

Biomaterials and TE Research & Innovation in The Netherlands

**Indo-Dutch workshop on Life Sciences & Health
Trivandrum, India, 21-22 january 2010**

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PPP consortium setup to push RM forward: BMM BMM's Vision

- Biomedical materials play a key role in enabling medical breakthroughs in healthcare which are essential to meeting the increasing demand for more efficient and effective medical treatment that can respond to socio-economic trends
- BMM is a Public Private Partnership (PPP) dedicated to the development of novel biomedical materials and their applications

A truly unique combination of partners joins its R&D efforts in BMM

- The BMM partners cover the whole knowledge and value chain
 - Companies in Life Sciences, Materials, Medical devices, Biotech, Biopharmaceuticals
 - Large companies, SME's and high tech start-ups alike
 - Universities, knowledge institutes and University Medical Centers
 - Charity and healthcare organizations
- None of the partners will be able to achieve the objectives by itself
 - Each party will contribute unique expertise and experience
 - Multi-disciplinary R&D requires the participation of all partners
 - Cooperation is crucial for the exchange of expertise and know-how

The objectives will be achieved through a strong public-private partnership



45 M€ from partners,
45 M€ from Dutch government
for a 5 year program

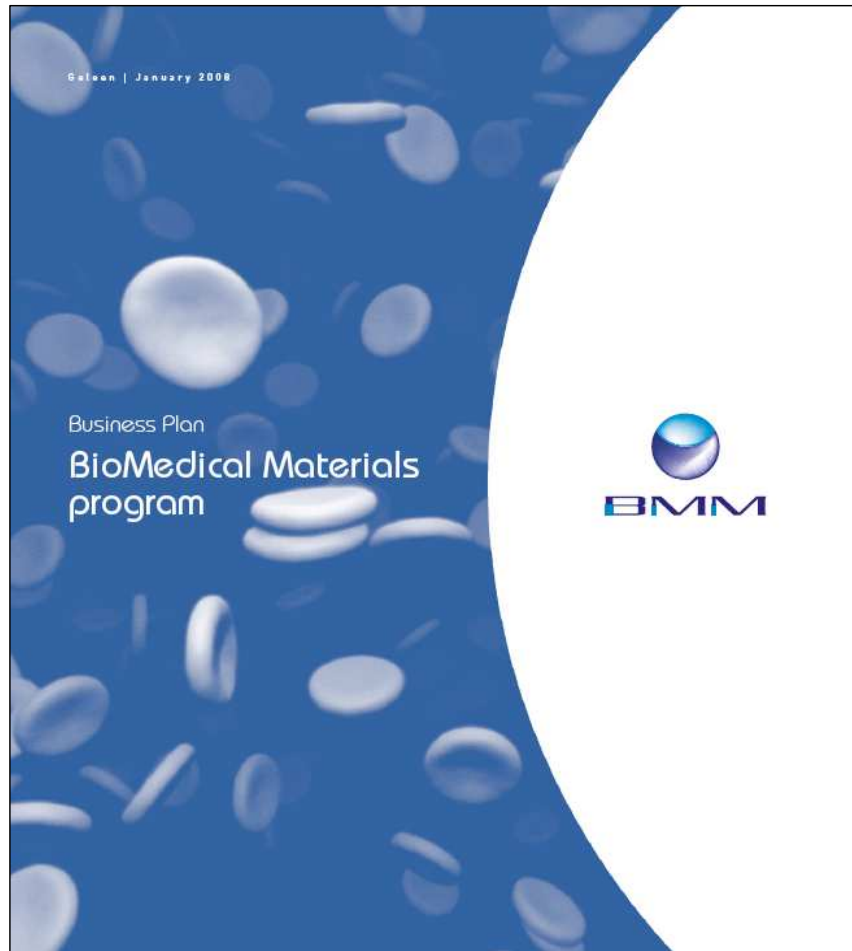


The outcome is important for society

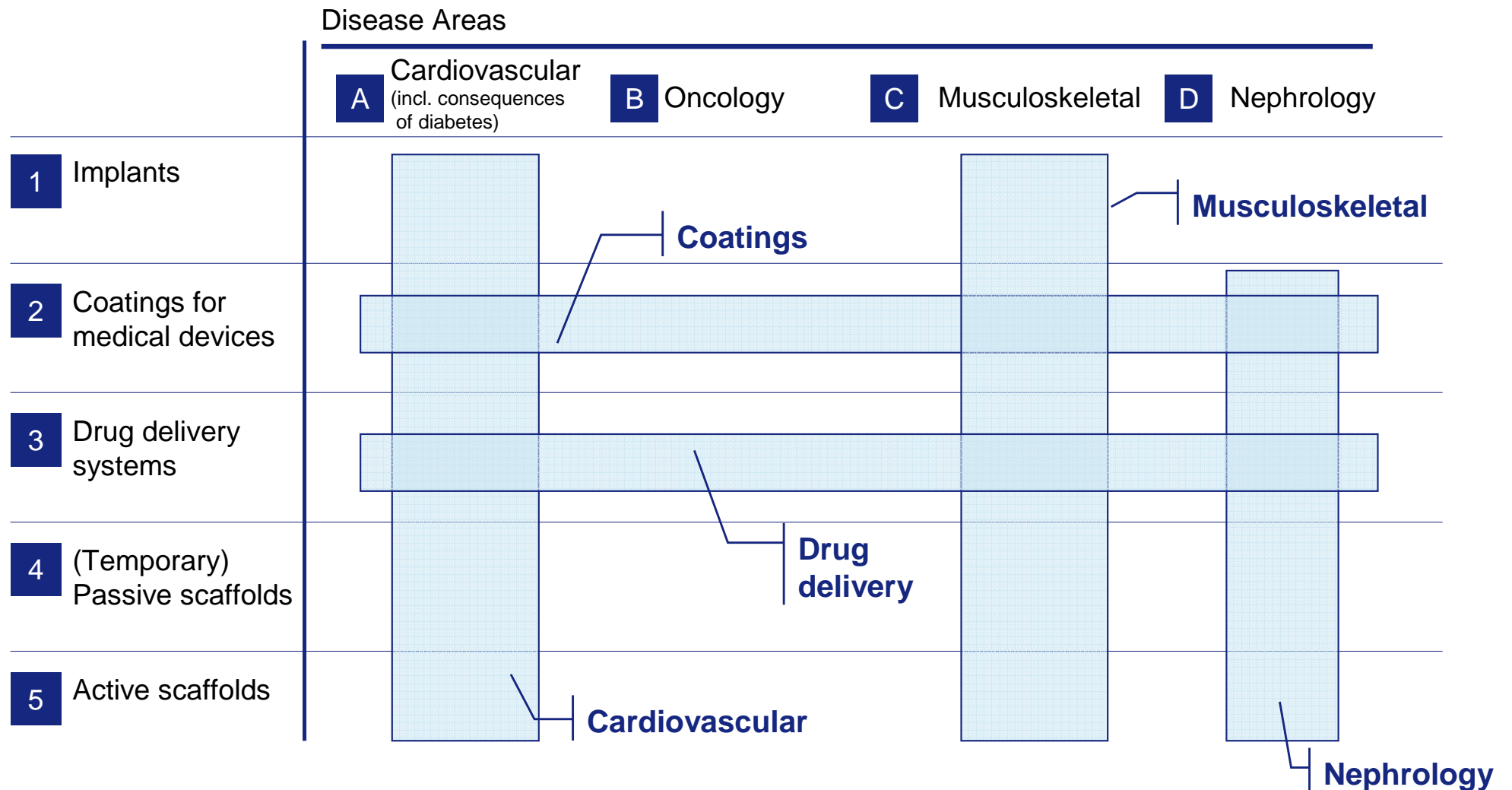
- BMM will create a strong knowledge infrastructure for RM
 - education of a new generation of highly talented academics
 - 150 new research positions in academia and industry
- Increased innovation and investments in a new and globally competitive technology
- Ample opportunity for start-ups, often the drivers for economic growth and employment of people
- Opportunity to attract foreign investments and companies, and for international cooperation
- Societal relevance and direct relation to healthcare and wellbeing
- Contribution to containment of direct and indirect costs of healthcare

Scientific, clinical, economic value creation

All partners have contributed to define the Strategic Research Agenda and Research Areas

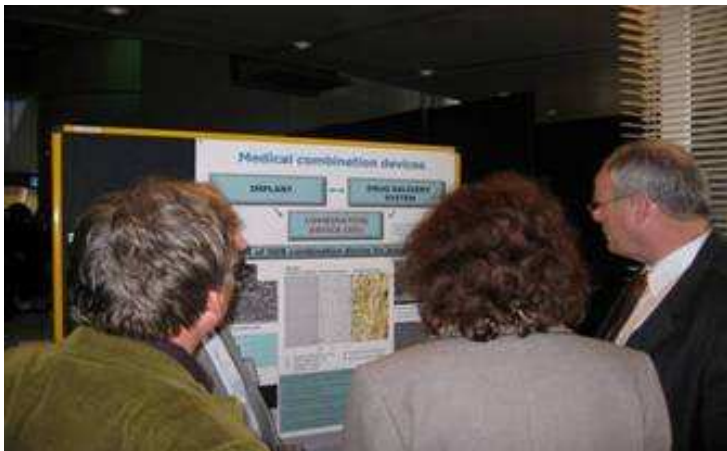


BMM's research program comprises five closely interlinked Research Areas



The BMM Networking and Information Days attracted over 200 scientists interested in participating in BMM

BMM Networking and Information Days in the Evoluon in Eindhoven, Netherlands



- Presentation of themes, ideas and concepts for projects within the BMM framework in a poster-session
- Consortia have been established, and new ones are being formed
- Details on the call for proposals and related topics such as finances and IP
- Timeline and activities towards the approval of the research projects
- **Approval of the first projects occurred in June 2008, second round June 2009**

All proposals must score at least "good" on scientific quality, economic and clinical value creation

Economic value creation

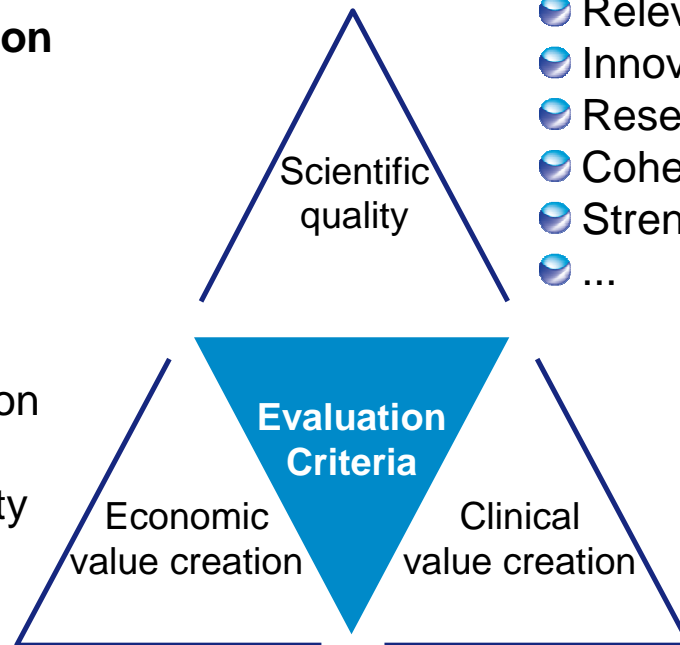
- Economic benefit for Dutch industry
- Products, therapies and/or services with commercial value
- Foreground IP with commercial valorization prospective
- Entrepreneurial activity
- Knowledge dissemination

Scientific quality

- Relevance
- Innovativeness
- Research method
- Coherence
- Strength of the consortium
- ...

Clinical value creation

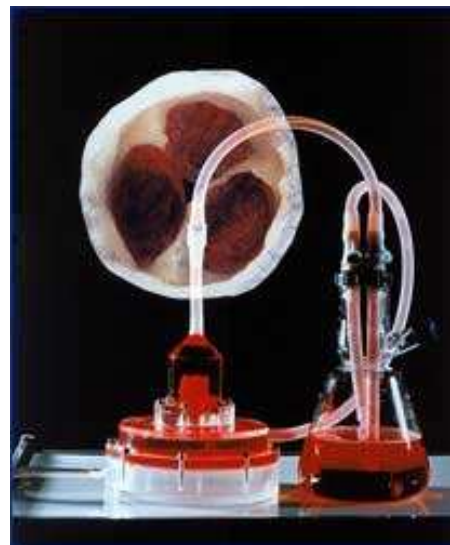
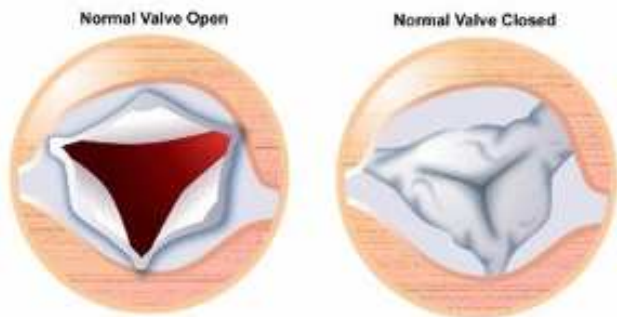
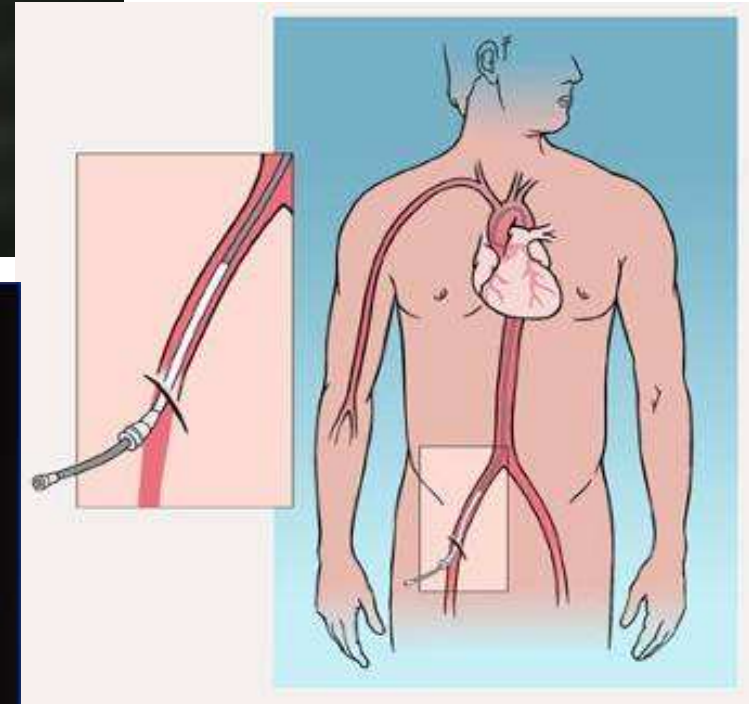
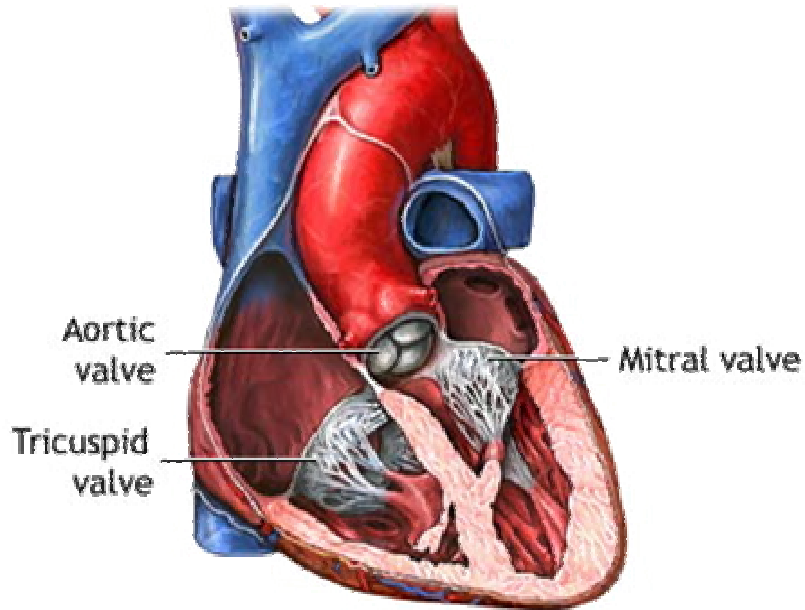
- Excellence of (pre)clinical objectives
- Contribution to a cost effective Dutch healthcare system
- Innovative therapies with a clear patient benefit
- Knowledge transfer to the healthcare system



Scale on which project are ranked

Excellent	Very good	Good	Below average	Poor
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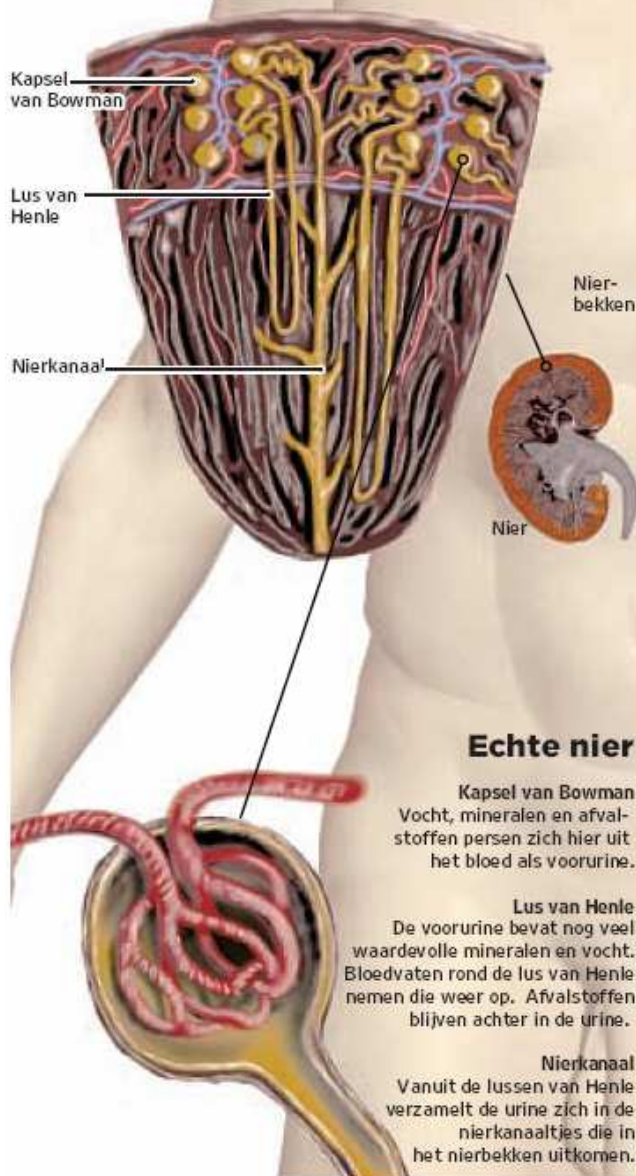
What will we do: Cardiovascular, heart valve from autologous cells



Draagbare kunstnier

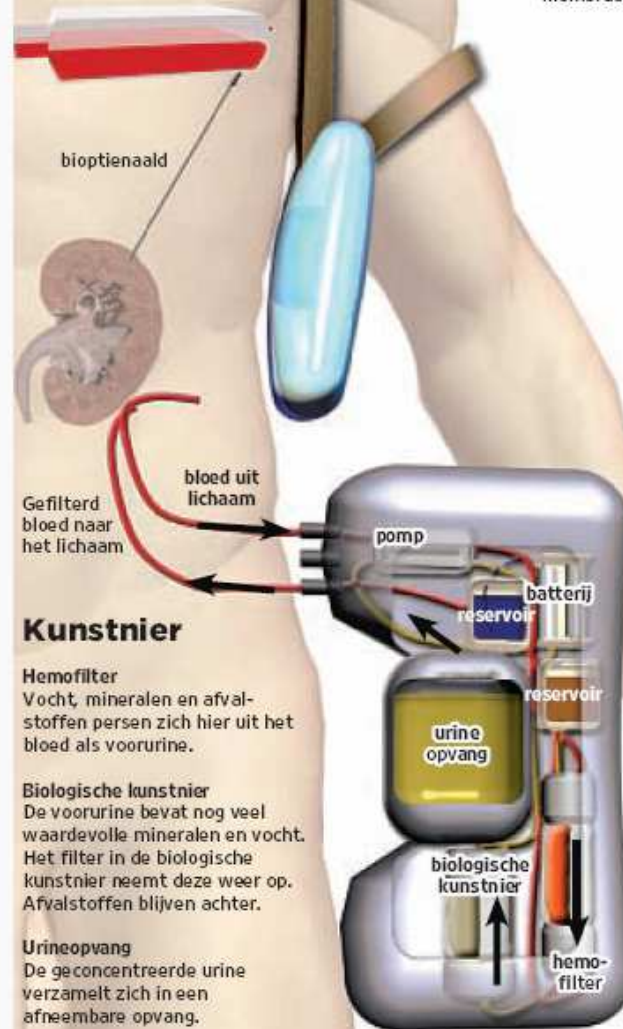
Nierdialyse is zwaar en in te veel gevallen niet eens effectief. Het Nederlandse topinstituut Biomedical Materials Program (BMM) werkt aan de ontwikkeling van een draagbare biologische kunstnier.

What will we do: Nephrology, bioartificial kidney



Kweekvat
Cellen voor de kunstnier komen uit echte nieren. Met een holle naald wordt een stukje weefsel uit de nier genomen. Niercellen uit dit stukje weefsel worden verder gekweekt

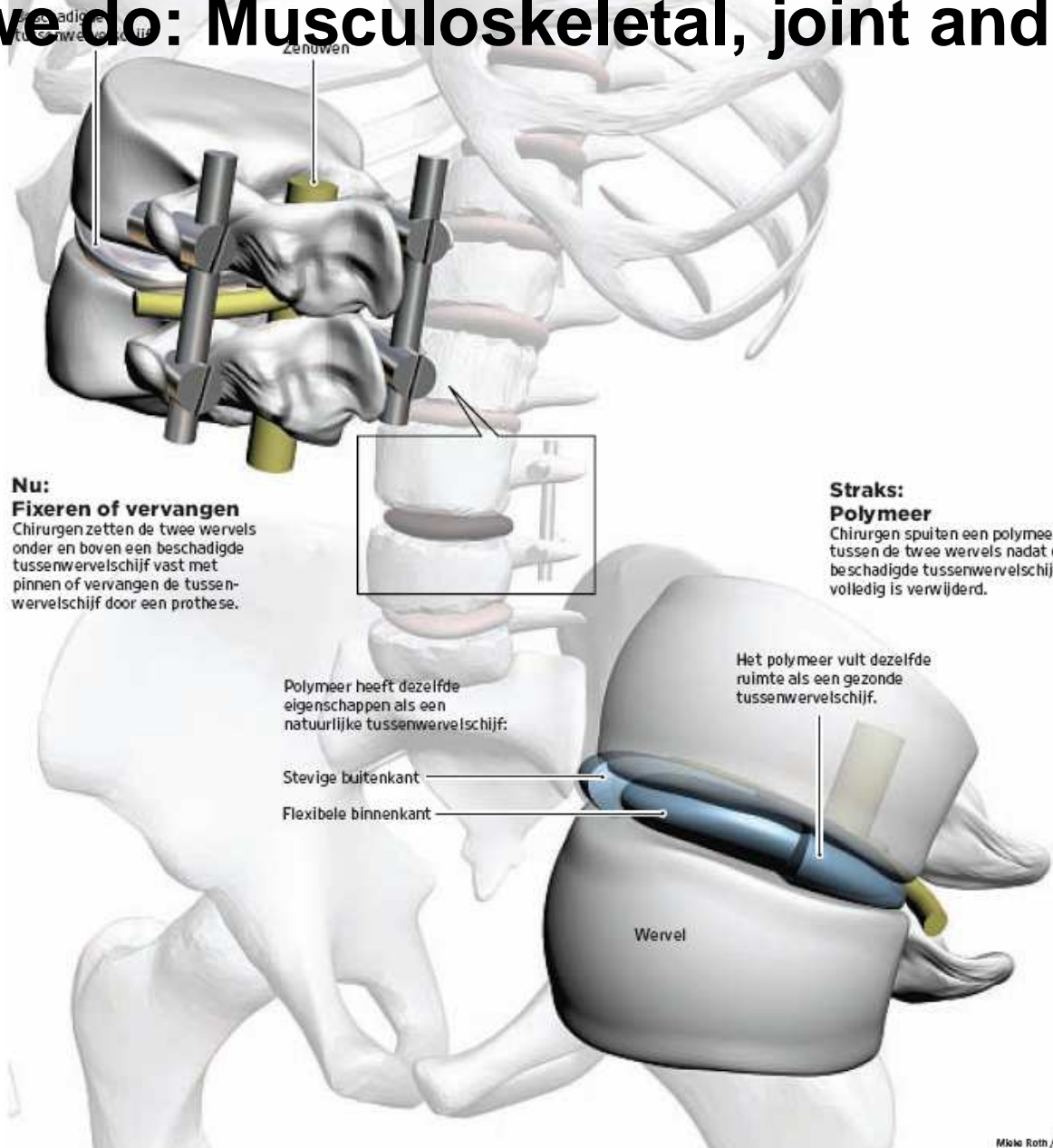
Membraan
Om de biologische kunstnier te kunnen vormen hechten de niercellen in een dikke laag op een synthetisch membraan.



Synthetische tussenwervelschijven

In plaats van ruggenwervels met pinnen vast te zetten, wordt in de toekomst de tussenwervelschijf vervangen door een gel-achtige substantie.

What will we do: Musculoskeletal, joint and spine



Indo-Dutch collaboration on RM?

- **Topics to be determined during this workshop**
- **To my regret no participants from the Netherlands' RM network**
- **We can focus on specific RM topics for a follow up visit and organize a RM workshop in collaboration with BMM and other RM experts in Holland.**
- **Discussion & questions**

Annexes



BMM

Creating Materials for Life

www.bmm-program.nl

Annex projects Cardiovascular



Instructive synthetic **scaffolds** for in vivo repopulation by circulating **endogenous progenitor cells** for heart valves and small diameter arteries
“one valve for life”



New generation DES (Nur77) capable of **inhibiting restenosis** and preventing late **thrombosis**



Polymer based drug delivery platform that enables local and prolonged delivery of growth factors for the **stimulation of neovascularization**



Improve cardiac function in patients suffering from heart failure **by autologous microtissue delivery**

Annex projects Musculoskeletal



Intervention in primary **intervertebral disc degeneration** by the application of **injectable, biodegradable and biomechanically functional biomaterials** containing regenerative stimuli e.g. stem cells, growth factors, anti catabolic factors **inhibiting progressive degeneration**



Novel **resorbable biomaterials** capable of sustained controlled **local delivery of drugs** in the joint for the **treatment of osteoarthritis**



Development of a **meniscus implant** that will be **chondroprotective, relieve the patient's pain and stabilize the knee joint**

Annex projects Nephrology



Effective **clearance of protein bound toxins ex vivo** by mimicking the tubular secretion by means of a **biological kidney support device**



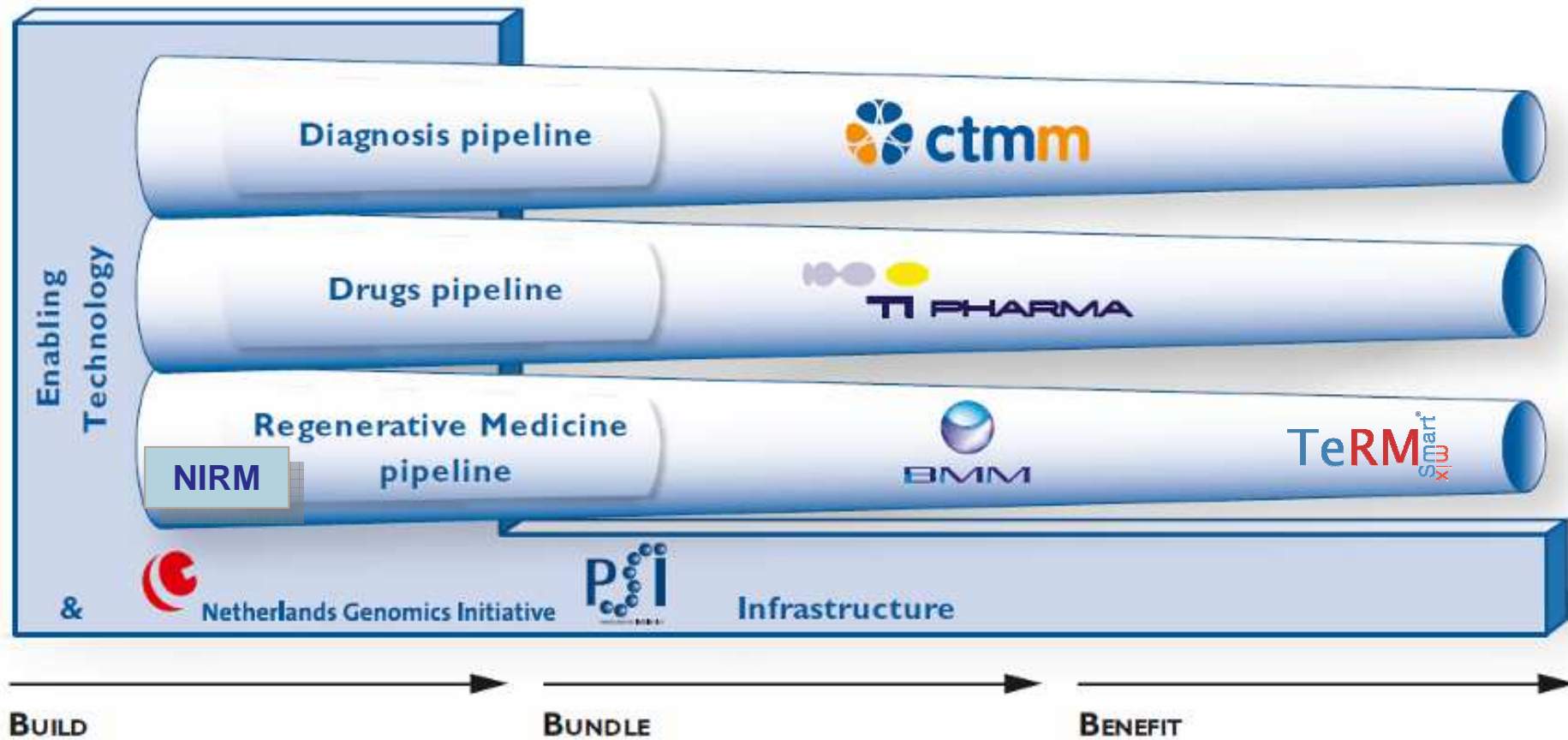
To generate a device for **smart intervention in renal repair**, a therapeutic strategy for **intrarenal modulation of inflammation** in chronic kidney disease

Annex project Coatings



New materials coatings to prevent **biomaterials associated infections (BAI)** or facilitate new treatment modalities employing **on demand, antimicrobials releasing coatings**

Dutch pipelines for Medical Innovations



BMM opened a Joint Call for Proposals together with CTMM and TI Pharma



Introduction

The three Public Private Partnerships CTMM, TI Pharma and BMM all focus on the translations of research findings to proof of concept for new products and services in healthcare. Each of these 'Top Institutes' has its own special focus. Improve diagnosis and imaging in CTMM, new medicines in TI Pharma, and new big **Personalized Medicine** BMM. The common denominator that characterizes these programs is *personalized medicine*, - treatment tailored for the individual patient to optimize efficacy, outcomes and patient comfort. *The deliverables of the research programs will contribute to personalized treatment, minimally invasive therapeutic interventions, an improved performance of existing and new drugs and better monitoring and staging of the regression of disease.*

Many of these innovations will rely on the simultaneous applications of technology developed in the three different programs. For example, the discovery of biomarkers of heart failure and arrhythmia (CTMM) will provide better patient triaging to select candidate stem cell therapies (BMM). Molecular Imaging and the use of companion diagnostics (CTMM) will greatly enhance the efficacy of targeted drugs (TI Pharma). New scaffolds or nanoparticles (BMM) may be used for the local release and targeting delivery of high concentrations of medicines (TI Pharma).

To be able to realize these innovations, close interactions between the different disciplines *three top institutes have to be stimulated. Therefore, CTMM, TI Pharma and BMM* a call for proposals for research focused on the interface of the three institutes: *Imaging Guided and Targeted Drug Delivery. The projects which will emerge from this call for proposals represent the first example of an interdisciplinary public-private consortium* that encompasses competencies from all three institutes. Projects are performed by academia and industry in close cooperation. This model will provide a roadmap for a more cohesive, interdisciplinary approach in the Dutch life sciences

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Imaging Guided and Targeted Drug Delivery