

Westmead Millennium Institute

Models for Translational Research

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Which Institute Model is Best?

- What is your aim?
 - Pure basic science
 - Translational research
 - Pure clinical research
- What natural advantages do you have?
 - Co-location with a health care facility
 - Co-location with a university
 - Co-location with other research institutes

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Research Focus

- Narrow (e.g., single system or discipline)
 - Rapidly build critical mass
 - BUT:
 - Less cross-fertilization
 - Do not take full advantage of co-localized hospitals
- Broad
 - Critical mass harder to build
 - Techniques and methods a unifying theme
 - Cross-discipline collaboration
 - Fully leverage co-localized facilities

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History of research at Westmead

1978	Westmead Hospital established with researching clinicians in all key staff specialists posts
1982	Westmead Hospital Research Foundation established
1992	Strategic plan identifies the need for research institute (institute without walls deemed to fail)
1995	Children's Medical Research Institute (CMRI) moves to the Westmead campus together with The Children's Hospital at Westmead (CHW)
1996	Westmead Millennium Institute (WMI) established
2000	WMI stage 1 building erected
2001	Westmead Research Hub established
2005	Sydney West Area Health Service and

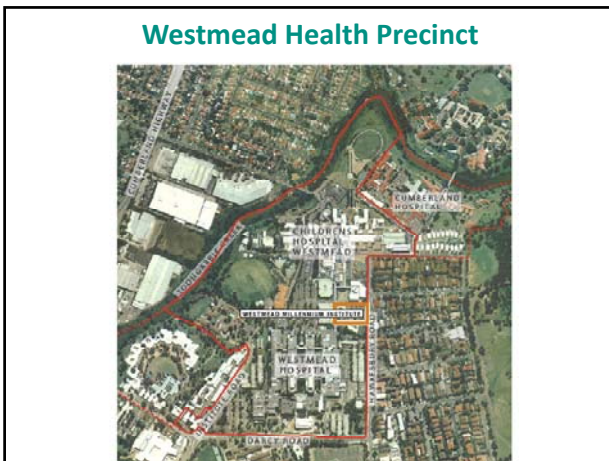
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Institute Environment

- Co-localized with:
 - 3 Hospitals (1470 beds + outpatient services)
 - Westmead (850 bed adult teaching hospital)
 - Children's (350 bed pediatric teaching hospital)
 - Cumberland (270 bed psychiatric hospital)
 - 3 Other Research entities
 - Westmead Centres of Health Research
 - Clinical Sciences Children's Hospital
 - Children's Medical Research Institute

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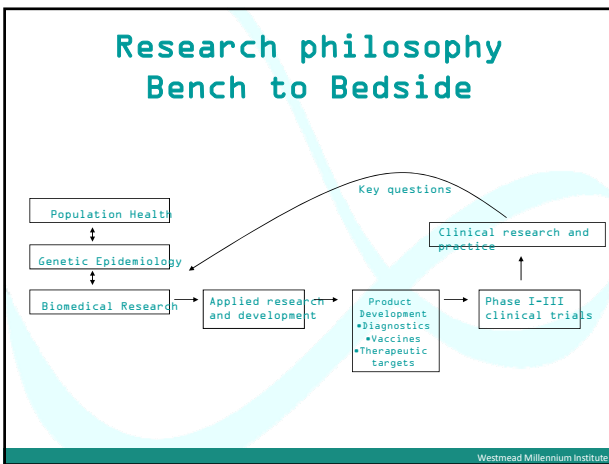


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11 groups, 450 staff
(105 students)

<p>Themes</p> <ul style="list-style-type: none"> Cancer Infection & immunology Liver & metabolic Neuroscience & vision Cardio-respiratory 	<p>Techniques</p> <ul style="list-style-type: none"> Molecular and cell biology Genetic Epidemiology Imaging and Microscopy Physiologic studies
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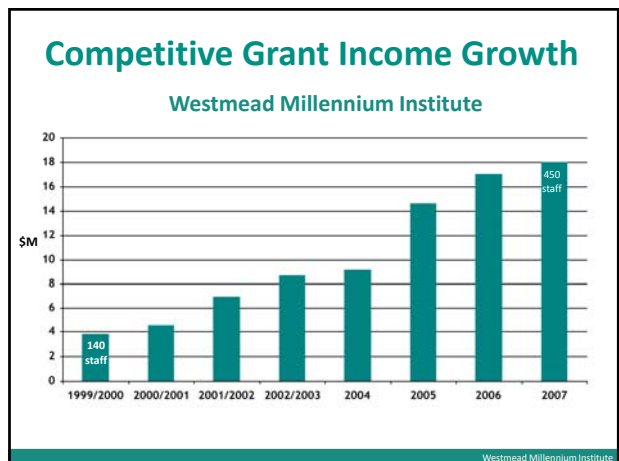
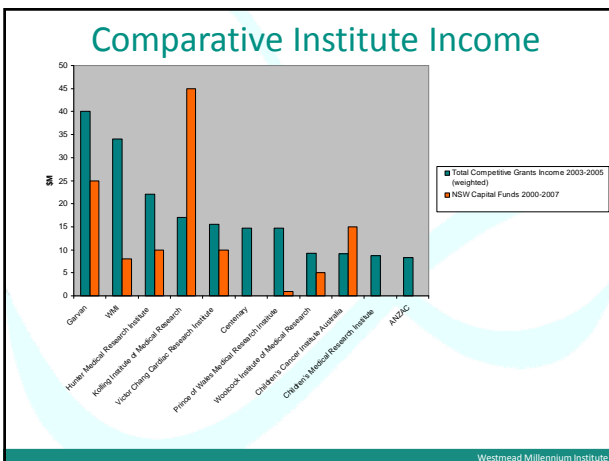
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Research at WMI Bench → Bedside → Community

Melanoma gene discovery	→	Genetic counselling of families
Isolation of pancreatic islets and 'tolerance'	→	Clinical islet transplantation for diabetes
Molecular studies of oral bacteria	→	Vaccines against caries/periodontitis
Host defences against herpes	→	Successful vaccines for herpes in women
Mechanisms of liver disease in diabetes and hepatitis	→	Discovery of Hepatitis C as a cause of diabetes
Mechanism which HIV uses to enter cells	→	Microbicides to prevent HIV transmission
Retinal photos	→	

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New initiatives – past 4 years

- Australian Centres for**
- Pancreatic Islet Transplantation
 - HIV and Hepatitis Virology
- 5 NHMRC Program Grants**
- Viruses of global importance (HIV)
 - Melanoma
 - Liver disease
 - Pancreatic islet transplants for diabetes
- Breast Cancer Tissue Bank**
- Expansion:**
- Breast and ovarian cancer
 - Bird flu / SARS
 - Gene discovery - schizophrenia
 - Prostate cancer
 - Liver cancer

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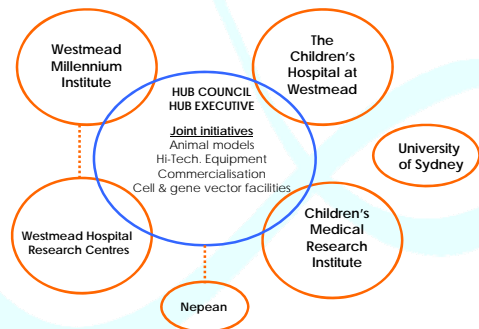
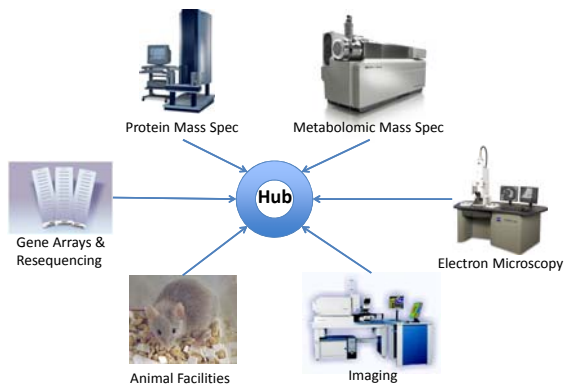
Formation of the Westmead Research Hub

- Collaboration and cross fertilisation
- Infrastructure, e.g., new buildings
- Technology, e.g., core high-tech facilities
- Critical mass
- Cost effectiveness through economies of scale



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Hub Core Technologies



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One of three leading biomedical research hubs in NSW

- National & International research and industry collaborations
- Over 900 research and support staff
- Over 270 PhD students

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Translational Research Examples: Storr Liver Unit

- Major research unit within WMI
- Approximately 40 staff and 4 Principal Investigators
- Focus on novel treatments for chronic liver diseases and liver cancer
 - Translation research
 - Clinical research

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Some Storr Projects (1)

- Whole genome haplotyping to identify genetic predictors for sustained response of hepatitis C to interferon-based anti-viral therapies
- Resources and Techniques
 - DNA bank from over 400 well characterized patients, including liver biopsies
 - Illumina 550k HapMap arrays
 - Bioinformatics and linkage analysis



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Some Storr Projects (2)

- Nuclear receptors as therapeutic targets to abrogate hepatic fibrosis in chronic liver diseases
- Resources and Techniques:
 - Hepatic stellate cells in culture
 - Illumina gene expression arrays and high-throughput RT-PCR
 - Animal models of acute and chronic liver injury
 - Patients with chronic hepatitis C unresponsive to existing anti-viral therapy
 - Collaboration with Salk Institute, La Jolla USA

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Successful Translational Research

- Understanding clinical needs
- Good science leading to an intimate understanding of the biology involved
- Collaborations that provide novel ideas, tools and techniques
- Access to excellent animal facilities (e.g., knockout mice, transgenics)
- Access to patients and excellent clinical trials facilities, including Phase I drug studies
- Intellectual property management

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Current problems

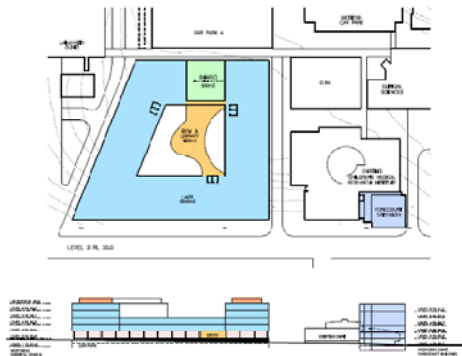
- Space
- Space
- and Space!
- Management of rapid growth
 - Infrastructure, e.g., information technology
 - Human resources
 - Mixture of Health and University staff

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New Building



New Building



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Where to from here?

- Consolidate and grow as one of NSW's and Australia's major research hubs
- Enhance clinical and translational research
- Core of a biotech industry around Westmead
- Continue to attract the best doctors and scientists to WMI and the Westmead precinct

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A BIG thank you to the researchers, postgraduate students and staff of WMI and Research Centres.....



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