Highway to health
Researchers get the data linkage breakthrough

Mass spectrometry
40 years on and still going strong

Pole Position
Australia lines up for SKA
Curtin's Research Strengths

Curtin is renowned for practical research that solves real-world problems. Curtin's four areas of research strength that serve to focus our research endeavours are:

Resources and energy >
Curtin supports Australia's key industry sector with high-impact research and development in areas such as mining, engineering and chemistry. To this end, the Resources and Chemistry Precinct—a major initiative—will open at Curtin's Bentley Campus in November 2009.

ICT and emerging technologies >
Curtin's ICT research continues to grow at the Institute for Multi-sensor Processing and Content Analysis, the Digital Ecosystems and Business Intelligence Institute, and the Department of Spatial Sciences which undertakes world-class research in geodesy, GIScience and remote sensing. ICT also underpins Curtin's work in emerging technologies, such as research in nanotechnology at the Western Australian Nanochemistry Research Institute.

Health >
Curtin is the most comprehensive provider of health sciences research in Western Australia. Our expertise in population health, ageing, chronic disease, Indigenous health and mental health was recently boosted by the establishment of the Curtin Health Innovation Research Institute which aims to produce new models of health care that address the changing needs of Australian communities.

Sustainable development >
Curtin recently launched the Australian Sustainable Development Institute (ASDI). The institute combines scientific research, engineering and social science in its focus on three key challenges for sustainable development: energy, water and coastal zone management. ASDI brings together the expertise of 16 research centres to tackle issues linked with climate change, depleting resources and population growth.

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R&D Overview
The first half of 2009 has been very successful for Curtin’s research endeavours. Our researchers continue to excel internationally, with several notable achievements. Professor Peter Howat, Director of the Centre for Behavioural Research in Cancer Control, has been awarded a Fellowship in the American Academy of Health Behavior. He is only the second Australian resident to become a fellow of the academy. Professor Howat has authored more than 280 publications, including more than 120 refereed journal articles, and has been the principal or co-investigator on 92 research grants.

I congratulate Dr Helen Armstrong, from the School of Information Systems, who was awarded the prestigious Western Australian IT Achiever of the Year Award at the 18th WA Information Technology and Telecommunications Awards held recently. The award recognises an individual's outstanding contribution to the IT&T Industry in WA, and Dr Armstrong is the first woman to have won the award.

The Curtin Institute of Radio Astronomy, launched in December 2008, will play a major role in the $25 million International Centre for Radio Astronomy Research, an initiative of the Western Australian Government to support Australia’s bid for the international Square Kilometre Array project. Curtin is also the lead organisation in a State Centre of Excellence for radio astronomy, under the leadership of Premier’s Fellow Professor Steven Tingay and Professor Peter Hall, Chair of Radio Astronomy Engineering.

The Faculty of Health Sciences has won several prestigious grants from the National Health and Medical Research Council. Associate Professor Tony Butler, from the National Drug Research Institute at Curtin’s Shenton Park Campus, was awarded $2.3 million to develop culturally appropriate mental health policy and service models for Indigenous and non-Indigenous researchers, to develop a sustainable, culturally appropriate mental health policy and service model.

Curtin’s commitment to high-quality research continues to attract high-calibre recruits. Professor Chun-Zhu Li joined the School of Chemical and Petroleum Engineering this year as Professor Clean Coal Technologies, and he leads the Curtin Centre for Advanced Energy Science and Engineering. Professor Mark Buntine has been appointed the new Head of Chemistry as the department prepares to move into the $116 million Resources and Chemistry Precinct later this year. Professor Peter Teunissen, winner of a prestigious Australian Research Council Federation Fellowship, joins the Department of Spatial Sciences from Delft University of Technology in the Netherlands.

This edition of R&D Now showcases a number of research programs that illustrate Curtin’s outstanding research leadership and our strong engagement with industry. We look forward to a productive year ahead as we continue our leadership in excellent and innovative research.

Professor Linda Kristjanson
Deputy Vice-Chancellor
Research and Development
Research using the most sophisticated instrument available for isotopic analysis of micrometer-sized samples may have made redundant a decade-long scientific dilemma about the discrepancy between the rise of atmospheric oxygen and the existence of the Earth’s first photosynthesizers.

In 2008, Professor Birger Rasmussen and three other researchers were working to develop new techniques for analysing the carbon isotopic signatures in organic matter, to gain information about ancient biological processes and early life. Their research has led to an Australian Research Council (ARC) Discovery Project. More importantly, their remarkable results were published last year in the prestigious science journal Nature.

The team – comprising Dr Ian Fletcher, Rasmussen’s colleague at Curtin’s Department of Applied Geology, Dr Matt Kilburn, from the University of Western Australia (UWA) and Dr Jochen Brocks, from the Australian National University (ANU) – showed that long-standing biomarker evidence for the existence of cyanobacteria (photosynthesising bacteria) and eukaryotes (organisms with cells containing a nucleus) 2.7 billion years ago is flawed.

Establishing when cyanobacteria proliferated is significant because from that point on oxygen was being released (as a byproduct of photosynthesis) into the Earth’s atmosphere. The availability of oxygen enabled the evolution of early complex life – organisms that used aerobic respiration to acquire energy – and on to the rapid biodiversification of life on Earth.

“Our research has shown that the oldest, unequivocal fossil evidence for cyanobacteria is 500 million years younger than has been widely accepted. Geochemical evidence, however, indicates cyanobacteria existed before 2.3 billion years ago; this is the time of the Earth’s first major oxidation event,” Rasmussen explained.

The shake sample from UWA’s Centre for Freshwater Research contains biomarkers known as steranes and sterrenes, which are characteristic of cyanobacteria and eukaryotes, respectively. In 1999, a research team (which included Brocks) extracted these biomarkers using solvents, and concluded they were derived from organisms deposited in the shale 2.7 billion years ago.

“However,” said Rasmussen, “we can see that organic matter in these rocks has been subjected to levels of heating that would have destroyed any indigenous biomarkers long ago.”

“We also found the ratios of carbon isotopes (\(^{13}C/^{12}C\)) in the biomarkers, which should have been similar to the indigenous organic matter, to be vastly different from both the matrix pyrobitumen and the co-occurring kerogen in the sediment. The biomarkers couldn’t be the same age as their host rock – they must be younger contaminants.”

The new research was possible due to the development of an instrument that provides ultra-high resolution isotopic mapping. As part of the John de Laeter Centre, the Cameca NanoSIMS-50 ion microprobe (housed at UWA) can measure the isotopic composition of particles as small as a few micrometers in situ within a sample.

g eoology.curtin.edu.au/local/research.html

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Professor Chun-Zhu Li took up the position as Director of the new Curtin Centre for Advanced Energy Science and Engineering earlier this year. An authority in the area of energy science and engineering, his work on coal, particularly brown coal or lignite, has covered a wide spectrum of topics, including the pyrolysis, gasification, liquefaction and combustion of coal as well as coal structure and properties. His expertise also includes biomass utilisation, natural gas conversion and the production of diesel from waste plastics.

Under Li’s leadership, the Curtin Centre for Advanced Energy Science and Engineering is developing novel technologies for fossil fuels and renewable energy sources. In partnership with Spotsil Oil Pty Ltd, the centre is working to develop a technology for converting low-grade lignite in Western Australia into liquid fuels and chemicals. Important advances in this technology will have a smaller carbon footprint than conventional coal-to-liquid technologies.

The centre is also investigating the utilisation of mallee biomass grown in WA. Most notably, Li is leading a major international collaborative project supported by the Asia-Pacific Partnership on Clean Development and Climate, which involves researchers in Australia, China, Japan and Korea. The project aims to develop a novel biomass gasification technology for distributed power generation.

Li’s team is also working on the production of liquid transport fuels from the pyrolysis and co-refining of mallee biomass, a project which is supported by Australian federal funding agencies. The development of mallee biomass to produce fuels is another novel technology of biomass utilisation the centre is developing – a project led by the centre’s Deputy Director, Associate Professor Hongwei Wu. Wu’s research focuses on the synthesis of high-quality liquid fuels and valuable chemicals.

Li has established productive international alliances, especially with researchers in Japan, China, Korea and the USA. Since receiving his PhD in chemical engineering from Imperial College London in 1999, he has authored or co-authored more than 350 papers in international journals and conference proceedings. He serves on the editorial and/or advisory boards of seven international journals, including Process Safety and Environmental Protection, Fuel and Energy & Fuels.

**Profile**

**Professor Chun-Zhu Li**

Director of the new Curtin Centre for Advanced Energy Science and Engineering

Faculty of Science and Engineering

Curtin University

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**LABS ADD POLISH TO PRECINCT**

Advanced laboratories are being outfitted for research teams as they prepare to move to the $116 million Resources and Chemistry Precinct later this year.

A nicipation is growing among research teams which will soon have access to laboratories unlike any they’ve previously used in Western Australia.

“We’ll double our lab space and have an entire new R&D environment for sour services,” said Professor Rolf Gubner, who leads the Western Australian Corrosion Research Group.

“We have very strong relationships with industry partners, and the precinct provides us with another level of capability for research and consultancy.”

Gubner’s team is one of several within Curtin’s Department of Chemistry that will relocate to the precinct. Professor Mark Buntine, Curtin’s newly appointed Head of Department of Chemistry, is enthusiastic about the future of all research teams within the University’s strong chemistry program.

The precinct’s advanced research laboratories will no doubt boost Buntine’s own research output in laser chemistry and spectroscopy and computational chemistry.

“The Chemistry Department is also working to increase our involvement in chemical synthesis relevant to the biomedical and biomolecular sciences,” Buntine said.

“Furthermore, the precinct’s advanced teaching laboratories, together with the presence of ChemCentre at the state-of-the-art facility, will attract quality students to the enabling sciences.”

The precinct’s main building will also house the Nanochemistry Research Institute, the WA Organic and Isotope Geochemistry Centre, led by Professor Kiti Girke, and the Curtin Water Quality Research Centre, led by Associate Professor Anna Hertz.

ChemCentre – the WA Government’s flagship chemical science facility – will relocate from the Perth CBD (where it has been based since the 1960s) to the precinct. Those working in areas such as minerals resources and hydrometallurgy will also be able to collaborate easily with other world-renowned research groups and industry partners, all within walking distance.
Diversity on the board

The ratio of men to women at board director level is about 10:1 for firms listed in the ASX200. Many firms could be strategically addressing the imbalance now that research from Curtin’s Graduate School of Business has shown they may be better equipped to address sustainability if women serve on the board.

A recent study by the Graduate School of Business’s (GSB) Dr Jeremy Galbreath focused on whether a link existed between boards that had women serving as directors and corporate sustainability – economic, environmental and social.

Galbreath’s investigation was compelled by a trend that has called for firms to move beyond narrow financial interest to respond to stakeholders’ demands for environmental quality and social responsiveness.

“Recent corporate scandals and concern over large bonuses for management have encouraged public scrutiny on organisational conduct,” Galbreath said.

“Corporate sustainability means that firms will perform in challenging economic climates, and respect the interests of multiple stakeholders and respond to their requirements.”

While previous research had established a positive link between women directors and solid financial performance, Galbreath realised that management researchers and practitioners would benefit from research that investigated whether female directors and sustainable performance were linked.

To ascertain the economic performance of firms listed in the ASX, in 2007 he collected and analysed data from secondary databases, and then studied the environmental and social dimensions of the sampled firms using content analysis of annual reports. The results showed a positive association between women directors and economic and social performance.

“There are several reasons for this. Firstly, male board members tend to have had a continuous background in business enterprise – they are accustomed to reacting solely from an economic viewpoint,” Galbreath said.

“They may have been socialised to behave financially, for example, by submitting shareholder funds for personal gain through large bonuses and other executive perks.

“Female board members, on the other hand, often come from ‘social’ organisational roles – for example, not-for-profit organisations or charities. Research suggests that women encourage business integrity and are more inclined to ensure codes of ethics are in place and enforced, which can protect against misuse of shareholder funds.”

Diversity in the organisational backgrounds of board members is also likely to encourage women to bring new discussion about the firm’s corporate behaviour and critical debate about board responsibilities and processes.

“Having more women on boards helps ensure that economic activities are balanced against environmental and social requirements. This may be due to the greater ‘relational’ capabilities of women, who work to see that all stakeholder requirements and concerns are addressed – not just those that are economic in nature,” Galbreath said.

“Female directors help channel communication between a firm and its stakeholders. This provides a good avenue for facilitating corporate sustainability,”

cbs.curtin.edu.au/business/research
Radio astronomy all the way to SKA

The International Year of Astronomy 2009 is an ideal time to commend the Curtin Institute of Radio Astronomy for the pace of its progress and achievements in major international projects.

Australia’s case for hosting the SKA project has been strengthened by the Federal Government’s May budget announcement that $80 million will be allocated to a new Australian National Centre for SKA Science to be established in Perth. The federal support follows a recent $25 million investment by the WA Government in the International Centre for Radio Astronomy Research (ICRAR). Hall and Tingay are Deputy Directors of ICRAR, which is an equal joint venture between Curtin and UWA that is focused on technical astronomy, science and engineering aspects of the SKA.

Tingay is Project Manager for the Murchison Widefield Array (MWA) project under development at the Murchison Radio-astronomy Observatory. The project is a major international collaboration between a number of US, Indian and Australian research teams. “The MWA will be a completely new type of radio telescope. Rather than an array of dishes, the MWA will be a configuration of ‘tiles’, each consisting of 16 antennas,” Tingay said.

“Tingay’s world-renowned expertise in a technical domain known as Very Long Baseline Interferometry (VLBI) has led to other breakthrough projects in WA. “VLBI combines and measures radio signals simultaneously from an array of telescopes separated by hundreds to thousands of kilometres,” he said.

“We’ve been developing software correlation techniques for the technology which will require high-speed optical fibres and a cache of supercomputers to process terabytes of astronomical data.”

“Those will generate real-time, wide-field images of the radio sky, and reveal more of the Universe’s radio phenomena in exquisite detail.”

Tingay’s ICRAR team, in collaboration with CSIRO, recently demonstrated how astronomical data could be transferred between the radio receivers on one side of Australia and computational facilities on the other. The demonstration used an AARNet transcontinental 10 Gbps connection, and was supported locally by iVEC (WA’s advanced-computing facility).

Hall joined Tingay at Curtin in 2008, coming from the position of International Project Engineer for the SKA and bringing unmatched insight into the design of the instrument and the policy development surrounding it. His research is concerned with the development of pivotal engineering technologies required for the SKA, and of decision-making tools for what is an extremely complex science and engineering design environment.

“For example, CPA will be concerned with the development of next-generation aperture array antennas, which is a natural fit to our present work on the MWA,” Hall said.

“At the local level, we’re working with Poseidon Scientific Instruments on the design and manufacture of MWA receiver systems and other electronics, with a view to extending the collaboration to new arrays.”

Hall also chairs the international Power Investigation Task Force for the SKA.

“The development of an efficient, alternative energy scheme for remote sites is a critical goal,” he explained. “And CPA is working closely with Horizon Power to achieve this.”

Hall and Tingay are also applying their complementary skills to the design of software and hardware instruments for the detection of cosmic transients: a new class of astronomy that promises to reveal the time-variable nature of the Universe, giving insight into new astrophysics.

Clearly, CPA’s capabilities for developing infrastructure and new technologies will enable many advances in radio astronomy. The International Year of Astronomy has marked the beginning of a brilliant future.
Better health outcomes for individuals and communities are the end goal of a major collaboration to establish Australia’s Population Health Research Network.

Consisting of nodes distributed throughout Australia, the Population Health Research Network (PHRN) will provide Australian health researchers with high-tech health data linkage facilities and services. But why is it important to efficiently link health data?

"Because all too often health policy is formed on an ad hoc basis to meet deadlines, without high-quality data to support the policy or expenditure," said Curtin’s Professor of Health Services Research, James Semmens.

"Health researchers know that collated health data has been under-utilised. This affects health policy, the provision of health services and individual health outcomes."

The Commonwealth Government has responded to the need and is providing $20 million for the PHRN, supplemented by a further $31.7 million from state governments and academic institutions via the National Collaborative Research Infrastructure Strategy program. Curtin has been provided with a budget of $3.6 million over a four-year period to establish and run the network’s Centre for Data Linkage (CDL).

The CDL will comprise a secure data linkage facility that links Commonwealth and jurisdictional datasets – and between those datasets and research datasets – using demographic data. The CDL will collate jurisdictional linkages into a national system, and assist with the delivery of linkable data to health researchers.

"The responsibility reflects our success with the WA Record Linkage Project and the Data Linkage Australia Centre of Excellence (WA) over the past 15 years. Security and privacy of data is a priority for the project, which will institute WA’s best practice protocols and block requests for identified data," Semmens said.

"It’s important to understand the CDL won’t hold the datasets, but will link the demographic data that has been separated from the remainder of each dataset to create ‘linkage keys’.

"Such complex integration of health data sets is enabled by the technological advancements that have paved the way for this project."

During the next six months, a number of international researchers will arrive in Perth to help establish the CDL and coordinate the essential infrastructure for maximising data linkage. The executive team currently includes Professor Christine O’Keefe, who has been seconded from CSIRO; James Boyd, who has been central to the development of the Scottish Record Linkage Project; and Anna Ferrante, seconded from The University of Western Australia and who has been responsible for the development of the WA Crime Research Database.

"The CDL team will also have a vital research role in the development of better data linkage systems and methods. And a key part of that will be the evaluation and quality assurance of new linkage systems and methods," Semmens said.

"I anticipate that the PHRN will transform the way that taxpayer funds are spent on public health. So, returning to a point I’ve made before, I don’t think we should be asking whether it’s ethical to do data linkage; the question is whether it’s ethical not.

healthsciences.curtin.edu.au/research

Highway to Better Health

Marine science and technology

Dr Nigel Gee arrived from the UK in late 2008 to visit Curtin as the inaugural recipient of the Innovator-in-Residence fellowship, with predictions of a new era in marine innovation, propelled, in part, by “polices that respond to climate change driving greener solutions for marine vessels – lower-power ship designs, lower emissions, bigger ships.”

He is known for his groundbreaking concept of the world’s fastest, large naval vessel for passenger-only catamaran in the world. His four-month visit to Curtin was an initiative by the Director of the Centre for Marine Science and Technology (CMST), Dr Kim Kaka.

"Nigel is an internationally renowned designer and engineer, with considerable experience in research and development programs," Kaka said. "We knew his expertise would be valuable in anticipating the needs and expectations for marine technology research.

"Australia has a reputation for marine technology innovation. However, we’re anticipating a severe skills shortage in engineering and naval architects that will adversely affect our local marine industries."

The CMST was founded in 1985 as a marine technology research and development facility to advance technical ocean-related skills in Australia. The centre’s expertise falls under three broad areas of marine acoustics, hydrodynamics and underwater visualisation technology.

Gee was able to take a six-month break from his consultancy work in the UK and offered CMST researchers and research students a leading naval architect’s perspective on how best to advance technological innovation – and promote collaboration – with industry. He anticipates that there will be a greater synergy between industry and academia so that university–industry collaboration will develop ideas within a rigorous scientific framework able to validate those ideas.

"And, departing from the strictly science perspective, he also noted that the use of industrial designers is a recognition by industry that aesthetics, ergonomics and user-friendliness are aspects of innovative products that are as important as pure functionality," as a result of Gee’s insights, the CMST will begin focusing research on a number of new areas in applied research to ensure Australia’s ships are both economically and environmentally sustainable.

cmst.curtin.edu.au

Associate Professor Dawn Bessarab

Centre for International Health, Faculty of Health Sciences

A ssoicate Professor Dawn Bessarab joined Curtin’s Centre for International Health in 2008, with a four-year research grant to help develop a high impact research in Indigenous health. With a career background in Indigenous-specific social work – particularly in family and domestic violence, community development, child protection and justice issues – Bessarab considerably bolstered Curtin’s expertise in Indigenous health research. Her past role with the then Western Australian Department for Community Development and the Department of the Attorney General involved promoting and developing Indigenous child protection services and Indigenous policies and services in the justice arena across WA courts.

Bessarab’s research approach to Aboriginal health and wellbeing comes from a psycho-social perspective. While working in child protection, she developed a strong interest in the gender roles that exist in contemporary Indigenous society. Her PhD in social work, completed at Curtin in 2007, explored notions of identity and meanings of gender for Aboriginal people living in both urban and regional settings. She intends to soon focus this area of research into new Aboriginal women, in particular, their domestic relationships.

Bessarab is working on a number of nationally funded research projects in Indigenous health. One of these, Not Just Scholars But Leaders: Learning Circles in Indigenous Health Research, has a 21-member team of investigators who are working to build the capacity of Indigenous researchers to conduct Indigenous-specific Indigenous Health Research. The project’s themes include Indigenous communities, health services, knowledge and data, and indigenous identities and health. The aim of the project is to develop and evaluate a culturally relevant learning program for Aboriginal parents of young children. The end goal is to restore identification with culture, promote parental confidence, knowledge and child rearing skills, and enhance resilience in Aboriginal children.

Profile

Bessarab

Associate Professor

Curtin University

Dawn Bessarab

Director, Centre for International Health

Curtin University

Bessarab is also working on the Restoring Aboriginal Parenting Project – another highly collaborative Healthy Start to Life project run by the Telethon Institute for Child Health Research, which is also funded by the NHMRC. The aim of the project is to develop and evaluate a culturally relevant parenting program for Aboriginal parents of young children. The end goal is to restore identification with culture, promote parental confidence, knowledge and child rearing skills, and enhance resilience in Aboriginal children.

Profile

Associate Professor

Dawn Bessarab

Curtin University

Bessarab
Professor Tony Wright's long-standing research interest in the mechanisms of musculoskeletal pain is leading to the development of a new diagnostic test for chronic pain. He realised that evidence of a correlation between pain and cold sensitivity could lead to a useful diagnostic tool for primary care practitioners.

To support the innovation, the US-based Merck pharmaceutical company has provided $400,000 through their investigator-initiated studies program. The research includes an evaluation of the prototype Cold Pain Test in patients with osteoarthritis, and an assessment of the treatment efficacy of a relevant drug.

Research and development is continuing, with ongoing testing for optimal formulation and delivery methods, and the design of assessment software.

"We're in the process of acquiring a full patent, and will soon be involved in broader investigator-initiated studies," Wright said.

The judges for the 2008 WA Inventor of the Year Awards recognised the value of an inexpensive tool for identifying people at risk of chronic pain, and awarded the Cold Pain Test Kit top prize in the Early Stage category.

Interpretative software will enable practitioners to quickly assess the extent the patient is demonstrating cold hyperalgesia, and their risk of developing severe chronic pain, before they then select the appropriate pain medication.

The Head of Curtin's School of Physiotherapy was aware that some patients present with greater pain and sensitivity than is expected for their disorder. Wright noticed that hyperalgesic patients (those with an increased sensitivity to pain) were also more sensitive to cold, and he realised that evidence of a correlation between pain and cold sensitivity could lead to a useful diagnostic tool for primary care practitioners.

"Pain that has lasted for months or years is far more challenging to overcome than acute pain," Wright said.

"Patients who have developed a severe chronic pain disorder can struggle to find pain relief even with the strongest of medications. If we can identify these patients early on in their disorder, appropriate pain management strategies can be in place before the psychological, physical, and even social consequences of chronic pain set in,"

Wright and his colleague, Penny Moss, at the School of Physiotherapy, began collaborating with Associate Professor Heather Benson, from the School of Pharmacy. Benson brought expertise in pharmaceutical research and transdermal drug delivery to the project.

Said Wright: "We were using a thermode to investigate the link between a patient's sensitivity to cold and their sensitivity to pain. However, to install a thermode in a diagnostic setting would cost more than $30,000, so we looked for a cheaper and more practical way of testing for cold-pain sensitivity."

The team developed a test using a naturally occurring compound as a substitute, and then designed a kit containing a topical formulation that delivers a specific concentration of the compound at a controlled rate to the skin. The kit is for use by GPs and pain specialists in the early stages of a patient's treatment.

"We hope the kit will help GPs manage their patients more efficiently, and improve the quality of care they can provide."

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How did you become interested in twin research?

In 1975, I had a call from a twins’ parent group concerned about the lack of research into multiple births. There were questions, for example, regarding why some twins didn’t do as well at schools as single-born children.

Why is twin research important?

Twin research is essential because many of the factors that influence the development of mental disorders, such as ADHD, are heritable. Studies of twins can help us understand the genetic and environmental contributions to these disorders. Twin research has been crucial in identifying the genetic underpinnings of ADHD, which has led to the development of personalized medicine.

Is there a lot more research into ADHD still to do?

Yes, there is still much research to be done into ADHD. While we have made significant progress in understanding the genetic and environmental factors that contribute to ADHD, there is still much that we don’t know. For example, we are now investigating the role of specific genes in the development of ADHD, and how these genes interact with environmental factors.

The current focus is on understanding the causes of ADHD and developing effective interventions. There are many questions that still need to be answered, and twin research will continue to be an important tool in advancing our understanding of this condition.

The NHMRC has also funded us to investigate why some children grow out of their ADHD, while others continue to have problems with attention, but not of ADHD, where people have severe problems with hyperactivity.

Professor David Hay is one of very few behavioural geneticists in Australia. His 40-year research career has involved three major strands: genetic and behavioural research on twins, Attention Deficit Hyperactivity Disorder (ADHD), and children of parents with mental illness. Hay has thrice been Curtin’s Faculty of Health Sciences Researcher of the Year. He will soon retire from the School of Psychology and from an astonishingly busy academic life.