R&D Day 2

The Future of Santen R&D

Global R&D
Santen Pharmaceutical Co., Ltd.

September 6th, 2019
Agenda

- R&D Day2
- Q&A session for DE-128 (MicroShunt)
Opening Remarks

Shigeo Taniuchi
President and Chief Operating Officer
Bringing the Joy of Sight

Naveed Shams, MD, Ph.D.
Senior Corporate Officer & Chief Scientific Officer,
Head of Global R&D
VIDEO: Patients Voice

Only available on site
Measures to Maximize Productivity

- Device
- New Modality
- Diagnosis
  - Drug Delivery System
  - Small molecule, antibody
  - Formulation Technology
Our Approach

- **Knowledge and experience in ophthalmology**
- **Experienced talent**

- **Collaboration with academia, research institute, industry partner**
- **Strategic investment**

- **Understanding contextual pathophysiology**

- **Disease Strategy with Excellence**

- **Capability and Talent**
  - Experienced talent
Our Synchronized Product Creation Process

*Speed, Quality and Efficiency*

**Product Concept**

Strategic Planning Team

- Business
- Science
- Medical

Collaborate with business/medical/science across regions

**Research**

Discovery Engine

- External Research
- Modality Innovation
- Global Alliance

Acquisition of the optimal candidates for product creation

**Development**

Operational Excellence

- Project Management
- Clinical Operation
- Regulatory

Operation professionals promote the project in each region

**New Value Generation**

Integration of existing technologies.
Patient Centricity is Our Guiding Force
Throughout the Product Development Journey

**Product Concept**

**Target Product Concept**
Create new product ideas by combining needs and technologies.

**Research**

**Optimal clinical endpoints**
Set true endpoints with translational research.

**Clinical Development Plan**
Active participation of patients in clinical trials.

**Development**

**Pharmaceutical Development**
Maximize the potential of the drugs.

**Contribution to Proper Use**
Information disclosure
- Clinical trial status and results

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This new approach will ensure we truly address patient needs!
R&D Leadership Team

Naveed Shams
Senior Corporate Officer & Chief Scientific Officer, Head of Global R&D

Reza Haque
Senior Vice President, Head of Biomedical Strategy & Research

Kenji Morishima
Corporate Officer, Head of Pharmaceutics & Pharmacology Representative, Asia R&D

Peter Sallstig
Senior Vice President, Head of Product Development Representative, US R&D

Takeshi Matsugi
Head of R&D Strategic Operations
Disease Area Strategy

Reza Haque, MD, Ph.D.
Senior Vice President,
Head of Biomedical Strategy & Research
We Can Enhance QoL for Patients Suffering from Various Eye Diseases

Addressing the needs of a changing world

Asia
- Increasing Myopia Patients
  - Myopia progression
  - Pathologic myopia

Developing world
- Reaching More Patients to Eye Care
  - Infectious disease

Developed world
- Aging Society
  - Age related diseases (AMD, Glaucoma etc.)
  - Chronic illness (Dry Eye, DR/DME, etc.)

Genetic diseases
- Improving Therapeutic Tech.
  - Rare Diseases
## Strategies to Address Future the Unmet Need

<table>
<thead>
<tr>
<th>Disease Area</th>
<th>Strategy</th>
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</table>
| **Glaucoma**                  | • DDS Rx Delivery
• Improved Eye Drop Delivery
• Continuous IOP-Monitoring Devices and Earlier Disease Progression Detection
• Surrogate Biomarkers
• Neuroprotection              |
| **Retinal and Uveal Disorders** | • Anti-VEGF (Adjunctive, *Long-Duration, Low Cost*)
• Therapy for Rare Disease
• Cell Therapy
• Gene Therapy
• Stem Cell Therapy           |
| **Myopia**                    | • Prevention *(Superior)*
• Treatment for Pathologic Myopia                                     |
| **Others**                    | • New MOA
• New molecules                                                        |
Glaucoma

Realize Neuroprotection with Partners

Tohoku University
University College of London
Singapore Eye Research Institute

Neuroprotectant candidates

Surrogate biomarkers

Optimal Formulation (DDS etc.)

Specialized Companies
Retinal and Uveal Disorders

Adjunctive Therapy of anti-VEGF

- Stronger Efficacy
- Longer Duration
- Low cost

DE-122

Approach to New Modality

- Cell Therapy
- Gene Therapy

Effective use of new modality to approach diseases for which there is no treatment

Improve dissatisfaction and burden of existing treatments

RPT

RIKEN
Rare Ocular disease
*Develop Novel Gene Therapy with Partners*

**CiCLE Program of AMED**

- **Gene therapy vector Platform**
- **Technology differentiating iPS cells**
- **Scientific knowledge for Product Development**
- **Platform conducting the clinical trial**

Develop Japan-made gene therapy
Myopia

Expand therapies to Asia where great UMNIs is exists, from two perspectives of prevention and treatment

Prevention
- DE-127 (Atropine Low Dose)
- Superior efficacy agents

Treatment for Pathologic Myopia
- New Device

Asia
No.1 Company for Myopia Market
First Therapy for Pathologic Myopia
Keratoconjunctival Disorders
Handling the global/regional UMNs of each disease carefully utilizing new technologies

Allergic Conjunctivitis
- Alesion
- Verkazia

Dry Eye
- Hyalein
- Diquas
- Ikervis

Infection
- Tarivid
- Cravit

- Improve Usability (Line Extension)
- New product
- Territory Expansion
Pharmaceutical Development

Kenji Morishima
Corporate Officer,
Head of Pharmaceutics & Pharmacology
Representative, Asia R&D
Maximize the Potential of the Drugs
Based on Solid Knowledge and Experience in Ophthalmology

API Based Development

Drug Centric Development

Drugs

Container

Formulation

Administration Root

DDS

Drug

Pharmaceutical Development with Network

Improving Patient Adherence

Efficacy & Safety

Treatment Independent of Patient Adherence

Therapy
Become Total Solution Provider in Ophthalmology

Go Beyond Eye Drop Company

Unmet Needs
Business Needs

Device

Oral

Supplement

New Preservative

Drug

Eye Drop

Formulation

PFMD, Unit Dose

Dimple Bottle

Injection

Drug Delivery System

Sustained Release

Improve Penetration

Digital Tool

Injection Tool

Injection Tool

Syringe, Needle

Bottle

Preservative

New Preservative

Assisting Tool

Preservative

Sustained Release

PMD, Unit Dose

Dimple Bottle

Improve Penetration

Instillation Monitoring

Marketable Products

Unmet Needs
Business Needs
Providing joy to patients by creating new product value.

100% focusing on ophthalmology, that's exactly why we can do it.
Product Development

Peter Sallstig, MD, MBA
Senior Vice President,
Head of Product Development
Representative, US R&D
A New Approach to Product Development

Increased predictability through accurate, science- and evidence-based study designs, plans, and budgets

Shortened timelines through faster study start-up and timely patient enrollment and trial completion

Optimized clinical operations and data collection
Ensure Competitive Advantage in Ophthalmology

**Optimized Product Development**

**Operational Excellence**
- Product development in an appropriate region based on accumulated knowledge and experience in Ophthalmology
- Continuous high quality communication with investigators
- Optimized clinical operations and project management in each region

**Establishment of Robust Global Development Platform**
- Deep understanding of the science
- Collaboration with Thought Leaders (KOLs) in Ophthalmology
- Credible relationship and communication with regulatory authorities

Launch on Time
Higher PTS
Value Generation
Key Focus Areas of Immediate Improvements

Better leverage of in house-know how and historical data fuels enhancement of core strength in product development.

Social media campaigns, site and patient-support tools, study websites, on-site enrolment managers, patient and investigator apps, digital listening.

**Science**

Basic principles drive POC/POM trials criteria.

Usage of more new technology,
## We are Addressing Changing Ophthalmic Treatment

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<tbody>
<tr>
<td><strong>Glaucoma</strong></td>
<td><em>IOP Lowering</em></td>
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<td>▶ New agent</td>
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<td>▶ Compliance (MIGS)</td>
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<td>▶ Territory Expansion</td>
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<td><strong>DE-117</strong></td>
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<td><strong>Retinal and Uveal Disorders</strong></td>
<td><em>Anti-VEGF (Adjunctive) Therapy for Rare Disease</em></td>
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<td><strong>DE-109</strong></td>
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Launching Where the Need is Greatest
Applying the Learnings to Future Markets

Case Study: Development Strategy for DE-117

- Development in Japan, which is the fastest to launch, then Asia
- Leverage knowledge experienced in previous regions
- Differentiation study for value maximization in Phase 3 (FUJI study)

※FUJI study: Safety and Efficacy of DE-117 in subjects With POAG or OH who are Non-/Low-responders to Latanoprost
Global Need Requires Global Approach

Case Study: Development Strategy for DE-128

- Learn and experience from any commercialization activities Europe under CE-mark
- Realized the maximum value through PMA process in the biggest market, US
- Utilize all knowledge/data in the following countries, Japan, Asia and China

- Under Planning
  - Utilize the regulatory work from the development in US into Japan/Asia.
  - Requiring local clinical study in China.

- Ongoing
  - To be PMA filed as planned in CY2019.

- Preparation

- Phase 3 (INN-005)

- Launch (CE-mark)
Protecting World’s Vision through Patient Centric R&D

Bring the Joy of Sight

Fulfilling Unmet Worldwide

Unique competitive advantage by excelling in product development capability and globalization of opportunities
VISION EVERY DAY.
Q&A Session
Q&A session for DE-128 (MicroShunt)
VIDEO: MicroShunt
VIDEO: Trabeculectomy

Only available on site
First FDA approved minimally invasive stand alone procedure for mild, moderate, and severe stage open angle Glaucoma, that lowers and sustains IOP under 15 mmHg, and completely eliminates eye drop medications in most patients.
Trabeculectomy:

High Treatment Burden for the Patient, Caregivers, and Physicians leading to poor quality of life:

- Unpredictable effectiveness & safety outcomes in the near term post operation leading to repeated visits to the Clinic and multiple interventions

- Procedure-related adverse effect such as hypotony, on recovery of vision & progression of Lens Opacities

- Higher cost of care

Micro Surgical Approach using MicroShunt:

Intraocular Pressure (mmHg) in Study Eye by Visit by Device
Q&A Session