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NEWS RELEASE

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Launch of ORBEYE Surgical Microscope with 4K 3D Capabilities

Supporting Precision Surgery with High-Resolution Digital Images with Stereoscopic Visual Field

Developed by Sony Olympus Medical Solutions Inc.

Olympus Corporation (President: Hiroyuki Sasa) today announced the launch of its ORBEYE Surgical Microscope, incorporating the latest advances in 4K 3D video technology, in Japan and America in early October 2017[1]. The technology used in the new microscope was developed by Sony Olympus Medical Solutions Inc. (President: Yoichi Tsusue), a joint venture between Olympus Corporation and Sony Imaging Products & Solutions Inc. (President: Shigeki Ishizuka).

Surgical microscope is an apparatus to facilitate operating procedures involving fine nerves, blood vessels and other small anatomic features, by providing an enlarged stereoscopic visual field of the surgical site. The increasing prevalence of malignant tumors and other problematic conditions that have accompanied population aging over recent years has spurred growth in the use of such instruments, most of which have employed optical designs.

The 4K 3D digital images of the new ORBEYE microscope improve surgical accuracy as it provides high-resolution stereoscopic images of the fine structure of tissue and blood vessels. As the progress of surgical procedures is to be displayed on a large 55-inch monitor, it is expected to reduce surgeon fatigue of an operator by eliminating the need for extensive viewing via microscope eyepieces for an extended time. In addition, the digitization technology has made the new microscope unit approximately 95% smaller in volume[2] than the conventional model[3], contributing to secure a larger surgical space and shorten setup times. The microscope unit was also made 50% lighter[4] than the conventional model[3] to facilitate its transportation between operating rooms. The technology adopted in the ORBEYE was developed by Sony Olympus Medical Solutions, and its product design was handled by Olympus Medical Systems Corp. The ORBEYE will be marketed by Olympus Corporation.

1 The system will be progressively launched in other markets
2 OME-9000: 19,000cm^3, ORBEYE: 820cm^3 (figures are approximate)
3 OME-9000
4 OME-9000: 450kg, ORBEYE: 216kg

- **Launch Overview**

Name	Launch Date
ORBEYE Surgical Microscope System	Early October 2017

- **Main Features**

1. High-resolution 4K 3D digital images support precision surgery
2. Use of 55-inch 4K 3D monitor contributes to a reduction of surgeon fatigue and facilitates team surgery
3. Significant reduction in size (95% smaller than the conventional model) leading to secure a larger surgical space and shorten setup times

ORBEYE surgical microscope

Use of ORBEYE during surgery

- **Development Background**

In addition to commanding a leading share of the global market for gastrointestinal endoscopes, Olympus supplies products that fulfill a wide range of operating theater needs, including surgical microscopes and products for endoscopic surgery. Sony Olympus Medical Solutions was established in 2013 as a medical joint-venture with Sony. It has been carrying out R&D for the products which contribute to medical advancement, making full use of Sony's leading-edge electronics technology and Olympus's expertise in the manufacture and development of medical devices. The joint venture launched its first product in 2015, a surgical endoscope system incorporating 4K technology that provided surgeons with added value during endoscopic procedures through the use of images with high-resolution, a wide color range[5] and a wide field of view.

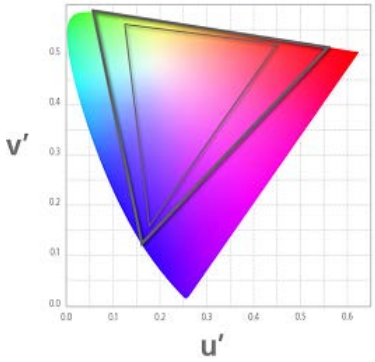
For its second product, the joint-venture has combined Olympus's surgical expertise with Sony's technological advances in the field of 4K 3D imaging and miniaturization, to develop the new ORBEYE microscope system, which is ideal for surgical use. For many years, fatigue has been an issue with surgical microscopes as the existing models have often required operators to peer through eyepieces for extended periods. These existing models also provided no easy way to share the high-resolution 3D images visible to the surgeon through the eyepiece with others in an operating room. As well as overcoming these problems, ORBEYE also sets a new standard for microsurgery—surgery performed using microscopes— by offering a support for more efficient surgery to a surgeon and other surgical staff and by providing a more comfortable surgical environment.

5 The surgical microscope system uses ITU-R BT.2020, the next-generation 4K broadcast standard

- **Main Features**

1. High-resolution 4K 3D digital images supporting precision surgery

The two of the Sony's 4K Exmor R™ CMOS image sensors are incorporated to deliver high-sensitivity, low-noise images. By deploying an image processing circuit designed to work across a wide color range[5] as well as offering resolution four times the pixel count of the Full HD standard, it provides high-resolution digital images during surgery. Furthermore, because it minimizes the delay associated with the large amounts of data that need to be processed by 4K 3D systems, ORBEYE provides smoother viewing and manipulation of the target location.



Comparison of color ranges
Thick line: Color range reproduced by 4K (ITU-R BT.2020)
Thin line: Typical color range of ITU-R BT.709 standard for high-definition video

2. Use of 55-inch 4K 3D monitor contributes to a reduction of surgeon fatigue and facilitates team surgery

The new model has no eyepiece, but delivers images via monitor for observation. This contributes to a reduction of surgeon fatigue by allowing a more comfortable working posture without requiring an operator to spend long periods peering into a microscope lens. Moreover, because the large 55-inch monitor enables the entire surgical team to view the same images, it contributes to an improved efficiency by allowing multiple operators, and by sharing information with other surgical staff.

3. Significant reduction in microscope size (95% smaller than conventional model) leading to secure larger surgical space and shorter setup times

The use of digital technology has made the microscope unit much smaller (95% smaller than the conventional model[2]) and it therefore provides the surgeon with additional space to perform operations. The unit's reduced size also allows faster setup times by eliminating the need to make often time-consuming adjustments to the balance of the arm, and by allowing use of a smaller and easier-to-fit surgical drape to keep the microscope clean.

[Reference material]

●Origin of ORBEYE Name

ORBEYE is a combination of “orb” (meaning something with a spherical or globular shape) and “eye”. The name expresses the idea of being able to approach things from an angle or direction that was not possible using existing microscopes. It also incorporates the hope that the product will be successful around the globe.