

the mouse house OF MOSS VALE



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ASK PEOPLE WHAT THEY THINK OF WHEN someone mentions the Southern Highlands and the answers range from bracing country walks, fine dining, misty vistas and quirky giftware shops. One thing certainly doesn't spring to mind – ground-breaking medical research. But tucked away in the bush behind Moss Vale's main street is exactly this – a thriving enterprise with highly trained scientists, technicians and state-of-the-art equipment. Its main focus is providing luxury accommodation for its very special "guests" – more than 27,000 mice – who play a vital role in Australia's internationally-acclaimed medical research.

Completed in 2008, the \$20 million Australian BioResources Facility (affectionately called the "Mouse House") was built and is operated by the Garvan Institute of Medical Research – one of Australia's largest and most prestigious medical research institutes. Initially founded as a research department of St Vincent's Hospital, Garvan maintains strong links with the

hospital and is currently partnering with it to build the Kinghorn Cancer Centre, opening in mid 2012 next door to Garvan on Victoria Street, Darlinghurst. Since its humble beginnings in 1963, Garvan has grown to more than 500 scientists, PhD students and support staff and now takes its place among world leaders in fighting disease.

Garvan's international reputation centres around its gene-based research, focused on understanding the role of genes and molecular and cellular processes in health and disease as the basis for developing future cures and preventative treatments. Over the past 20 years, it has achieved significant breakthroughs and delivered new insights into major diseases including cancer, Type 1 and Type 2 diabetes, arthritis, asthma, osteoporosis and neurological disorders such as Alzheimer's and Parkinson's diseases. The aim of all Garvan's work is to arrive at better and earlier diagnosis, improved prognosis and more personalised therapies for the major diseases that affect society today.

Dedicated scientists and increasingly complex technology continue to drive medical research but these days there are

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ABOVE: THE "BIOBUBBLE" PAVILION – THE FIRST OF ITS KIND IN AUSTRALIA AND (LEFT) THE MOUSE HOUSE EMPLOYS HIGHLY TRAINED LOCAL STAFF.

other requirements and in 2004 the Garvan Board decided to construct its own mouse breeding and holding facility to support and underpin its ever-expanding research programs. Up to this time, these mice were supplied by a small overcrowded capital-intensive facility in Darlinghurst. In order to capitalise on economies of scale, Garvan's vision was to build one large facility and invite other medical research institutes to share its use. And so began the long, exhaustive search for a suitable site with the appropriate zoning.

There were several essential criteria – the main being easy accessibility to Sydney, Canberra and Melbourne by road and rail. A low humidity climate for the sensitive equipment was also important, and availability of a local labour force was desirable.

It was never going to be easy but after an extensive search throughout NSW and a few false starts, it was discovered that the Southern Highlands ticked all the boxes. Not long afterwards,

the perfect parcel of land became available on the outskirts of Moss Vale and building work commenced. The Mouse House was officially opened in July 2008.

Architecturally impressive, the complex nestles on almost 19 hectares and blends unobtrusively into the surrounding hills and bushland. Designed to achieve a minimal environmental impact, at first glance it could be a luxury resort or up-market conference facility but once inside, it is very obviously a highly sophisticated scientific compound.

The Mouse House can hold up to 45,000 mice in the existing stage one development, with more than 400 different genetic types currently housed in sterile "BioBubbles." These BioBubbles are the first of their kind in Australia and – like the facility itself – have won international design awards.

Each BioBubble contains 1400 mouse boxes with individual air filtration and controlled lighting and noise levels, specially



THE MOUSE HOUSE WAS DESIGNED TO BLEND SYMPATHETICALLY INTO SURROUNDING BUSH LAND.

designed to control the spread of pathogens (such as bacteria or viruses) whether from the environment, from staff or from the mice themselves as well as to stringently monitor air quality. The overriding aim is to reduce stress on the mice and is a great improvement on the often antiquated, cramped conditions in the past.

The use of the BioBubble was a gamble for Garvan. As the first of its kind in Australia, any inevitable “glitches” in the design were ironed out in situ but the gamble has paid off and plans are underway for another BioBubble to be added once sufficient funds become available.

During the past decade, medical research has become increasingly cooperative. Gone are the days when researchers toiled in secret, guarding their work from colleagues who were viewed as competitors. Beginning with the International Human Genome Project in the 1990s (aimed at identifying and mapping the approximately 20,000–25,000 genes in human DNA from both a physical and functional standpoint) the methods, speed and expectation of research has change dramatically. Now researchers are collaborating both nationally and internationally to a very significant degree, sharing their findings as well as expensive equipment and facilities. So the Mouse House was built not just to support Garvan’s research – its business plan is based on collaboration with similar entities in Australia and overseas.

Other organisations currently partnering with Garvan include St Vincent’s Hospital, the Universities of NSW, Newcastle and Western Sydney, the Children’s Cancer Institute of Australia, Neuroscience Research Australia and ANZAC Institute. This list will keep expanding.

Extensive collaboration raised its own unique issues and a

web-based software system linked to a high-speed data network has been designed to allow researchers working at partner institutes to control and interact with their mouse colonies. This efficient system is called “Stuart” after the small but resourceful mouse in the movie *Stuart Little*.

The ethics and sensitivities around using mice for medical research are complex and delicate, and throughout the world vast resources are being ploughed into finding alternative (non-animal) methods. Wherever possible, scientists do try to use other methods but sometimes this is simply not feasible. For medical research to progress beyond a certain point, research must move from artificial conditions in a laboratory into a living organism. Even the most sophisticated technology still can’t clone a beating heart or a nervous system in a test tube and no computer has yet been invented that can reproduce all the complex interactions in the human body. So until this is achieved, mice – who are unique in that 99 per cent of their genes have a direct counterpart in humans – remain critical to research into diseases as diverse as cancer, diabetes, brain disorders, auto-immune conditions, osteoporosis and heart disease.

The Mouse House now has 26 full-time employees – scientists, technicians and support staff in addition to part-time employees and the expansion plans mean this number will increase. It is also hoped that the success of the Mouse House will attract other research institutes and organisations to the area, which has the potential to become a hub of scientific research innovation. **HL**

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