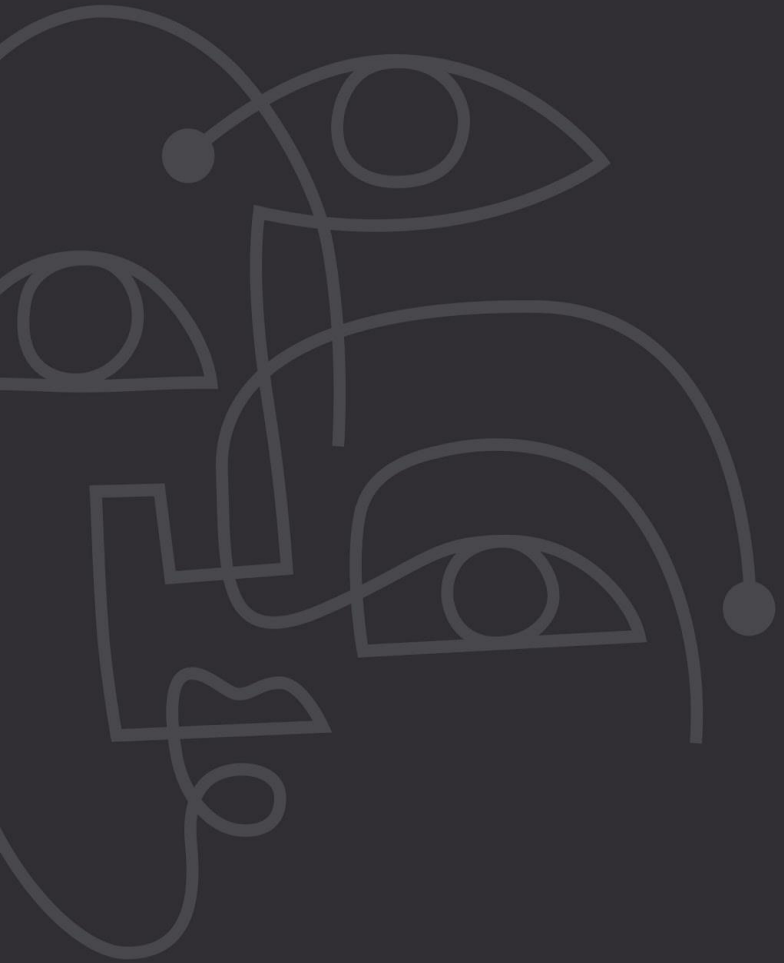

emyria (ASX:EMD)

A ***clinical stage*** biotech, informed by the ***patient experience***, focused on unmet needs in ***neuroscience*** and ***mental health***

November 2022 | Company Overview

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Presentation release authorised by Michael Winlo, CEO and Managing Director

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emyria | OVERVIEW **CONTENTS**

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An Australian public biotech company listed on the Australian Stock Exchange

(EMD:ASX) 2019

CLINICAL FOCUS

Neuroscience and **mental health**

LEADING PROGRAMS & TRACTION

CLINICAL: ULTRA-PURE CANNABINOID MEDICINES

- Emyria's proprietary "RX" platform improves the bioavailability, release profile, safety & tolerability of cannabinoid-based medicines
- Supports multiple global drug registration opportunities; FDA-ready
- *First dose form (EMD-RX5) in **Phase 3 clinical trials** (ACTRN: 12622001319763)*

PRECLINICAL: MDMA-INSPIRED MEDICINE DISCOVERY

- One of world's largest libraries of unique entities inspired by MDMA
- Partnership with Prof Matt Piggott, world recognised expert in amphetamine chemistry, from University of Western Australia
- ***Preclinical program commenced** with global leaders*

COMPARATIVE ADVANTAGES

- **Proprietary Real-World Data & tech** co-created with patients
- **A specialist clinical service** *(Emerald Clinics)*
- **Unique drug delivery platform**
- **Proprietary MDMA-inspired novel chemical entity library**
- **Global leadership** team with drug registration successes

IP & PROTECTION

Growing patent library covering **novel formulations**, **methods of treatment** and **new chemical entities**

emyria INVESTMENT **HIGHLIGHTS**

1

Proprietary Ultra-Pure CBD formulations - *partnership ready*

Demonstrated benefits over incumbent technologies.

No THC or impurities; **high bioavailability**; low patient variability & slow release.

Supports multiple dose forms & indications.

2

In phase 3 clinical trials

EMD-RX5: In pivotal ***Phase 3*** **clinical trials** to support over-the-counter registrations.

EMD-RX7: Preparing for *Phase 1* trials, preclinical studies show 4x bioavailability compared to Epidyolex™.

3

Proprietary **Real World Data (RWD)**

Emyria's clinical service, **Emerald Clinics**, has gathered the world's largest data set with patients guiding indication selection, cannabinoid dose form development and pivotal clinical trial design.

4

Substantial R&D pipeline

One of world's largest MDMA analogue libraries - novel, small, stable, brain-penetrating and neuroactive molecules with potential to become novel neuropsychiatric treatments.

5

World-class team with multiple FDA registrations

Emyria's in-house expertise covers drug development, clinical trials, drug registration, data analysis and patient care.

emyria | VISION

Accelerate the development of promising treatments where *evidence* is lacking **BY COLLABORATING WITH :**

PATIENTS to generate **CLINICAL DATA** **&** **GLOBAL EXPERTS** to create **NEW TREATMENT TECH** *(formulations & analogues)*

Register multiple treatments globally using our proprietary Ultra-Pure cannabinoid formulations, and guided by our Real World Data

Become a global leader in the development of multiple, novel neuropsychiatric treatments inspired by MDMA

1. See ASX announcement 5 August 2021 2. See ASX announcements August 2022

ADVANCED CANNABINOID DEVELOPMENT

EPIDYOLEX™ | THE WORLD'S ONLY GLOBALLY REGISTERED CBD OIL

Despite hundreds of CBD products available, only 1 product has demonstrated the **clinical effectiveness** and **product reliability** required achieve registration with major global regulators (like the FDA), driving significant value for shareholders

1998

Since 1998, GW Pharma has invested **>$2B** and run **>50 clinical trials** [1]

2018

FDA approved Epidyolex for rare seizure disorders. Evaluated as a **"small molecule"** *not "botanical"* [2]

2021

GW **acquired** by Jazz Pharma for **USD $7.2B** [3]

Jazz Pharmaceuticals

Jazz Pharmaceuticals to Acquire GW Pharmaceuticals plc, Creating an Innovative, High-Growth Global Biopharma Leader (February 3, 2021)

KEY INSIGHTS

Drug registration creates value but **we need *(1) great evidence*** and ***(2) great products***

We believe we can improve on Epidyolex oil and accelerate new drug registrations with Emyria's proprietary: **(1) Real-World Data** and **(2) unique, Ultra-Pure cannabinoid dose forms.**

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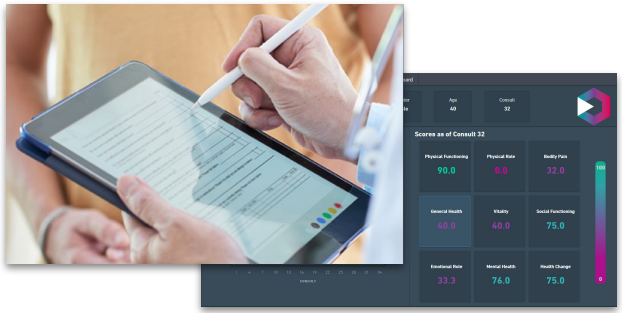
1. https://www.europeanpharmaceuticalreview.com/news/152570/highest-british-business-award-goes-to-cannabis-drug-developer-gw-pharmaceuticals/
2. GW Pharmaceuticals Annual Report June 2018
3. https://investor.jazzpharma.com/news-releases/news-release-details/jazz-pharmaceuticals-acquire-gw-pharmaceuticals-plc-creating

EVIDENCE GENERATION

Emyria's national clinical service and **remote monitoring technology** generates evidence with patients to inform drug development and care delivery.

emerald clinics | EVIDENCE-GENERATING CARE GUIDING **DRUG DEVELOPMENT**

Emerald Clinics provides care while generating clinical data from Real-World patients receiving cannabinoid-based treatment. Emyria analyses this data to learn **what treatments work best, for which clinical problems and in which patients.**



A national specialist service with
- 8 GPs
- >400 referring specialists

7,500 patients and growing:
- Ages 2-98 years
- 40+ clinical indications
- Thousands of assessments per month

Millions of data points captured to understand each patient's clinical journey

Custom-built and evolving data pipeline supported by *Palantir Foundry*

Validated assessments covering:
- Symptom response
- Clinician assessments
- Quality-of-life surveys
- And many more

Emyria's Real-World Data helps answer:

- What clinical indications and symptoms respond best to treatment?
- What dosages work best for which patient groups?
- What are the long-term safety and efficacy considerations?
- What dose forms do patients prefer?

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| WORLD'S LARGEST REAL-WORLD DATA SET *(RWD)* ON CANNABINOIDS

Emyria's comprehensive RWD is a proprietary source of clinical insights and evidence that supports our cannabinoid drug development programs.

PLOS ONE

RESEARCH ARTICLE

A large Australian longitudinal cohort registry demonstrates sustained safety and efficacy of oral medicinal cannabis for at least two years

Alistair W. Vickery[1,2]*, Sebastian Roth[1,3], Tracie Emerwein[1], Jessica Kennedy[1], Patrizia Washer[1]

1 Emyria Pty Ltd, Leederville, Western Australia, Australia, 2 School of Medicine, University of Western Australia, Crawley, Western Australia, Australia, 3 Department of Economics, University of Western Australia, Crawley, Western Australia, Australia

* avickery@emyria.com

Abstract

Introduction

Oral medicinal cannabis (MC) has been increasingly prescribed for a wide range of clinical conditions since 2016. Despite an exponential rise in prescriptions and publications, high quality clinical efficacy and safety studies are lacking. The outcomes of a large Australian clinical electronic registry cohort are presented.

Methods

A prospective cannabis-naïve patient cohort prescribed oral MC participated in an ongoing longitudinal registry at a network of specialised clinics. Patient MC dose, safety and validated outcome data were collected regularly over two years and analysed.

Results

3,961 patients (mean age 56.07 years [SD 19.08], 51.0% female) with multimorbidity (mean diagnoses 5.14 [SD 4.08]) and polypharmacy (mean 6.26 medications [SD 4.61]) were included in this analysis. Clinical indications were for: chronic pain (71.9%), psychiatric (15.4%), neurological (2.1%), and other diagnoses (10.7%). Median total oral daily dose was 10mg for Δ9-tetrahydrocannabinol (THC) and 22.5mg for cannabidiol (CBD). A stable dose was observed for over two years. 37.3% experienced treatment related adverse events. These were graded mild (67%), moderate (31%), severe (<2%, n = 23) and two (0.1%) serious adverse events. Statistically significant improvements at a p value of <0.001 across all outcomes were sustained for over two years, including: clinical global impression (CGI-E, +39%; CGI-I, +52%; p<0.001), pain interference and severity (BPI, 26.1% and 22.2%; p<0.001), mental health (DASS-21, depression 24.5%, anxiety 25.5%, stress 27.7%, p<0.001), insomnia (ISI, 35.0%; p<0.001), and health status (RAND SF36: physical function, 34.4%; emotional well-being, 37.3%; p<0.001). Mean number of concomitant medications did not significantly change over 2 years (p = 0.481).

OPEN ACCESS

Citation: Vickery AW, Roth S, Emerwein T, Kennedy J, Washer P (2022) A large Australian longitudinal cohort registry demonstrates sustained safety and efficacy of oral medicinal cannabis for at least two years. PLoS ONE 17(11): e0272241. https://doi.org/10.1371/journal.pone.0272241

Editor: Vijayanikash Suppiah, University of South Australia, AUSTRALIA

Received: July 28, 2022

Accepted: November 1, 2022

Published: November 18, 2022

Peer Review History: PLOS recognizes the benefits of transparency in the peer review process; therefore, we enable the publication of all of the content of peer review and author responses alongside final, published articles. The editorial history of this article is available here: https://doi.org/10.1371/journal.pone.0272241

Data Availability Statement: All data are included in the Supporting Information files. All the datasets used in the analysis as well as a set of instructions

Discussion

This is the largest and longest real-world analysis of the efficacy and safety of GMP-like oral medicinal cannabis (MC) in a continuous enrolment cohort registry. 3,961 heterogenous, cannabis naïve patients with a wide range of ages, clinical and complex conditions, and concomitant medications, prescribed oral MC, demonstrated a rapid and significant improvement across all measured patient and clinical reported validated outcomes. This significant improvement at a p value of <0.001, was maintained and sustained for over two years. Oral MC was well tolerated, with fewer than 2% experiencing severe TRAEs and only 2 serious TRAEs (hallucination and mania). This safety is particularly salient in contrast to the safety and tolerability of prescribed long-term opioids [21].

The Australian Emyria Clinical e-Registry (AECeR) collected clinical, demographic, dosing and safety data, as well as over 200,000 individual standardised validated questionnaires over his period. Naturally, large samples drawn from RWD have weaknesses. Such data sets can ten be unstructured, incomplete or inconsistent [22]. In this context, the development of the poke AECeR data system has auditing and compliance mechanisms to improve the rigor comprehensiveness of the data capture. Patient adherence to monitoring and questionompliance in normal administrative data sets can be uneven. Quality RWD requires ing maintenance and support.

e cohort were cannabis naïve with those testing positive for urinary THC at baseline ed except on compassionate grounds. The mean age at baseline was 56.07 years (SD and ranged in age from 2 years to 96 years. The Emerald Clinical Network is a private clinic with supplemental Medicare funding but largely patient self-funded. In Australia, oral MC is not subsidised, costing the patient an additional $AUD 2,000–4,000 per year. Despite this the retention rate in the AECeR was over 90% at six months and nearly 70% at 12 months. The average number of concomitant medications 6.26 (SD 4.61) was high, demonstrating

Read full article here

https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0272241

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emerald clinics | INSIGHT EXAMPLE

"Psychological Distress affects a high proportion of patients. Cannabinoids can help"

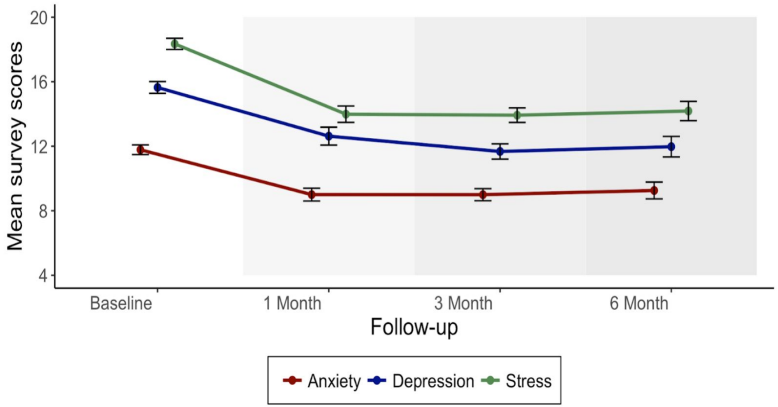
Emyria's Real World Data provides unique insights for where cannabinoid treatment is most effective across a range of important, unmet clinical indications. **Each of these indications presents an opportunity for Emyria to develop a registered medication.**

SYMPTOMS OF *PSYCHOLOGICAL DISTRESS* AFFECT MANY EMERALD PATIENTS

% of patients experiencing "mild" to "severe" symptoms of **psychological distress**

TOP 10 indications treated at Emerald Clinics	ANXIETY [1]	DEPRESSION [1]	STRESS [1]	INSOMNIA [2]
Chronic non-cancer pain	73	52	39	60
Insomnia	76	49	42	95
Cancer pain	75	37	24	75
Anxiety	57	70	73	85
PTSD	42	82	76	95
Autism	68	54	80	77
Depression	76	71	67	83
Migraine/headache	74	44	40	84
Irritable bowel syndrome	62	45	42	85
Parkinson's disease	59	52	43	89

SELECT CANNABINOIDS CAN IMPROVE SYMPTOMS OF *PSYCHOLOGICAL DISTRESS* IN SELECT PATIENT COHORTS



OPPORTUNITY: TO CREATE A RELIABLE CANNABINOID TREATMENT

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1. As measured using the validated DASS-21 assessment tool
2. As measured using the validated Insomnia Severity Index (ISI) tool

PRODUCT DEVELOPMENT

EMD-RX PLATFORM

A world-first, proprietary formulation that delivers **Ultra-Pure cannabinoids** in a solid, oral dose form with high bioavailability to support multiple, global, **over-the-counter** and **prescription** registration opportunities.

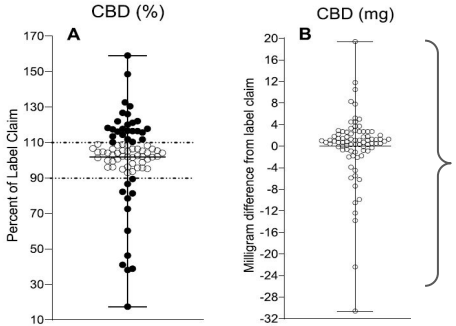
MOST **CANNABINOID** PRODUCTS HAVE LIMITATIONS

CBD PRODUCTS ARE UNDIFFERENTIATED

There are more than

products in Australia, most are undifferentiated.

PRODUCT RELIABILITY IS VARIABLE [1]



What's on the label is not in the box

BIOAVAILABILITY IS POOR [2]

Your body absorbs ~6.5% of what is taken orally

Food dramatically affects absorption

KEY OPPORTUNITY

Emyria has developed a cannabinoid product that is:

1. Ultra-Pure (meets requirements for FDA registration) **2. improves bioavailability** and has a **3. patient-preferred dose form.**

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1. Johnson, E., Kilgore, M. & Babalonis, S. Label accuracy of unregulated cannabidiol (CBD) products: measured concentration vs. label claim. J Cannabis Res 4, 28 (2022). https://doi.org/10.1186/s42238-022-00140-1
2. https://www.tga.gov.au/sites/default/files/auspar-cannabidiol-210115.pdf

EMD-RX PLATFORM

CLINICAL ADVANTAGES OVER INCUMBENTS

	EMD-RX	Vs	CBD oils *& similar preparations*
PATIENT PREFERRED FORM	**Convenient, solid oral capsules** (no spilling)		**Majority of products** are oil preparations
ULTRA PURITY	**No detectable** *THC* **No detectable** *impurities*		**Small quantities of** *THC* **Small quantities of** *impurities*
SAFE & TOLERABLE	**Safe & well tolerated** at trial doses **No observed** gastrointestinal upset		**Adverse events at higher doses** (eg GI upset)
NOVEL IP	**Proprietary** formulation		**Most CBD oils are "me too" products with generic formulations and limited IP protections**
FDA-READY	**FDA** Drug Master File for API. *Allows Emyria to reference material to regulator without disclosing contents [1]*		Most CBD oils ***do not*** meet FDA requirements for CBD purity *(with exception of Epidyolex) [2]*
PREFERRED DOSING PROFILE	**High** bioavailability**, low inter-patient** variability **& slow release**		**Poor** bioavailability**, high patient** variability
AT CLINICAL STAGE	**In Phase 3** clinical trials		**Majority of products have** no supportive trial data

KEY INSIGHT

Emyria's proprietary, FDA-ready dose form solves a number of limitations with common CBD preparations.
EMD-RX5 is ready for multiple indications and global registration opportunities with demonstrated clinical performance.

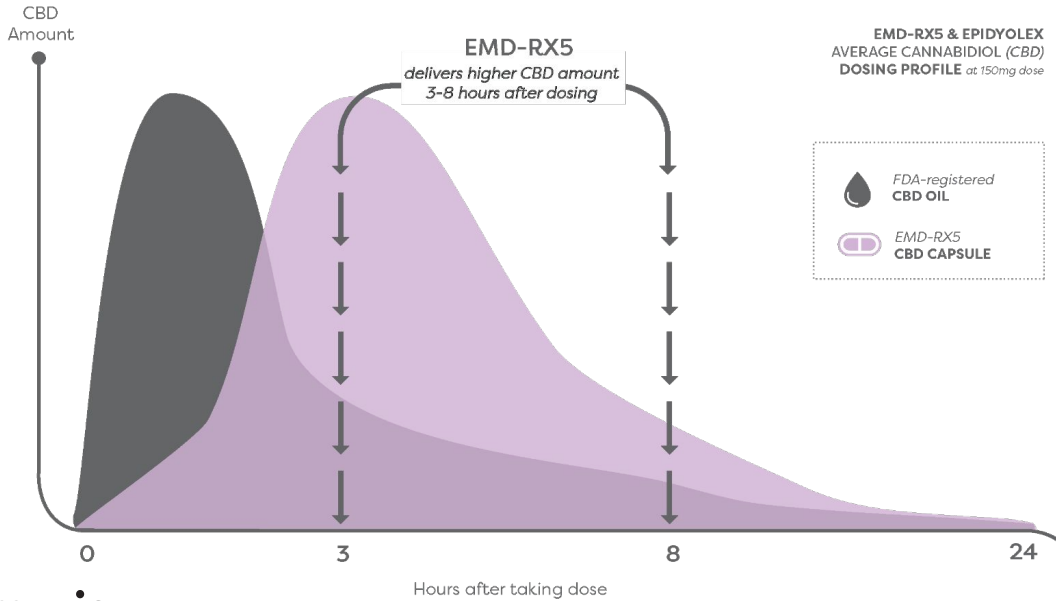
www.fda.gov/drugs/forms-submission-requirements/drug-master-files-dmfs
www.fda.gov/news-events/public-health-focus/fda-regulation-cannabis-and-cannabis-derived-products-including-cannabidiol-cbd

EMD-RX5

Emyria's first Ultra-Pure, low-dose CBD capsule is in Phase 3 trials and pursuing multiple, global "over-the-counter" registration opportunities

EMD-RX5 | ULTRA-PURE CBD *CAPSULE* VS EPIDYOLEX™ *OIL*

In less than 12 months, Emyria developed a proprietary Ultra-Pure CBD capsule and completed both animal and human trials.



Compared to Epidyolex, EMD-RX5:

Slower-release profile
(supports once to twice daily dosing)

Lower dose variability between patients
(more consistent drug exposure between patients)

Lower metabolite measures
(may contribute to improved long-term safety profile)

EMD-RX5:

Ultra-Pure CBD with a Drug Master File (DMF)
allows assessment as "small molecule" with FDA

Highly bioavailable

Safe and well tolerated
(no GI upset observed)

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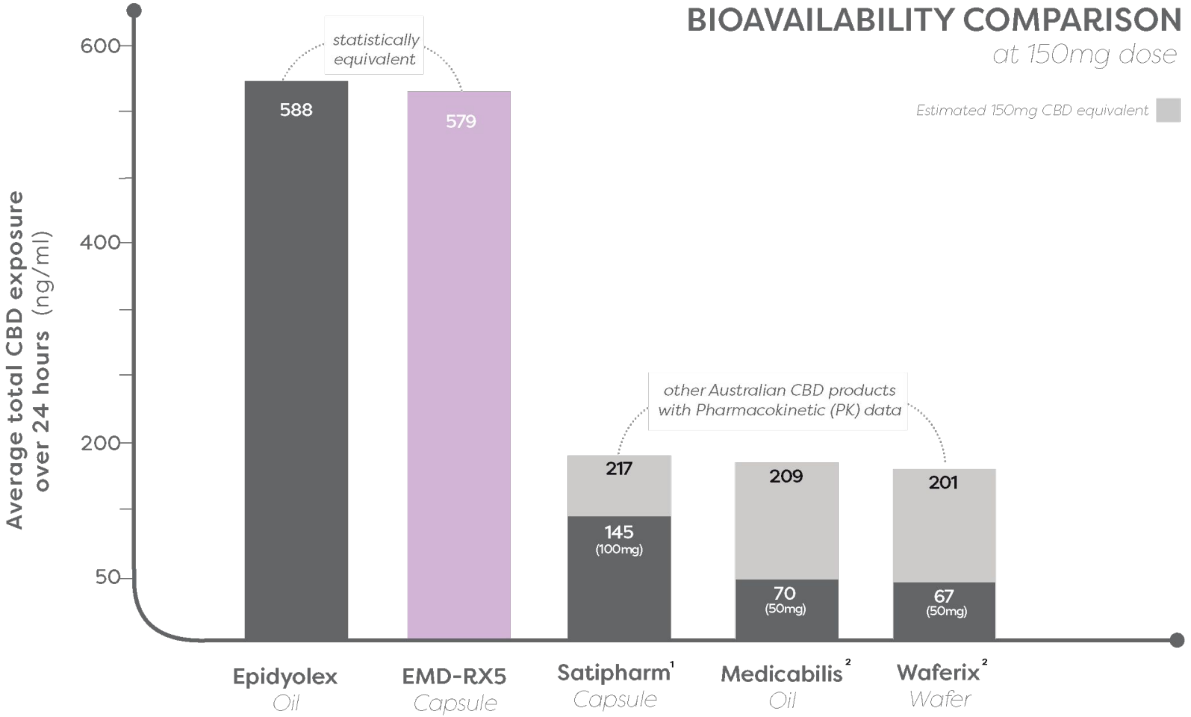
EMD-RX5 | **ULTRA-PURE CBD** *CAPSULE* **VS** EPIDYOLEX™ *OIL and other products*



[1] See ASX announcement 17 March 202

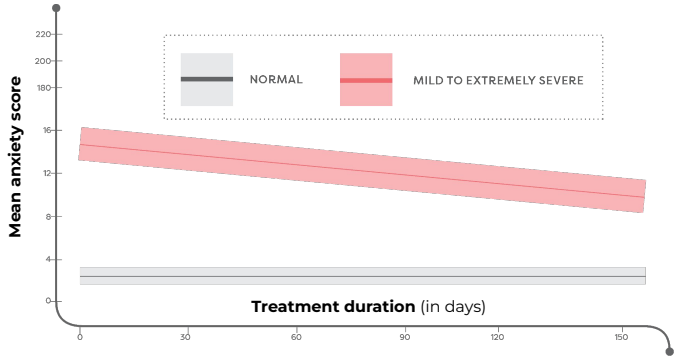
EMD-RX5 | OVER-THE-COUNTER TREATMENT FOR PSYCHOLOGICAL DISTRESS

INITIAL CLINICAL / COMMERCIAL OPPORTUNITY

15% of adults experience **high** or **very high** levels of **psychological distress** & incidence is growing [1] **There is no OTC treatment today.**

Psychological distress comprises symptoms of anxiety, stress, sleep disturbance and GI upset with a high prevalence in patients with chronic disease

INDICATION SELECTION SUPPORTED BY RWD



To develop dose form and registration trial program, Emyria generated and evaluated data on more than 600 patients receiving low-dose CBD for 6+ months

UNIQUE DOSE FORM

Proprietary formulation protects against generics

- Registered S3 treatments do not require a doctor's prescription. Australians spend **$5b/year on OTC medicines** in pharmacies [2]
- On November 2020 the **TGA allowed low-dose CBD** to be registered as an "over-the-counter", pharmacist-only, Schedule 3 (S3) medicine. [3]
- Emyria filed multiple 'methods of use' patents to cover use of low-dose CBD across a range of appropriate indications.

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1. National Study of Mental Health and Wellbeing 2020-21 series, Australian Bureau of Statistics
2. Medicines in the health system, Australian Institute of Health and Welfare (2022) 3. See ASX announcement 16 December 2021

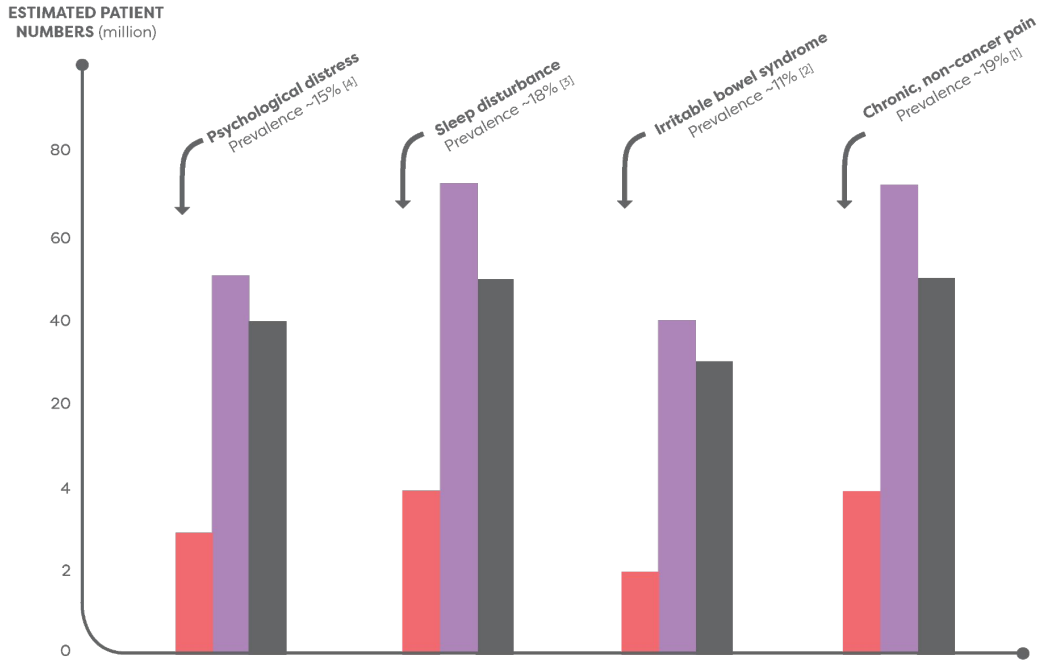
EMD-RX5 | GLOBAL OVER-THE-COUNTER STRATEGY

An Ultra-Pure cannabinoid product makes it possible to pursue registration beyond Australia in jurisdictions where product purity rules are stricter. With the support of Emyria's proprietary Real-World Data, EMD-RX5 has multi-indication potential.

AUSTRALIA
Adult Population
= 20 million

EU
Adult Population
= 360 million

USA
Adult Population
= 260 million



Emyria's **Ultra-Pure dose form** & **Real-World Data** supports growth through indication and geographic expansion.

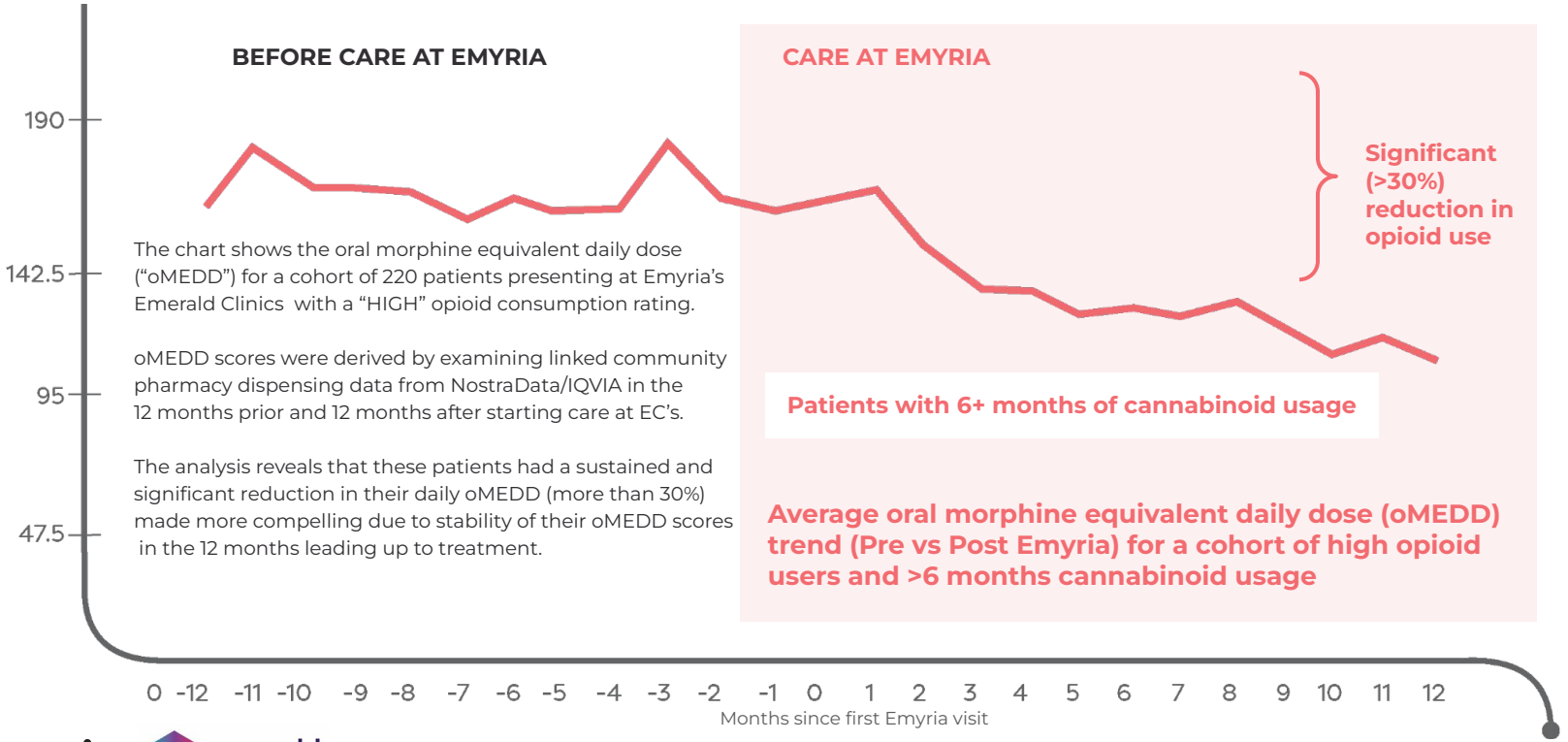
1. See ASX announcement 16 December 2021 2. Canavan, C., West, J. and Card, T., 2014. The epidemiology of irritable bowel syndrome. Clinical epidemiology, 6, p.71.
3.Grandner, M.A., Martin, J.L., Patel, N.P., Jackson, N.J., Gehrman, P.R., Pien, G., Perlis, M.L., Xie, D., Sha, D., Weaver, T. and Gooneratne, N.S., 2012. Age and sleep disturbances among American men and women: data from the US Behavioral Risk Factor Surveillance System. Sleep, 35(3), pp.395-406.
4. National Study of Mental Health and Wellbeing 2020-21 series, Australian Bureau of Statistics

FUTURE

CANNABINOID TREATMENT DEVELOPMENT

CANNABINOIDS CAN REDUCE OPIOID USE BY 30%

Emyria's Real-World Data shows cannabinoids can help reduce opioid use in some patients. An Ultra-Pure product creates an opportunity to develop a registerable treatment for an important unmet need.



The chart shows the oral morphine equivalent daily dose ("oMEDD") for a cohort of 220 patients presenting at Emyria's Emerald Clinics with a "HIGH" opioid consumption rating.

oMEDD scores were derived by examining linked community pharmacy dispensing data from NostraData/IQVIA in the 12 months prior and 12 months after starting care at EC's.

The analysis reveals that these patients had a sustained and significant reduction in their daily oMEDD (more than 30%) made more compelling due to stability of their oMEDD scores in the 12 months leading up to treatment.

Average oral morphine equivalent daily dose (oMEDD) trend (Pre vs Post Emyria) for a cohort of high opioid users and >6 months cannabinoid usage

NostraData

IQVIA

emyria emerald clinics

1. See ASX announcement 18 June 2021

EMD-RX7 | HIGHLY BIOAVAILABLE **ULTRA-PURE CBD** FOR PRESCRIPTION USE

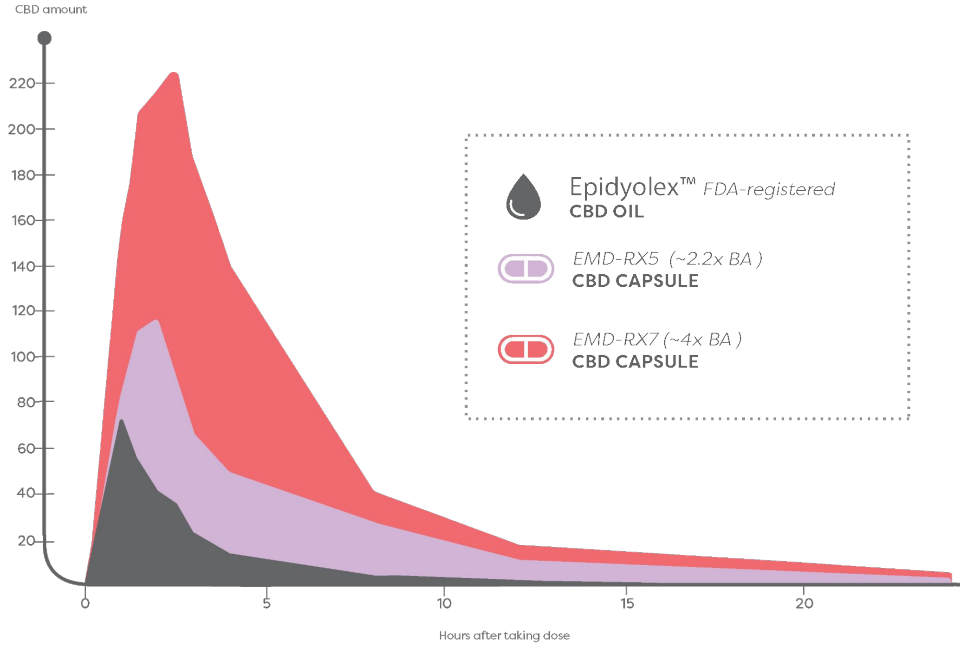
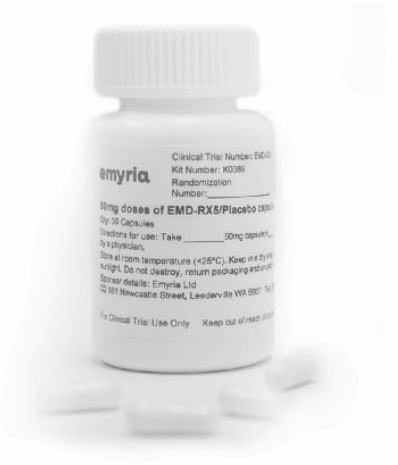


Chart shows concentrations of CBD in the blood for 3 different formulations as measured over a 24 hour period in an animal model.

Each formulation compared the same amount of CBD - 50mg.

EMD-RX7 showed more than 4 times the bioavailability of Epidyolex and is now being prepared for Phase 1 clinical trials to support prescription indications where higher doses of Ultra-Pure CBD are indicated. [1]

Emyria is exploring partnerships with leading US-based research institutions to further develop EMD-RX7 for FDA-focussed indications.



KEY INSIGHT **HIGHER BIOAVAILABILITY CBD** has potential to support multiple, global prescription registrations

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1. See ASX announcement 17 March 2022

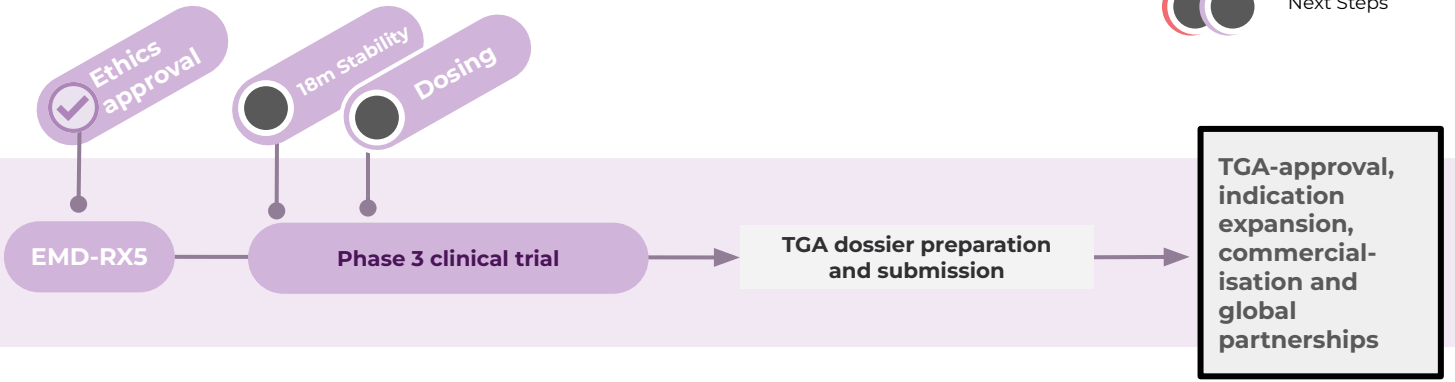
CANNABINOID DRUG DEVELOPMENT - WHAT'S NEXT?

Completed

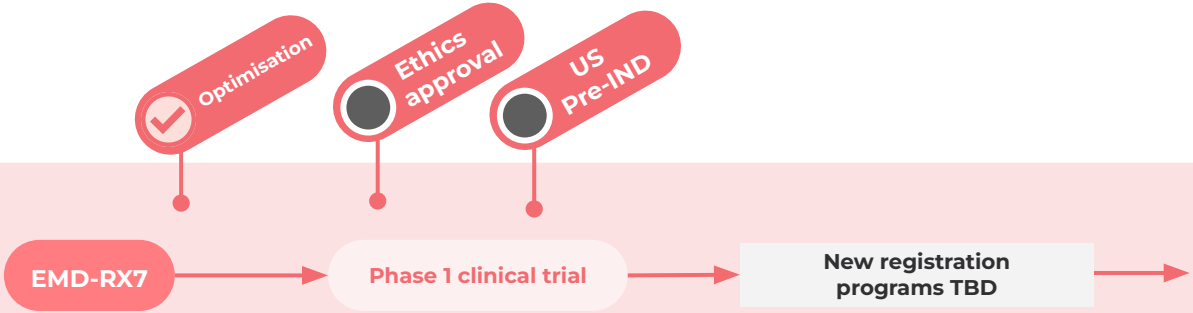
Next Steps

DRUG DEVELOPMENT

Complete pivotal Phase 3 clinical trial for **EMD-RX5** to support **TGA registration**



Complete preclinical screening & Phase 1 trial of **EMD-RX7** to support prescription opportunities



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EMYRIA HAS DEEP INSIGHTS ON MORE THAN 40 INDICATIONS

Emyria has deep clinical insights on more than **40 clinical indications** creating a deep pipeline of future drug development opportunities.

Alcohol use disorder	**Chronic non-cancer pain**	**Insomnia**	**Post-traumatic stress disorder**
Alzheimer's disease	**Complex regional pain syndrome**	**Irritable bowel syndrome**	**Primary orthostatic tremor**
Anorexia and wasting	**Conversion disorder**	**Meniere's disease**	**Refractory nausea and vomiting**
Anxiety	**Dementia**	**Migraine/headache**	**Rheumatoid arthritis**
Attention deficit hyperactivity disorder	**Depression**	**Motor neuron disease**	**Spasticity**
Autism	**Endometriosis**	**Multiple sclerosis**	**Tinnitus**
Behavioural disorder	**Epilepsy**	**Obsessive compulsive disorder**	**Tourette syndrome**
Cancer pain	**Essential tremor**	**Panic disorder and benzodiazepine dependence**	**Traumatic brain injury**
Cannabis use disorder	**Hereditary spastic paraplegia**	**Parkinson's disease**	**Vaginismus**
Chemotherapy-induced nausea and vomiting	**Hypersalivation**	**Personality disorder**	**Vertigo**
Chronic fatigue syndrome	**Inflammatory bowel disease**		

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1. List of conditions cared for at Emerald Clinics

MDMA-INSPIRED
DRUG DISCOVERY with THE UNIVERSITY OF WESTERN AUSTRALIA

WHAT IS **MDMA** ***(3,4-methylenedioxymethamphetamine or "ecstasy")*** **?**

An illegal amphetamine that increases the release of 3 primary neurotransmitters:

1

Serotonin
thought to contribute to feelings of *well-being*

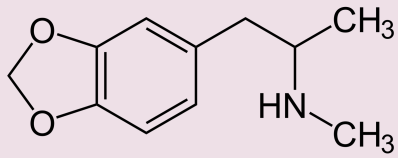
2

Dopamine
associated with feelings of *pleasure and satisfaction*

3

Noradrenaline
affects attention and related to *"fight or flight" response*

MDMA belongs to a class of drugs called **"empathogens"** or **"entactogens"** - drugs that produce experiences of *emotional communion*, oneness, relatedness, emotional openness—that is, empathy or sympathy.



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WHY IS MDMA SUCH A PROMISING BACKBONE FOR NEW DRUG DISCOVERY?

NEW DRUG DISCOVERY

"Emyria is creating new chemical entities with the potential to become neuropsychiatric treatments"

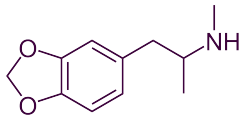
MDMA and ITS ANALOGUES HAVE:

Privileged chemistry

- Small, stable and brain-penetrating molecules *(required for oral neurological drugs)*
- Many points of diversification *(lots of opportunity to create new chemical entities and IP)*

Neurologically active

- MDMA hits many brain targets *(opportunity to elicit different neurological effects)*
- Opportunities to tune selectivity



Promising therapeutic applications

- Increase receptiveness & positive mood *(next-generation MDMA assisted therapy)*
- Avoid potentially toxic metabolites
- Reduce stimulant amphetamine effects
- Moderate or remove euphoria

} *(safer treatments)*

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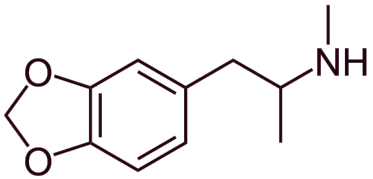
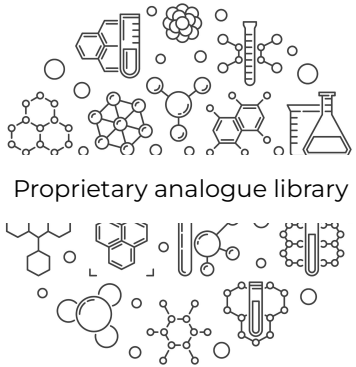
MDMA INSPIRED DRUG DISCOVERY | WORKFLOW

NEW DRUG DISCOVERY

with THE UNIVERSITY OF WESTERN AUSTRALIA

Take MDMA as inspiration → **Design and synthesise new compounds** → **Screen analogues** (In vitro and In vivo) → **Prioritise indications**





Proprietary analogue library

- Pharmacology (target) screens
- Safety screens
- Behavioural studies
- Metabolism assays
- Peripheral effects

Mental health
(Next-gen MDMA)
Slides 32-35

Movement disorders
(Neuro treatments)
Slides 36-37

Non-neurological
(Fibrotic diseases)
Slides 38-39

>140 novel chemical entities

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MDMA INSPIRED DRUG DISCOVERY | WEBINAR

For a deep dive on our

MDMA-INSPIRED DRUG DISCOVERY PROGRAM go to:

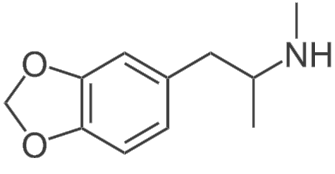
https://youtu.be/suZbQ3Bxuj8

Or, take a look at our
MDMA-INSPIRED DRUG DISCOVERY DECK

https://wcsecure.weblink.com.au/pdf/EMD/02581678.pdf

MDMA-Inspired Drug Discovery – Webinar – October 2022 – YouTube

MDMA is the best known member of the **"entactogens"** - drugs that produce feelings of ***emotional communion,*** oneness, relatedness, emotional openness & fear extinction.



CLINICAL
OPPORTUNITIES

UNIQUE PSYCHO- PHARMACOLOGICAL | **EFFECTS OF MDMA**

Potential Target: MENTAL HEALTH

INCREASED

- feelings of wellbeing
- sociability and extroversion
- interpersonal trust

AN ALERT STATE OF CONSCIOUSNESS

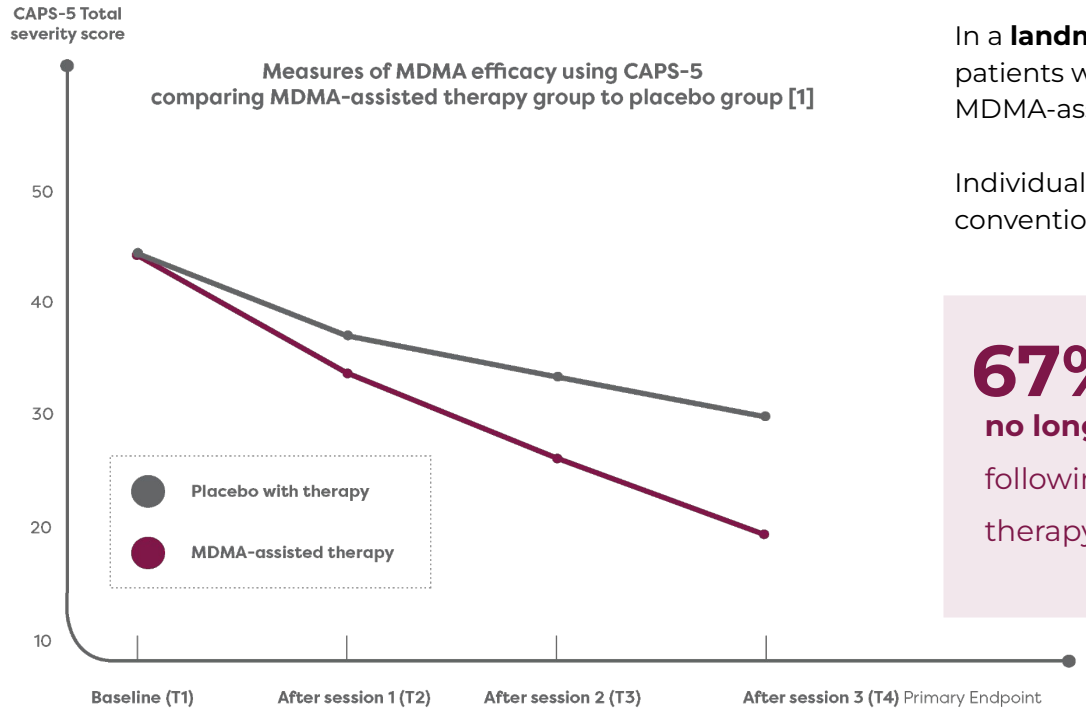
DECREASED

- feelings of fear & defensiveness

These effects suggest MDMA could be a promising **adjunct to psychotherapy** for a range of challenging MENTAL HEALTH CONDITIONS.

MDMA-ASSISTED THERAPY FOR **POST-TRAUMATIC STRESS DISORDER**

Potential Target: MENTAL HEALTH



In a **landmark Phase 3 study** (n=91) [1], patients with PTSD were randomized to receive MDMA-assisted therapy or therapy with placebo.

Individuals had severe illness refractory to all conventional treatment for an **average of 15 years**.

67% Of participants in the MDMA group **no longer met the PTSD diagnosis criteria** following treatment, compared to **32%** in the therapy-only group.

1. Trial of MDMA-assisted therapy for severe PTSD, Multidisciplinary Association for Psychedelic Studies (MAPS), 2021
2.Mitchell JM, et al. MDMA-assisted therapy for severe PTSD: a randomized, double-blind, placebo-controlled phase 3 study. Nature Medicine. 2021 Jun;27(6):1025-33

POST-TRAUMATIC STRESS DISORDER [1] | MDMA-ASSISTED THERAPY

Potential Target: MENTAL HEALTH

Prevalence: 8.4m (but with a large, undiagnosed population of ~79%)

Treatment pattern: Benzodiazepines, antidepressants. High concomitant medication use.

Costs: ~USD$25B/year *(direct medical costs)*

Unmet needs: Non-responders have few alternatives.
There are subpopulations not served well by current treatments.
Tolerability issues of current treatment in sensitive populations.

ROLE FOR MDMA?

MDMA-assisted therapy has been shown to greatly improve PTSD symptoms. [2]

CLINICAL AND COMMERCIAL OPPORTUNITY FOR ANALOGUES?

MDMA-assisted therapy requires long sessions (6-12 hours). ***Can we shorten the action of MDMA*** to improve the delivery of this promising treatment in standard clinical practice?

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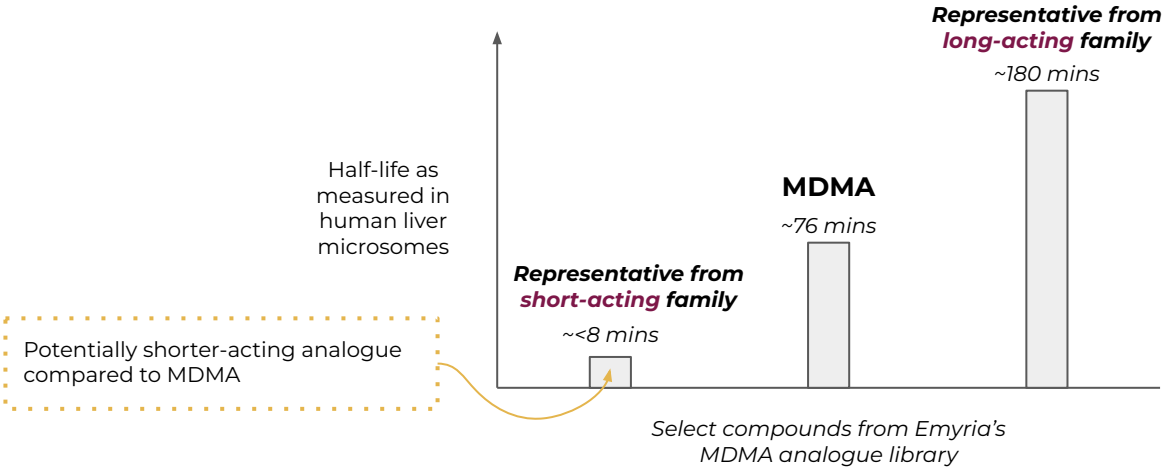
1. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7366572/
2. https://www.nature.com/articles/s41591-021-01336-3

POST-TRAUMATIC STRESS DISORDER | *shorter* MDMA-ASSISTED THERAPY?

Potential Target: MENTAL HEALTH

Recent in vitro metabolic studies of Emyria's analogues demonstrate that our library has compounds with diverse half-lives, suggesting it may be possible to generate MDMA analogues with much faster, and slower onset of action.



Note: These in vitro studies approximate liver-led metabolism of drugs. Other potential metabolic pathways *(and other clearance pathways)* not represented in microsomes are not evaluated.

NEXT STEPS:

- Functional assays to identify novel compounds most like MDMA
- Further in vitro metabolic screening to approximate half-life

PARKINSON'S DISEASE [1]

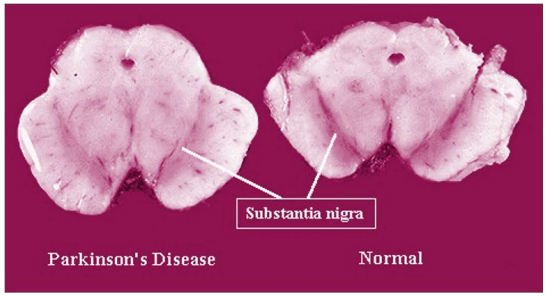
Potential Target: MOVEMENT DISORDERS

Prevalence: 7m worldwide
(second most common neurological disorder after Alzheimer's)

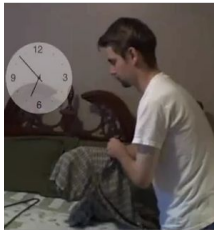
Treatment pattern: Dopamine promoters (eg L-Dopa), antidepressants, cognition-enhancers, anti-tremor medications.

Costs: ~USD$1B/year

Unmet needs: Better control of tremor, gait and balance, posture, dexterity, and communication skills.
High incidence of L-Dopa induced dyskinesia (LID) in late stage.



Section of substantia nigra



Patient with bradykinesia

PARKINSON'S DISEASE is a neurodegenerative disorder that affects the dopamine-producing *("dopaminergic")* neurons in a specific area of the brain called substantia nigra.

The resulting symptoms of Parkinson's disease are typically slow movement *(bradykinesia)* and tremor.

ROLE FOR MDMA?
MDMA has been shown to improve L-dopa induced dyskinesia. [2]

CLINICAL AND COMMERCIAL OPPORTUNITY FOR ANALOGUES?
Can we preserve the movement benefits of MDMA but ***remove the euphoria?***

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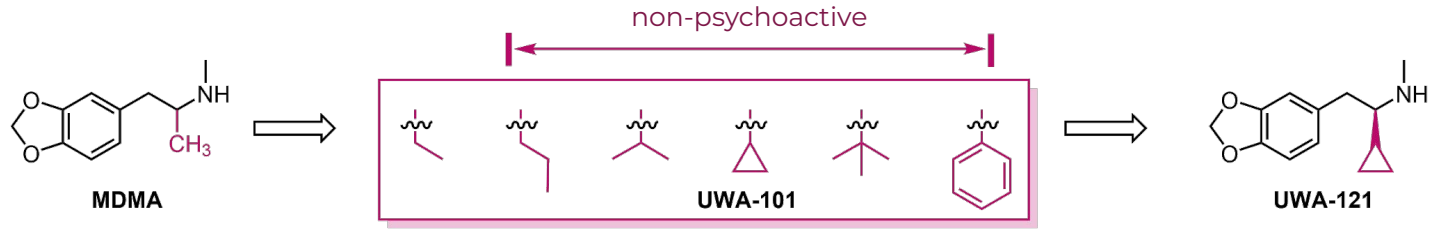
1. https://www.nature.com/articles/s41531-020-0117-1
2. https://www.newscientist.com/article/dn3015-ecstasy-has-dramatic-effect-on-parkinsons-symptoms/

PARKINSON'S DISEASE | Benefits of MDMA ***without the high?***

Potential Target: MOVEMENT DISORDERS



\+ Profoundly improves PD therapy *(i.e increases "on time" of L-Dopa)*

— Psychoactivity *(eg. euphoria, stimulant effects)* unsuitable for a chronic condition

Researchers at UWA created a series of non-psychoactive MDMA analogues; evaluated in rat and primate models of Parkinson's disease

A single enantiomer analogue (mirror image) was the most promising, non-psychoactive compound.

In a gold-standard PD primate model, UWA-121[1]:

- **Extended** on-time by **40%**
- Increased **'good quality'** on-time by **215%**

NEXT STEPS:

- Advance new compounds
- Evaluate long-term safety & durability

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1. See ASX release 01 Sep 2021

IDIOPATHIC PULMONARY FIBROSIS [1]

Potential Target: FIBROTIC DISEASE

Prevalence: 1.2m people worldwide

Treatment pattern: Antifibrosis drugs (Pirfenidone, Nintedanib), oxygen therapy, GI reflux medications

Costs: ~USD$3B/year

Unmet needs: Reversing fibrotic changes, reduce side-effects of treatment

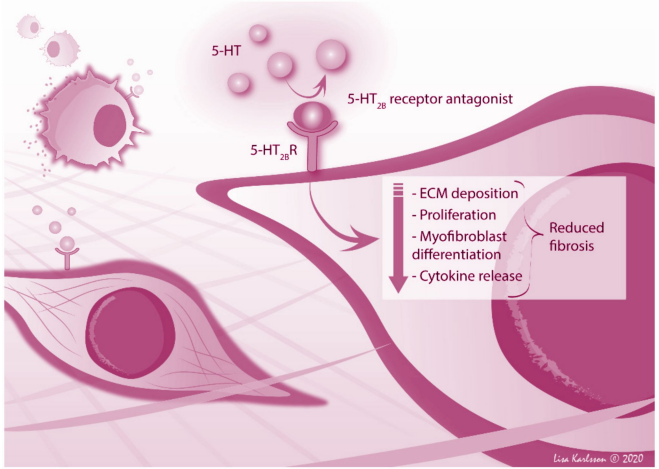

*Figure: Shows anti-fibrotic cellular-signalling changes that may be initiated by **antagonism** at the 5HT2B receptor.*

ROLE FOR MDMA?

MDMA analogues can induce fibrosis. Screening for this feature can reveal compounds with anti-fibrotic potential.

CLINICAL AND COMMERCIAL OPPORTUNITY FOR ANALOGUES?

Can we generate **MDMA analogues with strong antagonism at serotonin-mediated fibrosis pathways and reduce fibrosis**?

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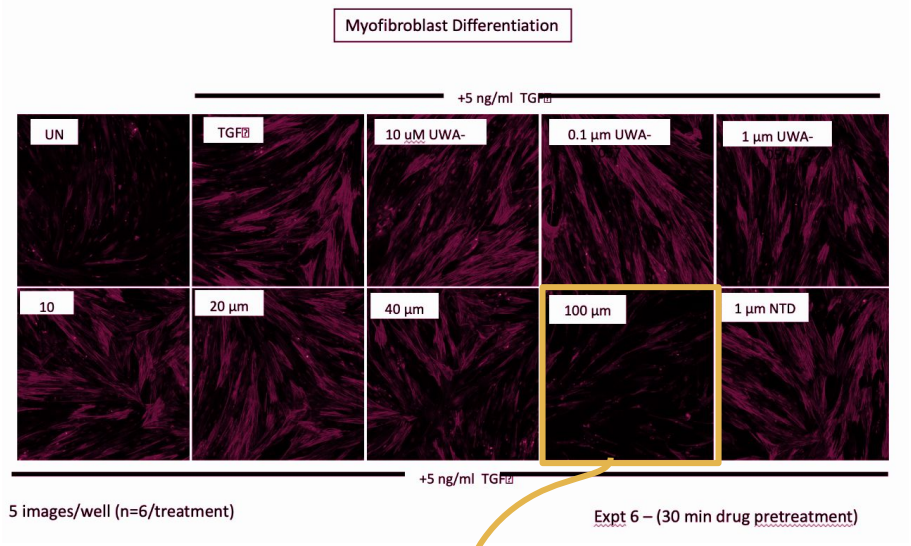
1. https://www.lung.org/lung-health-diseases/lung-disease-lookup/pulmonary-fibrosis/patients/how-is-pulmonary-fibrosis-treated

IDIOPATHIC PULMONARY FIBROSIS | *5HT2B ANTAGONIST* POTENTIAL

Potential Target: FIBROTIC DISEASE



Very early results suggest a reduction in collagen deposition at some test concentrations. Studies still ongoing and results need to be validated but promising early signal.

These preliminary in vitro screens, performed by the Institute of Respiratory Health, [1] measure the deposition of collagen (dark pink shapes) in human lung fibrocytes at varying concentrations of a test analogue.

These results show that, at a concentration of 100um, the test analogue appears to suppress collagen. Compare with 1um concentration of an approved antifibrosis drug, Nintedanib (NTD).

These results show fibrocyte suppression is possible and motivates further exploration of additional analogues and at varying concentrations.

NEXT STEPS:

- Continue human-cell line assays for additional analogues
- Competitive grant applications to support preclinical program

1. See ASX release 04 August 2022

MDMA-INSPIRED DRUG DISCOVERY | SUMMARY

with THE UNIVERSITY OF WESTERN AUSTRALIA

Emyria-UWA MDMA analogue library captures a unique chemical space with differentiated pharmacology and novel IP

- ***Largest reported database*** of MDMA analogues currently in development with **>140 compounds** in the library (*and growing*) with demonstrated stability and purity
- ***Compounds demonstrate diverse receptor binding profiles*** on gold standard screening with positive preclinical proof-of-concept results suggesting the library has **broad clinical and commercial potential**
- ***Current list of potential indications spans major unmet needs in:***

NEUROPSYCHIATRY & **ANTI-FIBROSIS**

(Parkinson's, ADHD, narcolepsy, antidepressants, anxiolytics, antipsychotics, appetite suppression)

(currently undergoing preclinical assays)

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1. See ASX announcement 5 August 2021 2. See ASX announcements August 2022

CORPORATE & IP

LEADERSHIP | GLOBAL DRUG DEVELOPMENT & COMMERCIALISATION SUCCESSES

Dr Stewart Washer
Executive Chairman
PhD (Microbiology)

- Emyria founder, largest shareholder
- Founded multiple ASX companies
- Multiple trade sales

Prof Sir John Tooke
Non-Executive Director &
Chair of the Risk Committee
FRCP, FMedSci

- Knighted for services to medicine
- Clinician researcher - past President AMS
- Advisor to NHS on “learning health systems”

Dr Karen Smith
Executive Director
MD, PhD, MBA, LLM

- Experienced biopharma C-suite exec
- Overseen 20+ FDA approvals
- Multiple, $B+ M&A completions

Dr Michael Winlo
CEO & Managing Director
MBBS(Hons), MBA (Stanford)

- Data, trials and drug development
- Paper-to-digital at Linear
- Founding five, Palantir Health Team

C/Prof Alistair Vickery
Medical Director
MBBS, FRACGP, FCHSM

- Big Data researcher, epidemiology
- Chair of Black Swan Health
- Professor of Medicine at UWA

Matt Callahan
Non-Executive Director
LLB

- 4 FDA approvals
- Venture capital experience
- Successful exit - iCeutica to Iroko

CLINICAL AMBASSADORS | GLOBAL EXPERTS IN NEUROSCIENCE AND PSYCHIATRY

Dr Jen Morgan (St. Johns)
Anaesthetist & Pain Specialist
MBBS, FRANZCA

- Anaesthetics
- Pain medicine specialist
- Research collaborator with Emyria

Dr Richard Magtengaard
Non-Executive Director &
Chair of the Risk Committee
FRCP, FMedSci

- Psychiatry
- Ex-Naval Officer Australian Navy
- Advisor to DVA

Ass/Prof. Sara Ward (Temple University)
CIPN Expert
PhD

- Professor neural sciences
- Preclinical researcher in CIPN
- Cannabinoid expert

Dr Jeremy Tannenbaum
CEO & Managing Director
MBBS(Hons), MBA (Stanford)

- Dual psychiatry and pain medicine specialist
- Research into psychedelics

Dr Phil Finch
Pain Specialist
MBBS, FRANZCA

- Pain medicine specialist
- Cannabinoid authorised prescriber
- Research collaborator with Emyria

Prof Mat-Martin Iverson
Neuropharmacologist
Professor, BSc Alta., PhD Br.Col.

- Psychoneuropharmacology expert
- ex-Professor at UWA
- Amphetamine research specialist

Dr Bill Bosch
Formulation specialist
PhD, BA

- Co-inventor of the SoluMatrix™
- 3 FDA approved products
- Experienced bio-pharmaceutical executive

EMYRIA'S GROWING **PATENT PORTFOLIO**

TITLE	OFFICIAL NO.	STATUS
Analogues	2021903836	Provisional filed
Cannabidiol Dosing Regime	2021902001	Provisional filed
Cannabinoid Dosage Form	2022900479	Provisional filed
Use of Cannabidiol for the Treatment of Psychological Distress	2020904152	Provisional filed
Use Of Cannabidiol for the Treatment of Psychological Distress	2021901086	Provisional filed
Use Of Cannabidiol for the Treatment of Irritable Bowel Syndrome Symptoms	2021901672	Provisional filed
Use Of Cannabinoid Combination for the Treatment of Irritable Bowel Syndrome Symptoms	2021901674	Provisional filed
Others in development covering unique delivery platforms, dose responses and clinical indications	*Additional provisionals expected*	

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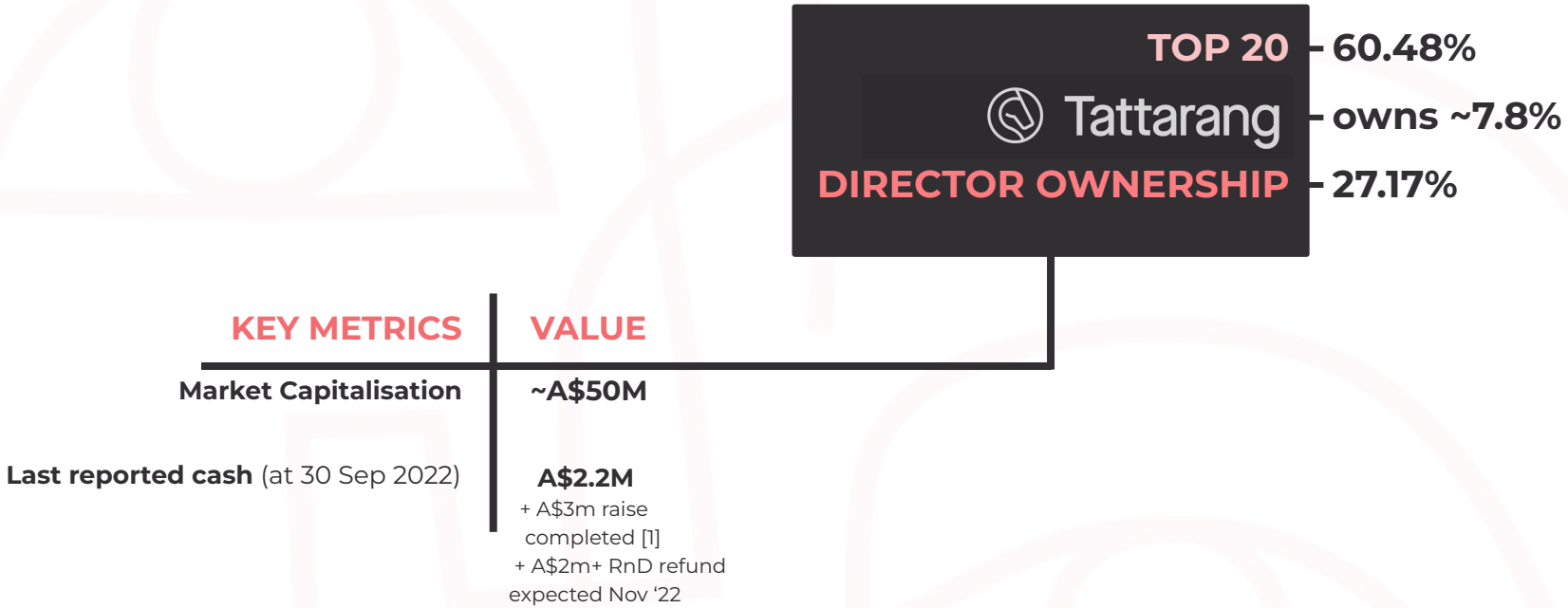
CAPITAL **STRUCTURE**



1. See ASX announcement 31 October 2022

MAJOR **ACHIEVEMENTS & NEAR-TERM** CATALYSTS

DRUG DEVELOPMENT

CLINICAL PROGRAMS
Ultra-Pure cannabinoid delivery platform

NEW DRUG DISCOVERY

PRE-CLINICAL PROGRAM
MDMA-like analogues

CORPORATE ACHIEVEMENTS
Added bio-pharmaceutical executive to Board - **Dr Karen Smith.** Ex-Chief Medical Officer and Global Head of Research & Development at Jazz Pharmaceuticals. Dr. Smith has overseen multiple FDA registrations and participated in multiple, billion + dollar biotech mergers and acquisitions.
Part of **Tenmile's** initial investment cohort **-***Tattarang's Health Investment Fund*
Invited to Palantir's Foundry for Builders program, boosting data integration and analysis capabilities

EMD-RX5 *"direct-to-consumer"*
Formulation optimisation
Phase 1 study
Ethics approved for Phase 3
Phase 3 commencement
Regulatory submission
Commercial strategy **Australia**
Commercial strategy **Europe**
Commercial strategy **USA**

EMD-RX7 *"prescription medicine"*
Formulation optimisation
Phase 1
Pre-IND **(FDA)**
Pivotal trials

MDMA-like drug development
Continuous creation & screening
First patent family filed
US-focussed preclinical program
Metabolic studies
Preclinical assays *(multiple animal models)*
Human cell line assays
Advanced assay development
Lead selection
Phase 1 trials
Global commercial strategy

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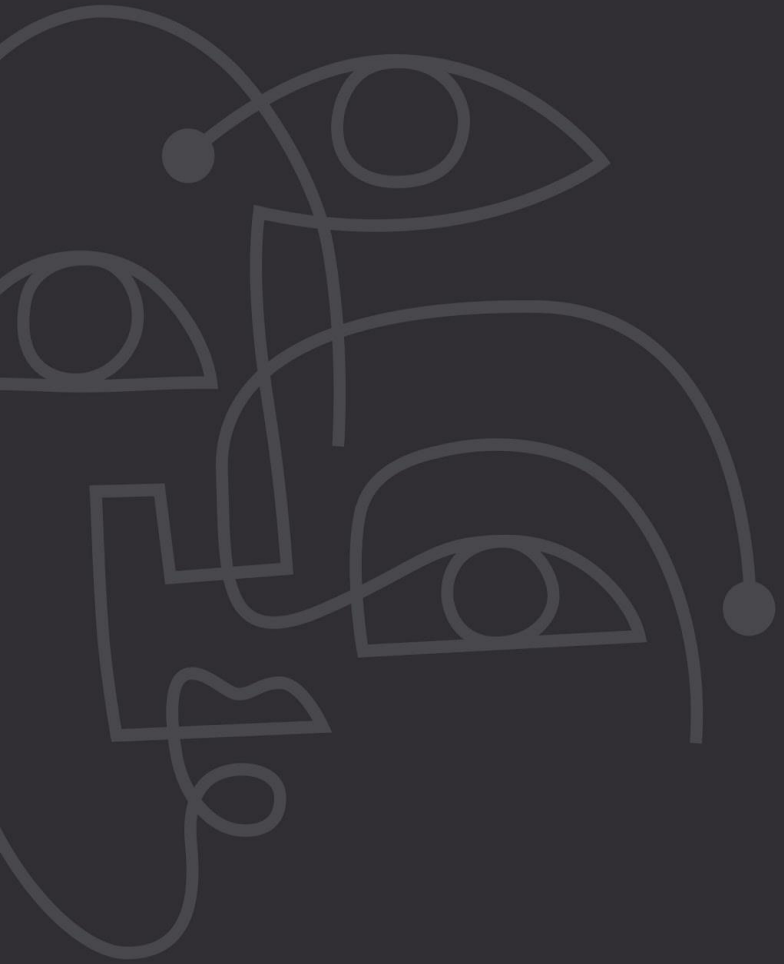

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