio de 2020.*


## **Certification**

*Mr. Jordi López Sancho, Sworn Translator-Interpreter of English, appointed by the Spanish Ministry of Foreign Affairs and Cooperation, certifies the foregoing to be a true and full translation into Spanish of a document written in English.*

*In Barcelona, on 4 June 2020.*

*Firma/Signature*

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