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FINANCE
NEWS NETWORK

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About Recce Pharmaceuticals Ltd

- ▶ Founded in 2008
- ▶ Publicly listed on ASX 2016 (ASX:RCE)
- ▶ Whole new class of antibiotic
- ▶ RECCE® 327 – broad spectrum antibiotic for sepsis
- ▶ Qualified Infectious Disease Product (QIDP) designation
RECCE® 327 labelled under GAIN Act for:
 - 10 years market exclusivity (post approval)
 - Fast track (life of regulatory process)
- ▶ Patented manufacturing to Phase I & II volumes
- ▶ In discussion with US Food & Drug Administration



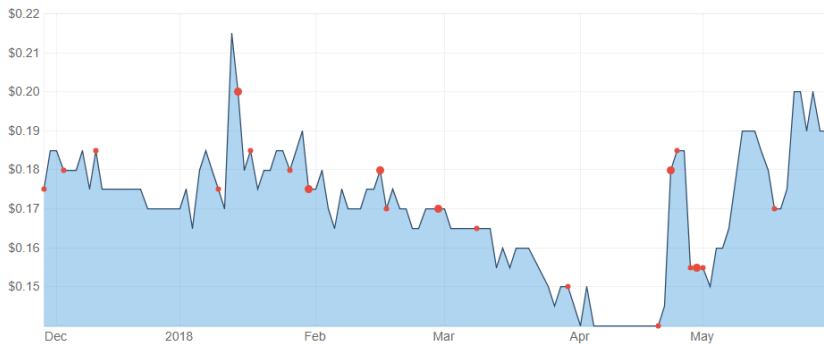
Recce is a drug discovery and development business, commercialising a new class of synthetic antibiotics to address the global health challenge of antibiotic resistant superbugs.

Capital structure

Major shareholders 31 March 2018

| | |
|---------------------------|-------|
| 1. G. & O. Melrose* | 35.0% |
| 2. Foord Asset Management | 5.2% |
| 3. J. Graham* | 4.1% |
| 4. M. Dilizia* | 3.3% |
| 5. State One Equities | 2.9% |

ASX:RCE 6 months



* Held by Executive Directors

Snapshot

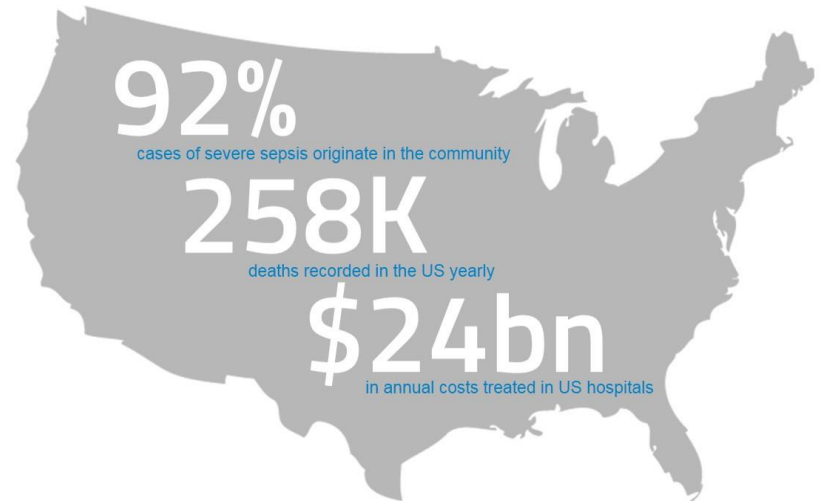
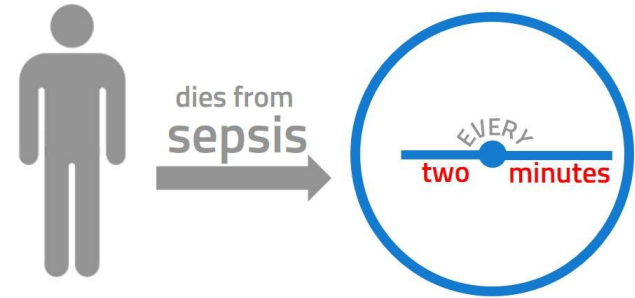
| | |
|----------------------------------|------------------------|
| ASX code | RCE |
| Shares on issue | 89.34 million |
| Share price | 20 cents |
| Market cap (approx.) | \$17.8 million |
| Cash and deposits 31 Dec 2017 | \$1.13 million |
| Trading range 52 week | 13.5-26.0 cents |
| Average daily volume 3 months | 110.7K |

Tackling Superbugs – RECCE® 327 (Video)



Sepsis – it's a big problem!

- ▶ Sepsis is a life threatening inflammatory response to infection that has spread in the body
- ▶ Leading cause of death in intensive care units and top 10 cause of mortality worldwide
- ▶ Two per cent of hospitalisations are for sepsis but they make up 17% of in hospital deaths
- ▶ Care is improving but the incidence of severe sepsis is increasing rapidly
- ▶ Most expensive condition to treat - double the average cost per stay across all other conditions
- ▶ **Currently no drug therapies specifically for the treatment of sepsis**
- ▶ Desperate and unmet medical need for new safe and efficacious products



Natural antibiotics vs synthetic antibiotics

- ▶ Overuse of antibiotics has led to antibiotic resistant bacteria in humans and animals (superbugs)
- ▶ Antibiotic resistance is widely acknowledged as an urgent global health issue
- ▶ Commercial antibiotics are naturally derived – superbugs have been forming for millennia – and will continue to do so
- ▶ RECCE® 327 is a man-made synthetic compound – no superbugs to it and detailed experimentation indicates it will never form superbugs thanks to its unique mechanism of action.



Pre-formed
natural superbugs

Contain natural antibiotics

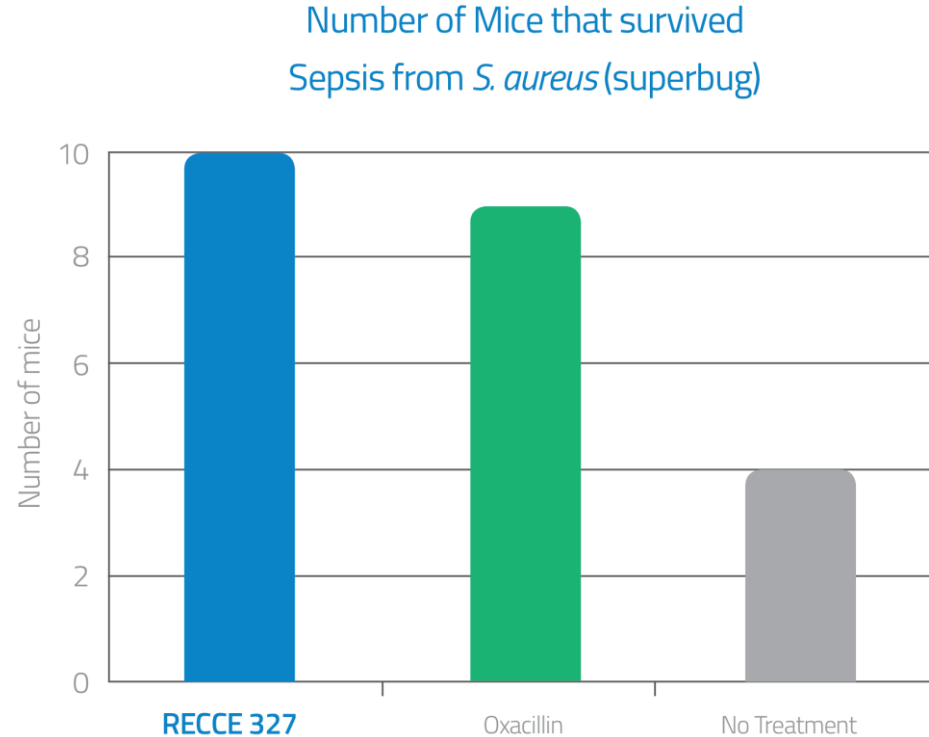


NO Pre-formed
natural superbugs

Synthetic antibiotics

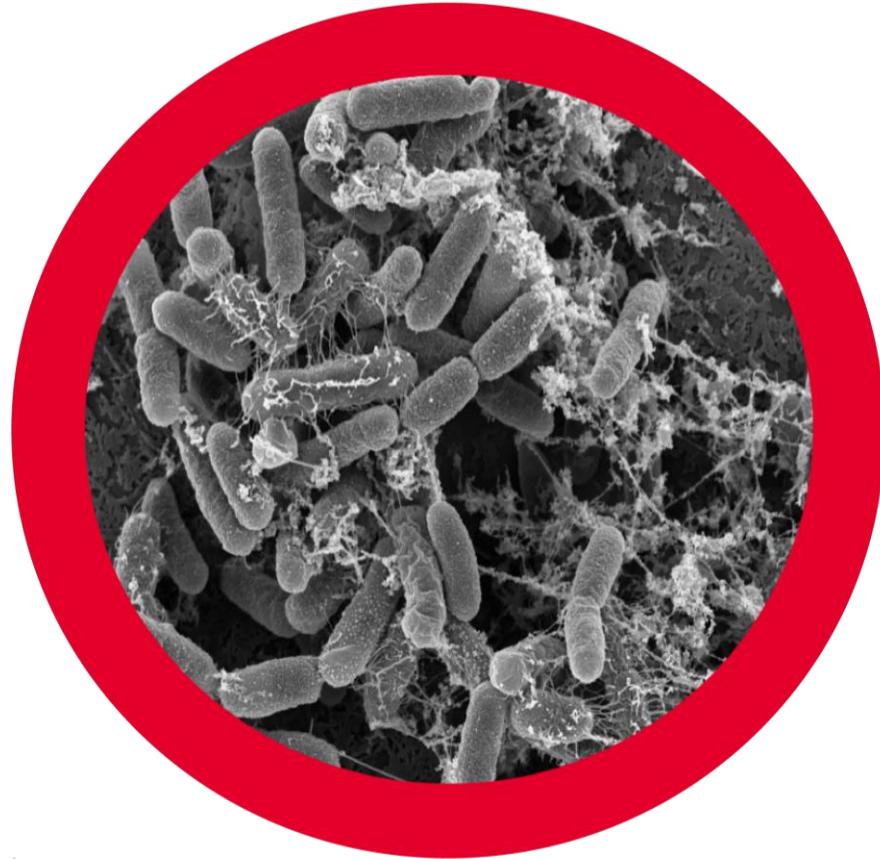
Independent study* example treating sepsis

- ▶ Three groups of 10 mice were each infected with MRSA (*S.aureus* superbug)
- ▶ All ten mice treated with RECCE® antibiotic survived
- ▶ Nine mice treated with current antibiotic (Oxacillin) survived
- ▶ Four mice that had no treatment at all, survived



* Results from an independent laboratory in USA

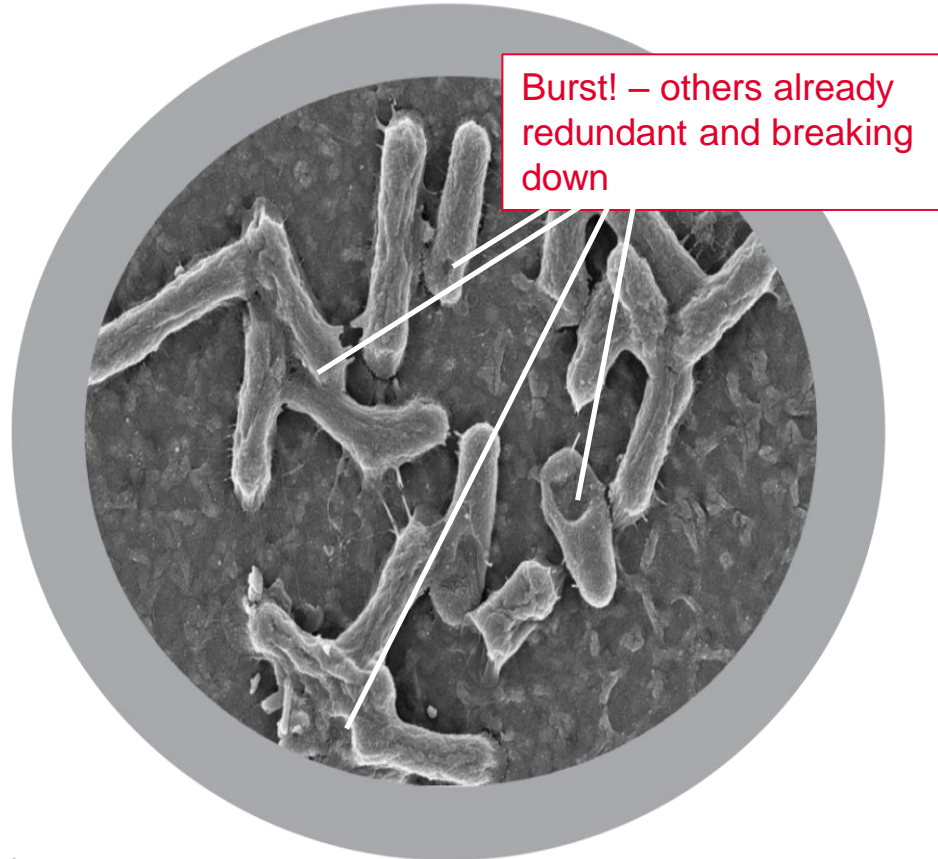
RECCE[®] 327 mechanism of action in practice



00:00 minutes

Before application
of RECCE[®] 327,
the *E.coli* bacteria
cells are healthy,
smooth and intact

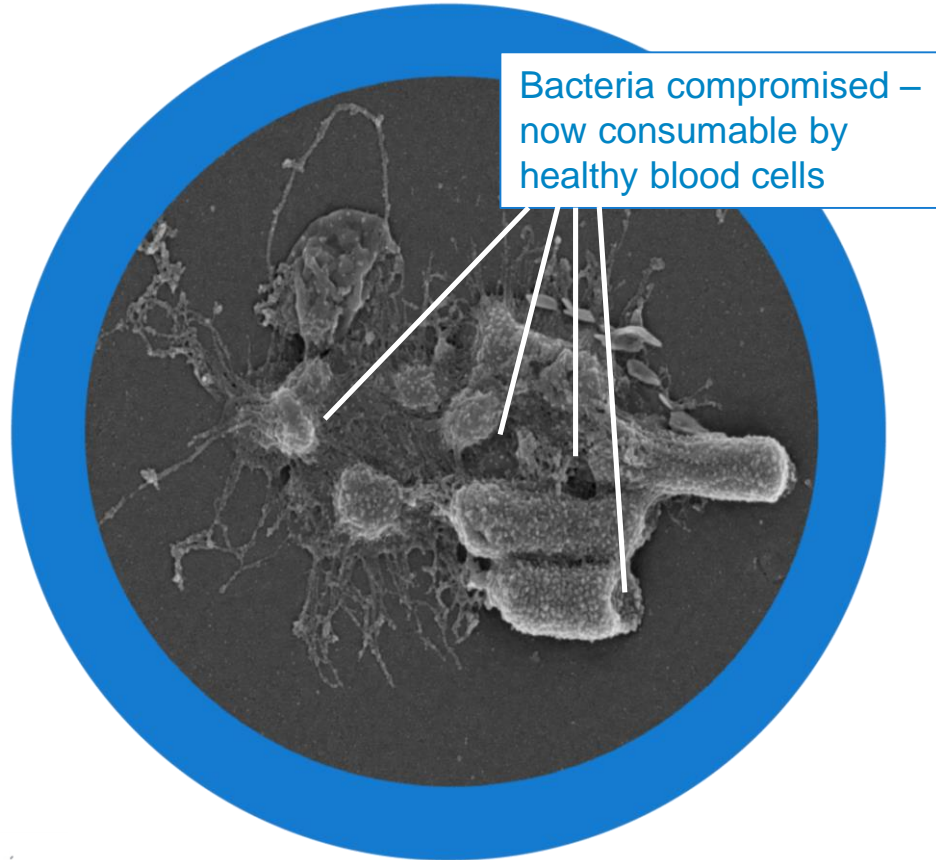
RECCE[®] 327 mechanism of action in practice



20 minutes

After application of RECCE[®] 327, the *E.coli* bacteria cell membrane begins to weaken and is disrupted

RECCE[®] 327 mechanism of action in practice



180 minutes

E. coli bacteria
cells (10e6 cfu/ml)
having their outer
membrane weakened
– and bursting from
treatment with
RECCE[®] 327 (1000
ppm)

What is Qualified Infectious Disease Product?

- ▶ Legal status awarded under *US Generating Antibiotic Incentives Now (GAIN) Act*
- ▶ Labeled for **fast track designation** – speed the FDA’s review process
- ▶ **10 years market exclusivity**, starting from the date of New Drug Application approval if RECCE® 327 completes the necessary clinical trials and is approved by the FDA
- ▶ QIDP designated drugs to treat serious or life-threatening conditions and fill an unmet medical need, are labeled for expedited review in order to facilitate their development

Qualified Infectious Disease Product (QIDP) designation is awarded if FDA considers the drug to treat “*serious or life-threatening infections, including those caused by an antibacterial or antifungal resistant pathogen.*”



RECCE[®] 327 – clinical and commercial advantages

Clinical – safety and efficacy

- ▶ Broad spectrum activity
- ▶ Same dose for pathogenic bacteria, in natural or superbug forms
- ▶ Active against superbug forms of bacteria
- ▶ Numerous studies to date indicate the safety of RECCE[®] 327
- ▶ Focus is **Sepsis, *S. aureus* (Staph) and *Escherichia coli* (*E. coli*)**
- ▶ First drug designed specifically for the treatment of sepsis

Commercial

- ▶ **FDA has awarded** RECCE[®] 327 Qualified Infectious Disease Product designation (QIDP) status – Fast Track/10 years market exclusivity (post approval)
- ▶ **Significant economies of production** (time and cost)
- ▶ Eligible for international concessions – legal status approved under *US Generating Antibiotic Incentives Now* (GAIN) act
- ▶ **Designed as a multiple product company** – technology offering multiple paths to profitability



Example for representative purposes only

Board and management structure

Dr Graham Melrose – Executive Chairman

BSc (Hons), PhD (UWA), MBA (Macq), FRACI, C Chem, FAICD

Founder and inventor. Former Executive Director and Chief Research at Johnson & Johnson (Aust) Pty Ltd in Sydney, with global responsibilities, particularly in Asia-Pacific

Michele Dilizia – Executive Director

BSc (Med Sci), Grad Dip Bus (Mkting), BA (Journ), GAICD, MASM

Co-inventor and qualified medical scientist; specialisation in medical microbiology and regulatory affairs

James Graham – Executive Director

BCom (Entrepreneurship), GAICD

Extensive experience in marketing, business development and commercialisation of early stage technologies with global potential

Dr John Prendergast – Non-Executive Director

BSc (Hons), MSc (UNSW), PhD (UNSW), CSS (HU)

US based, current Chairman and Co-founder of Palatin Technologies, Inc. (NYSE: PTN) and Lead Director of Heat Biologics, Inc. (NASDAQ: HTBX) – extensive experience in the international commercialisation of pharmaceutical technologies

Alistair McKeough (McKeough & Whittens) – outsourced Company Secretary

Alistair is a qualified lawyer and Principal/Managing Director of McKeough & Whittens, Alistair has broad experience as a commercial litigator and Company Secretary to ASX Listed companies

Justin Reynolds (Pitcher Partners Sydney) – outsourced CFO

Justin is a qualified accountant and Partner of Pitcher Partners Sydney, Justin has broad experience covering all areas of accounting, taxation and assurance. Particularly, Justin's areas of expertise are business services and outsourced accounting

Arthur Kollaras – Principal Engineer

BSc Beng (Chem), PhilEng (Enviro)

Highly qualified in chemical engineering and microbiology, has significant experience taking a new technology concept to pilot plant and full scale FDA standards and production internationally

Dr Justin Ward – Principal Quality Chemist

BSc (Chem), PhD (Chem), MRACI, CChem

A quality control expert who has worked with leading pharmaceutical companies, he is bringing Recce's research and development, and manufacturing up to US FDA requirements

Economics of antibiotic development

- ▶ Due to economic constraints big pharma has largely ignored development of new antibiotics for the past decades
 - The more effective an antibiotic is, the less likely it is to be used by clinicians who want to ‘save’ it
 - Conventional antibiotics invariably suffer resistance soon after their (expensive) development

▶ RECCE® antibiotics are designed to overcome antibiotic resistance – potentially breaking sales barriers/opening new opportunities

Example: *Unique mechanism of action indicates RECCE® antibiotics WILL NOT become susceptible to bacterial mutation (superbugs) no matter repeated bacterial exposure (use). Clinicians could quickly administer, knowing it WILL work (Gram-positive, Gram-negative or superbugs), stopping the infection – restricted use may be a thing of the past!*

Global market interest in antibiotic resistant treatments – M&A activity

| Date | Company | Acquired/merger/ acquisition by | Deal value (US\$) | Phase acquired | Detail |
|--------|--------------------------------|------------------------------------|-------------------------------|-------------------|---|
| Dec-14 | Cubist | Merck | \$8.4bn | Ph 3 | Antibiotics - one marketed - Cubicin for G-pos \$625m (revenue in 2010, over \$1bn in 2013) – mostly MRSA |
| Aug-16 | Astra Zeneca (antibiotics) | Pfizer Inc | \$1.5bn | Ph 2-NDA | Late-stage small molecule antibiotics business – most markets outside the US only |
| Jan-15 | Meiji Seika Pharma & Fedora | Roche | Up to \$750m | Ph 1 | Beta-lactamase inhibitor (ex. Japan) |
| Oct-17 | Warp Drive Bio | Roche | Up to \$387m | Device | Potential natural antibiotic identification technology |
| Dec-17 | Summit Therapeutics | Eurofarma | Up to \$27m | Ph 2 | Clostridium difficile infection (Latin America only) |
| May-16 | Vertex Pharma | Spero Therapeutics | Not disclosed | Ph 1 | Bacterial infections |
| Jan-18 | Prokaryotics | Merck | Not disclosed | Preclinical | Bacterial cell envelope enzymes |
| Mar-18 | Redx Pharma | Deinove | Not disclosed | Preclinical | Gram-negative bacteria |

Manufacturing and production

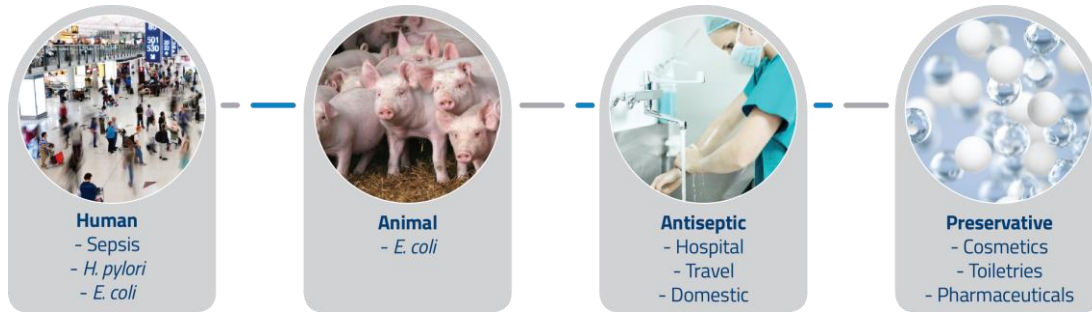
- ▶ Wholly owned automated manufacturing facility in Sydney's Macquarie Park
- ▶ Raw materials plentiful and CHEAP - few \$/kilogram
- ▶ Automated manufacture process taking around 1¼ hours
- ▶ No expensive waste – 99.9% product yield
- ▶ Currently producing in volumes to support planned Phase I and Phase II clinical trials
- ▶ Facility built to pharmaceutical specification – will grow



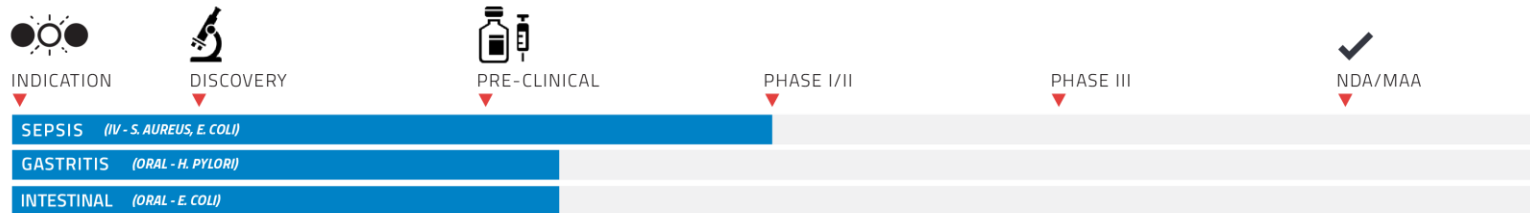
Principal Engineer Arthur Kollaras & Executive Chairman/Chief Research Officer Dr Graham Melrose assess finished product

RECCE[®] antibiotics – a technology

Recce's technology enjoys the added opportunity of multiple markets and product categories.



Current RECCE[®] 327 development program



Estimated timelines/indications are subject to changes in development plans and regulatory requirements/clarifications

NDA - New Drug Application

MAA - Marketing Authorisation Application

Patents and trademarks

Patent portfolio covers all key geographies, manufacturing and modes of use

| Filed | Patent Family 1 <u>Granted</u> | Expiry | Patent Family 2 & 3 | Expiry | Trademarks registered |
|----------------|-----------------------------------|--------|------------------------|--------|--------------------------|
| Australia | ✓ | 2028 | Pending | 2034 | ✓ |
| USA | ✓ | 2029 | Pending | 2034 | ✓ |
| Europe | ✓ | 2028 | Pending | 2034 | ✓ |
| Germany | ✓ | 2028 | Pending | 2034 | - |
| Spain | ✓ | 2028 | Pending | 2034 | - |
| France | ✓ | 2029 | Pending | 2034 | - |
| United Kingdom | ✓ | 2028 | Pending | 2034 | - |
| Italy | ✓ | 2028 | Pending | 2034 | - |
| Sweden | ✓ | 2028 | Pending | 2034 | - |
| Japan | ✓ | 2028 | Pending | 2034 | ✓ |
| China | ✓ | 2028 | Pending | 2034 | - |

Patent Family 1 – granted

Unique and highly economical manufacturing process

Patent Family 2 – pending

Applications (Multi drug delivery)

Patent Family 3 – pending

Anti-viral uses

Trademarks

RECCE® for use on pharmaceutical products and services

RECCE[®] 327 overview

Advantages unique to RECCE[®] antibiotics

- Avoids time-consuming diagnosis/guess work (patient survival decreases by 6% every hour left un-treated)
- Active against all tested superbug forms of bacteria
- Does not lose efficacy with repeated use
- New synthetic with **NO** superbugs against it
- New class of antibiotic
- First drug designed specifically for the treatment of sepsis

Corporate advantages unique to Recce

- Extraordinary economy of production in only a few steps
- Production method very easily varied to produce different antibiotics for specific purposes
- Many variants to the Recce technology opens the opportunities and securities of alternative uses, e.g. *H. Pylori*, *E. coli*, virus, veterinary and antiseptic markets

Investment summary



Thank you

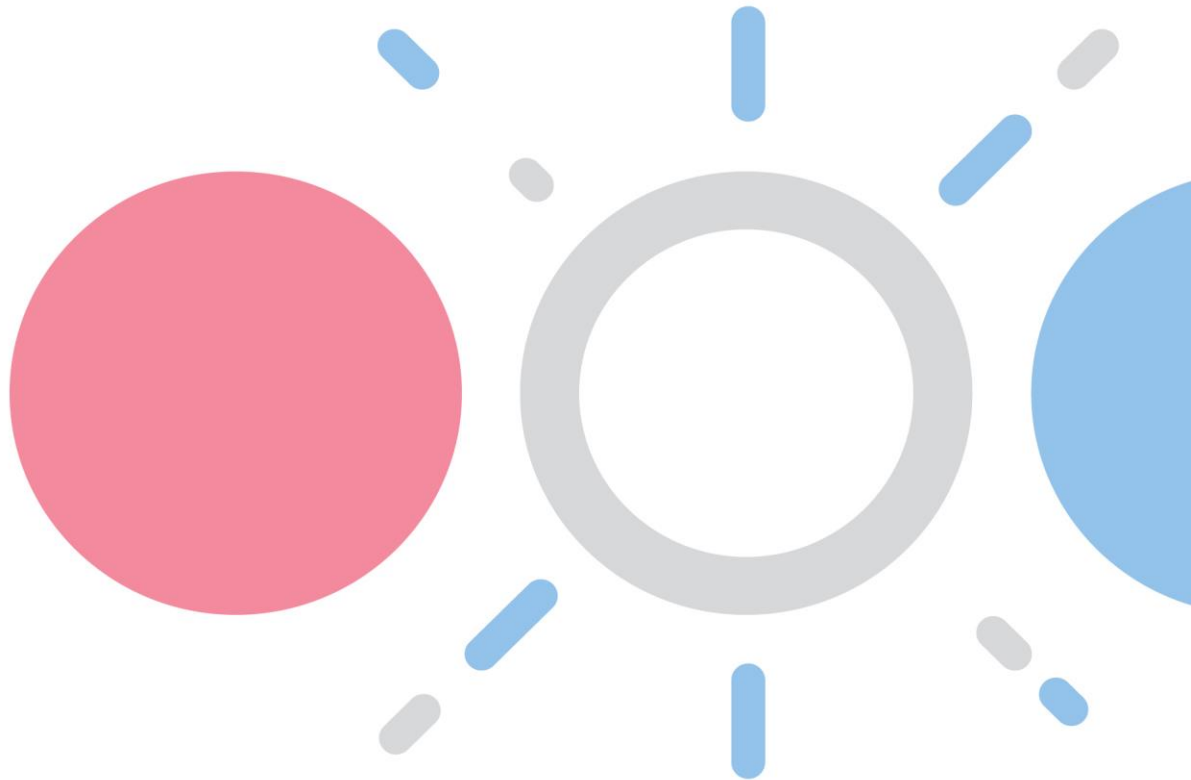
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WHO – an urgent need for new antibiotics

Global priority list of antibiotic – resistant bacteria to guide research, discovery and development of new antibiotics

- ▶ WHO published a global priority pathogens list of antibiotic-resistant bacteria
- ▶ Its purpose was to identify the most important resistant bacteria at a global level
- ▶ The list includes 12 pathogens prioritized in three categories - Critical, High and Medium

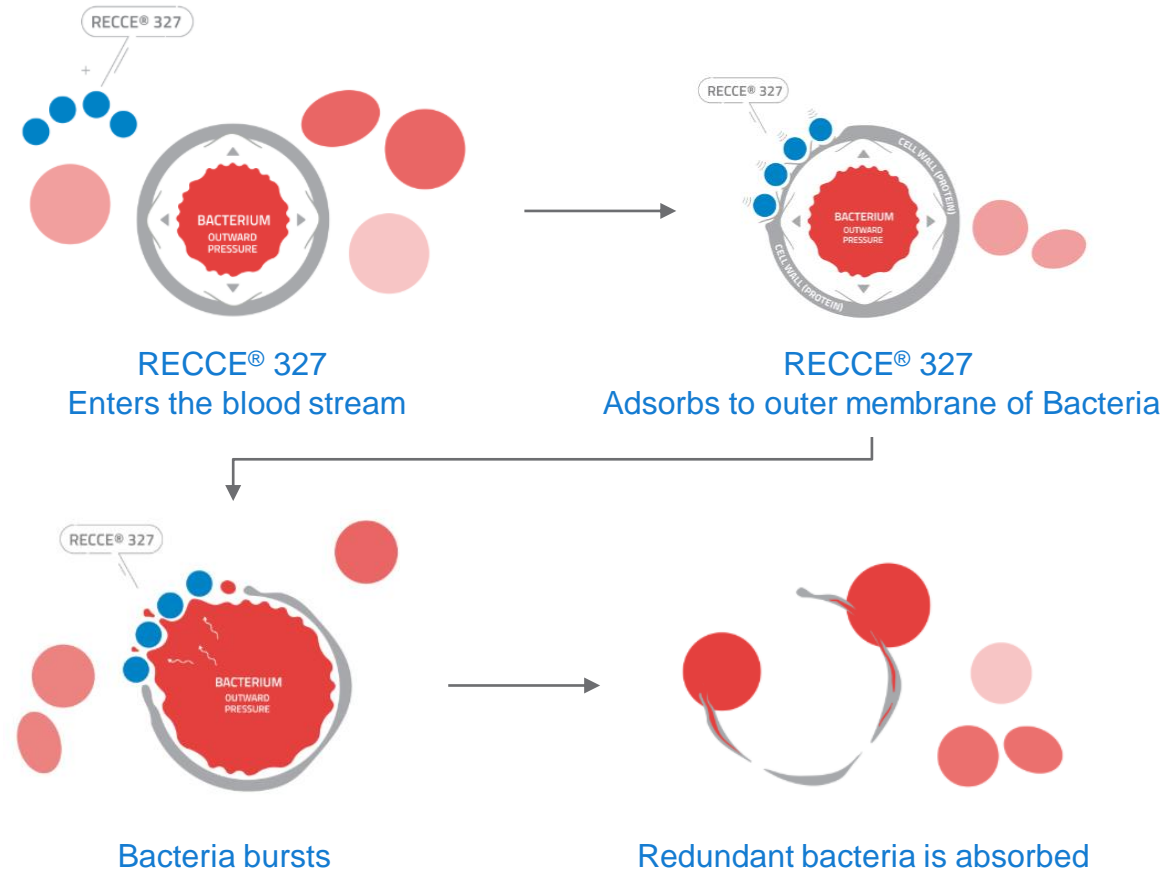
1. Active *in vitro* against Recce's own superbug of this bacterium
2. Active *in vivo* against a member of this family CRE *E. coli*
3. Active *in vitro* against a very closely related species, *Enterococcus faecalis*, Vancomycin resistant
4. Active both *in vitro* and *in vivo* against MRSA, Methicillin-resistant *Staphylococcus aureus*
5. Active both *in vitro* and *in vivo* against three strains (2 of which were superbugs)
6. Active *in vitro* against the normal bacterium (superbug form unavailable)
7. Active *in vitro* against related superbug *Klebsiella pneumoniae*

| PRIORITY 1: CRITICAL | | RECCE® 327 |
|---|---|------------|
| • <i>Pseudomonas aeruginosa</i> , carbapenem-resistant | ✓ | 1 |
| • <i>Enterobacteriaceae</i> , carbapenem-resistant, ESBL-producing | ✓ | 2 |
| • <i>Acinetobacter baumannii</i> , carbapenem-resistant | | Not Tested |
| PRIORITY 2: HIGH | | |
| • <i>Enterococcus faecium</i> , vancomycin-resistant | ✓ | 3 |
| • <i>Staphylococcus aureus</i> , methicillin-resistant, vancomycin-intermediate and resistant | ✓ | 4 |
| • <i>Helicobacter pylori</i> , clarithromycin-resistant | ✓ | 5 |
| • <i>Neisseria gonorrhoeae</i> , cephalosporin-resistant, fluoroquinolone-resistant | ✓ | 6 |
| • <i>Campylobacter spp.</i> , fluoroquinolone-resistant | | Not Tested |
| • <i>Salmonellae</i> , fluoroquinolone-resistant | | Not Tested |
| PRIORITY 3: MEDIUM | | |
| • <i>Streptococcus pneumoniae</i> , penicillin-non-susceptible | ✓ | 7 |
| • <i>Haemophilus influenzae</i> , ampicillin-resistant | | Not Tested |
| • <i>Shigella spp.</i> , fluoroquinolone-resistant | | Not Tested |



RECCE® 327 – how it works (in more detail)

- ▶ RECCE® antibiotics, attracted by protein in a bacteria's outer membrane, non-specifically attach through hydrophobic interaction
- ▶ Weakening the outer cell wall, internal pressure causes the bacteria to burst and lose viability
- ▶ Outer protein can mutate as much as it likes (superbug) - RECCE® antibiotic will still kill it



RECCE[®] 327 – safety and efficacy (detail)

► Efficacy

- Performs as a broad spectrum antibiotic
- Acts against bacteria in both normal and mutated superbug forms
- Multiple tests demonstrate efficacy against Gram-positive *S.aureus* (Staph) including superbug forms
- Multiple tests demonstrate efficacy against Gram-negative *E.coli* including superbug forms
- Rate and MIC/MKC data demonstrates potency and broad spectrum activity against range of bacteria
- Contains a patented polymeric structure, intentionally designed to overcome the traditional challenges of bacterial mutation/resistance
- *In-vivo* (mice) study against influenza virus

► Safety

- Multiple studies of toxicity in small and large animals
- Multiple tests of mutagenicity (cancer) are clear
- Numerous studies to date indicate the safety of RECCE[®] 327
- Is suited to administration against sepsis by intra-venous drip
- Indicates a safe therapeutic dosing window