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THE PRECINCT POST
WESTMEAD

HEALTHCARE | EDUCATION | RESEARCH | BUSINESS

BABYLAB COMES TO WESTMEAD

Western Sydney University's MARCS BabyLab has found a new home for its third national research facility, and it's right here at Westmead.

WESTMEAD
REDEVELOPMENT
The Westmead Education and Conference Centre, located on level one of Westmead Hospital, has undergone a major refurbishment and is now open for business.

WESTMEAD
PRECINCT
A new partnership cemented our future as an innovation leader.

WESTMEAD
MEDICAL RESEARCH INSTITUTE
A new clinical trial at Westmead Hospital has offered hope for cancer patients.

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WESTERN SYDNEY PARTNERSHIP CEMENTS FUTURE AS **LEADER IN INNOVATION**

WESTMEAD PRECINCT PARTNERS CAME TOGETHER FOR THE ANNOUNCEMENT

A new partnership between the Sydney Science Park and the Westmead precinct has connected leading scientific research with innovative business, bringing thousands of jobs to western Sydney.

Minister for Education Rob Stokes was on-hand to welcome a partnership agreement between Celestino, the developer of the Sydney Science Park, and the Westmead precinct's seven health, education and research organisations.

Mr Stokes said the agreement would create organisational, professional and research links between the two significant western Sydney campuses.

"The partnership between the Westmead precinct and Sydney Science Park cements western Sydney as a world-leader in research and innovation," he said.

"The rapid growth of western Sydney requires the creation of more high-quality, knowledge-based jobs; it is precincts like Westmead and Sydney Science Park that will provide these jobs of the future."

Westmead is the largest health, education, and research precinct in Australia. It includes Western Sydney Local Health District, Sydney Children's Hospitals Network, Westmead Private Hospital, University of Sydney, Western Sydney University, Westmead Institute for Medical Research and Children's Medical Research Institute.

Western Sydney Local Health District chief executive Danny O'Connor, representing the precinct, said the arrangement would connect Sydney Science Park's planned venture capital network with Westmead's health, research and education offerings.

"The Westmead precinct has already produced a high number of successful research and clinical innovation projects and this partnership will further enhance healthcare outcomes for western Sydney and NSW, as well as establish western Sydney as a leader in innovation and centre of knowledge jobs in NSW."

Celestino CEO John Vassallo said the partnership would enhance the potential for scientific discovery and innovation, and create business opportunities.

"This agreement provides an opportunity for businesses and organisations at Sydney Science Park to leverage the knowledge, expertise and data that has amassed at Westmead over nearly 40 years," he said.

More than $3 billion has been committed by government, universities and the private sector over the next decade to upgrade and expand the Westmead precinct's health services, education and medical research facilities.

These developments are expected to increase employment across the precinct by 70 per cent, to more than 30,000 jobs by 2036. Student numbers are expected to triple to more than 10,000.

The Sydney Science Park is set to be developed on a 280-hectare site at Luddenham, three kilometres from the site of the future western Sydney airport. Sydney Science Park is expected to provide 12,000 jobs, educate 10,000 students and house more than 10,000 people. Development will start in 2018.

WESTMEAD EDUCATION AND CONFERENCE CENTRE (WECC) **LEVEL 1 OPEN**

Students in the case study room in WECC level 1.

AFTER MORE THAN A YEAR OF PLANNING, CONSTRUCTION AND COMMISSIONING, **LEVEL 1 OF THE WESTMEAD EDUCATION AND CONFERENCE CENTRE (WECC) IS NOW OPEN.**

The new facilities were designed collaboratively by the University of Sydney, Western Sydney Local Health District and Sydney Children's Hospitals Network, with construction funded by the University and delivered by the Westmead Redevelopment.

Level 1 of the WECC has been renovated to provide sophisticated, creative spaces that inspire flexible learning and teaching. State-of-the-art technology in architecturally-designed rooms aims to foster active learning and collaboration.

"The transformation of education, training and research at Westmead responds to our growing multidisciplinary environment, and aligns with the Westmead precinct's vision of being a global innovation district," Western Sydney Local Health District research and education network operations director Helene Abouyanni said.

Kate O'Sullivan, chief operating officer of the University of Sydney at Westmead said: "the University of Sydney's investment in Westmead will see the number of students at the campus quadruple to more than 6000 and will enhance the already active interdisciplinary collaborations between health, research and education."

The WECC level 1 project is the first major upgrade of shared education, training and research spaces at Westmead Hospital. The design of the space has been influenced by consultation with staff and students, and experience from leading education facilities around the world.

NSW Education Minister Rob Stokes will officially open WECC level 1 on 27 November, 2017.

"THE UNIVERSITY OF SYDNEY'S INVESTMENT IN WESTMEAD WILL ENHANCE THE ALREADY ACTIVE INTERDISCIPLINARY COLLABORATIONS BETWEEN HEALTH, RESEARCH AND EDUCATION." - KATE O'SULLIVAN, CHIEF OPERATING OFFICER OF THE UNIVERSITY OF SYDNEY AT WESTMEAD

WESTMEAD HEALTH, RESEARCH AND EDUCATION SUPER PRECINCT CONTINUES TO ADVANCE

Artist's impression of Westmead and Parramatta.

A consortium of local and international talent will lead the next phase of development of a visionary master plan for the Westmead precinct.

A search was recently undertaken to find thought leaders and creative and innovative master planners to add value to the current thinking around the urban design and planning of the Westmead health and education precinct, and its links to Parramatta.

With more than $3 billion committed by government, universities and the private sector, the precinct is on a trajectory to increase its high-value, knowledge-based jobs to more than 26,000 and increase student numbers to more than 10,000 by 2026.

Western Sydney Local Health District (WSLHD) chief executive Danny O'Connor welcomed the announcement of the new consortium, to be led by NSW firm Cox Architecture.

"Cox and their consortium partners will help us as we weave Westmead's culture of collaboration and innovation into urban design," he said.

"This will integrate the planning for Westmead across transport, education, healthcare, industry, retail, accommodation and research.

"The proposal from the consortium was a stand-out, with their wide range of ideas and approaches. The experienced, specialist team from 12 different organisations will combine local knowledge with innovative international experience, bringing lessons learned from other health and education precincts around the world."

The consortium will work across NSW state and local governments and with the precinct partners to bring a fresh outlook on planning places to live, work, learn and play that will attract talented people from around Australia and the world. The planning around Parramatta is a significant consideration for the consortium as they work on ideas that integrate the precinct into Sydney's second CBD.

Greater Sydney Commission chief commissioner Lucy Turnbull AO said: "I'd like to commend the Westmead precinct partners for their innovative approach to master planning.

"It was only 40 or so years ago that Westmead Hospital was opened on a former racecourse. Today, it is Australia's largest health and education precinct and an integral part of the commission's vision for Greater Parramatta and the Olympic Peninsula (GPOP) - the geographic heart and true centre of greater Sydney.

"I look forward to seeing the consortium's world-class vision for the health and education precinct come to fruition."

City of Parramatta Council chief executive officer Greg Dyer said collaborations like this were critical to the success of Westmead.

"Westmead is a very important part of our city and we need a coherent and co-ordinated approach to planning to ensure the precinct realises its full potential. The council is partnering with WSLHD to deliver a visionary master plan. The appointment of an experienced consortium to lead the process is a great step towards achieving an innovation precinct with integrated healthcare, transport, science, education and living opportunities," he said.

The consortium will work with the Westmead Alliance and across government and industry over the next five months. The full consortium includes Cox Architecture, WSP, CallisonRTKL, Urban Apostles, Future/City, Six Ideas, Tyrell Studio, Oliver Klein Planning, Atelier10, HAA, Deloitte and KJA.

BABYLAB COMES TO WESTMEAD

MARCS BABYLAB ACADEMIC LEADER DR MARINA KALASHNIKOVA PLAYS WITH AN INFANT RESEARCH PARTICIPANT WHO WEARS A NON-INVASIVE ELECTROENCEPHALOGRAPH (EEG) CAP TO MONITOR BRAIN ACTIVITY.

Mum Amy Matthews and baby Lauren.

Western Sydney University's MARCS BabyLab has found a new home for its third national research facility, and it's right here in the Westmead precinct.

Located on Western Sydney University's Westmead Campus, the MARCS BabyLab is a state-of-the art research laboratory that will house behavioural and neurophysiological infant research.

The new location will expand the BabyLab's outreach to western Sydney and allow for greater collaboration with The Children's Hospital at Westmead.

Operating since 1999, the BabyLab sits within the speech and language program at the MARCS Institute for Brain, Behaviour and Development.

The MARCS BabyLab is at the forefront of non-invasive infant research in Australia and is highly ranked among the best internationally. For almost two decades, the BabyLab has conducted research into how infants (0–2 years) and children (3–12 years) acquire language.

The research focuses on how infants learn the sounds and words of their language, how the language they hear supports their learning, and individual experiences with language learning in the first years of life (e.g. learning two languages from birth).

MARCS Institute director Professor Kate Stevens said understanding how these factors impact the development of later language and literacy skills was at the cornerstone of the BabyLab's research.

"Our research is vital in identifying the link between language development in the first years of life, and how this impacts on opportunities in later life through education, social networks and employment," she said.

"We're excited for new opportunities to collaborate with the Westmead precinct in translating our research findings and co-creating new research questions and projects."

MARCS BabyLab academic leader Dr Marina Kalashnikova said the facility was not only committed to excellent research and training for students, but also to delivering high-impact, applied research findings.

"Our researchers don't just investigate how infants acquire knowledge about their native language; they also investigate how infants learn to interact with the world around them," she said.

Dr Kalashnikova and her colleagues Dr Christopher Carignan and Professor Denis Burnham recently published a paper titled "The Origins of Baby Talk", which investigated the qualities of infant-directed speech – the special type of speech parents use when they interact with their children.

The paper is available here: **http://rsos.royalsocietypublishing.org/content/4/8/170306** or visit **www.westernsydney.edu.au/babylab** to learn more.

Artist's impression of the Parramatta Light Rail

PARRAMATTA LIGHT RAIL PLANS ON PUBLIC EXHIBITION

THE TRANSFORMATION AT WESTMEAD CONTINUES TO GATHER PACE, WITH A NEW LIGHT RAIL LINK REINFORCING THE CITY'S ROLE AS PART OF AUSTRALIA'S BOOMING CITY, PARRAMATTA.

The connection between the Westmead precinct, Parramatta CBD and the surrounding area is important to social and economic growth and reinforcing this vibrant business district as a geographical, commercial and cultural centre and an engine for jobs and innovation.

Westmead precinct partners has been working closely with the Parramatta Light Rail team to ensure this great new service benefits its patients, families, staff, students, researchers and the broader community.

Parramatta Light Rail is an important addition to the transport mix at Westmead and supports the vision of Westmead as a liveable and workable health, education and research precinct that will continue to attract the best minds from across Australia and around the world.

The Westmead Redevelopment project is also working closely with our precinct partners and the Parramatta Light Rail team to ensure the new light rail is seamlessly integrated into the redeveloped Westmead precinct.

Member for Seven Hills Mark Taylor, City of Parramatta Council Lord Mayor Cr Andrew Wilson (right) and cyclists Janett Clarkson and Darryn Capes-Davis.

WESTMEAD **ON-ROAD CYCLEWAY COMPLETED**

The City of Parramatta's first on-road, separated cycleway is now open in Westmead, providing a safe connection between Parramatta Park and the T-Way cycleway.

The 300-metre section of cycleway along Queens Road completes one of the key missing links in the T-Way cycleway that runs almost completely off-road from Windsor to Parramatta.

City of Parramatta Council Lord Mayor Andrew Wilson said the new section, which physically separates cyclists from traffic, was an important strategic link in the broader cycle network.

"Sharing the road with cars is the greatest barrier to participation in cycling, particularly for younger or older members of the community," he said.

"Enhancing safety on our cycleways will encourage a broader section of the community to take up cycling whether it be for work, fun or recreation.

"Figures show monthly usage has doubled on the recently opened Subiaco Creek link on the Parramatta Valley Cycleway. In the past year alone, more than 175,000 cyclists have used the foreshore path.

"City of Parramatta Council is working hard with key stakeholders, including the state government, to develop high-quality cycle and pedestrian networks that connect residents, workers and visitors to locations throughout our area and beyond.

"Our research shows that Queens Road is the most popular route into the Parramatta CBD from the west, with up to 100 cyclists using the link daily, and we expect this number to increase significantly with the new cycleway."

RECENTLY COMPLETED CYCLIST AND PEDESTRIAN PROJECTS

- Subiaco Creek link
- Shepherd's Wharf at the end of Park Rd, Rydalmere
- Baludarri Wetlands Boardwalk, Rangihou Reserve Parramatta to James Ruse Drive, through to the heritage-listed wetlands and connecting to Western Sydney University
- The Lennox Bridge Portals

UPCOMING PROJECTS

- Ermington Foreshore Transformation: the separation of walking and cycling along the Rydalmere foreshore.
- Alfred Street Bridge: a new pedestrian and cyclist bridge over the Parramatta River between James Ruse Drive and Macarthur Street.
- Epping to Carlingford: an improved connection for cyclists between Epping and Carlingford stations.

NEW CLINICAL TRIAL OFFERS HOPE **FOR CANCER PATIENTS**

Professor David Gottlieb (left) with former patient Dr Mark Walsh and Dr Ken Micklethwaite

"THIS NEW APPROACH TO CELL AND GENE THERAPY FOR CANCER IS EXCITING BECAUSE IT HARNESSES THE POWER OF THE IMMUNE SYSTEM TO FIGHT THE CANCER." - LEAD RESEARCHER DR KENNETH MICKLETHWAITE

Leukaemia and lymphoma sufferers now have access to a potentially life-saving cancer treatment using genetically modified immune cells, courtesy of an Australian-first clinical trial out of Westmead.

A team of researchers and clinicians from Westmead Institute for Medical Research (WIMR) and Westmead Hospital, led by Professor David Gottlieb, Professor of Haematology at the University of Sydney and a senior physician at Westmead Hospital, received final TGA and ethics approvals for the trial – the first of its kind to be approved in Australia – and phase 1 clinical trials kicked off in August.

The trial uses a Westmead-designed gene-altering leukaemia and lymphoma treatment, enabling immune cells that have been genetically engineered to hone in, and attack, tumors.

Lead researcher Dr Kenneth Micklethwaite, a University of Sydney Clinical Lecturer at Westmead Clinical School, said he hoped the treatment would benefit patients with otherwise incurable blood cancers, offering them access to effective treatments, currently unavailable in Australia.

"For many patients, despite heavy chemotherapy and bone marrow transplants, their leukaemia and lymphoma cannot be eradicated, often resulting in death," he said.

"This new approach to cell and gene therapy for cancer is exciting because it harnesses the power of the immune system to fight the cancer.

"It really offers an alternative for patients who are no longer responding to chemotherapy – we hope this approach will significantly increase the number of people we treat and cure, without using chemotherapy."

The treatment involves collecting T-cells, a type of immune cell, from a simple blood draw and then genetically engineering them in a laboratory to produce special receptors on their surface called chimeric antigen receptors (CARs).

These engineered CAR T-cells are then infused into the patient, and with guidance from the newly engineered receptor, the cells recognise and kill cancer cells that carry the antigen on their surfaces.

Westmead Hospital head of cell therapies Professor David Gottlieb said he hoped the new trials would finally give Australians access to this kind of treatment – at a fraction of the cost of similar treatments being developed internationally.

"While initial trials conducted in the US have been highly encouraging, these trials are inaccessible to Australian patients, except those willing to travel overseas and pay up to $1 million," he said.

"This trial is exciting for Westmead as our trials are built on home-grown research, and our CAR T-cells are developed through an entirely Australian-based manufacturing process.

"The long term goal of our research is to make CAR T-cells affordable and widely accessible to Australian patients as quickly as we can."

Prof Ian Alexander

ONE STEP CLOSER TO HELPING CURE GENETIC DISEASES

An important discovery published in Nature Genetics will make gene therapy – which is already helping to cure genetic diseases – safer and more effective for children.

The discovery by Prof Ian Alexander, Professor in Paediatrics and Molecular Medicine at the University of Sydney and head of the gene therapy research unit, a joint initiative of the Children's Medical Research Institute and Kids Research Institute and his team, will help improve gene therapy in the future.

In key organs such as the liver, there are gene transfer tools used to replace or repair faulty disease-causing genes — AAV vectors. AAV vectors are like miniature Trojan horses that are used to carry healthy copies of genes into cells.

These vectors are safe because they are derived from a naturally occurring AAV virus.

"Up to 70 per cent of people have been exposed to naturally occurring AAV already and suffer no ill effects," said Prof Alexander.

When giving gene therapy to children, safety is a top concern.

Prof Alexander and his team have discovered a small region in naturally occurring AAV that can sometimes have negative effects on liver cells.

"Knowing what this region of AAV provides us with a new way of measuring the small risk associated with gene therapy in the liver, and will allow us to more accurately balance risk against likely benefits," said Prof Alexander.

While gene therapy is already helping patients around the world overcome genetic diseases, gene therapy treatments still need to be tailored to the thousands of conditions where this approach offers the prospect of effective treatment.

It is hoped this research will help children like two-year-old Charlize and her twin brother Isaac, who were both born with a rare and severe metabolic disease called propionic acidemia.

Those with the disease have trouble breaking down and using amino acids in food, causing problems with appetite and low muscle tone, platelets and white blood cells. If the illness is not controlled, sufferers can go into a metabolic crisis, which can cause breathing problems, seizures, swelling of the brain, stroke and coma, often leading to death.

Isaac underwent surgery for a new liver, which is supposed to make enough of the missing enzyme for him to have a normal life. But after surgery, he had a mass bacterial infection and went into septic shock. Sadly, in January this year, Isaac passed away. Now his twin sister Charlize is on the transplant list as she awaits a new liver.

"Now we've identified this element, we can edit it out of our AAV vectors. This is important when clinicians want to treat brain diseases but not affect the liver, for example. This means increased specificity as well as safety," Prof Alexander said.

There are currently 130 registered AAV clinical trials globally, with more than 2000 patients treated so far, and this will only grow in the future. Prof Alexander's work will help ensure research produces safe and effective cures for genetic diseases. And the sooner such treatments are available for children like Charlize, the better.

THE SEARCH **FOR SPERM**

Dr Shannon Kim

ADVANCES IN MICROSURGICAL TECHNIQUES ARE GIVING NEW HOPE TO MEN SUFFERING FROM INFERTILITY, THANKS TO A COLLABORATION BETWEEN SURGEONS AT WESTMEAD PRIVATE HOSPITAL AND WESTMEAD FERTILITY CLINIC.

Dr Shannon Kim, a urologist at Westmead Private Hospital and Dr Howard Smith, head of the Westmead Fertility Centre at Westmead Hospital and his team, have been working on a treatment for non-obstructive azoospermia, a condition that causes no sperm to be produced in ejaculated semen.

The team are using micro TESE, or micro dissection, a new surgical technique that has been developed to detect sperm in the testicles of men with poor sperm production. Because the testicular tubes that produce and carry semen are microscopic structures, they cannot be seen by the naked eye.

However, using a new operating microscope system at Westmead Private Hospital, Dr Kim has been able to selectively remove the "better" tubes, which are more likely to contain sperm.

Once the specimens are removed, the search for sperm begins. Embryologists from Westmead Fertility Centre examine the specimens under a microscope. Once sperm is found, they are transported the short distance to Westmead Hospital to be injected into awaiting eggs.

This advanced technique allows Dr Kim to direct the biopsy to the best areas and increase the chance of finding sperm, while removing smaller amounts of tissue, causing less damage.

The combination of using the operating microscope, dissecting the testicular tubules and having trained surgeons available to search for sperm can make the difference between success and failure for many couples. These advances have allowed men who were previously considered absolutely sterile to father biological children.

Westmead Redevelopment
Building health. Transforming lives.

The Precinct Post is an initiative of the NSW Government's Westmead Redevelopment.

Enquiries about the Precinct Post should be directed to the Westmead Redevelopment project office on **1800 990 296** or **WSLHD-WestmeadProject@health.nsw.gov.au**