DEXA-Dan: Embedding the Corporeal Body

Artist Danny McDonald, art writer Katherine McDonald, and neuroscientist Dr Gavin Lambert outline *Confocal: A View Within*, a collaborative project f using art with science. Advances in medical science have opened new worlds of enquiry, provided fresh examinations of the human condition and raised numerous ethical and moral issues. What is the role of the artist in this creative arena of generally restricted access, and what collective role can scientists play in an alternative aesthetic, cultural and educational expression of their research? Danny McDonald addresses these questions in his monumental, digital self-portrait entitled DEXA-Dan. Installed over four storeys of the foyer window of the Baker IDI Heart and Diabetes Institute (Melbourne), in an environment that is not generally perceived as having a link with artistic practice, the artwork revealed perspectives on medical research and sought to redefine the notion of a portrait – firstly in terms of unique medical data, and secondly, as the result of collective contribution. Specifically based on a series of ethical scientific tests on the artist by laboratory researchers, it sought to ally the creative energy and skills of the artist, scientists, public relations and technical advisors of the institution with commercial digital printing and installation teams, a graphic designer, photographer and dedicated writers.

Consider the link between the synchronised industry of the insect world, cells and bacteria specifically tasked within a host that is programmed primarily for a grander function, the furious complexity of firing neurons sustaining a life form and the coordinated enterprise of a scientific research institution. Synergy is a shared characteristic here. As in nature, so it often is in aspirational human activity, and in this regard, the history of man’s successful collective creativity is long.

The project *Confocal: A View Within* was conceived by Australian artist Danny McDonald during a five-year residency in the Human Neurotransmitters Laboratory at the Baker IDI Heart and Diabetes Institute in Melbourne, Australia.1 With the collaboration of his project partner, Dr Gavin Lambert, an established clinical scientist interested in artistic expression, the artist directed the creation of *DEXA-Dan*,2 a monumental medical self-portrait installation that was adhered to four storeys of the glass window in the foyer of the Baker IDI building.

McDonald, who has long been fascinated by the symbiotic relationship between art and science, wanted to make an innovative image that challenged the notion of the artist as sole creator of his own likeness – and indeed to invent a new kind of self-portrait that he did not physically make, using interior parts of his body he had never seen – a clinical work that utilised the collective endeavour of scientists, their confocal microscopy and other tests on the artist to construct a whole body of ‘worlds within worlds’. McDonald foresaw that when daylight projected the *DEXA-Dan* image on to the building’s interior it would transpose his metaphorical body back into the laboratories from whence it came.

In their book *The Molecular Gaze Art in the Genetic Age*, Anker and Nelkin note the potential alliance of art and science in investigating and expressing cultural meaning in the physical body:
Both artists and scientists are exploring the nature of personhood, the meanings embedded in the corporeal body. Both are probing the deeper world underlying surface manifestations. Both aspire to comprehend nature’s secrets.3

Sharing the mutual aim of presenting engaging ideas to promote knowledge creation and improved understanding, art, science, discovery and education have been inextricably linked in history; artists such as Da Vinci, Alberti, Brunelleschi, Cellini, Dürer and Wren variously combined the duties of painter, engraver, architect, anatomist, inventor, industrial designer and sculptor. One might think of Calder’s modernist mobiles and stabiles as examples of science as inspiration for art and, in the latter twentieth and early part of this century, evaluate the laboratory’s influence on art in Hirst’s preserved animals, Gilbert and Georges’ blood and urine works, Stelarc’s prosthetics and Piccinini’s mutants when considering a discourse about the contemporary association of art and science.

In science, and medical research in particular, the burgeoning number of authors contributing to scientific manuscripts suggests that collective creativity is at play although one cannot discount that increased publication rates and expanding author lists are not driven by the external pressures linked with promotion, tenure and funding, rather than discovery and the realization that the contributions of the focussed collective exceed the output of the scientists in isolation. Intuitively there are obvious benefits of cross disciplinary collaborations in medical research; in partnerships between the clinician and the biochemist, the surgeon and the geneticist, the neuroscientist and the psychiatrist, each brings complementary skills to tackle a problem. But what is the role of the non-scientist in this restricted environment?

In 2004 McDonald began his informal dialogue with Baker IDI scientists and technicians with the contention that artistic and scientific thinking and experience at their highest level may be convergent or contiguous, although he felt it was difficult to reach a conclusion about their relationship as both disciplines deal with elusive, evolving and catalytic ideals and truths. He speculated that perhaps it is only the form in which their experience is explored that is different and, if art and science share original and creative thought in an effort to penetrate, perceive, conceive, demonstrate and manipulate the nature of things – then are they man’s most ambitious universal ventures? Given that art is simply the varied expressive result of creative people’s general needs and interests, and that most scientific maxims are working hypotheses under continual review, are both players in a search for something that ultimately dwarfs them?

These questions arose from McDonald’s past artwork and his Monash University Master of Arts by Research project entitled Curio-Science, dating back to a previous artist residency in the Department of Endocrinology and Diabetes at the Royal Children’s Hospital, Melbourne in 1997. Like his father at a similarly young age, McDonald had invasive heart surgery at the Alfred Hospital, Melbourne in 1995. His earlier exhibited artwork had probed the general subject of science but this event helped to focus his creative and theoretical concerns on advances in medical research and the associated impact on society that these developments have made. The Curio-Science material was art as response to issues of contemporary science and technology, and its dialectic depended upon McDonald’s artistic appropriation of medical concepts and imagery to reflect the quantic of art and
science as language systems with a personal and corporeal application – a genetic family health narrative.

Medical science emerged as a convenient host for McDonald because he was considering issues related to health as a means of personalising and fluxing the elements of science, technology and art. His residency at the Royal Melbourne Children’s Hospital, as with the subsequent Confocal: A View Within project at the Baker IDI, allowed virtually unrestricted access to the research laboratories’ visual data, imaging equipment and other facilities and provided, most importantly, an opportunity for discourse with staff about their practice and findings.

There was no formal expectation by the institution of anything from the artist beyond a wholesome discussion of the apparent parallels between the disciplines and an eventual demonstration of the perhaps esoteric findings after he had sifted through their product. The Royal Children’s Hospital and the Murdoch Institute provided resource and public relations services, graphic designer Lynda Warner assisted with image file preparation, and McDonald’s artworks were outsourced to digital printers Colour Graphic and subsequently to master silkscreen printer Larry Rawling. Funding was sourced from Arts Victoria for the printing and exhibition outcomes. The resultant artworks shown at Australian Galleries, the Murdoch Institute and Monash University were large-scale digital and silkscreen combination prints on transparent polycarbonate substrates. By recontextualising laboratory data in the form of a visual art statement, McDonald interchanged their primary coding environments, outward appearances, purposes and language devices to create two hybrid series of images entitled Bastards of Perception and Curio-Science.

Through non-literal use of laboratory imagery in some works, in addition to the schematised and diagrammatic visage of others, and the deliberate obfuscation and betrayal of original source contexts, the question of how the means of our perception and interpretation of visual information are related was introduced. The viewer was invited to speculate about the origins of the images as well as consider the unfamiliar role they had been asked to play in their new context. Here science was made to speak visually as art.

Underlying these essential purposes, and rendered more comprehensible perhaps by virtue of the artwork titles, was a personal narrative of more corporeal concern. Central to this was an application of semiotic principles in the art works’ dialogue between unusual imagery sourced from another discipline and the visual language system required to make it resonate as art. Each work had its own value but together they reinforced the thrust of the folio as a perspective on structure, biology and the source of human identity – questions that have formed the foundation of art and science over the millennia.

It was the primary interaction of all of the research elements as well as the nexus of individual works that was transcendent and which rendered the works finally as the aesthetic product of a more important and palpable process – firstly, by and for the artist, secondly, from and for the scientists, and thirdly, to and for the viewing public. As an outsider looking in to the realm of medical research as well as himself as a subject, McDonald’s Curio-Science project provided a successful model for the Confocal – A View Within investigation, installation and launch. This previously autonomous artist, a little tired of the constraints of traditional
printmaking and the commercial gallery scene, had now grown used to working with researchers and technicians in a number of very different fields, and he became more curious about melding formal research with artistic expression in alternative venues, perhaps forging a ‘playful’ connection between disciplines where there had been none before, directing teams of kindred spirit contributors and redirecting and recontextualising earmarked material to another cultural role. In this sense, the initial concept for the Baker IDI residency was McDonald’s, but the subsequent *Confocal: A View Within* project was a negotiated union and *DEXA-Dan* its well-fertilised progeny.

In 2006, as an adjunct to the Baker IDI, McDonald was invited to contribute to the Southern Graphics Council’s international conference Genetic Imprint at the University of Wisconsin, USA. There he met and exhibited with Professor Suzanne Anker. McDonald was keen to examine Anker’s views and her notion of art and science reciprocity and to find a potential subject for an artwork that could draw on otherwise distinct and dedicated cultural material. Certainly, advances in medical science have opened new worlds of enquiry, provided fresh examinations of the human condition and raised numerous ethical and moral issues. What collective role could scientists play in an alternative aesthetic, cultural and educational expression of their research?

In 2004 McDonald was introduced to Brian Jones, then manager of the Imaging Laboratory of the Baker IDI Institute. Together they formed a proposal to the institute’s management for an inaugural artist residency to form a genial co-agency and conceive a public outcome. The initial aims of the project were to explore the notion of a self-portrait, create an artwork which explores issues and perspectives on medical research in an institutional environment not generally perceived as having a link with artistic practice, take the subject of scientific research out of an exclusive laboratory environment and place it in a varied public and critical art context in order to comment on social issues.

The project was approved in principle and placed in the supervisory care of Dr Gavin Lambert, a National Health & Medical Research Fellow (of Australia) and a Senior Research Fellow and Laboratory Head of the Human Neurotransmitters Laboratory. More time was spent negotiating the scope of the proposal and pursuing philanthropic funding. McDonald and Dr Lambert extended the discussion of the relationship of art and science, the research focus and the laboratory’s purpose, and they gradually established the two discipline’s intrinsic ‘creativity’ as the common ground for a partnership.

The Baker IDI was an appropriate venue from McDonald’s viewpoint as it has a long history of innovative and productive research aimed at reducing death and disability from heart disease and diabetes. The Institute’s work encompasses molecular and cellular biology, basic research; community education and disease prevention work and clinical services; research into lifesaving and life-enhancing devices and other therapies; and training of the next generation of important scientists. It also seemed that medical research was an ideal science to investigate because so much of its activity was expressed in a variety of hard copy visual forms via digital and analogue technologies.
Appropriation of this media suited McDonald’s viewpoint as a printmaker who was familiar with visual paper print product and because this research field was, like art after all, concerned with the human condition. Underpinning his choice of medical science was an interest in contrasting both art and sciences’ apparent differences with their resemblances as if they were in fact polarities of the same discipline. There was a presumption that scientists would be interested to see their data reconfigured in the agreeable and respected form that art making might bring to this primary interface. It was thought that they might be curious about a new perspective on their own material and intrigued by the, perhaps minute, possibility that this apparently subjective view might just prompt a shift in the appraisal of their apparently objective science, as well as provide an opportunity to more seriously reexamine their specialist areas in the context of the rest of society’s concerns.

McDonald’s expectations centred on their provision of information and resources which would require a great deal of valuable staff work time. Initially, it seemed best to glean small portions of information from a wide number of people, run key ideas and questions past a central figure and form a clearer position for the project as the new material informed it.

It was soon evident that the laboratory’s specialised science and complex language could not be easily grasped in a short time frame and that McDonald’s function, as directing artist in the project did not finally depend on a complete absorption of their task. It was enough to see the potential of medical science as a means of exploring identity through the meaningful fabric of the body, as determined by a variety of information systems and coding structures. The attempted liaison of science, art and technology was also to provide a new perspective on an elusive but all pervasive Nature.

The tacit diagrams, digital hardcopy and transparencies of micro tissue sections, genetic mutations, molecular forms and gel sequences McDonald initially viewed was information arising from fundamental scientific questions, and was comprehensible to the team which utilised language systems for their expression. He was interested in the idea of representing this dedicated material as art form; extracting it from the laboratory, recontextualising and manipulating it as a kind of aesthetic and cultural hybrid. It seemed highly relevant to use the original laboratory hardcopy as a model for the resultant artwork, and McDonald began an investigation of appropriate print technologies and materials to realise a public outcome for exhibition.

Rather than produce another series of digital print works, McDonald considered an installation work and was drawn to the fabric of the Baker IDI building and in particular the potential for its façade to interact with the artwork. The existing Smorgon Atrium, already spectacular in scale and setting, might lend itself well to the portrait concept and could resonate for a wide spectrum of the Melbourne public, and particularly the community found at the Alfred Medical Research and Education Precinct (AMREP).

In addition, the atrium presented the Institute’s corporate image, and as a large open space contained by three balconied walls and the east-facing window, it provided a duality of function perfectly suited to the window print concept, and as a cultural interface. Given the recent opening of the Victorian State Government funded Day Surgery and the new arrival of the Baker IDI to the AMREP site, the
foyer window offered considerable exposure of the work.

The window matrix quickly firmed as a most appropriate location for a digital print installation artwork as each of the glass panels could function as a two-way image-reading substrate and provide a multi lens-like view within and without the structure. Images of varying size would be digitally printed on a clear adhesive substrate to be manually installed on the window.

The important role of the optical lens is worth mentioning here because it is part of a technology that reveals or creates information for the scientist and artist alike and, interestingly, it connects the concept of focus in these works with the notion of time. The lens is a means of unlocking information previously denied by the limits of our vision to reveal scales of phenomena on either side of our zone of standard consciousness. This pristine device pushes and pulls layered information from the future, present and past into a clear arena for mapping by various technologies. In this sense, the lens spans time. It can display the current physical status and expose the potential of a gene as well as manifest the history of the cosmos in our present.

By the mid-stage of the residency the dialogue with staff about the general issues of the project had been superseded by a dynamic sequence of question and answer as McDonald’s idea for an installation developed. The scientists’ interest in the concepts, application of their familiar material to his purposes and the emerging concept of the window image continued and they were at least entertained by his perhaps odd usage of their digital and analogue technologies, supplemented by his reports on and samples of allied commercial printing developments from a world outside their expertise. Implicit in their interest was an acknowledgement of mutual concern with technological interface and the importance of novel speculation as a powerful lever in the serious business of medical research. Implicit also was a mutual appreciation of the importance of finding ways to create new perspectives and transparencies on blinkered and opaque issues which form around our fascination with Nature and our being.

The residency to this point had functioned as a research mechanism for gathering and refining the concepts, issues and material content intrinsic to the larger project which was being coordinated from McDonald’s studio. Once the essential reference material had been obtained, the project escalated into the production domain and consideration of materials, equipment and processes for the visual statement became paramount.

On the basis of McDonald’s proposal for the creation of large-scale adhesive digital images for temporary installation on the four-storey foyer window of the atrium, the project eventually received keen support from the City of Melbourne to supply seeding funds. As it was envisaged that the primary artwork would take the form of a self-portrait/research visage – a definition of self through data of various kinds – McDonald intended to pictorially juxtapose laboratory imagery derived from in-house scientific investigations and ethically approved tests on the artist conducted by scientists in various Institute laboratories. Staff of the Human Neurotransmitters Laboratory largely, but not exclusively, undertook the experiments. The series of images reflects their work linking the heart and brain and draw on investigations in hypertension, obesity, orthostatic intolerance and psychogenic
heart disease. The thrust of their studies, and the final art installation, reinforces the group's observation that the sympathetic nervous system is on centre stage in cardiovascular medicine.

Being a nexus of interested, curious and, lastly, financially bound parties, the project was to be managed and directed by the artist, in partnership with Dr Lambert, and supported by the public relations team of the Institute's development department. Initially, the window imagery would be developed by the artist in collaboration with a graphic designer, and subsequently print production and installation were to be overseen by a branding company in Melbourne. The critical domain contributions of dedicated catalogue and magazine writers were also obtained at this point.

The administration of the Baker IDI perceived the multi-levelled project as an exciting private initiative to promote their valuable research, and both McDonald and Dr Lambert further envisaged the window serving as a lens, not only for the general community to ‘look in’ and discover the diversity of modern research practice, but also for the institute's scientists to re-examine their work and place it in the context of the wider community rather than within the insular environment of their peers. It was important that the artwork provide visible and educational public outcomes resonating for the critical appraisal of art, scientific and technology communities, and that benefit could be ascribed to the professional development of all key personnel within this framework.

Given McDonald's interest in the different language systems that we use to explain our experience of an apparently indifferent Nature, it was important for the project to find a subject that would translate for the artist, the scientist and the viewing public. The notion of the 'self-portrait' seemed appropriate here – a hook that everyone could hang his or her hat on. Dr Lambert determined the tests and material that helped make a useful statement, and an enormous pool of genetic sequencing gels, graphs, spreadsheets, magnetic resonance imaging, confocal and other microscopy of cells and chromosomes, brain scans, chemical diagrams, drawings, photographs, digital records, numbers, text, physician’s handwriting and the like was gathered from participating Baker IDI staff and McDonald’s hospital records. The Baker IDI Institute provided support and in-kind consultation with scientists and technicians, broad research data and library. Funding was obtained from the Living the Arts program of the Council of the City of Melbourne, Olympus Australia and in-kind support was provided by digital printers Printcomm. Another in-kind participant in the research and technical aspect of the project was Brian Jones formerly of the Baker IDI and now working at Olympus Australia who supervised the artist’s access to their scientific imaging archive and who personally conducted the confocal microscopy of the artist’s chromosome samples. The window imagery was composed with the assistance of leading graphic designer Lynda Warner and her assistant Tracey Diggins in Hobart. The installation of the adhesive images was outsourced to abseiling team Vertigo who were coordinated and supervised by the architectural signage firm Diadem Branded Environments. The artwork was documented by freelance photographer Dianna Snape, Lynda Warner prepared presentation elements such as brochure design, Katherine McDonald provided editing services; further articles and images were published in Australian art and design magazines such as Imprint, Indesign and Artichoke.
The term confocal here is meant to suggest having the same focus or foci. Confocal microscopy is an optical imaging technique using fluorescent-dyed cellular material and laser light to obtain high-resolution detail in three-dimensional form. IDI stands for International Diabetes Institute.

2 Dual Energy X-ray Absorption is an imaging test that measures bone density (the amount of bone mineral contained in a certain volume of bone) by passing X-rays with two different energy levels through the bone. McDonald's DEXA scan provided the basic structure for his artwork.

3 Suzanne Anker and Dorothy Nelkin, The Molecular Gaze Art in the Genetic Age, ed. By Philip R Reilly (New York: Cold Spring Harbor Laboratory Press, 2004), pp. 3-4. They go on to say: "By redefining the body and reducing it to an array of molecules and their sequences, geneticists are changing our understanding of human nature. The living text of this paradigm becomes a system, composed of assemblies of molecular parts responding to recipes, instructions and codes. Challenging the conventional and widely assumed boundaries between life and death, human and machine, the self and the other, the molecular model implies a radical shift in our vision of what it means to be human [...]. Such depictions of science matter. They are important in bridging the distinction between the work of science and the world of cultural meaning."

4 See Katherine McDonald, "Danny McDonald’s Confocal project at the Baker IDI, Melbourne", Imprint, 44 (2009), 17; Penny Craswell, "Art from the heart", Indesign, 37, (June-August 2009), 68-69. News diary, Artichoke, 26 (2009), 38.

The funding objective was always central to the project’s viability but the creative response, research and technical support required was driven by a pervasive altruism. From a ‘collective creativity’ point of view, it is important to emphasise the real time contributions of Dr Lambert, his laboratory team and other Baker IDI participants. The artist, editor and graphic designer provided time and creative services gratis.

Creative industries rely on networking, and successful outcomes often depend on the referral system of friends and colleagues and approval by CEOs and funding body powerbrokers. Once legitimised in this way, the creative cross-referencing gains additional value. McDonald and Dr Lambert prepared the project’s mission statement and budget submissions for philanthropic, industry and government funding bodies, and Dr Lambert became the project’s advocate within the Institute, providing the connection with his and other staff that might like to be involved. Eventually it became a broad team effort much like a film or stage production with various participants responsible for delivering particular types of material.

The project thus thrived in a positive atmosphere of ‘collective input’. Generally, people were intrigued and entertained by the opportunity to review their practice and freely offer their data and expertise to another cultural context, especially one with a prominent public face where their material would be ‘writ large’.

For the artist, the residency functioned as a privileged ‘insertion’ or ‘intervention’ into an exclusive environment that has positively contributed to the lives of many people. It is unusual for an artist to establish a residency and line of communication in such an environment, and it was another thing again to conceive of a project or work or exhibition that contributed something to art/science discourse. McDonald and Dr Lambert involved as many scientists as possible so that they would take some ownership of a work that reflected their quiet lab contributions and to make a strong statement about the Institute’s function. Importantly, the installation was viewed on as a vehicle, not only to promote their science but also to prompt further inquisition in already inquisitive minds. In its public setting, the installation allowed the general community to consider the diversity of contemporary medical research practice and reflect on their own medical destinies or molecular identity in the unusual venue of a medical precinct.

DEXA-Dan is primarily the result of instrumentation. As a clinical view from within, it attempts to explore what might constitute truth or authenticity in self-portraiture. As a definition of McDonald through data of various kinds, it is an intrinsic account via twenty-first century mechanisms, information systems and alternative technologies, elements that transcend a conventional likeness, and present new knowledge of the artist’s internal being/consciousness and materiality. One might read DEXA-Dan as satire on scientific reductionism, but it is also just a part of the artist’s ongoing exploratory use of text, language, information and imagery. Representing a point of intersection between art and science, medicine and technology, DEXA-Dan provides a graphic image expressed in alternative vocabulary as to what McDonald is, rather than what he looks like. His corporeal past, present and future is evident in a complex interplay of elements and processes that define him.