



Division of Next Generation Endoscopic Intervention (Project ENGINE)

Global Center for Medical Engineering and Informatics

Osaka University, Osaka, Japan

Towards next generation...



To develop truly efficient medical devices, high level and diverse manufacturing skill is necessary along with the knowledge and information from physicians. To convert physicians' ideas into a commercial reality, we also need to cooperate with industries with mature know-how.

In 2008, we formed an industry-academia consortium called “project ENGINE” (Endeavor for Next Generation of INterventional Endoscopy), to develop innovative instruments for cutting edge endoscopic diagnosis and treatment. The number of involved industries was 6 at its very beginning, and now we have 18 industries to collaborate with. Currently, ENGINE consists of over 30 medical doctors from universities and hospitals. The fruits of past 7-year activity are : 99 patent applications, 15 prototype devices including 3 pending PMDA approvals, and 9 commercialized items. ENGINE has received more than 10 major governmental grants, as well as 20 public/private grants from domestic/international funding sources (as of June 2017).

With our team of highly motivated medical doctors towards this future treatment and highly spirited engineers to develop next generation instruments, we truly believe we can bring something out to the world starting out from ENGINE!

A handwritten signature in black ink, reading "Kiyokazu Nakajima". The signature is written in a cursive style with a long horizontal stroke above the name.

Kiyokazu Nakajima, MD, FACS
Professor and Principal Investigator

Division of Next Generation Endoscopic Intervention (Project ENGINE)
and Department of Gastroenterological Surgery, Osaka University
Osaka, Japan

History of ENGINE

- 2008 — Founded as small R&D group of NOTES related devices (PI: Kiyokazu Nakajima, MD)
- 2009 — Kicked off as R&D consortium of cutting edge endoscopy related devices,
6 industries First governmental grant from METI
- 2012 — First success on commercialized product (Leak Cutter®)
Authorized as Division of Next Generation Endoscopic Intervention, **10 industries**
- 2013 — International collaboration (National University of Singapore, Singapore) funded by JSPS
Monozukuri Nippon Grand Award (Endoshower®)
- 2015 — International collaboration (All India Institute of Medical Sciences, Delhi, India) Boost-up to
15 industries
Wide acceptance of commercialized products (Suction Ball Coagulator® series)
- 2016 — International collaboration (Cornell University, New York, USA)
- 2017 — Expanding to **18 industries** and continuing

MAIN MISSION: To develop endoscopic devices which enhance positive “integration” of flexible endoscopy and rigid laparoscopy utilizing Japan’s finest manufacturing technology

ENGINE Industries

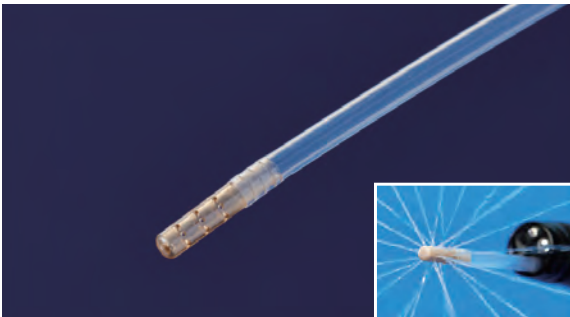


ENGINE Products



Leak Cutter, TOP, Tokyo

A leak proof adapter for flexible GI endoscopy inspired by laparoscopic trocars. Gas leak is eliminated with this simple device, leading to safer and shorter endoscopic intervention. Released in 2012 as the first ENGINE item. Well accepted among ESD masters.



EndoShower, Yasec, Shiga

World first suction/irrigation catheter for flexible GI endoscopy, enabling “laparoscopy-like” suction and irrigation inside GI tract. Precise making technology realized 0.4mm X 24 side holes on ultra-thin tip (OD 2.6mm). Released in 2013. Awarded by METI in 2013.



EndoCarry, Hakko, Nagano

This retrieval bag, of 0.02mm ultra-thin but very tough plastic membrane, can oncologically isolate and remove cancerous specimen during flexible endoscopy. First released as single open model in 2015, then improved as multiple open model in 2017.



Suction Ball Coagulator, Yasec, Shiga

One of ENGINE’s biggest hit items released in 2015 for open abdominal and thoracic surgery. SBC enables simultaneous blood suction and tissue coagulation for hemostasis in single action. Laparoscopy version became available in 2016. Widely disseminated among surgeons.



EndoApron, Daiei, Osaka

World first disposable laparoscopic instrument holder. Now surgeon can keep all necessary forceps, energy devices and others around his/her waist. Dramatically reduces scrubbed nurse’s workload. Best suited for emergency and solo situation. Released in 2014.

Endotornado, TOP, Tokyo

An innovative endoscopic platform (over-tube) with built-in side channel. This device enables robust and adjustable tissue traction by using grasping forceps via side channel and rotating it around endoscope. PMDA cleared in 2016 (not commercially available).



Laparo Cocoon, Tokusen, Hyogo

A fruit of fine metal processing technology. This very thin laparoscopic retractor (< 3mm OD) has 5 flexible but strong metal wires converged at their distal ends, providing atraumatic but consistent tissue retraction. PMDA cleared in 2015 (not commercially available).



GW-200, Fujifilm, Tokyo

A killer device in era of “steady pressure automatically controlled endoscopy” (SPACE). This unit creates and maintain “laparoscopy-like” steady endoscopic visualization and working space in GI tract. PMDA cleared in 2016 (not commercially available).



Dr. HUBY micro, Sanyo, Osaka

With unique manufacturing technology, this surgical cotton swab is not just ultra-thin (< 3mm OD), still very stable under continuous exposure to body fluid, leaving minimal cotton lint inside body. PMDA cleared in 2017 and will be released within the year.



Selfgown, Daiei, Osaka

World first self-donning and self-adjusting surgical gown, eliminating need for circulator’s assistance in busy OR. Also very easy to slip off without contamination. Good for emergency and severely short-handed settings. Released in 2017.



Our Approach



1

Needs Finding



2

Designing & Prototyping



3

Preclinical Evaluation



4

Data Collection



5

Date Analysis for Improvements



6

Clinical Evaluation / First in Human



7

Commercialization



8

Academic Sales

内視鏡挿入中のサイドリーク	(+)	(-)
内視鏡抜去時のリーク	(+)	(-)
強制脱気機能	(-)	(+)
内視鏡のホルド性	(-)	(+)
定格	1,200円/個	2,980円/個

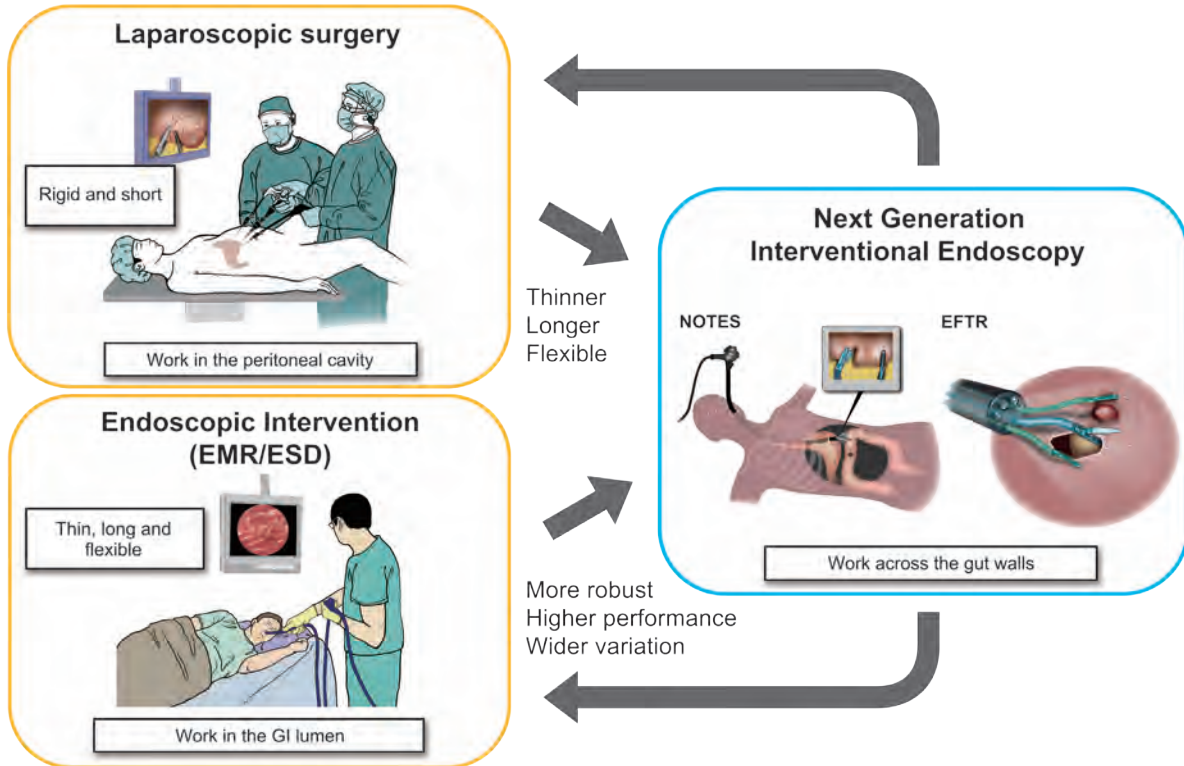
both Lecture Schedule

| 13:40-14:00, 14:10-14:30

| 13:40-14:00

TOP

Our Strategy: Integration & Spin-off



Laparoscopy (rigid) and endoscopy (flexible) will be positively integrated towards next generation type endoscopy. Medical devices, however, should not be developed only for future endoscopy. Their “spin-off” use for current modalities must always be considered. Both integration and spin-off require intensive and continuous R&D with tight collaboration among surgeons, gastroenterologists, engineers and business specialists. ENGINE challenges to become one of the best practices in this field.

Contact Us

Division of Next Generation Endoscopic Intervention (Project ENGINE)

Global Center for Medical Engineering and Informatics, Osaka University, Osaka, Japan

Suite 0912, Center of Medical Innovation
and Translational Research

2-2, Yamadaoka, Suita, Osaka 565-0871, Japan

TEL: +81-6-6210-8420 FAX: +81-6-6210-8424

Email: project_engine@me.com

Visit our website for more information!

<http://project-engine.org/eng>



Driven By Our Pride.