Health & Wealth through Open Innovation

The industrial perspective and the future of innovative research

Marcel Wubbolts
Chief Technology Officer, Royal DSM

2 June 2014
DSM Biomedical materials improve over 4.4 million people’s lives, every day.
Mission

Our purpose is to create brighter lives for people today and generations to come.

We connect our unique competences in Life Sciences and Materials Sciences to create solutions that nourish, protect and improve performance.
Sustainable Innovation Themes → a Sustainable Company

People
- Health
- Food & Nutrition
- Security

Planet
- Energy Security
- Sustainable Manufacturing
- Raw Materials

Profit

People+
- Eco+

DSM
BRIGHT SCIENCE. BRIGHTER LIVING.
Building an intrinsically innovative company

20% Innovation Sales 2015 @ ~5% higher Gross Margins

Top Quartile McKinsey Innovation Benchmark 2012

€1B Disruptive Platforms, 2020
Why do we need Open Innovation?

99.999996% of world population outside DSM!

Networks needed!
Value Creation by Open Innovation

Open innovation is no longer a competitive advantage. It has become a competitive necessity!

Market Scouting, Business Intelligence

Fuzzy Front End
- Supplier driven innovation
- Public, Private Partnerships
- Crowdsourcing
- Interaction / Synthesis

Competence Development, Technology Intelligence

Intellectual Asset Management

Focused Portfolios
- Acquisitions, Alliances / JVs
- Spin in
- Spin out/off
- Divestments

Open innovation is a core competence.

ODI

R&D services (Chemelot)

Licensing In

Licensing Out

Joint Business Developments

Venturing

Spin in/off
Reversing the funnel - 
\textit{start with the end in mind}......

\textit{Clearly defined ambition}

In which market do I want to be?

\textit{Coherent platform}

with multiple ventures
Managing breakthrough innovation

DSM Innovation Center

New Business Development
- EBA Biomedical
- EBA Bio-based Products & Services
- EBA Advanced Surfaces
- Business Incubator

Enablers / Accelerators
- Excellence in Innovation
- CTO Office
- Licensing
- Venturing
Three exciting growth platforms established

**DSM Biomedical**

Innovative materials that enable more advanced clinical procedures and improved patient outcomes

**DSM Bio-based products & Services**

Advanced Enzymes and Yeast platforms: enabling Advanced Bio-Energy and Bio-based chemicals

**DSM Advanced Surfaces**

Smart coatings and surface technologies to boost performance in the solar industry
Biomaterials history at DSM

- **2000**: Start of DSM Dyneema’s medical R&D efforts
- **2002**: Official launch of Dyneema Purity® orthopedic sutures
- **2004**: Biomedical EBA launched
- **2006**: PTG Acquisition
  - First cardiovascular & ophthalmic drug delivery development agreements
- **2008**: DSM targets EBA sales in 2020 > €1bn
  - First sales of Dyneema Purity® fiber in cardiovascular and spinal applications
- **2010**: Expanded portfolio for ophthalmic applications
- **2012**: Kensey Nash Acquisition
- **2014**: In-house medical coating service plant
  - US Dyneema Purity® fiber plant
  - Dyneema Purity® 10 dtex fiber launch
  - 510(k) clearance from the FDA for PRP Device

- **2000**: Medical Coatings R&D efforts started in DSM Desotech
- **2002**: First sales of Dyneema Purity® fiber for knee ligament fixation
- **2004**: Start of UH and drug delivery activities
  - BMM Public Private Partnership funded by Dutch government
- **2006**: First sales of Medical Coatings
- **2008**: Medivas technology acquisition for Drug Delivery
  - Bionate® II PCU
  - Antimicrobial Coatings
  - Next generation UH product
  - VitroStealth® non-biofouling coatings
- **2010**: Actamax DSM-DuPont JV
  - HQ move to US
- **2012**: 510(k) clearance from the FDA for Meso Bilayer Surgical Mesh
- **2014**: UHMWPE membrane technology

DSM - BRIGHT SCIENCE. BRIGHT LIVING.
Broader portfolio of biomedical materials

Biomedical Polyurethanes
- Coatings: Hydrophilic & Non-biofouling
- Drug delivery: Slow, sustained release

Biomedical Polyethylene
- ECMs: Extracellular Matrices
- Mechanical Devices: Innovative devices and tooling

Natural Materials
- Polymers & Metals: PLA, PEEK, Polyurethane & Metal Implants

Polymer Hydrogels
- Silicone hydrogels

Making medical products longer-lasting, more effective, less invasive and more productive
Open Innovation in biomedical materials

Device design;
Exclusive material developments

Joint R&D
Joint Business Developments
Licensing In
Venturing
Spin in
Acquisitions
Spin out/off
Divestments
Licensing Out
R&D services

Actamax
Joint-venture
BMM and DSM

6 projects aligned with DSM Biomedical strategic focus area’s:

Drug Delivery
- IDiDAS
- Pent
- Smartcare

Medical Coatings
- Nantico

Biomedical Materials
- Trammpolin
- SpineGuide
Industrial benefits of PPP’s

PPP’s support industrial innovation, especially in developing radical new platforms (like Biomedical for DSM):

• Competence developments
• Product development opportunities
• Development of new platform technologies
• Development of processing technologies
• Talent recruitment
InSciTe Vision

InSciTe focuses on the strengths of its founding fathers: making smarter materials and the smarter making of materials

MAKING MATERIALS SMARTER

- By making biomedical materials for healthcare applications and with healing properties
- Resulting in solutions for high quality, affordable healthcare

Cardiovascular

Orthopedics

Ophthalmology
Inspiration.... beyond our borders

Realising the bio-based economy potential in Europe

Supported by

Bio-based Industries Consortium

DSM
BRIGHT SCIENCE. BRIGHTER LIVING.