

FY2019 Q1 Financial Results

May 14, 2019

HEALIOS K.K.

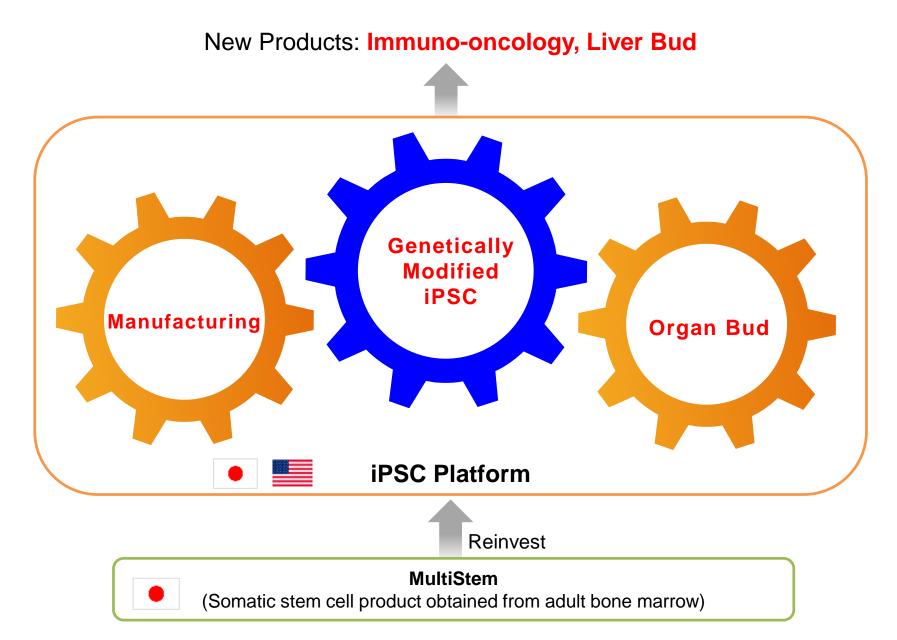
(TSE: 4593)

https://www.healios.co.jp/en

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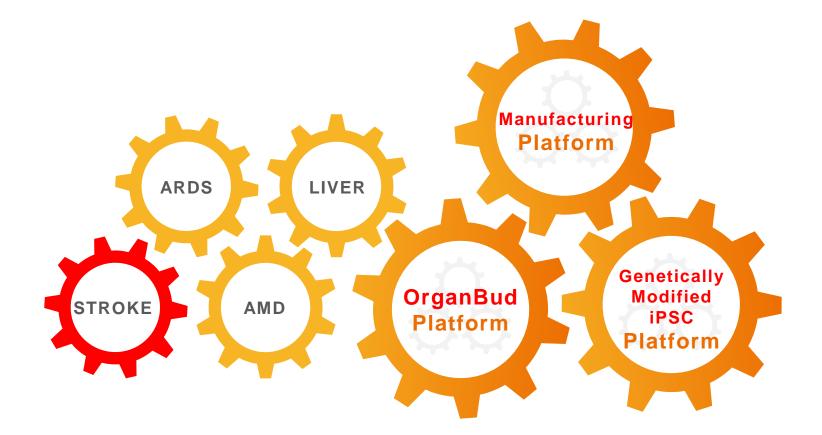
## Strategy



# Pipeline

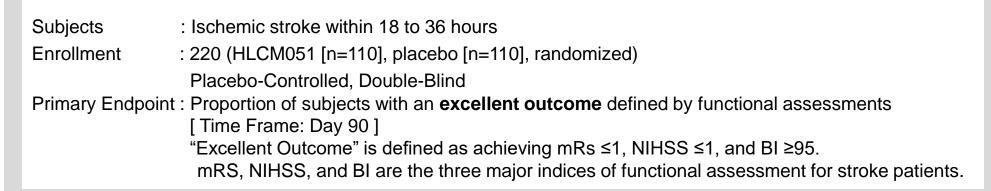
Market	Field	Development Code	Indication	Pre- clinical test	Clinical trial	Apply- approve	On Market	Progress status
	Somatic Stem Cell	HLCM051	lschemic Stroke					Clinical trial ongoing
Japan iPSC Regenerative Medicine			ARDS					First patient enrolled in April 2019
	HLCR011	Wet AMD	-				Undergoing preparation for clinical trial	
		HLCL041	Metabolic Liver Disease					Joint research with Yokohama City University

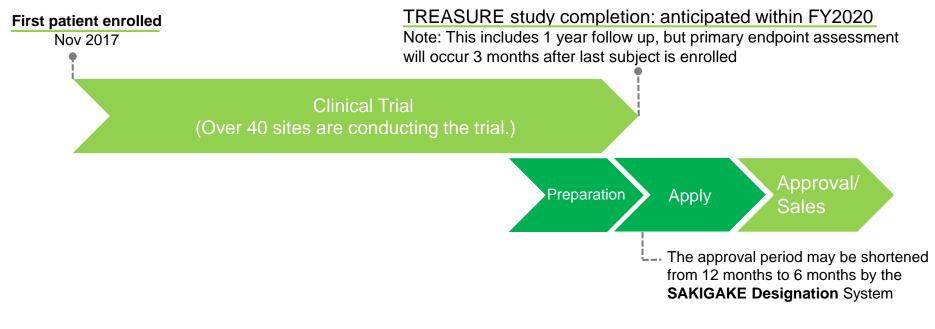
Market	Field	Development Code	Indication	Pre- clinical test	Phase 1 trial	Phase 2 trial	Phase 3 trial	Apply- approve	On Market	Progress status
US EU	iPSC Regenerative Medicine	HLCR012	Dry AMD	•						CRADA with NEI



# HLCM051 Stroke TREASURE Study Ongoing

"Placebo-Controlled, Double-Blind, Phase 2/3 Efficacy and Safety Trial of HLCM051 (MultiStem<sup>®</sup>) in Patients With Ischemic Stroke"

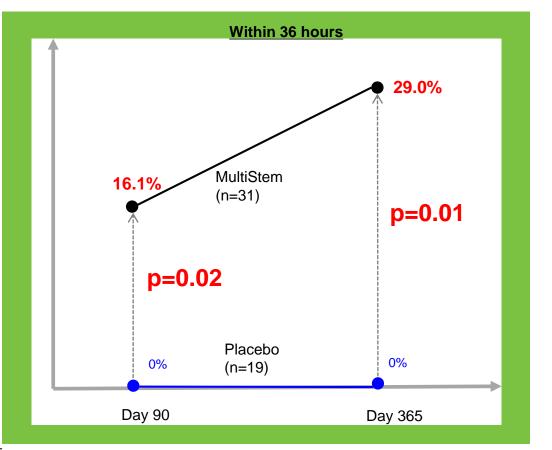




#### Results of double blind study conducted by Athersys <Stroke>

The proportion of patients who achieved Excellent Outcome was **statistically significant** (compared with the placebo group) both at Day 90 and Day 365 in the group of patients who received MultiStem within 36 hours of the onset of cerebral infarction.

Analysis of the **placebo-controlled double-blind study** conducted by Athersys in the US and the UK



Subjects: Administered MultiStem or Placebo within 36 hours of the onset of stroke

Endpoint:

Proportion of subjects with an Excellent Outcome

<Excellent Outcome> is defined as mRS score of  $\leq 1$  (scale, 0 to 6), NIHSS score of  $\leq 1$  (scale, 0 to 42), and BI score of  $\geq 95$  (scale, 0 to 100).

# HLCM051 Stroke Outline of ischemic stroke in Japan

Ischemic stroke

Ischemic stroke, which represents the most common form of stroke (70 - 75% of cases in Japan), is caused by a blockage of blood flow in the brain that cuts off the supply of oxygen and nutrients, resulting in tissue loss.

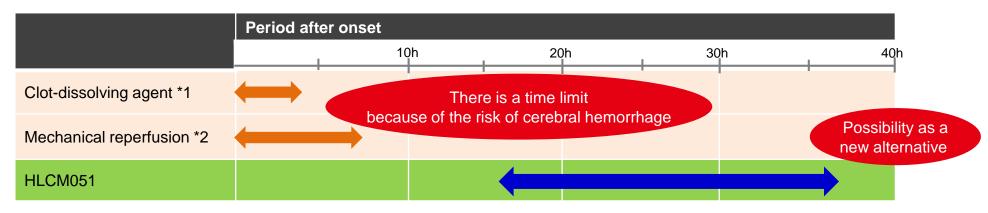
It is estimated that 37.9% of bedridden patients and 21.7% of persons who were in need of care were affected by ischemic stroke.



(Source) Athersys

#### Treatment in accordance with the period after onset

Expected development of a new therapy that can be applied in a longer treatment window period following the onset of ischemic stroke (ability to help more patients)



\*1: Dissolves blood clots in the brain vessels. \*2: Insertion of the catheter into a blood vessel and recovery of the thrombus directly with a wire.

(Note) This material was prepared to explicitly describe the major therapeutic options for ischemic stroke and their treatment window periods after onset. Appropriate treatments are conducted according to patients' conditions and classification of their symptoms. Experimental or investigational treatments not included in the above are also performed. Copyright © HEALIOS K.K. All rights reserved. HLCM051 Stroke Annual number of new patients with ischemic stroke in Japan

	Japan 🥚	Note
Number of patients (yearly)	230,000 – 330,000	Annual medical costs for ischemic stroke estimated at 1,070.7 billion yen (2009)
Severe patients (atherothrombotic and cardiogenic cerebral infarction)	130,000	
patients within 36 h after onset	62,000	

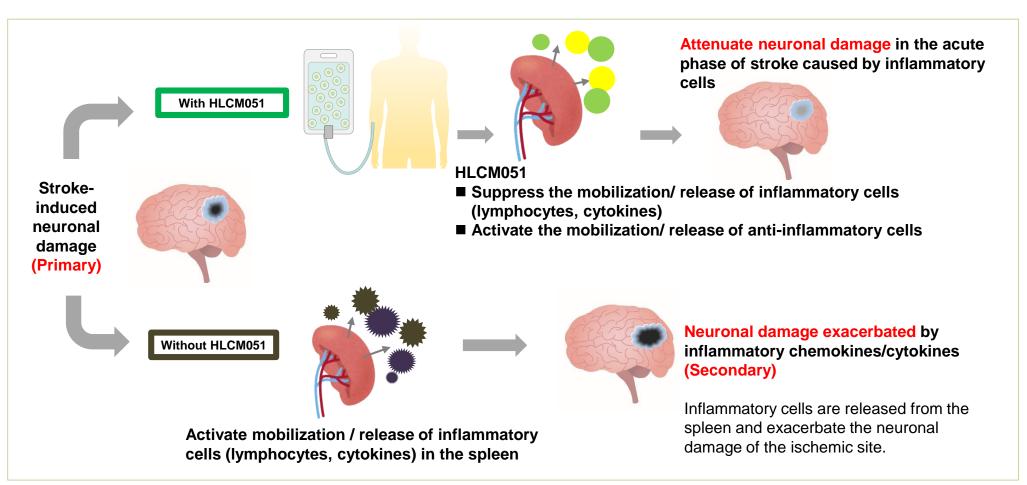
(Source) Healios estimated the annual number of new patients with ischemic stroke in Japan according to materials issued by the Fire and Disaster Management Agency, the Ministry of Internal Affairs and Communication, and the Ministry of Health, Labour and Welfare – DATAMONITOR epidemiological estimates also shown as upper end of range.

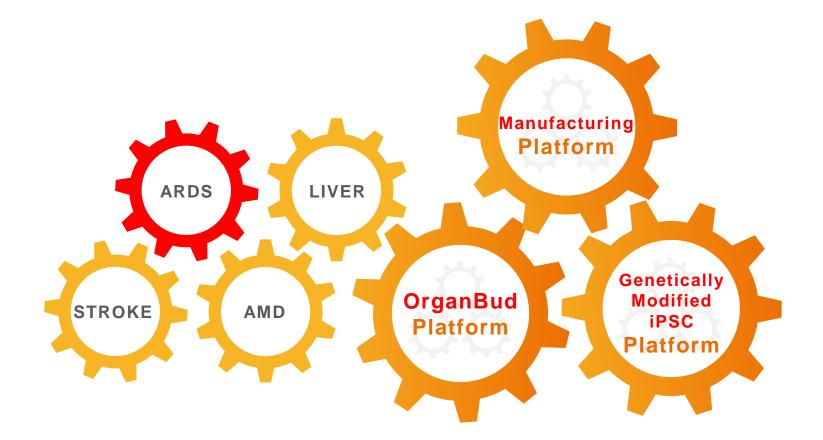
(Source) Healios estimated the percentage of patients who reach the hospital within 36 hours after onset at 47% according to the results of its market research.

(Note) Calculated using 2013 and 2014 fiscal year-end exchange rates.

# HLCM051 Stroke Mechanism of HLCM051 treatment

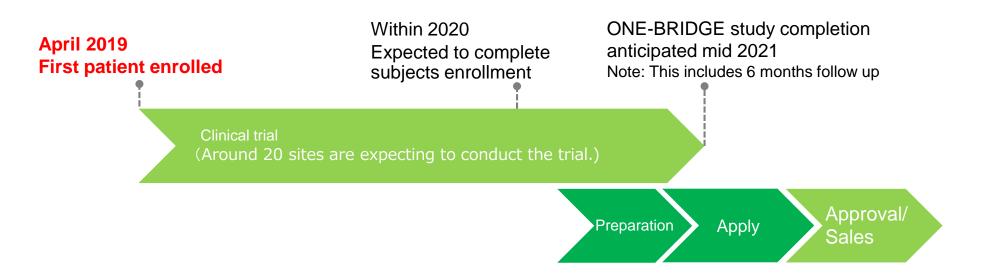
- Following intravenous administration after acute neurological injury, HLCM051 distributes to the spleen, downregulating the hyperinflammatory response.
- HLCM051 promotes a neuroprotective effect by releasing various cytokines and growth factors.





Efficacy and Safety Study of HLCM051 (MultiStem<sup>®</sup>) For Pneumonic Acute Respiratory Distress Syndrome (ONE-BRIDGE)

Subjects:Patients with pneumonia induced ARDSEnrollment:30 (MultiStem 20, Standard therapy 10) Randomized<br/>Open label, Standard therapy-controlledPrimary endpoint:The number of days out of 28 in which a ventilator was not used for the patient<br/>(i.e. ventilator free days)



UPDATE

## Results of double blind study conducted by Athersys <ARDS>

Positive Results From Athersys' Exploratory Clinical Study in US and UK using MultiStem for the patients of ARDS (January 2019)

- The study results provide further confirmation of tolerability and a favorable safety profile associated with MultiStem treatment.
- Diagnosis from the double blinded, placebo-controlled study (MultiStem: 20 subjects, Placebo: 10 subjects) after 28 days of administration shows an improvement trend in the MultiStem administration group. (In more severe ARDS patients, the difference between MultiStem treatment and placebo was greater.)

	MultiStem (n=20)	Placebo (n=10)
Mortality	25%	40%
Ventilator- free (VF) days	12.9 days	9.2 days
Intensive Care Unit (ICU) free days	10.3 days	8.1 days

# HLCM051 ARDS About Acute Respiratory Distress Syndrome (ARDS)

#### ARDS

Acute Respiratory Distress Syndrome (ARDS) is a general term for the symptoms of acute respiratory failure suddenly occurring in all seriously ill patients. The major causes are severe pneumonia, septicemia, trauma etc. Inflammatory cells are activated in response to these diseases or injuries, causing damage to the tissue of the lungs. As a result, water accumulates in the lungs, leading to acute respiratory failure.

Typically, ARDS is said to occur within 24 to 48 hours of the onset of the illness or injury that caused it. The mortality rate is approximately 30 to 58%\*.



(Source) Athersys

(\* ARDS treatment guideline 2016)

#### Treatment

Artificial respiration using an endotracheal tube or mask is used to treat for respiratory failure in an intensive care unit. However, it is known that prolonged use of a ventilator worsens a patient's prognosis.

At present, there are no therapeutic drugs that can make a direct improvement to a patient's vital prognosis when ARDS develops. There is a demand for new treatments for ARDS that will lead to improvements in patients' symptoms and prognosis.

# HLCM051 ARDS Number of ARDS patients

Epidemiological data	Incidence rate	The estimated number of ARDS patients in Japan
Epidemiology, Patterns of Care, and Mortality for Patients With Acute Respiratory Distress Syndrome in Intensive Care Units in 50 Countries. Source: JAMA.2016; 315(8): 788-800	<ul> <li>0.42 cases per ICU bed</li> <li>10.4% of ICU admissions</li> <li>23.4% of patients requiring mechanical ventilation</li> </ul>	11,937
Epidemiology of Acute Lung Injury (ALI) / Acute Respiratory Distress Syndrome (ARDS) in Chiba Prefecture Source: Journal of Japanese Association for Acute Medicine 2007; 18(6): 219-228	6.1 per 100,000 persons	7,320
Underlying diseases of ARDS	The number of ARDS patients in Japan is estimated by He epidemiological data and the total of	alios based on the incidence rate of demographical population in Japan.
Other (8%) Trauma (7%) Aspiration (10%) Pneumonia (34%)	Approximately 1/3 of ARDS patients were caused by pneumonia	
	* A double-blinded Phase II study	by Athersys, <u>the enrolled</u>

subjects of which were not limited by the underlying ARDS causing diseases, showed an improvement trend. (see P12)

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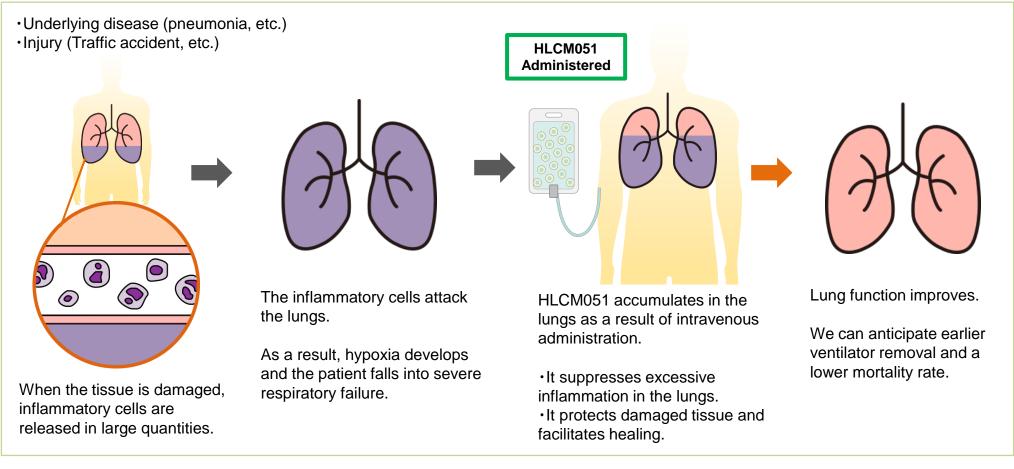
Source : Respiratory Investigation; 55(4): 257-263

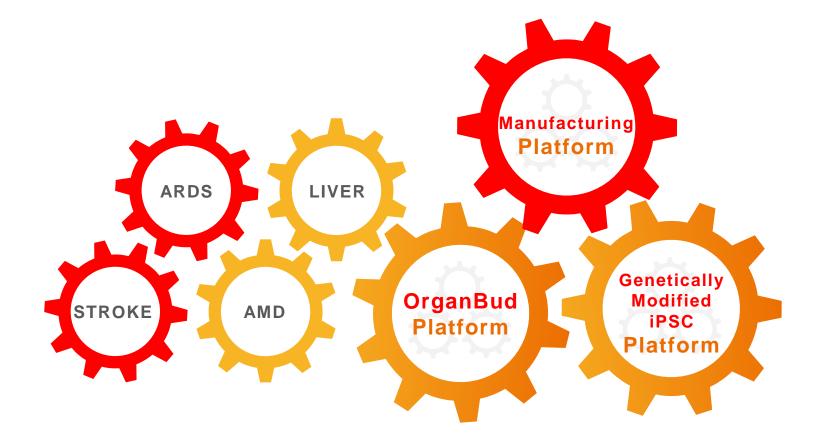
Sepsis (29%)

Surgery (11%)

ARDS Pathological Process and HLCM051 Expected Mechanism of Action

- Following intravenous administration after ARDS, HLCM051 accumulates in the lungs and controls excessive inflammation.
- HLCM051 protects damaged tissue and promotes restoration.





## Athersys' Stem Cell Products: MultiStem®

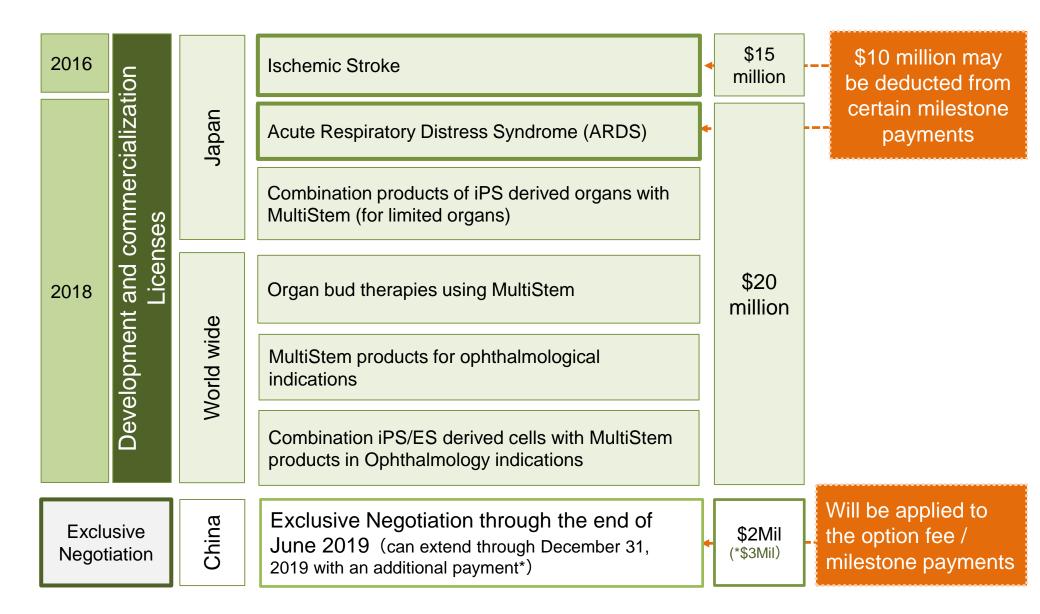
	Athersys,	Inc.
	Location	Cleveland, Ohio, U.S.
Athersys	Listed	NASDAQ : ATHX
	Products	Stem cell products: MultiStem®



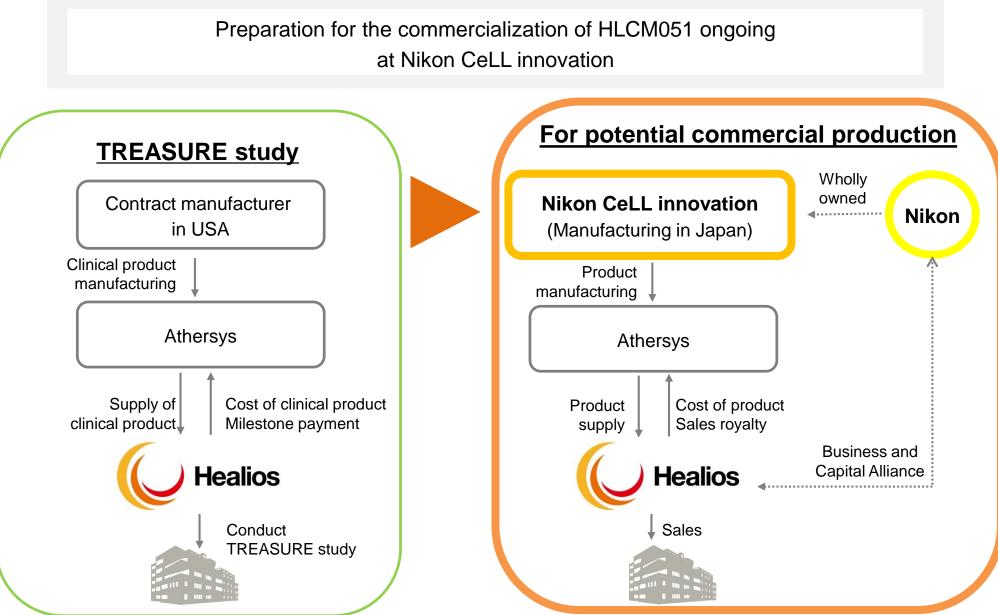
#### MultiStem

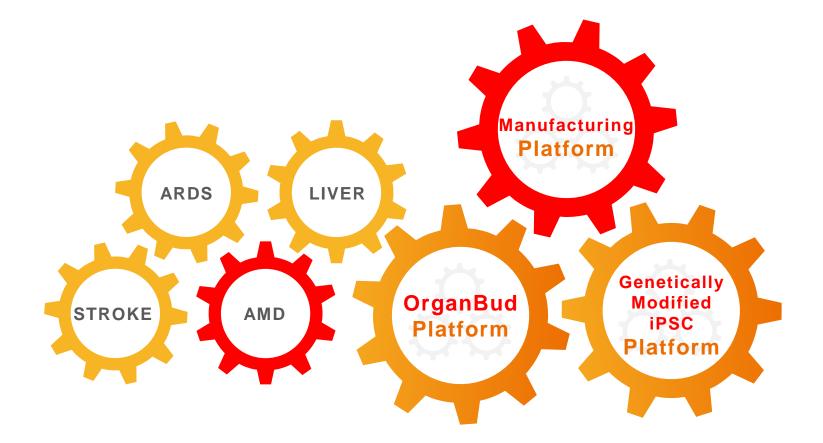
- Cell therapy product based on patented technology
- Developing for "off-the-shelf" administration:
  - no tissue matching needed
- Long shelf life: can be kept frozen in a stable condition for years
- Consistent safety profile
- Promotes healing and tissue repair through multiple mechanisms of action
- Not a permanent transplant: cells cleared from the body over time

#### Acquisition of MultiStem License



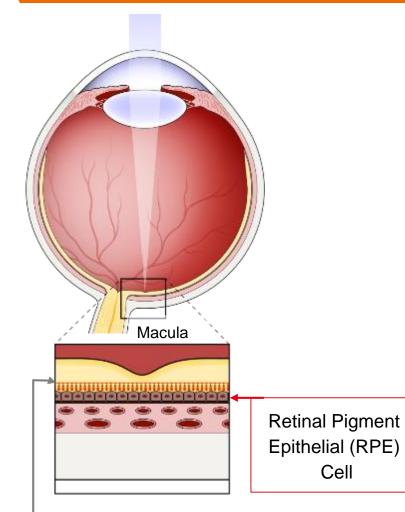
#### HLCM051 Business Partners





# HLCR011 AMD Explanation of AMD pathological conditions

#### AMD causes RPE cells to degenerate, which damages function.



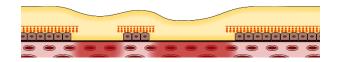
#### Photoreceptor Cells

**Regular Macular Part** 

#### Developed Dry AMD

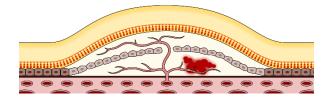
#### Immunity barrier maintained

 $\rightarrow$  Degeneration of photoreceptor  $\rightarrow$  Dry AMD



#### Wet AMD

Destruction of immunity barrier  $\rightarrow$  Invasion of immune cells  $\rightarrow$  Inflammation  $\rightarrow$  Wet AMD



# HLCR011 AMD Number of AMD patients

#### Number of both Wet and Dry patients (including mild cases)

(Thousand patients)

	America	Japan 🔴	Others
nber of AMD ients	10,000	9,230	13,000
mber of AMD ients in Serious Cases	2,000	690	2,600-3,220
Wet-patients in serious cases	1,000-1,500	630	1,300-1,950
Dry-patients in serious cases	850-900	60	1,100-1,170

\*According to research by Hisayama Kyushu University Graduate School of Medicine in Fukuoka (based on a comprehensive study), the total number of patients in Japan is calculated, estimating the total number of first-stage age-related macular degeneration and latter stage of age-related macular degeneration based on population statistics (2007). Also, the Disease Information Center announced that the number of patients suffering serious cases is approximately 690,000. The total number of patients in the US, which the National Eye Institute reports, includes the total number of age-related macular degeneration patients in mild cases and patients with visual field defects. Also, our company calculated the total number of Dry/Wet patients based on the incidence rates presented by AMDF (2010). Our company calculated the total number of patients in Europe based on incidence rates in each grade of European population statistics (2010)

\* source: Prevalence of age-related maculopathy in older Europeans: the European Eye Study (EUREYE). Source: Arch Ophthalmol. 2006 Apr; 124(4):529-35

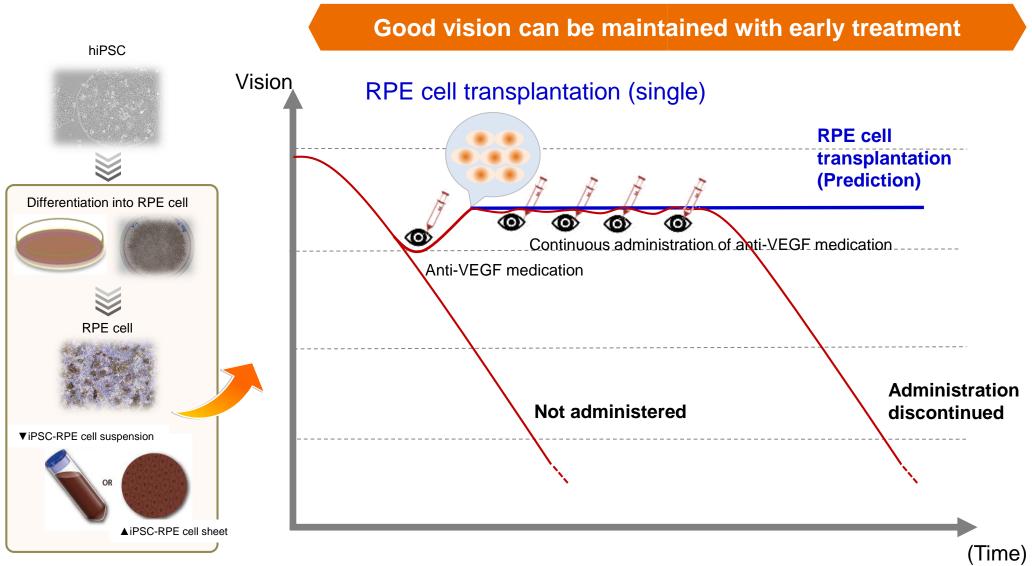
# HLCR011 AMD Market scale of anti-VEGF treatment

#### Sales of anti-VEGF treatment are increasing every year. No medicine for Dry AMD.

Indication	Medicine / Effect	year	America	Japan 🔴	Others	Total
Anti-\/FGF	2015	3.853 billion USD	496 million USD	2.661 billion USD	7.01 billion USD	
Wet AMD and Other 3 diseases	andRestraint ofOther 3New Blood	2016	4.729 billion USD	580 million USD	3.127 billion USD	8.436 billion USD
		2017	5.116 billion USD	632 million USD	3.483 billion USD	9.231 billion USD
Dry AMD				No Medicine		

(Source) Market scale was calculated using official materials from drug companies (Roche Diagnostic, Novartis, Regeneron, Bayer HealthCare, Santen Pharmaceutical Co., Ltd). Calculated using 2015,2016,2017 fiscal year-average exchange rates. (FY2015:\$1=¥121, FY2016: \$1=¥110, FY2017: \$1=¥112)

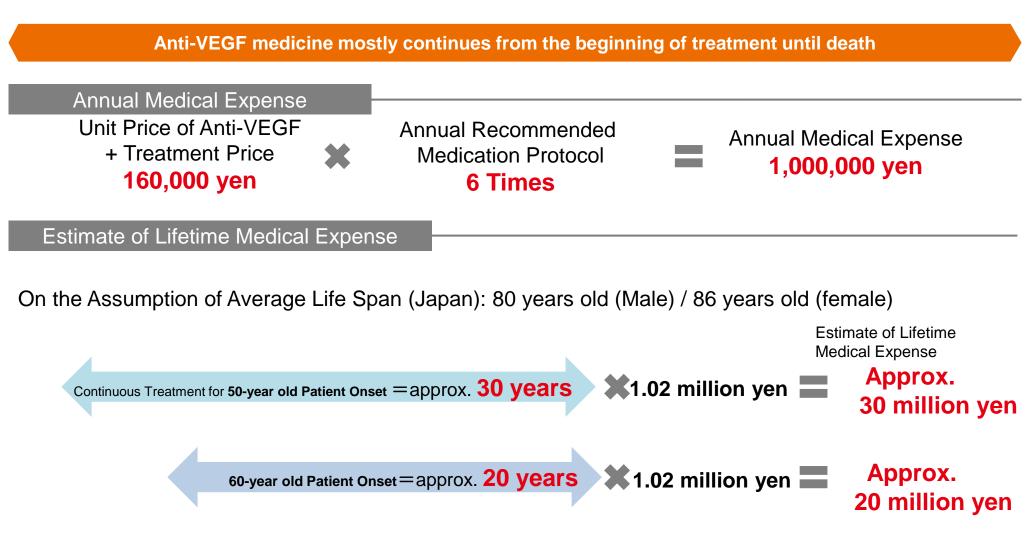
## HLCR011 AMD Image of changes in vision with iPSC-RPE cell products treatment



\* The purpose of this illustration is to promote understanding of the effects of RPE cell transplantation. Changes in vision with the administration of anti-VEGF medication vary according to patient symptoms and administration frequency.

#### HLCR011 AMD Guide to medicine price

– Approach based on the cost of existing treatment



(source) Onset Data: National Eye Institute; Average Life Span: The Ministry of Health, Labor and Welfare; Annual Recommended Medication Protocol: Materials Presented by Institute of Physical and Chemical Research

# HLCR011 AMD Manufacturing for iPSC-derived RPE products

Sighregen (our joint venture with Sumitomo Dainippon Pharma) is establishing a manufacturing facility in "SMaRT", the Manufacturing Plant for Regenerative Medicine & Cell Therapy by Sumitomo Dainippon Pharma



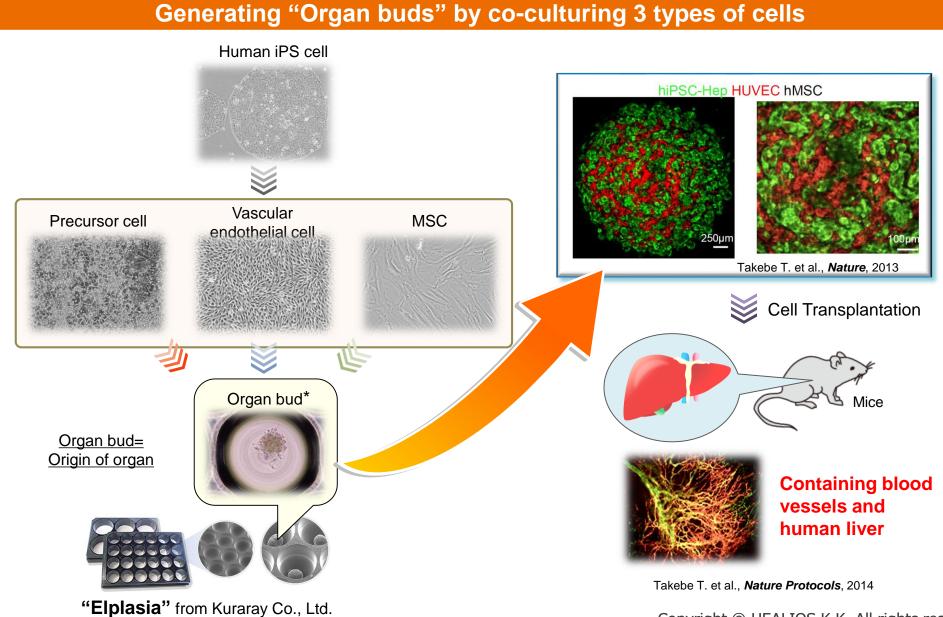
Sighregen rents the facility in SMaRT and is establishing the iPSC-RPE manufacturing system.

Sumitomo Dainippon Pharma completed the new manufacturing plant for regenerative medicine & cell therapy "SMaRT" in Osaka in March 2018.





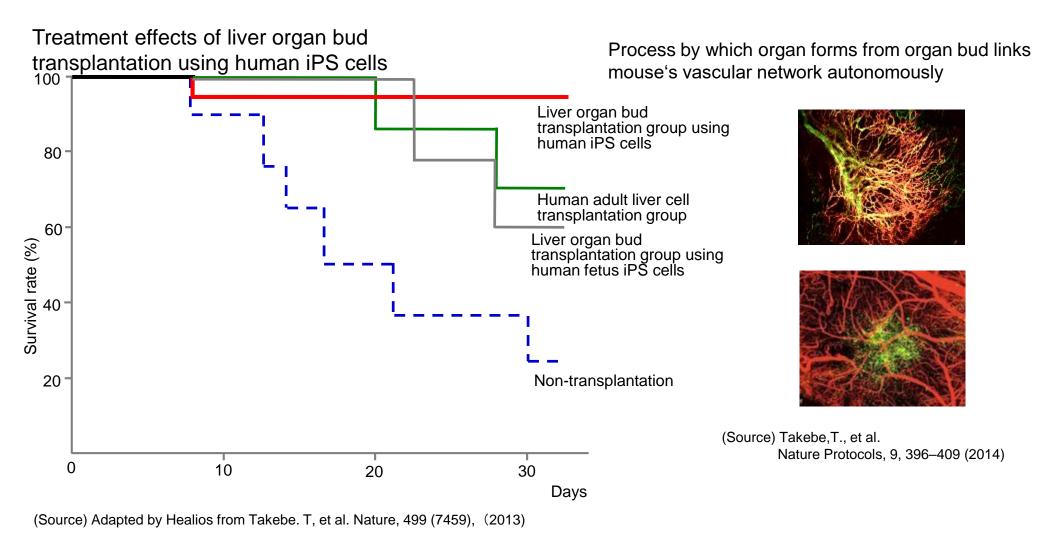
#### HLCL041 LIVER OrganBud Platform 3D organ generation mechanism



(http://www.elplasia.com/products/round\_bottom/)

# HLCL041 LIVER OrganBud Platform Survival rate of liver failure in mouse model

#### Survival rate improves significantly in transplantation experiments



# HLCL041 LIVER OrganBud Platform Expansion of marketability

#### **Prospecting R&D for alternative treatment for liver transplantation**

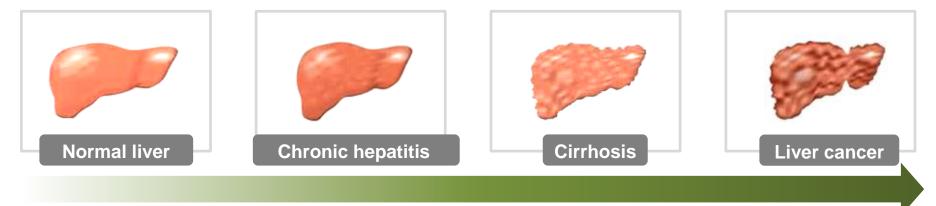
		<b>T</b> -4-1		
	US	Japan 🔴	Europe	Total
Number of patients undergoing treatment (Annual)	Approx. 6,000	Approx. 400	Approx. 4,000	Approx. 10,000
Number of patients on waiting list (Annual)	Approx. 15,000	Approx. 400	Approx. 4,000	Approx. 20,000

(Source) Compiled by Healios based on materials disclosed by Japanese Liver Transplantation Society, UNOS, Eurotransplan, UK Transplant, Agence de la biomédecine, and Scandia Transplant.

#### Liver disease drawing attention in the future is cirrhosis

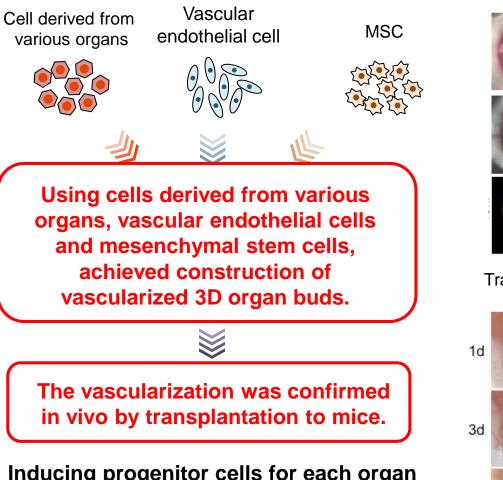
Estimated patients with cirrhosis in Japan: 400,000 to 500,000. About 56,000 receive treatment at medical facilities. Annual deaths in Japan: 17,000 patients. (Source) Patient Survey 2011 Liver Cancer White Paper 2015

#### Progress of liver disease

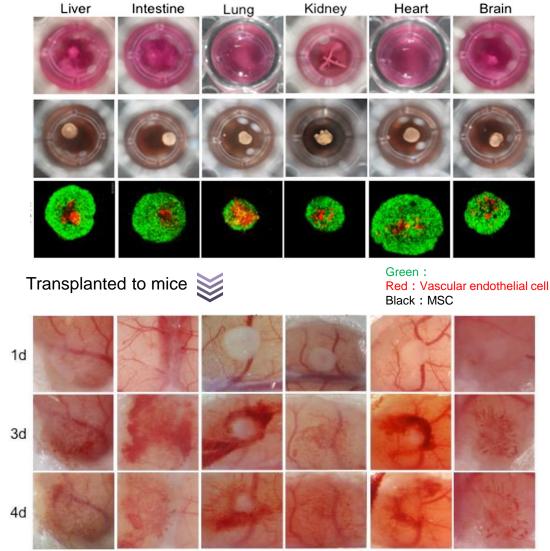


# **HLCL041 LIVER OrganBud Platform**

#### Potential of application for various organs



Inducing progenitor cells for each organ from iPS cells will expand the possibility of development across various organs.



Modified from Takebe T. et al., Cell Stem Cell, 2015

# Financial Highlights

#### Statement of income

(Units: one million US dollar)

	FY 2018		FY 2019 Q1		
	Q1		YoY variance	Main reasons for increase/decrease	
Sales	—				
Operating income	-5.11	-9.01	-3.90	Mainly due to increase in R&D expenses - \$3.66mn	
Ordinary income	-5.10	-9.03	-3.93		
Net income	-5.11	-8.14	-3.03	Mainly due to increase in extraordinary income +\$0.91mn (Milestone Revenue)	

R&D expenses	3.40	7.06	3.66	
Number of employees	75	98	23	-

\*Adopt average exchange rate (JPY/USD) over respective 3 month periods for P&L. FY2018 Q1 108.22 yen per dollar and FY2019 Q1 110.21 yen per dollar.

#### UPDATE

#### **Balance sheet**

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(Units: one million US dollar)

		December 31, 2018	March 31, 2019		
				Variance	Main reasons for increase/decrease
	Current assets	111.05 (82.3%)	<b>97.05</b> (79.4%)	-14.01	Mainly due to decrease in cash equivalents -\$12.51mn (cash equivalent balance at 3/31/19 was \$92.24mn)
	Non-current assets	23.91 (17.7%)	<b>25.13</b> (20.6%)	1.23	
Total assets		<b>134.96</b> (100.0%)	<b>122.18</b> (100.0%)	-12.78	
	Current liabilities	<b>14.62</b> (10.8%)	<b>9.28</b> (7.6%)	-5.34	Mainly due to decrease in Advances received -\$3.19mn and Accounts payable -\$1.86mn
	Non-current liabilities	<b>23.20</b> (17.2%)	<b>22.94</b> (18.8%)	-0.25	
Total liabilities		<b>37.82</b> (28.0%)	<b>32.22</b> (26.4%)	-5.60	
Total net assets		<b>97.14</b> (72.0%)	<b>89.96</b> (73.6%)	-7.18	Mainly due to net loss -\$8.14mn
Total liabilities and net assets		134.96 (100.0%)	<b>122.18</b> (100.0%)	-12.78	

\*Adopt spot rate (JPY/USD) at end of fiscal period for B/S.

FY2018 Q4 111.00 yen per dollar and FY2019 Q1 110.99 yen per dollar.

# Appendix

# HEALIOS K.K. Leadership



Jun Narimatsu	Richard Kincaid	David Smith	Michael Alfant	Gregory Bonfiglio	Yoshinari Matsuda	Seigo Kashii
Accountant Supporting various venture companies in the field of IT/ Healthcare	President & CO Nezu Asia Capit Management (he fund )	al Lonza Corp.	Group Chairman & CEO, Fusion Systems, Co., Ltd. Presidents Emeriti, ACCJ	Founder & Managing Partner of Proteus, LLC. (Investment in RM ventures) Chairman of the Board of CCRM	Attorney-at-Law, Senior Management Partner of Uruma Law Offices Legal Professional Corporation	Ex-corporate auditor of Astellas Pharma
	lasanori Sawada	New Mahendra Rao	Hardy TS Kagimoto	Kouichi Tamura Michih Nishiya		
(Chief	tive officer, CMO Medical Officer) iinistrative field	Chairperson of Scientific Advisory Board	Chairman and CEO	Executive officer, Research and Manufacturing fiel	EXECUTIVE OF	-
MI	D, PhD, MBA	First Director of NIH Center of Regenerative Medicine	MD, Founder	Ex-Astellas US Direc of Laboratories Expertise in Immunosuppressa Research	Tacrolimus appr sales at Astella	roval and is in the

We established the Healios Scientific Advisory Board (SAB).
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Role of Healios SAB: To deliver the best treatment not only in Japan but also for the world.

- Appropriately grasp the current position of Healios in a global context;
- Support research and development activity encouraging speed, efficiency, and alliances;
- Provide advice from the point of view of specialists.

# Chairperson of Healios SAB **Dr. Mahendra Rao**

Dr. Rao is an eminent scientist in the field of stem cell biology. He has broad experience not only in the academic field but also in government, regulatory and the clinical setting. He earned his medical license at the University of Bombay (currently the University of Mumbai) in India, and completed his doctorate in neurobiology at the California Institute of Technology. Dr. Rao was appointed the Director of the U.S. National Institute of Health (NIH) Center for Regenerative Medicine when it was established in 2010, where he led the country's stem cell research. He has worked as a scientific advisor to numerous companies and foundations, and has served on advisory panels to the government of the U.S. and other countries.



UPDAT

# **Company Overview**

About Us	
Company Name	HEALIOS K.K. (TSE: 4593)
Mission	To foster a "Life Explosion" that enriches the lives of people around the world
Head Office	World Trade Center Building 15F 2-4-1 Hamamatsucho Minato-ku, Tokyo Japan 105-6115
Representative	Hardy TS Kagimoto, MD, Chairman and CEO
Paid in Capital	11,395 million yen (As of end of March, 2019)
Number of Employees	98 (As of end of March, 2019)
Research Institution	Kobe and Yokohama
Affiliated Company	SighRegen Co., Ltd. (Joint Venture with Sumitomo Dainippon Pharma Co., Ltd.)
	Healios NA, Inc. (Established in February 2018)
Subsidiary	Organoid Neogenesis Laboratory Inc. (Established in June 2018 to promote the practical use of organ bud technology)

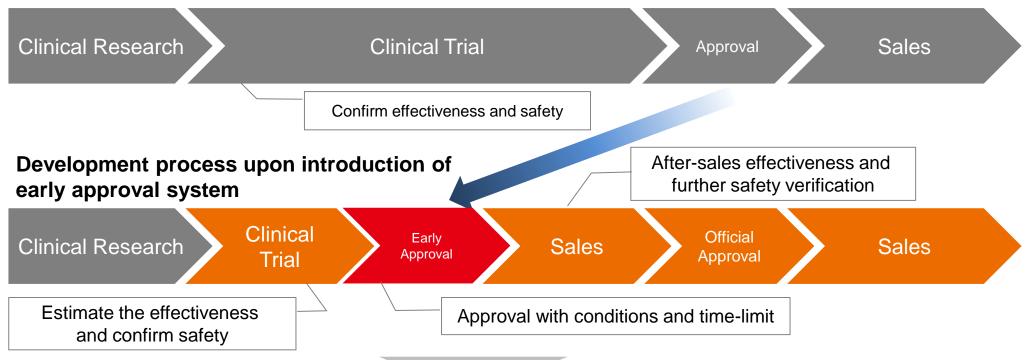
# **Company History**

2011	Establishment of the company		
2012	Tokyo office opened		
2013		A patent licensing agreement concluded with RIKEN Joint Development Agreement with Sumitomo Dainippon Pharma Co., Ltd.	
2014		Joint research with Yokohama City University on Organ bud	
2015	Listed on Tokyo Stock Exchange (MOTHERS)		
2016			HLCM051 license agreement with Athersys, Inc.
2017	A business and capital alliance with Nikon BBG250 Business transfer		
2018	Establishment of Healios NA, Inc. in the US Establishment of Organoid Neogenesis Laboratory Inc.	CRADA with National Eye Institute	Strategic investment and collaboration expansion with Athersys Development for ARDS
2019			

## Historical relaxation of Japanese regulations

#### Japanese Government Revises Regulations to Put Japan at the Forefront

#### **Traditional process of development**



- Drastic reduction in the trial time period and number of patients with "Early Approval System".
- Insurance is listed at 'Early Approval' stage.

#### Important note on future events, etc.

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# Healios

<Contact information> Corporate Communications HEALIOS K.K.

Phone: +81-(0)3-5777-8308 Press contact: pr@healios.jp Investor contact: ir@healios.jp