Resonance Health Ltd

Investor Handbook

Resonance Health

Be Better Informed

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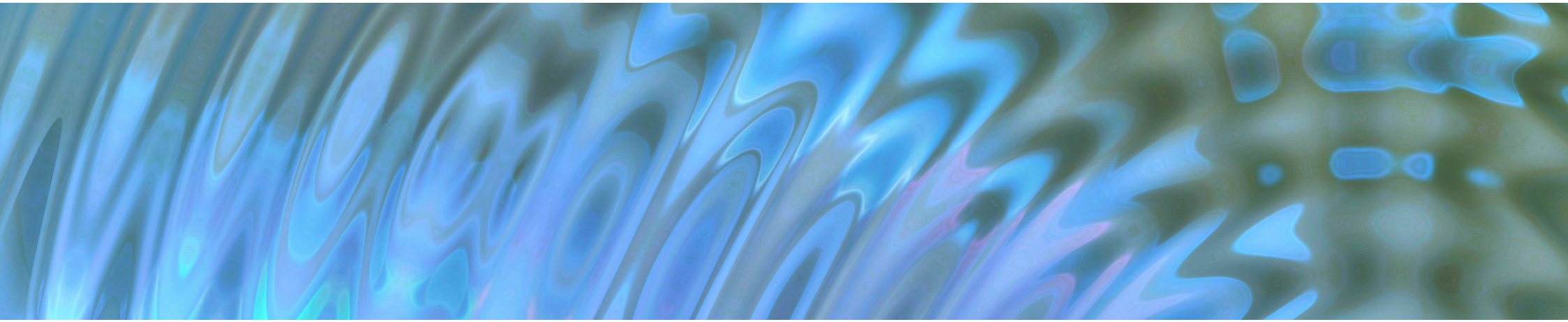


ABOUT RESONANCE

"Resonance Health provides medical diagnostic solutions for the measurement of iron-levels, fat-content and other biomarkers in human organs including the liver, heart, and pancreas."

Resonance recently announced an artificial intelligence (AI) prototype to measure liver-iron-concentration (LIC) in a non-invasive way. This product responds to a critical need for an affordable, safe, and accurate LIC diagnostic in developing nations and has received global endorsement from advocacy groups.

The new AI test positions Resonance at the forefront of AI and machine learning in radiological diagnostics, a material growth area in medicine. Resonance is investigating a range of applications for its AI expertise including new products which are not based on radiological (MRI) scans.

Resonance's longest-standing products, FerriScan and Cardiac T2*, are recognised globally as the most accurate methods of measuring LIC in the heart and liver, providing a comprehensive picture of body iron loading. These products have received regulatory clearance (FDA, TGA, CE Mark).

Another more recent product measures iron levels in the bone marrow and has application for the approximately 50,000 patients that undergo bone marrow transplants each year. The product is a secondary application of FerriScan and regulatory clearance is expected late in 2017. European CE Mark and US FDA approval is expected late in 2017.

Other Resonance products include regulatory cleared HepaFat-Scan which provides an accurate measurement of volumetric liver fat fraction (VLFF). This product has multiple applications including the diagnosis and management of fatty liver disease which is estimated to affect approximately 35% of the US adult population.

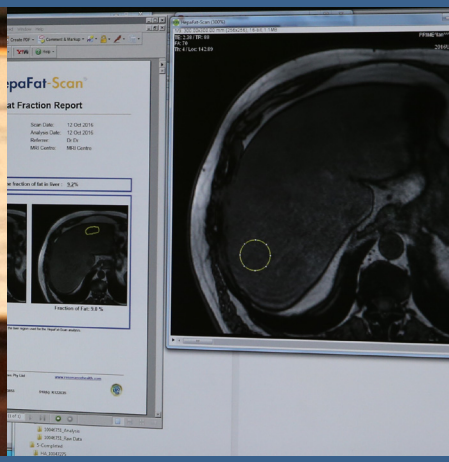
A pancreas fat assessment is now being developed and this will have application for diabetes and metabolic disease.

Resonance is listed on the Australian Securities Exchange (ASX: RHT) and is headquartered in Perth, Western Australia.

OUR VISION & MISSION

- To **better inform** medical practitioners and patients
- To be **a leader** in radiological medical diagnostic solutions
- To consistently deliver **high-quality**, customer-focussed services
- To continually develop and **commercialise** new products and solutions
- To advance healthcare and patient outcomes through product **excellence**
- To achieve these things in an ethical and **socially responsible** way
- To deliver **positive outcomes** and returns for our shareholders

WHY INVEST IN RESONANCE



1. Artificial Intelligence (AI) / R&D Investment:

- Resonance is at the forefront of AI in medical radiological diagnostics
- Developing an AI solution to meet the critical needs of developing countries
- AI automates manual intervention providing faster, more affordable diagnostics
- Widespread recognition that AI will play a major role in medical diagnostics
- Pipeline of products being developed and commercialised

2. Proven Track Record of Successful Product Development:

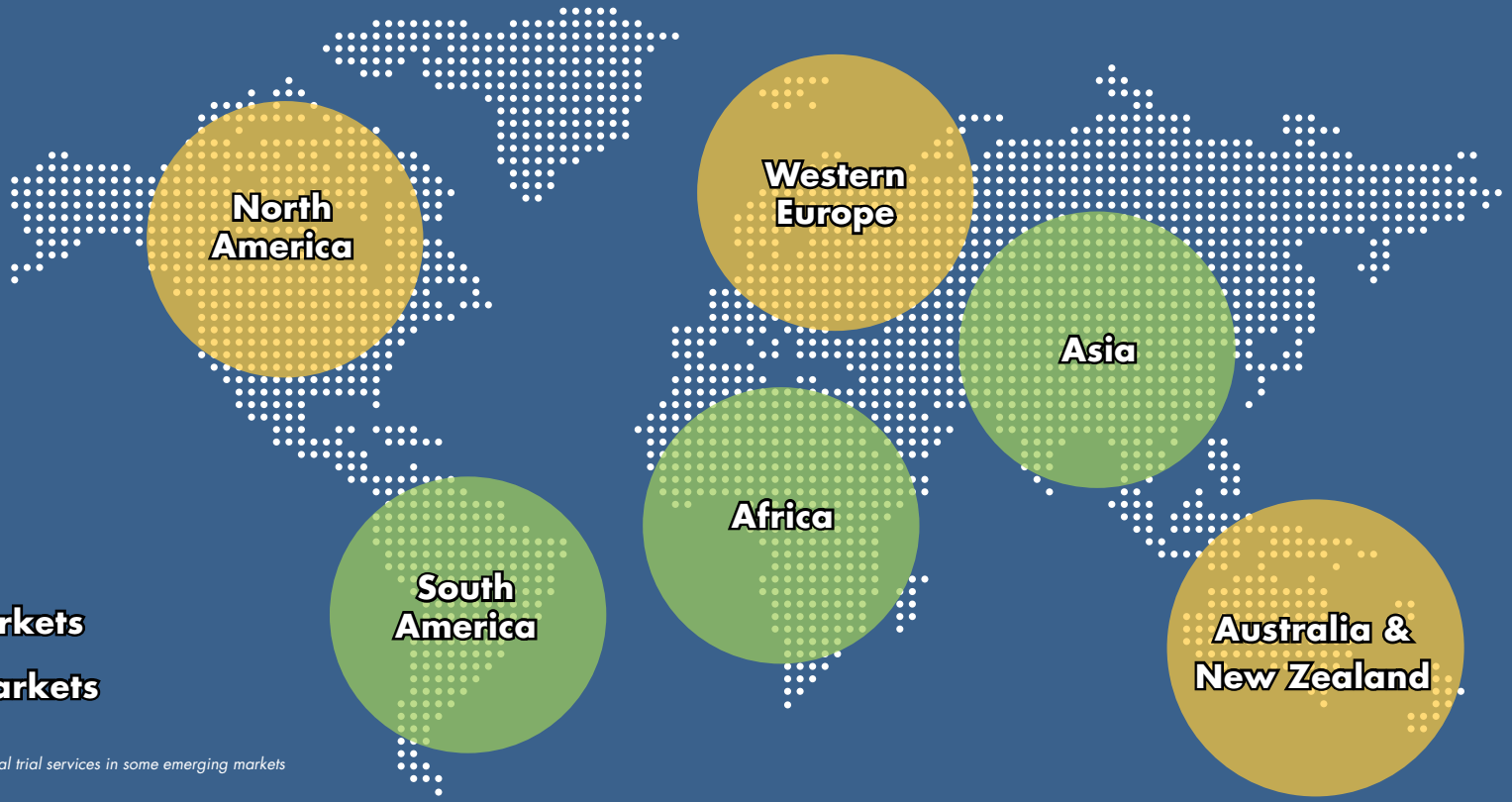
- Resonance has achieved regulatory (FDA, TGA, and CE mark) approval for multiple products:
  - (i) FerriScan (iron in the liver), approved in 2005
  - (ii) Cardiac T2* (iron in the heart), approved in 2011
  - (iii) HepaFat-Scan (fat in the liver), approved in 2014
  - (iv) Bone Marrow R2-MRI (iron in bone marrow), approved in 2017*

3. Reputation for Excellence Combined with Commercial Focus:

- 230 radiology clinics world-wide now offer FerriScan services
- 6,000 FerriScans performed in FY16 with over 35,000 performed in total
- Working towards US CPT code to make FerriScan reimbursable by health funds
- One of the few small-cap biotech companies generating consistent revenues
- Strong commitment to product commercialisation and innovation through R&D
- Nature of products calls for repetition of tests i.e. repeat income

**approval expected late in 2017*

GLOBAL FOOTPRINT MAP



*Resonance already provides clinical trial services in some emerging markets

COMPANY HISTORY & PROJECTED MILESTONES

2000
Discovery is initially 'spun-off' from UWA into Inner Vision Biometrics Pty Ltd (IVB)

2005
FerriScan obtains regulatory clearance in USA, Europe and Australia (FDA, TGA, CE)

2011
Cardiac T2* achieves regulatory clearance in USA, Europe and Australia

2016
Regulatory clearance sought for a new Bone Marrow R2-MRI iron test

2017
Leading NGO identifies critical need for an affordable LIC test in developing countries

2017
Regulatory clearance achieved for Bone Marrow R2-MRI test (FDA expected late 2017)

2017
Strategic Partnership entered into with Perth Radiological Clinic, for the expansion of AI applications

2000
UWA Physics Dept discovers new way of diagnosing iron levels using MRI

2003
IVB completes a backdoor listing on the ASX through Resonance Health Ltd (RHT)

2005
RHT achieves ISO certification (International Standards Organisation)

2013
HepaFat-Scan, a measurement tool for fatty liver, achieves regulatory clearance

2016
Milestone achieved, of 30,000 FerriScans to patients globally to date

2017
RHT announces Artificial Intelligence cloud-based solution for an affordable LIC test

2017
Beta Testing commences for the new cloud-based AI prototype

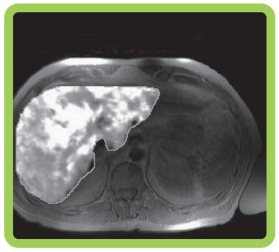
CORPORATE, OPERATIONAL & FINANCIAL HIGHLIGHTS

Resonance Health

FerriScan + Cardiac T2*
Service Model

Patient referred for MRI scan at an approved Radiology Centre

MRI data is securely transmitted to the Resonance Health Service Centre



Analysis and quality checks performed

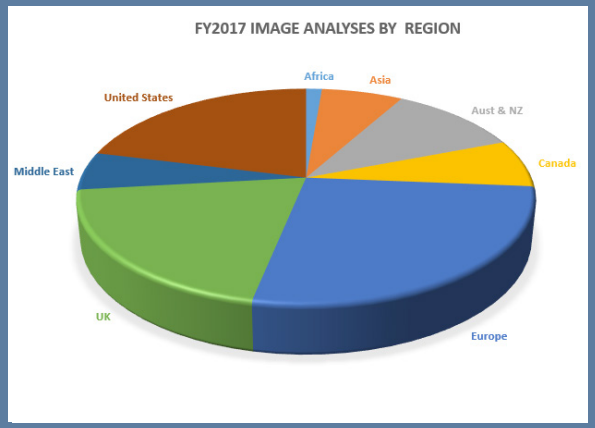
Report available for secure download by Radiology Centre within target time of 2 business days

2017 Financial Highlights:

- Revenue of **$2.6m** and net Loss of **$384k***
- R&D and marketing investment of **$1.1m**
- Eligible for R&D tax incentives and rebates
- High repetition of business (i.e. recurring services)
- Cash of **$1.6m** (30 June 2017)
- No Debt!

Capital Structure & Substantial Shareholders:

- **402.5m** shares on issue and nil options
- Southam Investments Pty Ltd **67.4m shares** (16.8%)
- SG Hiscock & Co **37.1m shares** (9.2%)
- Founders & University of WA **20.3m shares** (5.0%)
- Board & Management **81.8m shares** (20.3%)
- Top 20 Shareholders **193.5m shares** (48.1%)



Conscious decision by RHT to invest heavily in R&D resulting in overall reported net loss

BOARD & MANAGEMENT

BOARD

Dr Martin Blake	Non-Exec Chair	*Radiologist & Nuclear Physician*
Mr Simon Panton	Non-Exec Director	*Business Executive & Largest RHT Shareholder*
Dr Travis Baroni	Non-Exec Director	*PhD & Commercialisation Specialist*

MANAGEMENT

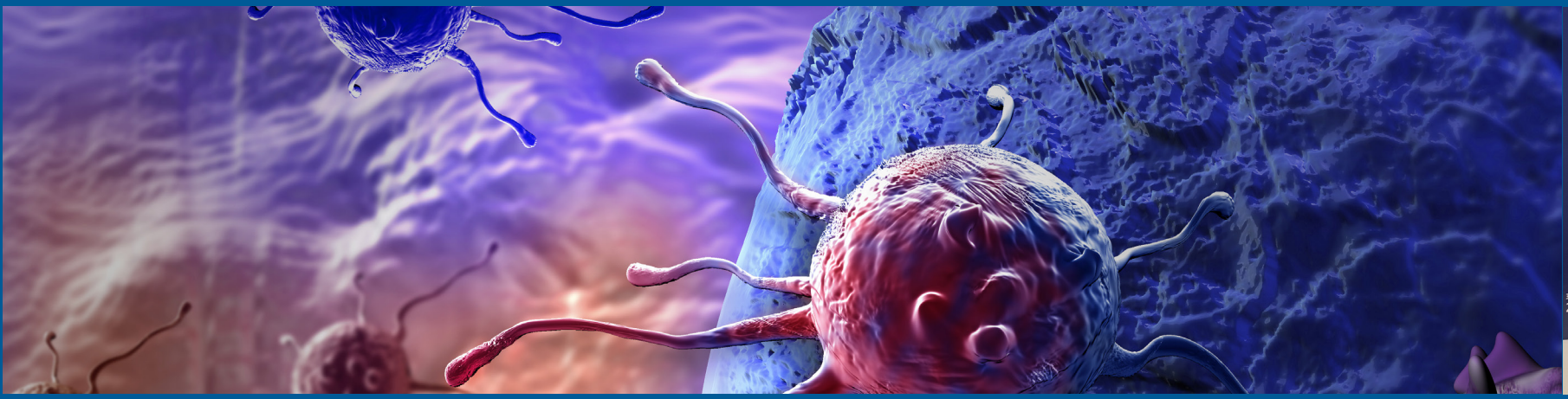
Alison Laws	Chief Business Development Officer	*Commercial, Sales & Marketing, Corporate Strategy*
Sander Bangma	Chief Operating Officer	*Operations, IT, IP & Software, Medical Devices*
Prof. Tim St Pierre	Chief Scientific Officer	*PhD Physicist & Company Founder*
Adrian Bowers	CFO & Company Sec	*Accountant & Chartered Secretary*
Melanie Baxter	Marketing Director	*Marketing & Comms Specialist (UK based)*
Celine Royet	QA & Regulatory Affairs	*PharmD & Medical Device Specialist*
Dr Sherif Boulos	R&D – Clinical	*PhD in Neuroscience*
Dr WenJie Pang	R&D – Technical	*PhD in Physics*
Assoc. Prof Michael House	R&D – Research	*PhD in Physics*

"The Resonance Health team has a strong passion for healthcare and is dedicated to making a positive impact on the clinical community.

This passion, together with a focus on commercial outcomes and a deep understanding of the markets is key to the Company's long term success; benefiting both patients and shareholders alike."

— Sander Bangma
COO, Resonance Health Ltd

HUMAN IRON LEVELS & ORGAN FAT – THE IMPORTANCE OF ACCURATE MEASUREMENT



"The need for a reliable way of measuring Iron load in the heart and liver cannot be underscored enough, first and above all for the benefit and safety of the patient…"

— Panos Englezos, President – Thalassaemia International Federation (TIF)

Millions of people globally suffer from iron overload related health disorders where the body absorbs excessive amounts of iron, either from food and drink or blood transfusions, resulting in a build-up of iron in the liver, heart, pancreas and other organs. This build-up can cause scarring of these organs (fibrosis) which can lead to further health complications.

Resonance Health's products are used to diagnose and manage iron levels in a non-invasive safe way, using MRI imaging as opposed to invasive and expensive liver biopsy. Resonance has also developed a test for measuring iron in bone marrow which could be a critical diagnostic in determining suitability for bone marrow transplants, over 50,000 of which are performed globally each year.

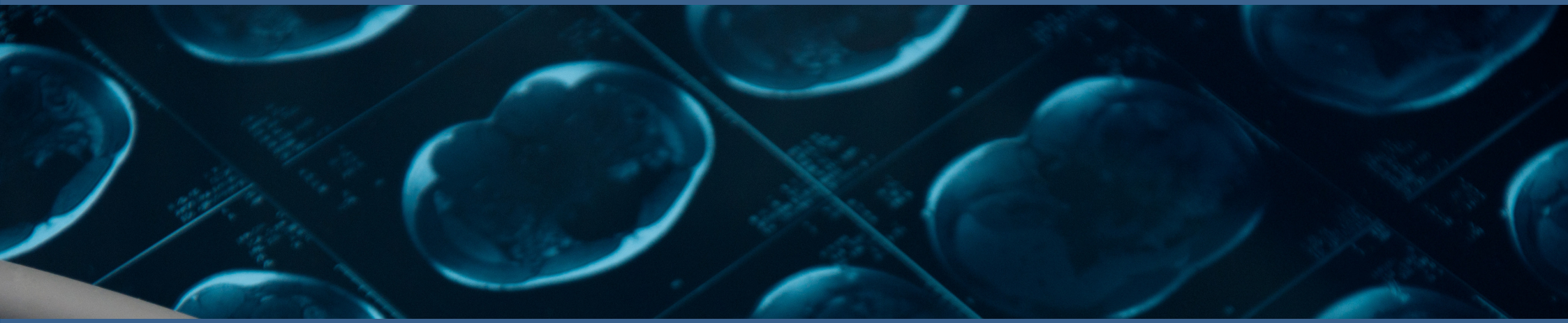
"Fat in and around human organs is related to disease and numerous health problems. One such disease is fatty liver disease which is the most common liver disease in the western world affecting 20-30% of the population, rising to 50-90% of the obese population and approximately 50% of the diabetic population."

— Alison Laws, Chief Business Development Officer, Resonance Health Ltd

Resonance's products can also accurately diagnose fatty liver disease which is estimated to affect around 30% of US adults. The alternative test for fatty liver disease is a needle biopsy which is invasive, can be painful, and carries risk. A test is now being developed to assess the fat content in the pancreas. Proper diagnosis of organ fat has applications for the management of diabetes and metabolic disease and the diagnosis of other diseases.

Resonance is working towards the automation of several products using 'machine learned' artificial intelligence. This will materially streamline and expedite the way radiological diagnostics are delivered resulting in faster, potentially more accurate medical diagnosis at a lower cost for the patient. AI is widely seen as playing a major role in the future of medicine and Resonance is at the forefront of this shift.

PRODUCT PORTFOLIO



Products in Development:

1. Artificial Intelligence / Machine Learning LIC Assessment
2. Liver Fibrosis / Inflammation Measurement
3. Pancreas Fat Assessment / Organ Volume Measurement
4. Blood Marker Test

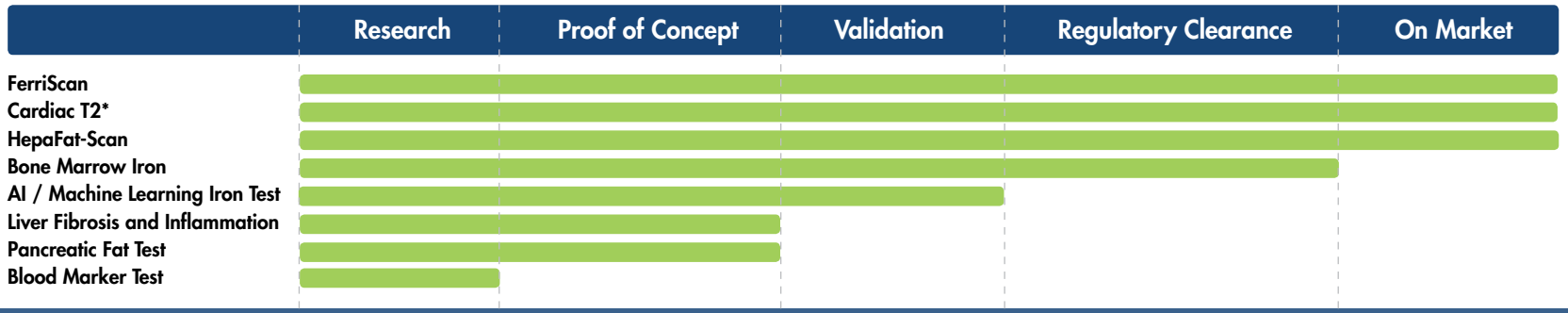
Regulatory Approved Diagnostics:

1. FerriScan	MRI Measurement of Liver Iron Concentration (LIC)
2. Cardiac T2*	Offered in combination with FerriScan for enhanced iron burden assessment
3. HepaFat-Scan	MRI Measurement of Volumetric Liver Fat Fraction (VLFF)
4. Bone Marrow R2-MRI	MRI assessment of Bone Marrow Iron

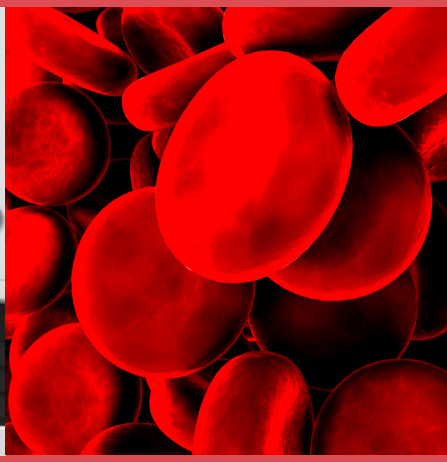
"What if an algorithm could tell you whether you have cancer based on your CT scan or mammography exam? While I am certain that radiologists' creative work will be necessary in the future to solve complex issues and supervising diagnostic processes; AI will definitely become part of their daily routine in diagnosing simpler cases and taking over repetitive tasks. So rather than getting threatened by it, we should familiarize with how it could help change the course of radiology for the better."

— The Medical Futuris (medicalfuturist.com)

Product Development and Commercialisation Status



FERRISCAN & CARDIAC T2* (IRON TESTS)



What it is:

- Measures, diagnoses and manages iron in the liver and heart
- Alternative to FerriScan is liver biopsy which is invasive and expensive
- These products are generating sales revenue for Resonance
- Cardiac T2* is offered in combination with the FerriScan test

How it works:

- Iron is stored in the liver where it can cause permanent liver damage
- Cardiac T2* assesses iron in the heart where iron can lead to heart failure
- Ongoing management of disease benefits from repeat use of FerriScan
- Used by pharmaceutical companies in clinical trials for efficacy of products

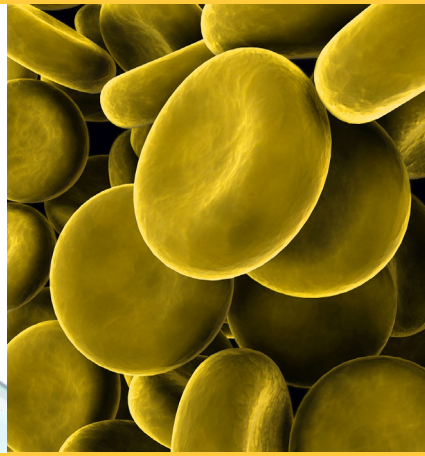
Commercialisation:

- 6,000 FerriScan measurements performed in FY16, over 35,000 in total
- 230 radiological centres worldwide certified to perform scans
- US$250 approx cost per FerriScan plus US$100 for Cardiac T2*
- Largest markets are USA, UK, Europe, Canada and ANZ
- FerriScan is on rebate schemes in Europe and Canada

"FerriScan is globally recognised in the clinical community as the gold standard method for measurement of liver-iron-concentration (LIC). FerriScan is the LIC measurement relied upon by clinical Key Opinion Leaders to assist them in determining the optimal treatment for patients with a range of iron overload conditions. FerriScan has further substantiated its reputation as the only method offering a non-invasive, reliable, accurate and safe measurement of LIC, a parameter critical to the wellbeing of a substantial patient population worldwide."

— Sander Bangma - COO, Resonance Health Ltd

HEPAFAT-SCAN & PANCREAS FAT (FAT TESTS)



What it is:

- Hepafat-Scan assesses amount of fat in the liver, obtained regulatory clearance in 2014
- Application in diagnosis/management of fatty liver disease, diabetes, metabolic disease, and surgery
- Objective is for HepaFat-Scan to be used for the routine care of patients including NAFLD
- Pancreas fat test still in development, studies will determine if regulatory clearances are sought

How it works:

- Like FerriScan and Cardiac T2*, HepaFat-Scan is MRI based and non-invasive (no risk)
- Alternative test for fatty liver is needle biopsy which is invasive, painful and carries risk
- Pancreas fat test is an extension of the HepaFat-Scan technology

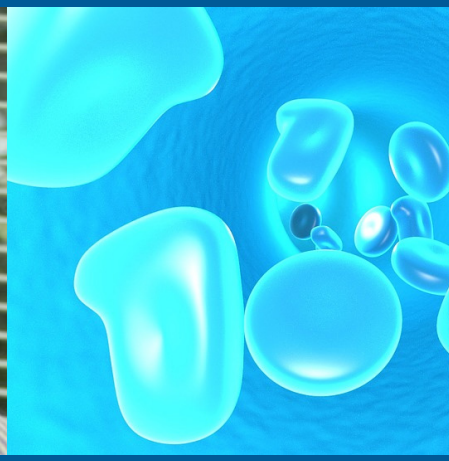
Commercialisation:

- In early stage of commercialisation, main application to date is clinical studies
- Working with global key opinion leaders to promote clinical uptake of the test
- Marketable data being obtained from these studies, to drive commercialisation
- Pancreas test is potentially important in the diagnosis of diabetes and metabolic syndrome

"HepaFat-Scan has substantial advantages over both liver biopsy and magnetic resonance spectroscopy (MRS) in terms of its accuracy, ease of use, and patient safety. Although the current gold standard for assessing liver fat is via liver biopsy; this technique is invasive, painful, and lacks sensitivity due to its subjective nature. Conversely, while MRS is both an accurate and non-invasive test, it is very time-consuming, technically challenging, and not recommended for routine clinical use."

— Dr. Sherif Boulos,
Clinical R&D Officer - Resonance Health

BONE MARROW R2-MRI IRON ASSESSMENT (IRON TEST)



What it is:

- MRI based test for assessing iron levels in the bone marrow
- Decreased and increased bone marrow iron have clinical significance
- Multiple blood transfusions can result in increased bone marrow iron

How it works:

- High iron levels in bone marrow can create complications in bone marrow transplant
- Extension of the FerriScan and Cardiac T2* technology, uses same protocols
- FerriScan is used by some clinicians to assess patient's suitability for marrow transplant

Commercialisation:

- Regulatory clearances expected by the end of 2017
- Potential application prior to all bone marrow transplants
- 50K patients worldwide annually have bone marrow transplants (usually cancers)
- All services charged per analysis (no licence or software fees required)
- No requirement for radiology centres to purchase new equipment

"A non-invasive standardised method for assessing bone marrow iron may provide important additional clinical information to assist in managing patients being considered for bone marrow transplant as severe complications such as graft versus host disease can, in some cases, become more severe and costly to manage than the original disease of the patient."

— **Dr Josu de la Fuente, Consultant Paediatric Haematologist & Senior Lecturer at Imperial College London**

ARTIFICIAL INTELLIGENCE

What it is:

- Resonance has developed an Artificial Intelligence (AI) prototype for LIC measurement
- The higher cost of FerriScan is a barrier to its use in developing countries
- Resonance has partnered with the Thalassaemia International Federation (TIF) to expedite the development of the AI prototype

How it works:

- Automates manual analysis steps of FerriScan and hence deliverable at a lower cost
- Resonance is partnering with clinicians and advocacy groups on the AI prototype
- Potential for this application to expand distribution pathways to radiologists' desktop and MRI platforms
- Recent study shows that the alternative technique failed to identify 30% of at risk patients

Commercialisation:

- Globally there over 330K people born annually who could benefit from the new AI test
- TIF (a leading global NGO) has identified an urgent need for the more affordable LIC test
- Developing nations currently using an unsafe and un-validated test for LIC measurement
- Strategic Partnership entered into with Perth Radiological Clinic, for the expansion of AI applications

New applications of AI in Medicine

- Advances in AI are driving innovation in medicine
- Resonance's application of AI for the measurement of liver iron places it at the forefront of AI
- Resonance aims to partner with radiological companies and MRI manufacturers to apply its AI skills to new areas and develop new commercial partners with large distribution networks

"We urge all centres and health care professionals to ensure that they are using only validated techniques. TIF is seeking collaboration with all Governments, other involved stakeholders, the industry, and in particular Resonance Health, who at the moment are providing the only validated tool to date, so as to identify ways to expand to the maximum access of its patients for LIC measurements globally.

TIF has also been informed that Resonance Health have now developed a prototype for a new affordable MRI test and it is within our scope to partner with them to expedite the development and access pathways for this new test that would offer a solution for those centres with very large numbers of patients, in economically disadvantaged regions to enable access to a reliable and validated MRI technique."

— Thalassaemia International Federation (TIF) Media Release & Clinical Alert, 21 June 2017

PRODUCTS IN DEVELOPMENT

LIVER FIBROSIS/INFLAMMATION MEASUREMENT/BLOOD MARKER TEST

What it is:

- Inflammation in the liver causes fibrosis (scarring of the liver)
- Approximately 5% of the US population is thought to have NASH (liver inflammation)
- People with NASH are at risk of developing fibrosis and other long term liver complications
- In early stage of investigating new diagnostic blood marker test

How it works:

- Liver fibrosis product is based on non-invasive measurement of disease using MRI
- These initiatives still in early development stage, Resonance working on measurement protocols
- Clinicians have high interest in development of these products given prevalence of inflammation and fibrosis

Commercialisation:

- Large market for this due to the high prevalence of liver inflammation & fibrosis
- High demand for non-invasive test that measures the combination of iron, fat, inflammation and fibrosis
- Blood screen test would not be MRI based and therefore removes MRI as a barrier to use

"Considered the 'gold standard' for determining the extent of liver disease, several points of interest regarding liver biopsy should be considered. Liver biopsy is not always accurate and has several shortcomings. The procedure is invasive and not without potential complications such as bleeding and infection. At least 20 percent of patients have pain that requires medications after liver biopsy. Rare complications include puncture of another organ, infection, and bleeding. Significant bleeding after liver biopsy occurs in one out of 100 to one out of 1,000 cases, and deaths are reported in one out of 5,000 to one out of 10,000 cases."

— www.liversupport.com/liver-fibrosis

DISCLAIMER

Forward Looking Statements:

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Please seek advice from your medical practitioner or health professional about using any of Resonance Health's products or services. They will be able to advise if our products and services are suitable for you. Not all Resonance Health products and services are available in all countries.

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ADVERTISING FEATURE

AI in medical imaging

Virtual mind reads liver signs

In the war against liver disease, radiologists are getting help from an unexpected source – artificial intelligence.

Perth healthcare company Resonance Health is using AI to make the diagnosis of liver disorders both faster and cheaper.

This is vital in fighting the impact of liver disease, which is rapidly rising in the world today.

The US Health Department says almost 70 per cent of American adults are overweight or obese. In Australia, it's almost as bad: a survey by the Australian Bureau of Statistics found that more than 63 per cent of adults were overweight or obese in 2014-15. That's up from 56 per cent in 1995.

Along with obesity comes a host of related diseases. A high-fat, low-exercise lifestyle can lead to relatively benign fatty liver disease, or to the more serious non-alcoholic steatohepatitis (NASH) – a condition that can lead to liver cancer and liver failure. There's no cure for severe fatty liver disease but, if it is detected early enough, its progress can be halted. Radiology plays an important part in that detection.

Sander Bangma, general manager of Resonance, says: "Liver health is a major concern. That's why we need a better overall picture of it."

For more than 10 years, Resonance Health has provided FerriScan – an MRI scan of liver iron concentration – to 30 countries. Bangma says FerriScan is recognised as the most accurate measurement of liver iron levels.

"It's a niche product, but it's been very successful."

More recently, Resonance introduced HepaFat-Scan, which does the same for liver fat levels.

Bangma says other imaging techniques such as ultrasound don't provide the same level of information as HepaFat-Scan. And for many patients, a liver biopsy, the current gold standard for diagnosis, isn't an option.

"What HepaFat-Scan provides is a non-invasive method of ascertaining a patient's liver fat content, and it gives us a much clearer picture of that content than ultrasound does."

Until recently, FerriScan also presented Resonance with a business problem – cost.

FerriScan's high price point prohibited Resonance from entering the market in less developed countries.

"Demand for liver iron measurements is much higher in developing countries because of a prevalence of iron overload conditions," Bangma says.

That's when Resonance started looking into artificial intelligence. AI is a hot topic in the business world right now.

"The way AI solves problems lends itself perfectly to medical imaging," Bangma says.

Resonance's current scanning procedure requires a sophisticated algorithm to process the MRI data. The algorithm needs to be handled by highly trained analysts, and that's where the cost skyrockets.

"For many markets it's just not affordable," Bangma says.

"But with AI handling the algorithm, no human interaction is required. What once took 20 minutes now takes just one."

The approach has evolved rapidly, says Resonance Health's chief scientific officer, Professor Tim St Pierre.

"We've trained the AI by using our database of 10 years' worth of medical imaging," he says.

"At first, we provided it with both a patient's scans and their results, and got it to work backwards."

Resonance Health is using AI to make the diagnosis of liver disorders both faster and cheaper. PHOTO: DECADE3D – FOTOLIA

> The way AI solves problems lends itself perfectly to medical imaging.
> Sander Bangma

Once the AI "neural network" had worked out how the results were determined, Resonance provided more scans, but withheld the results to test the system. The neural network proved to be a quick learner, and now provides an analysis of imaging comparable to that produced by the human experts.

"In the last three months the AI has come a long way, and customer response has been very enthusiastic."

Beta tests of the AI are set to begin this month.

"We hope to have a commercial application in the next six months, one that'll be cheaper and provide better care for new markets," Bangma says.

Spun out of the University of Western Australia, Resonance's original focus was on non-invasive methods of measuring iron.

"We feel we reached that goal with FerriScan, but we weren't going to rest on our laurels," Bangma says. He sees the developments in AI as a launchpad into other areas of medical science.

"We already have a successful product on the market that pays the way for us to do research and development like this. The advent of AI has opened the door much wider for us," he says.

"The tools we're building could be applied to other areas of liver health, and beyond that, other parts of the body."

Partnerships with radiologists would help Resonance reach that goal faster.

"Their databanks of images can be used to train the AI to adapt to other medical imaging techniques. It's ambitious, but it's very possible," Bangma says.

"AI has really ushered in a new era for Resonance. It's a very exciting time."

What lies hidden in your medical scan?

Men's health

Jill Margo

Routine medical scans hold a wealth of hidden information not detectable to the naked eye. Now, a smart new method has been devised to extract more from these images.

The method has combined radiology and computer science to create the new science of radiomics and it is tipped to have a significant impact on clinical medicine of the future.

Just as genomics examines genes to predict your future health, so radiomics will use ordinary medical scans to determine how sick you are and to predict how much longer you have to live.

It uses algorithms to extract large amounts of data from features in the images. The algorithms then analyse this data to detect if anything unusual or pathological is lying latent in the imaged organs.

The conclusions are presented in the form of a score. If the algorithm is designed to detect heart attacks, it would score the likelihood of a person having such an event on a scale from 1 to 100.

It can predict medical outcomes in a way that doctors are not trained to do, says radiologist Dr Luke Oakden-Rayner, who is completing his PhD in radiomics at the University of Adelaide's School of Public Health.

Radiomics is just emerging and he believes one day it will provide a seamless layer on top of the conventional interpretation provided radiologists. At the push of a button a specially trained computer will present its analysis.

Oakden-Rayner has just led an international research team in a proof-of-principle study published in the Nature journal *Scientific Reports*.

It used radiomics in 48 patients over the age of 60 who had routine CT scans of the chest.

The trained computer was able to predict which patients would die within five years, with 69 per cent accuracy, comparable to "manual" predictions made by doctors.

It reached only 69 per cent accuracy because the team deliberately denied it access to factors such as age and sex, which are important predictive factors

The team wanted to see how good the algorithms were using the pure images alone. When they include the other factors, they expect the prediction will be more accurate.

The algorithms were most certain about patients with severe chronic diseases such as emphysema and congestive heart failure.

Oakden-Rayner says these skills are developed through "deep learning", a technique that allows computer systems to learn how to understand and analyse data, in this case from medical images.

After being trained on tens of thousands of images from scans, the system knows what to look for and can detect subtle patterns not visible to the naked eye.

When well-trained, they have the ability to detect underlying microscopic changes from which they can predict how long a patient will live.

"The accurate assessment of biological age and the prediction of a patient's longevity has so far been limited by doctors' inability to look inside the body and measure the health of each organ," Oakden-Rayner says.

"Our results show the computer learnt to recognise the complex imaging appearances of diseases, a skill that requires extensive training for human experts."

While the team could not identify exactly what the computer system was seeing, deep learning, may offer new hope for early detection of serious chronic diseases.

With the widespread use of high-resolution medical imaging in routine clinical practice, he says these systems – once successfully tested in large-scale data sets – could be translated to clinical use with relative ease.

The next stage of research involves analysing tens of thousands more patient images. "The way these systems learn is similar to human learning. They learn how to recognise disease by being shown lots and lots of cases, and over the course of this, they build up an experience base."

> *The computer is trained to solve problems rather than having the answers programmed into it.*

Human doctors often don't know why they've made a diagnosis. They describe it as intuitive and as the art of medicine.

Oakden-Rayner says through vast exposure, deep learning replicates how doctors understand these diseases. It is modelled on neural networks in the brain.

The computer is trained to solve problems rather than having the answers programmed into it.

Instead of writing code telling it exactly what to look for, the scientists make a powerful machine learning algorithm that learns from data as it drills down for microscopic details.

At Harvard, researchers are developing a branch of onco-radiomics to detect changes in cancerous tumours and to complement biopsy results.

And at Stanford, a team is developing an app to look at skin lesions to determine if they are cancerous.

They published a study in *Nature* earlier this year showing how their algorithm, created to diagnose skin cancer, matched the performance of 21 board-certified dermatologists.

They had compiled a database of 130,000 high-quality skin disease images and trained their algorithm visually to diagnose potential cancer.

Their next challenge is to validate the algorithm in real world clinics and make it available on a mobile device.

Jill Margo is an adjunct associate professor at the University of NSW.

Radiologist Luke Oakden-Rayner was at the helm of an international study into Radiomics.

These computer systems can detect underlying microscopic changes from which they can predict how long a patient will live, says radiologist Luke Oakden-Rayner.