Nagoya University Hospital
Seeds and Services for Clinical Research

Nagoya University
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## 1. Supported seeds

**Stage A**

### [Definition]
Basic researches seeking patent application

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<th>Principal Investigator</th>
<th>Organization</th>
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<tbody>
<tr>
<td>1</td>
<td>Development of novel therapy using microenvironmental factors produced by adipose tissue-derived stem cells</td>
<td>Shoichi Maruyama</td>
<td>Nagoya University</td>
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<td>2</td>
<td>Development of diagnostic tools for schizophrenia and bipolar disorder using lymphocyte</td>
<td>Norio Ozaki</td>
<td>Nagoya University</td>
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<td>4</td>
<td>Screening and development of plant-derived fibrosis inhibitors</td>
<td>Kazuo Umezawa</td>
<td>Aichi Medical University</td>
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<td>5</td>
<td>Development of Immunotherapy for the Recurrence of Hepatocellular Carcinoma</td>
<td>Shuichi Kaneko</td>
<td>Kanazawa University</td>
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<td>6</td>
<td>Development of Novel photodynamic therapy by using glucose conjugated chlorin</td>
<td>Hiromi Kataoka</td>
<td>Nagoya City University</td>
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<tr>
<td>7</td>
<td>Development of new treatment for heart failure using the third multipotent stem cells</td>
<td>Shinya Minatoguchi</td>
<td>Gifu University</td>
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<td>8</td>
<td>Development of RNA medicine for Ewing Sarcoma</td>
<td>Yukihiro Akao</td>
<td>Gifu University</td>
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<td>10</td>
<td>Exhaustive Discovery of Therapeutics Based on the Logical Drug Design</td>
<td>Kazuo Kuwata</td>
<td>Gifu University</td>
</tr>
</tbody>
</table>
### Stage B

**[Definition]**

Researches seeking non-clinical POC and submission of clinical trial application

<table>
<thead>
<tr>
<th>Control number</th>
<th>Project Title</th>
<th>Principal Investigator</th>
<th>Organization</th>
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</thead>
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<tr>
<td>1</td>
<td>Development of a New Quick Diagnostic Method of Acute Kidney Injury</td>
<td>Seiichi Matsuo</td>
<td>Nagoya University</td>
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<td>2</td>
<td>Development of treatment for stress urinary incontinence utilizing the micro-environmental factors produced by stroma / stem cells from adipose tissue</td>
<td>Momokazu Goto</td>
<td>Nagoya University</td>
</tr>
<tr>
<td>4</td>
<td>Advanced multimodal treatment strategies for malignant glioma by means of nano-medicine encapsulated with nucleic acidic medicine</td>
<td>Toshihiko Wakabayashi</td>
<td>Nagoya University</td>
</tr>
<tr>
<td>5</td>
<td>Drug screening for promoting osteoblastic differentiation and bone formation through activating Runx2 expression</td>
<td>Naoki Ishiguro</td>
<td>Nagoya University</td>
</tr>
<tr>
<td>6</td>
<td>Development of Cytomegalovirus Specific Cytotoxic T Lymphocyte (CMV-CTL) Therapy</td>
<td>Tomoki Naoe</td>
<td>Nagoya University</td>
</tr>
<tr>
<td>7</td>
<td>Development of tau aggregation inhibitor</td>
<td>Akihiko Takashima</td>
<td>National Center for Geriatrics and Gerontology</td>
</tr>
<tr>
<td>Control number</td>
<td>Project Title</td>
<td>Principal Investigator</td>
<td>Organization</td>
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<td>----------------</td>
<td>-------------------------------------------------------------------------------</td>
<td>------------------------</td>
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</tr>
<tr>
<td>1</td>
<td>Limb Lengthening Using Culture - Expanded Bone Marrow Cells</td>
<td>Naoki Ishiguro</td>
<td>Nagoya University</td>
</tr>
<tr>
<td>2</td>
<td>Development of virus specific cytotoxic T lymphocyte therapy after allogeneic hematopoietic stem cell transplantation</td>
<td>Seiji Kojima</td>
<td>Nagoya University</td>
</tr>
<tr>
<td>3</td>
<td>Human bone marrow derived mesenchymal stem cell therapy for steroid refractory Graft versus Host disease after stem cell transplantation</td>
<td>Seiji Kojima</td>
<td>Nagoya University</td>
</tr>
<tr>
<td>5</td>
<td>Optimization of regenerative medicine of the resected jaw bone for improvement of the quality of life</td>
<td>Minoru Ueda</td>
<td>Nagoya University</td>
</tr>
</tbody>
</table>
Aims

1. To identify micro-environmental factors produced by adipose derived stem cells (ASC).
2. To find the combination of multiple factors which has the best therapeutic effect.

**Advantages of adipose stem cells**

<table>
<thead>
<tr>
<th>Source Procedure Intrusiveness</th>
<th>Adipose tissue</th>
<th>Bone marrow</th>
<th>Peripheral blood</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD34 positive cells (%)</td>
<td>Easy (low)</td>
<td>Moderate</td>
<td>Easy (minimal)</td>
</tr>
<tr>
<td>Volume required to get 10^6 cells</td>
<td>Minimal</td>
<td>Moderate</td>
<td>Easy (minimal)</td>
</tr>
<tr>
<td>(~10% of)</td>
<td>~100 g</td>
<td>50 mL</td>
<td>20 L</td>
</tr>
</tbody>
</table>

LASC (low serum cultured ASC) produce more micro-environmental factors with higher therapeutic effects as compared to normal ASC or bone marrow derived stem cells (BMSC).

**Potential applications**

- LASC: Tissue regeneration inducers
- BMSC: Immune suppressors
- Normal ASC:
- LASC:
  - Best combination of multiple factors

**Marketability**

Marketability is big because there is no other curative methods and a high effectiveness is expected on the target diseases.

**Patent Information**

Planning to apply for patent

**Features of Technology**

We have found that adipose tissue derived mesenchymal stem cells (ASCs) have greater therapeutic effects than bone marrow derived mesenchymal stem cells when applied to animal models of various organ dysfunction and collagen diseases by secreting factors which promote tissue regeneration and suppress immune reactoin. The aim of this project is to secure an intellectual property by identifying the microenvironmental factors produced by ASCs and by finding the combination of factors which shows the highest therapeutic effects on organ dysfunction (e.g. chronic kidney failures) and collagen diseases (e.g. scleroderma).

**企業 Partnerships**

Joint project and licensing out

<table>
<thead>
<tr>
<th>Target Diseases</th>
<th>Organ dysfunction (e.g. chronic kidney failure), Collagen disease (e.g. scleroderma)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patent Information</td>
<td>Planning to apply for patent</td>
</tr>
<tr>
<td>Marketability</td>
<td>Marketability is big because there is no other curative methods and a high effectiveness is expected on the target diseases.</td>
</tr>
<tr>
<td>Problems on The Development</td>
<td>Enforcement of the non-clinical trial</td>
</tr>
<tr>
<td></td>
<td>Making the protocol of clinical trial</td>
</tr>
<tr>
<td>Enterprise Partnerships</td>
<td>Joint project and licensing out</td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>
Development of diagnostic tools for schizophrenia and bipolar disorder using lymphocyte A2

Target Diseases
- Schizophrenia, Bipolar disorder

Patent Information
- Use invention

Features of Technology
- Diagnosis of mental disorders, including schizophrenia or bipolar disorder, has been carried out based on assessment of psychiatric symptoms. As a result, various problems may occur due to delays in the initiation of correct treatment or misdiagnosis.

- Although development of a useful diagnostic method has been long awaited in order to improve prognosis, development of a diagnostic tool has not made progress much, mainly because of the difficulty to detect molecular pathophysiology in brain of mental disorders.

- Identifying the alterations in protein and mRNA levels associated with mental disorders using comprehensive analysis of peripheral lymphocytes, which is easily obtained in clinical practice, may facilitate development of a diagnostic method based on objective biological indicators (i.e. biomarkers).

Marketability
- The reduction of health care costs and large market potentials will be facilitated by establishment of objective biological indicators for mental disorders.

Problems on The Development
- Identification of the target protein and mRNA
- Assessment of the project by the companies

Enterprise Partnerships
- Co-development or out-licensing

Other
Screening and development of plant-derived fibrosis inhibitors

Kazuo Umezawa
Aichi Medical University

Development

Selection of first seed A and its preparation
Search for new fibrosis inhibitors
Selection of practical seed from Umezawa Lab chemical library

New drugs for fibrosis and cancer

Development

Collaboration with industry

Effect and side effect evaluation

Enhancement of bleomycin activity
Suppression of fibrosis in liver, lungs, kidney, etc

Mechanism and target molecule

Target Diseases
Liver cirrhosis, lung and kidney fibrosis, cancer and leukemia

Patent Information
Patent for preparation

Features of Technology

Low molecular weight compound A was extracted from a plant. It showed anti-diabetic activity increasing the differentiation of pancreatic beta cells. Recently we further found that compound A inhibited islet fibrosis in vivo. It is possible that it is active to other pathological fibrosis in the body. Fibrosis is often lethal to the patients. Compound A can be the first widely used drug for fibrotic diseases.

Marketability
It should be used for various fibrosis diseases. So marketability is quite large.

Problems on The development
Preclinical evaluations

Enterprise Partnerships
We do wish to collaborate with pharmaceutical company.

Other
**Development of Immunotherapy for the Recurrence of Hepatocellular Carcinoma**

**Principal Investigator**
Shuichi Kaneko

**Organization**
Kanazawa University

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**Target Diseases**
Hepatocellular Carcinoma

<table>
<thead>
<tr>
<th>Patent Information</th>
<th>Preparing</th>
</tr>
</thead>
</table>

| Features of Technology | 1) Effective hybridization of each peptide which is available for immunotherapy of hepatocellular carcinoma. 2) This vaccine is a prophylactic vaccine for prevention of recurrence of hepatocellular carcinoma after standard treatments. |

| Marketability | This hybrid peptide is available for many kinds of cancers |

| Problems on The Development | Establishment of the method for hybridization of peptides Evaluation of the safety and efficacy of hybrid peptide |

| Enterprise Partnerships | Joint development |

| Other | |
**Development of Novel photodynamic therapy by using glucose conjugated chlorin**

**Principal Investigator**
Hiromi Kataoka

**Organization**
Nagoya City University

### Target Diseases
- Esophageal Cancer, Gastric Cancer, Bile Duct Cancer, Lung Cancer, Bladder Cancer, Uterus Cancer, Brain tumor, Skin Cancer, Liver cancer

### Patent Information
- substance patent

### Features of Technology
- We are performing the development research of novel photodynamic therapy for clinical application by using glucose conjugated photosensitizer. This new glucose conjugated photosensitizer increased cancer cell specificity and selectivity on the basis of Warburg’s effect. We investigate the antitumor effects for various kinds of cancer by synthesizing new glucose conjugated photosensitizers.

### Marketability
- This novel photodynamic therapy is considered to be widely applicable for almost all kinds of solid cancer, thus it would be marketable worldwide.

### Problems on The Development
- operation of nonclinical test, setting up standardized materials

### Enterprise Partnerships
- joint development or license out

### Other
Development of new treatment for heart failure using the third multipotent stem cells

Shinya Minatoguchi
Gifu University

<table>
<thead>
<tr>
<th>Target Diseases</th>
<th>Heart failure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patent Information</td>
<td>material patent</td>
</tr>
<tr>
<td>Features of Technology</td>
<td>Development of new treatment for cardiac failure by cardiomyocyte regeneration using the third multipotent stem cells following ES cells and iPS cells</td>
</tr>
<tr>
<td>Marketability</td>
<td>Marketability is large and social significance is important because heart failure patients increase</td>
</tr>
<tr>
<td>Problems on The Development</td>
<td>Performance of non-clinical examination Establishment of Proof of Concept</td>
</tr>
<tr>
<td>Enterprise Partnerships</td>
<td>collaboration</td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>
Development of RNA medicine for Ewing Sarcoma

Yukihiro Akao
Gifu University

Target Diseases: Ewing sarcoma


Features of Technology:
① Development of siRNA for the chromosome translocation-related EWS/Fli-1 fusion gene that closely contributes to the pathogenesis in Ewing sarcoma (ES).
② The siRNA for EWS/Fli-1 (siEF) targets only ES cells, not normal cells.

Marketability: Ewing sarcoma is a rare tumor occurred in childhood

Problems on The Development: Development of a novel drug delivery system (DDS)

Enterprise Partnerships: Collaboration in basic and preclinical research

Other
Exhaustive Discovery of Therapeutics Based on the Logical Drug Design

Kazuo Kuwata
Gifu University

Discovery of compounds with IC_{50} of 6 nM by in silico screening !!

<table>
<thead>
<tr>
<th>Target Diseases</th>
<th>cancer, influenza virus infection, senescence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patent Information</td>
<td>Under preparation</td>
</tr>
<tr>
<td>Features of Technology</td>
<td>Based on the geometrical characteristics of disease-related protein, we developed a new strategy of logical drug design using structural-dynamical information of protein, ab-initio calculation, organic synthesis and bioassay. We applied these techniques for exhaustive discovery of therapeutics for almost all diseases, especially cancer, influenza virus infection and senescence.</td>
</tr>
<tr>
<td>Marketability</td>
<td>Extremely High</td>
</tr>
<tr>
<td>Problems on The Development</td>
<td>No Money !</td>
</tr>
<tr>
<td>Enterprise Partnerships</td>
<td>Joint development or license out</td>
</tr>
<tr>
<td>Other</td>
<td></td>
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</tbody>
</table>
**Project Title**

Development of a New Quick Diagnostic Method of Acute Kidney Injury

**Principal Investigator**

Seiichi Matsuo

**Organization**

Nagoya University

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### Target Diseases

- Acute Kidney Injury (AKI)

### Patent Information

- A Use Patent is obtained

### Features of Technology

There is a time lag between the renal injury and an increase in serum creatinine in cases of AKI. Absence of sensitive biological markers of AKI for early detection of injury leads to delay in the introduction of treatment. Therefore, reliable biomarkers are needed in order to detect early kidney injury. We examined the diagnostic utility of substance A as a new biomarker for the detection of AKI in a prospective study for the early diagnosis of AKI in patients with open Abdominal Aortic Aneurysm repair surgery.

### Marketability

There are about 1 million patients with AKI in Japan.

### Problems on The Development

The clinical performance test of a diagnostic kit cooperation with a company

### Enterprise Partnerships

Joint development or licensing out with a company

### Other

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<table>
<thead>
<tr>
<th>Target Diseases</th>
<th>Acute Kidney Injury (AKI)</th>
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</thead>
<tbody>
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<td>Patent Information</td>
<td>A Use Patent is obtained</td>
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<tr>
<td>Features of Technology</td>
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<td>The clinical performance test of a diagnostic kit cooperation with a company</td>
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<td>Enterprise Partnerships</td>
<td>Joint development or licensing out with a company</td>
</tr>
<tr>
<td>Other</td>
<td>---</td>
</tr>
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</table>
**Development of treatment for stress urinary incontinence utilizing the micro-environmental factors produced by stroma / stem cells from adipose tissue**

**Principal Investigator:** Momokazu Goto

**Organization:** Nagoya University

### Target Diseases
- Urinary stress incontinence

### Patent Information
- Invention of patent

### Features of Technology
We are developing a regenerative treatment aiming at cure of stress urinary incontinence due to urethral sphincter dysfunction by injecting stem cells derived from autologous adipose tissue into the periurethral space and the external urethral sphincter. In addition, we pay our attention to the microenvironmental factors produced by stem cells from adipose tissue and will elucidate the mechanism of the sphincter function improvement by the stem cell injection, and examine the effect of these factors to microvessel blood flow, muscle reproduction, and nerve reproduction.

### Marketability
- Number of patients in Japan is 5,000 thousand

### Problems on The Development
- Non clinical research operation program of standard of test article

### Enterprise Partnerships
- Collaborative research and out license

**Other**
**Project Title**: Advanced multimodal treatment strategies for malignant glioma by means of nano-medicine encapsulated with nucleic acidic medicine

**Principal Investigator**: Toshihiko Wakabayashi
**Organization**: Nagoya University

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**ORIGINAL ARTICLE**

*Efficient delivery of liposome-mediated MGMT-siRNA reinforces the cytotoxicity of temozolomide in GBM-initiating cells*

T Kato1, A Natsuno2, H Toda1, H Iwamizo1, T Sugita1, R Hachisu1, R Watanabe1, K Yuuki1, K Moromizu1, K Imanievicz2 and T Wakabayashi

1Department of Neurosurgery, Nagoya University School of Medicine, Nagoya, Japan; 2Center for Genetic and Regenerative Medicine, Nagoya University School of Medicine, Nagoya, Japan; 3Hokkaido System Science, Sapporo, Japan; 4Division of Diagnostic Pathology, Saiseikai Gensei Hospital, Saisei, Japan; and 5Department of Neurosurgery, University of California at San Francisco, San Francisco, CA, USA

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**Liposomes could be used by DDS in vivo**

<table>
<thead>
<tr>
<th>Material</th>
<th>Model</th>
<th>Target</th>
<th>route</th>
<th>Animal</th>
</tr>
</thead>
<tbody>
<tr>
<td>LECT</td>
<td>Japanese encephalitis virus and rabies virus</td>
<td>Vicia envelope</td>
<td>Intracranial</td>
<td>Mouse</td>
</tr>
<tr>
<td>Lipidoids</td>
<td>Dextran</td>
<td>FUS/EpV8</td>
<td>Intravenous</td>
<td>Mouse, rat, monkey</td>
</tr>
<tr>
<td>Lipidoids</td>
<td>Dextran</td>
<td>FUS/EpV8</td>
<td>Intravenous</td>
<td>Mouse, hamster</td>
</tr>
<tr>
<td>Lipidoids</td>
<td>Heparin/steroids</td>
<td>PKC/9</td>
<td>Intravenous</td>
<td>Mouse, rat</td>
</tr>
<tr>
<td>LipoThera Liposomes</td>
<td>Liver cirrhosis</td>
<td>pre</td>
<td>Intravenous</td>
<td>Rat</td>
</tr>
<tr>
<td>Oligofectamine</td>
<td>HIV-2</td>
<td>HIV-2-associated viral protein (U51 and U52)</td>
<td>Intravenous</td>
<td>Mouse</td>
</tr>
<tr>
<td>SMALP</td>
<td>HIV</td>
<td>HIV</td>
<td>Intravenous</td>
<td>Mouse</td>
</tr>
<tr>
<td>HIVA</td>
<td>HIV</td>
<td>HIV</td>
<td>Intravenous</td>
<td>Monkey</td>
</tr>
<tr>
<td>Hoda</td>
<td>Polyol</td>
<td>ascorbic acid</td>
<td>Intravenous</td>
<td>Guinea pig</td>
</tr>
</tbody>
</table>

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Collaborator: Hokkaido System Science, UCSF

**Results**: Nat Rev Drug Discov, 2009

**Priority**: PCT/JP2007/000720 (HSS)


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**Target Diseases**

<table>
<thead>
<tr>
<th>Target Diseases</th>
<th>Brain tumors</th>
</tr>
</thead>
</table>

**Patent Information**

Temozolomide (TMZ), an oral alkylating chemotherapeutic agent, has demonstrated anti-tumor activity with minimal additional toxicity in the treatment of glioblastoma multiforme (GBM) and median survival time is prolonged significantly in the previous study. However, its clinical outcomes depend on O6-methylguanine-DNA methyltransferase (MGMT) status and modification of MGMT is one of the key factors to get more significant clinical benefits in the future. As for the candidate, MGMT siRNA capsulated with nano-particle has a possibility to deplete MGMT levels in the cell and it is shown that MGMT siRNA acted as a controller for MGMT when added with TMZ in the preclinical studies. That is why newly established nano-leveled particle treatment strategies with MGMT siRNA against GBM should be required as a possible candidate for clinical trial for the next step.

**Features of Technology**

10,000/year

**Marketability**

**Problems on The Development**

Nano-capsule produce by GMP level, Robotic accuracy, target image

**Enterprise Partnerships**

Development partnership, license out
### Principal Investigator

Naoki Ishiguro

### Organization

Nagoya University

#### Project Title

Drug screening for promoting osteoblastic differentiation and bone formation through activating Runx2 expression

#### Target Diseases

- serious comminuted fractures or pseudarthroses
- huge bone defects
- diseases for requiring limb lengthening

#### Patent Information

Utility patent

#### Features of Technology

We have identified that a product A upregulated expressions of Runx2 and its target osteoblastic genes. Osteoblastic differentiation of human bone marrow stromal cells was markedly enhanced by adding the product A to culture medium. In regard to in-vivo applications of the product A for larger bone defects, we could develop hybrid artificial bones consisting of bone substitutes such as HA and βTCP, cultured bone marrow-derived osteoblasts, and the product A.

#### Marketability

Possibility of extending indications for fracture healing in elderly populations

#### Problems on The Development

Preclinical test
To determine optimal dose and timing for administration

#### Enterprise Partnerships

Joint development with enterprises or Licensing-out

### Other
Development of Cytomegalovirus Specific Cytotoxic T Lymphocyte (CMV-CTL) Therapy

Principal Investigator: Tomoki Naoe
Organization: Nagoya University

Objective
To evaluate the safety of CMV specific CTL infusion for the treatment of refractory CMV infection after allogeneic hematopoietic stem cell transplantation

Study completed, Nov. 2012
Target sample size: 5, Treated patient number: 5

Severe adverse events: 0
Number of patients with CMV clearance: 4

Target Diseases
- Refractory CMV infection after allogeneic hematopoietic stem cell transplantation (HSCT)

Patent Information
- Process patent

Features of Technology
- CMV causes various manifestations such as hepatitis, interstitial pneumonia, gastritis and retinitis in immunocompromised hosts. CMV has remained one of the most common pathogens causing morbidity and mortality after allogeneic HSCT. CMV-CTLs are generated and expanded in vitro from transplant donor, and infused to recipients with refractory CMV infection after allogeneic HSCT. We aim to establish efficient CMV-CTL therapy.

Marketability
- 1,500/year in Japan

Problems on The Development
- Efficient CMV-CTL expansion
- Recruitment of candidates
- Cell bank for CMV-CTL generated from third-party

Enterprise Partnerships
- Cooperative development, Out-license

Other
**Development of tau aggregation inhibitor**

**Principal Investigator:** Akihiko Takashima  
**Organization:** National Center for Geriatrics and Gerontology

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### Target Diseases

Alzheimer’s disease, and the other tauopathies

### Patent Information

Material

### Features of Technology

Therapy targeting tau is keenly demanded as new therapeutic strategy for Alzheimer’s disease after failing clinical studies of Ab therapy. We identified a causative tau aggregate for neuronal loss in dementia, called granular tau oligomer, and screened an inhibitor X1, which is already available on market. To avoid an expected risk of X1, we developed D-X1. D-X1 has a similar blocking potential for tau aggregation in mouse model, and far reduced side effects. Therefore, D-X1 is promisingly expected potential therapeutic drug for Alzheimer’s disease.

### Marketability

About 2 million elderlies have already developed, and more people will develop it near future.

### Problems on The Development

Cost of manufacturing product  
Drafting efficient clinical study

### Enterprise Partnerships

Co-development or License-out

### Other
### Target Diseases
Skeletal dysplasias, Limb length discrepancy

### Patent Information

### Features of Technology
Culture-expanded bone marrow cells and platelet rich plasma are transplanted into the distraction gap with thrombin and calcium to promote callus formation. We have performed cell-based limb lengthening since 2002. Our cell therapy enhanced osteogenesis during limb lengthening, leading to shortening of the total treatment time and decrease in complication rate significantly.

### Marketability
The market is small but this technique gives large social value

### Problems on The Development
Improvement of technique for enhancement of osteogenesis
Cooperation with enterprises

### Enterprise Partnerships
Joint development with enterprises or Licensing-out

### Other
Development of virus specific cytotoxic T lymphocyte therapy after allogeneic hematopoietic stem cell transplantation

Seiji Kojima
Nagoya University

Target Diseases
Refractory virus infections (CMV, EBV) after allogeneic hematopoietic stem cell transplantation

Patent Information
Process patent

Features of Technology
Epstein–Barr virus-associated lymphoproliferative diseases (EBV-LPD) after hematopoietic stem cell transplantation (HSCT) remain serious and potentially life-threatening. Cytomegalovirus (CMV) disease and infection refractory to antiviral treatment after HSCT is associated with a high mortality. Adoptive transfer of virus-specific T cells could reconstitute viral immunity after HSCT and could protect from virus-related complications. We established the expansion method of virus specific T cells and phase I study was finished.

Marketability
1500/year (CMV), 300/year (EBV) in Japan

Problems on The Development
Cell bank for virus specific CTL generated from 3rd party donor

Enterprise Partnerships
Cooperative development, Out-license

Other

1) Phase I study of CMV specific CTL for treatment of refractory CMV infection after allogeneic hematopoietic stem cell transplantation (study completed, Nov. 2012)
2) Phase I study of EBV specific CTL for treatment of Epstein–Barr virus–associated lymphoproliferative diseases (EBV–LPD) after hematopoietic stem cell transplantation
Target Diseases
Steroid refractory Graft versus Host Disease (GVHD) after stem cell transplantation

Patent Information
Steroid refractory GVHD after stem cell transplantation is generally fatal. Mesenchymal stem cells (MSCs) can suppress activated T lymphocytes and improve steroid refractory GVHD. Methods of human bone marrow derived MSCs culture were established and our culture system does not have biohazard such as feta bovine serum using Platelet lysate from the donor instead.

Features of Technology

Marketability
200 patients, fatal disease without alternative therapy

Problems on The Development
Establishment of MSC bank

Enterprise Partnerships
sales and delivery

Other
Optimization of regenerative medicine of the resected jaw bone for improvement of the quality of life

Minoru Ueda  
Nagoya University

### Target Diseases
1. Tumors and cysts of jaw bone  
2. Cleft lip, palate and alveolar bone  
3. Maxillofacial fracture  
4. Atrophy of jaw bone including extraction of the teeth

### Patent Information
1. Composite for bone or periodontal tissue formation  
2. Preparation and usage of the osteogenic cell material  
3. Composite for bone regenerative medicine  
4. Preparative methods of the composite for regenerative medicine of bone  
5. Materials for bone graft and bone quality improvement  
6. Materials and their preparation for improvement of the integration of dental implant to bone

### Features of Technology
The aim of this study is that this bone regenerative method using osteoblastic cells against such diseases as above will be applied as a general therapy. This method can reduce the physical and mental burden of the patients who would receive the conventional autogenous bone grafts, and will improve the quality of life of them.

### Marketability
7,800 patients (oral cancer) in Japan

### Problems on The Development
Improvement of the quality and safety concerns of the material as requested by the national regulations.

### Enterprise Partnerships
Joint development and/or licensing business
2. Facility

![Diagram of facility with labels]


3. Services

**Patent**
- Support for Patent Application
- Support for Patent Investigation

**Clinical Trials**
- Support for Protocol Development
- Research Coordination
- Case Registration
- Data Management
- Monitoring
- Statistical Analysis
- Cell Preparation
- Research Support

**Pharmaceutical Affairs**
- Communication with Regulatory Agencies
Executive office

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