Yoshioka Yayoi (1871 - 1959)
Yoshioka in younger days

• April 1871, born as Washiyama Yoyoi in Kakegawa, Shizuoka prefecture
• Although, she had only grade school education, she decided to become a doctor and entered Saisei-Gakusha school of medicine and graduated from there.
• She received the 27th medical license granted to a woman in Japan.
Back Ground

• Many women’s college were established between Meiji and Taisho period, but very few co-educational colleges. Especially Imperial Universities shut the door to women, except for the Faculty of Science, Tohoku University.

• In 1948 right after WW II, according to the educational reform by the government of Japan, women students can freely choose higher education as they wish.
Japanese Postal Stamp 100 year commemoration of women’s higher education
From Iidamachi to Kawadacho
School Expansion

• In 1903, the school moved to Kawadacho.
• In 1912, the school was granted to call Tokyo Joshi Igaku Senmon Gakkou by the ministry of Education.
• Yoshioka Arata was doing administrative job for the school instead of Yayoi who was busy in seeing patients and teaching medicine to the students.
• Yoshioka Arata, his health deteriorated and died due to diabetes mellitus at the age of 55 in 1922.
Army Accounting School

TWMU
1930 by Architect Masuda Kiyoshi

2003
GKK ARCHITECTS & ENGINEERS Co., LTD.
**FOUNDERS’ PHILOSOPHY**

- Original Mission
  - Women’s social independence

- Philosophy
  - Devotion to patients
  - Sincerity and Compassion

Yayoi Yoshioka
1871-1959
Tokyo Women’s Medical University

Founded in 1900
Brief History of TWMU

1900 Tokyo Women’s Medical School was founded.

1952 Modern higher education started; renamed as Tokyo Women’s Medical College

1970s Became the largest hospital in Japan (currently 3rd)

1998 Nursing School was founded
    Renamed Tokyo Women’s Medical University
<table>
<thead>
<tr>
<th>Medical and Nursing Schools</th>
<th>Courses</th>
<th>Students</th>
<th>Faculties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Sch.</td>
<td>1</td>
<td>661 F</td>
<td>880 Prof(115)</td>
</tr>
<tr>
<td>Graduate Sch. of Medicine</td>
<td>6</td>
<td>115 F/M</td>
<td>15</td>
</tr>
<tr>
<td>Nursing Sch.</td>
<td>1</td>
<td>363 F</td>
<td>49 Prof(10)</td>
</tr>
<tr>
<td>Graduate Sch. of Nursing</td>
<td>1</td>
<td>51 F/M</td>
<td>1</td>
</tr>
</tbody>
</table>

2016
The University Hospital

- Tokyo Women’s Medical University Hospital
  - 38 clinical disciplines with 9 organ/disease-specialized centers
  - 1,100 beds
  - 3,200 outpatients/day
  - 900 doctors including 120 residents
  - 1,100 nurses

Data from 2016
Affiliated hospitals

- TWMU East Medical Center
  - Community-based hospital
  - 495 beds
  - 226 doctors 462 nurses
  - 25 clinical disciplines
  - 404 beds

- Yachiyo Medical Center
  - Community-based hospital
  - 500 beds (2017)
  - 28 clinical disciplines
  - 171 doctors 381 nurses
  - Maternal-neonatal center (NFICU, NICU)

- Institute of Rheumatology
- Institute of Oriental Medicine
- Institute of Women’s Health
HOSPITAL FACILITIES
Outline of Electronic Medical Record

The sample of a screen

放射線システム
RIS/PACS
横河電気製

JPEG image

DICOM image
Outline of Electronic Medical Record

Nihon Kohden
生理検査システム (Endoscopes)

Report reference
(Electrocardiogram)
Outpatient Chemotherapy Room

Outpatient Cancer Chemotherapy

表 1. 外来化学療法件数の推移

<table>
<thead>
<tr>
<th>年度</th>
<th>2006</th>
<th>07</th>
<th>08</th>
<th>09</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>数</td>
<td>7954</td>
<td>8524</td>
<td>8562</td>
<td>8828</td>
<td>9820</td>
<td>10112</td>
<td>13083</td>
</tr>
</tbody>
</table>
Blood Transfusion Cell Processing Division

Patient X Sample (Label = X) Patient Y (Label = X)
A (+) B (+)

One particular patient proved to have 2 different blood types.

⚠️ Prevention

☆ Don’t draw blood into test tube without label.
☆ Label must be attached to the test tube.
☆ Patient will participate to check his/her blood type.
☆ Use PDA
3 point check; barcode
Gamma KNIFE Therapy

PERFEXION

Metastatic Brain Tumor
Brain Tumor, Trigeminal Neuralgia
Cerebral Artery Aneurysm

Department of Neurosurgery
RESEARCH ACTIVITIES

- Tissue reengeneering
- Development of Medical Equipment
- **TWIns**
  Institute of Advanced Biomedical Engineering and Science
  Faculty of Advanced Techno-Surgery

- Tokyo Women's Medical University Institute for Integrated Medical Sciences (TIIMS)
  Integration of basic medical research and clinical medical research based on investigation of molecular information of diseases
`Intelligent OR'

Faculty of Advanced Techno-Surgery

腫瘍の位置情報を知らせる術中MRIやナビゲーションシステム
We research and develop technologies which improve the safety of surgery. The brain is very soft and delicate organ like “tofu”, which has very ramified function. “Brain Surgery” is to treat very fragile and complex organ, and there are strong needs of systematic training for surgeons to improve the safety of treatment. It is inevitable to develop new surgical systems that support surgeons. Especially, it is important that the systems can help surgeons identifying the area to be removed or preserved while the safety and accuracy of surgery is assured. To achieve them, we are trying to develop new technology that assists surgery in cooperation between staff from industries, universities, and government, under the idea of Medical/Engineering Cooperation and Speed & Innovation.
細胞シートを用いた治療

食道
・食道ガンの内視鏡切除後の口腔粘膜シートによる再生治療

角膜
・角膜転部細胞や口腔粘膜細胞シートによる角膜上皮の再生治療

心臓
・間葉系幹細胞や筋芽細胞シートによる拡張性心筋症または虚血性心疾患の再生治療

歯
・歯根膜細胞シートによる歯周組織の再生治療

耳
・鼻粘膜細胞による中耳腔粘膜組織の再生治療

肺
・繊維芽細胞シートによる気胸など気漏の再生治療

軟骨
・軟骨細胞シートによる関節軟骨の修復再建治療

肝臓
・遺伝子修飾した高機能化肝臓細胞シートによる肝再建治療

腎臓
・腎臓細胞シートを用いた新規糖尿病治療の実現
Process of Cell Sheet Transplantation

1 day
Biopsy

Skeltal muscle
Hospital

7 weeks
Cell Processing

QA/QC under GMP
Terumo

2 days
Sheet processing/Transplantation

Cell sheet (2days)
Open heart surgery
Hospital
About 11,000 people die of esophageal cancer annually in Japan. There are basically three different methods for treating it: surgery, chemotherapy and radiation therapies. Especially in early esophageal cancer that is confined to the mucosa, endoscopic mucosal resection (EMR) has been the standard treatment method. In recent years, endoscopic submucosal dissection (ESD), which enables a precise diagnosis and a more extensive en-bloc resection compared to conventional EMR, has been developed, and its use is being extended to treat esophageal cancer. However, ulcerative esophageal constriction from extensive esophageal ESD may present a serious problem.
With these issues in mind, we have developed a regenerative treatment method in which we remove pieces of tissue from the autologous oral mucosa, and then produce an oral mucosal epithelial cell sheet by using a temperature responsive culture dish. This enables us to endoscopically transplant the cell sheet to the ulcerative surface after ESD. Based on the new Guidelines for Clinical Research Using Human Stem Cells, which took effect on September 1st, 2006, we constructed within our university a GMP-compliant cell-processing center. We started registration of patients in January 2008 and have treated 10 cases so far. Clinical application research on treating Barretts ulcer of esophagus will be carried out jointly with Karolinska Institut in Sweden.
Endoscopic submucosal dissection (esd) for the curative treatment of early esophageal cancer
Endoscopic Submucosal Dissection: ESD

Esophagus Cancer
(1) Removal of oral mucosal tissue

(2) Seeding of cells Isolated by enzyme on insert temperature-responsive culture dishes

Culture for two weeks

(3) Harvest by reducing of temperature to 20°C

(4) Endoscopic transplantation immediately after esophageal ESD

Esophagus

Ulceration after esophageal ESD

Transplantation of cell sheets

Autologous oral mucosal epithelial cell sheets
Corneal regeneration by transplantation of corneal epithelial cell sheets
**Target Patient of This therapy**

- End-stage ischemic heart failure Patients
- No optimal pharmacological therapy
- Worsening heart failure even though standard treatments

### Myoblast cell sheet

*Developed by Prof. Sawa at Osaka university and Prof. Okano at Tokyo Women’s Medical University.*

### Cardiac Therapy Using Autologous Myoblast Cell Sheet

<table>
<thead>
<tr>
<th>Asymptomatic</th>
<th>Mild</th>
<th>Moderate-severe</th>
<th>Refractory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage A ➔ Stage B ➔ Stage C ➔ Stage D</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Stage A**
  - Treat hypertension, diabetes, dyslipidemia, ACE inhibitors or ARBs in some patients
  - Risk-factor reduction, patient and family education

- **Stage B**
  - ACE inhibitors or ARBs in all patients; beta-blockers in selected patients

- **Stage C**
  - ACE inhibitors and beta-blockers in all patients
  - Dietary sodium restriction, diuretics, and digoxin
  - Cardiac resynchronization if bundle-branch block present

- **Stage D**
  - Inotropes
  - VAD, transplantation
  - Hospice
  - Consider multidisciplinary team
  - Revascularization, mitral-valve surgery
  - Aldosterone antagonist, nesiritide
  - Cell sheets

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- **Myoblast cell sheet**
  - Developed by Prof. Sawa at Osaka university and Prof. Okano at Tokyo Women’s Medical University.
Process of Cell Sheet Transplantation

1 day
- Biopsy

7 weeks
- Cell Processing
  - QA/QC under GMP

2 days
- Sheet processing/Transplantation
  - Open heart surgery

Skeltal muscle

Hospital

Terumo

Hospital
The cardiac regenerative technology that is being developed by Terumo is expected to improve the condition of severe heart failure by affixing the autologous myoblast sheets on the damaged sites of patient's heart muscle. The skeletal myoblasts are harvested from the muscle in the patient's thigh, extracorporeally cultured and formed into sheets.
Cell culture

Harvest muscle tissues

Produce cell sheets

Sheet transplantation
GMP準拠のCPC施設

- 第1CPC  ハイテクリサーチセンター内（2003年スタート、床面積 100m²）
- 第2CPC  TWIns 1F CSTECエリア内（2008年4月スタート）

床面積 280 m²

・臨床研究および治験  ・GMP対応施設  ・2PJを同時進行

CellSeed (株)セルシードとの協同運営
記録者

作成者

記録者

作成者
Short-term Student Exchange Program

1. Cardiff University, School of Medicine, U.K.
2. Université Libre de Bruxelles／the Free University of Brussels, Belgium
3. University of Hawaii, John A. Burns School of Medicine, U.S.A.
4. Shanghai Jiao Tong University School of Medicine, China
5. Columbia University, College of Surgeons and Physicians, U.S.A.
6. China Medical University, China
7. Faculté de Médecine de Marseille, France
8. Memorial Hermann Hospital, the teaching hospital affiliated of the University of Texas at Houston, U.S.A.
9. Ewha Womans University’s School of Medicine, Korea
10. Mount Sinai School of Medicine, U.S.A.
11. The Warren Alpert Medical School of Brown University, U.S.A.
12. Odessa National Medical University, Ukraine
13. Hacettepe University, Turkey
14. Taipei Medical University, Taiwan
[School of Nursing]
1. Alverno College, U.S.A.
2. Hawaii Pacific University, U.S.A.
3. Ewha Womans University’s College of Health Science, Korea