Monash MedTech–Gateway to a Global Medical Technologies Network
The opportunity to develop a medical device industry through university partnerships

Dr Alan Finkel
Chancellor - Monash University
Developing International Networks to support local innovation

Dr. David Lester
Excerpts from Recommendations of The Australian International Collaborative Research Workshop – Monash Prato Centre, November 2011

- “[To promote] our ability as a nation to think globally in our research efforts and partnerships”.
- “we [need to be] considered as part of newly forming international networks and partnerships of national priority and strategic fit.....“
- “Open Innovation methods need to be established”
Opportunity for Monash to Establish a Global MedTech Community

- The Center for Integration of Medicine and Innovative Technology (CIMIT), an established Boston-based consortium of all their major institutes, is creating a global network in medical technologies focusing on unmet clinical needs.
Summary of CIMIT’s Impacts/Outcomes

- **INNOVATION**
  - Network of major Boston medical research campuses and health delivery partners
  - Over 500 innovation products developed
  - Over 10,000 patents impacted
  - Over 700 peer reviewed publications
  - Model successfully expanded to Singapore and Manchester (more evolving)
  - Over 500 project reviewers from around the world – global network

- **HEALTH**
  - Over 3 dozen companies formed or impacted
  - Greater than 20% programs resulted in regulatory approved products

- **MANUFACTURING**
  - Over 600 Commercial Jobs
  - Over $440M in commercial investment
Value of CIMIT model to the stakeholder pathway in Australia for development of Medical Devices – Creating a pipeline and solving the “bottle neck”

Examples of Organizations
- Basic Research: e.g. Monash
- Applied Research
- Start up: e.g. Small Technology Cluster
- SME: e.g. Hydrix, Grey, MiniFab
- Commercialization: e.g. MedTronic, HealthScope

Examples of Funding
- Basic Research: NHMRC & ARC grants
- Applied Research: TTCF, MRCF & CA grants/awards
- Start up: TTCF, MRCF & CA grants
- SME: MVP Program & CA
- Commercialization: Corporate R & D
Impacts/Outcomes of Monash MedTech

VIC Pipeline of MedTech Products

INNOVATION
- New Business Opportunities for Existing Companies
- New Sources of Grant Funding
- Global Scientific/Commercial Network

MANUFACTURING
- Engineering/Scientist/Business Jobs
- Increased Victorian Advanced Manufacturing
- New Sources of Local/Foreign Investment

Science
- Engineering
- Architecture/Design

Monash MedTech Platforms
- I E & C
- Bus/Eco

The Alfred Monash Medical Centre

New Business Opportunities for Existing Companies
New Business Entities
Global Scientific/Commercial Network
Engineering/Scientist/Business Jobs
Increased Victorian Advanced Manufacturing
New Sources of Local/Foreign Investment
Science
Engineering
Architecture/Design
Monash MedTech Platforms
I E & C
Bus/Eco
The Alfred Monash Medical Centre

Science
- Medicine
- MIMR
- MIPS
A Monash Pipeline already exists!

- Examples of potential secondary stage projects:
  - Dr. Andreas Fouras (Monash Engineering) – lung cancer imaging diagnostic
  - Assoc. Prof. Paul Fitzgerald (Alfred/Monash) – near infra-red spectroscopic depression diagnostic
  - Dr. Andrew Wei (Alfred/Monash) – leukaemia diagnostic
  - Dr. Shaun Jackson (Monash/Aust. Center for Blood Diseases) – “super science” drug delivery.

- Examples of potential primary stage projects:
  - Dr. Andrew Wei (Alfred/Monash) – Registrar for leukaemia diagnosis
  - Dr. Neil Watkins (MIMR/Monash) – Xenograft oncology drug testing
  - Dr. Neimai Karmakar (Monash Engineering) – RFID technology for sleep apnoea.
  - Drs. Jingxin Zhang (Monash Engineering) and Dr. Flavia Cicuttini (Alfred/Monash) – Imaging of knee and hip joints for osteoarthritis
  - Dr. Arthur Lowery (Monash Engineering) – The Bionic Eye subprograms.
CIMIT Global Model
Moving from a Hub to a Global Network
How would the CIMIT Global Hub operate?

- Individual hubs set up around **strategic medical centres** that recognize that translational medical research is the way of the future in medicine.

- **Hub is evolving.** Boston and Manchester are functional. Future sites identified include Singapore (AStar), Lomabardi (University Centre), and Seoul (hospital consortium).

- A secure **Open Innovation platform/exchange** will sit in the middle of hubs allowing sharing and resource/program allocation based on most suitable resources.
# Value proposition to stakeholders of the domestic and global programs

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<tr>
<th>Stakeholder/Value</th>
<th>Government</th>
<th>Industry</th>
<th>Monash</th>
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<td>Global Network</td>
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<td>Commercialization pathways</td>
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<td>De-risking technology development</td>
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Monash MedTech – Gateway to a Global Medical Technologies Industry

THE TIME IS NOW!
Public-Private Partnerships

The Monash Vision Group Experience

Arthur Lowery
Director, Monash Vision Group
Summary

- My life crossing borders
- Monash Bionic Eye
- Who brings what to the table?
- What are we really building?
My life crossing borders

**Industry**

- **Racial Research** (Military Radio, Microelectronics)
- **Marconi Radar Systems**
- **British Telecom Res. Lab.** (Summer researcher & PhD)
- **Virtual Photonics** (Photonic Design Automation)
- **Ofidium** (Optical Communications)

**Academia**

- **Durham University** (Student: Applied Physics & Electronics)
- **Nottingham Uni.** (EEE Lecturer)
- **The Uni. of Mel.** (EEE Reader & Photonics CRC)
- **Monash Uni.** (Electrical & Computer Systems Eng. Professor & Head)
- **Monash Vision Group - Bionic Eye** (2009-)

**1980-1983**

- 1980-1983
- 1983
- 1984
- 1984-1990
- 1990
- 1996-8
- 2004
- 2008-Contracts
- 2008-Contracts

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**1983**

- 1983

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**1980-1983**

- 1980-1983
- 1983
Monash Vision Group – A Bionic Eye

Supported under the Federal Government’s Special Research Initiative: ARC Research in Bionic Vision Science and Technology Initiative. $8M ARC funding + $7M partner funding
Putting a Team Together

- Physiology
- Surgery
- Patient Recruitment, Training
- Electrical Engineering
  - Electrode Design
  - Wireless Power Transmission
- Electronic Engineering
  - Signal Processing
  - Robotic Vision
  - Digital Design
  - Analog Design (Electrode drivers and monitoring)
- Mechanical/Materials Engineering
  - Biocompatibility
  - Electrode Coatings
  - Manufacturing
  - Insertion Tools
- Mathematics
  - Modelling the vision system
- Immunology
  - Biological reactions to materials and stimulation
- Management, Commercialisation, Regulatory Approval, Legal, Financial and Marketing

PARTNERS
Monash University
Grey Innovation
MiniFAB
The Alfred Hospital
• Names are the lead partner responsible for production.
• Most parties contribute to the design of each component in some way.
• Evaluation involves most researchers.
Who brings what to the table?

Industry provides

- Ready-built, proven, *development teams* that can spring rapidly into action
- *State of the art* production methods backed by tested know-how
- Accredited processes (ISO9000+)
- Supply chains to actually make things

Academia provides

- Global view of the state of the art in research
- Fundamental understanding of the scientific basis for technologies
- Deep understanding of engineering and biological systems
- A network of a very broad range of disciplines within the university, and globally

Both provide

- Creative thought, Passionate people, Solutions
What is the bionic eye really building?

- An implant that goes into someone’s brain for 20 years

- But also:
  - a team of academics and industry professionals
  - a capability for future projects
  - an understanding of key issues for biomedical engineering
  - solutions and research strategies to solve these
  - friendships and networks
Success in a high cost manufacturing environment

Dr. Erol Harvey, CEO MiniFAB
Success in a high cost manufacturing environment

Experienced Entrepreneurial Leadership with Ambitious Goals

- Focus & Depth
- Innovation integrated into company
- Partnerships that reduce risk and drive innovation
- Global
- Products & Services of High Performance, Quality, Value
- Decentralised business structure
- Loyal, knowledgeable employees
- Strategic alignment with customers
Working with Mesoblast to develop Stem Cell Therapies

Prof Euan Wallace
The Ritchie Centre for Translational Medicine

Cell Therapy
Regenerative Medicine
Fetal and Neonatal Health

- Placental stem cells
- Adult stem cells
- Lung and brain repair
- Cerebral palsy
- Cystic fibrosis
- Biomatrices
- Development of organ systems
- Injury and altered development
- New therapies and treatments
- Fetal to neonatal transition

Women's Health
- Uterine and endometrial biology
- Pelvic Organ prolapse
- Pregnancy and childbirth

Infant and Child Health
- Infant cardiorespiratory development
- SIDS
- Childhood sleep disorders

Director: Euan Wallace
Cell Therapy and Regenerative Medicine

- Placenta
- Umbilical cord blood
- Adult tissues and bone marrow
- Uterine stem cells
- Wharton’s jelly
- Cancer stem cells
- Somatic Cells
Cell Therapy and Regenerative Medicine

- Muscle
- Lung
- Pancreas
- Heart
- Bone
- Brain
- Liver
- Placental cells
- Fat
- Multiple sclerosis
- Stroke
- Parkinson’s disease
- Traumatic brain injury
- Spinal fusion
- Tissue engineering
- Neonatal lung disease
- ARDS
- Industrial lung injury
- Ischaemic injury
Two Mesoblast clinical trials being run by Ritchie Centre at Monash Medical Centre
Victorian Consortium for Cell-based Therapies (VCCT)

Expression of Interest
Closing Remarks
The Victorian MedTech Community

INDUSTRY
- SMEs
- Start-ups
  - Domestic/International Corporations

GOVERNMENT
- Health
- Innovation
  - Manufacturing

GOVERNMENT
- The Alfred Monash Medical Centre

INDUSTRY
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