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### **Overview**

### Veyonda® emerging as major immunotherapy-oncology (I-O) drug

Confirmed first-in-class anticancer actions recognized as major industry goals

Clinical evidence of anticancer responses

Potential use across most forms of solid cancer

Aim is to make it a key player in transformation of the I-O drug market from current US\$30 billion into projected US\$150+ billion p.a.

#### Some realities......

Responses will vary from <u>none</u> to <u>partial</u> to <u>complete</u>. Objective is in <u>most patients</u> to <u>extend</u> <u>life</u> and to provide a <u>better quality of life</u> in a <u>cost-effective</u>, well-tolerated way

Gold standard proof will require a Phase 2 and at least one Phase 3 study, take 5-7 years and cost at least US\$100M. Our goal is end of current round of trialling in 2.5 years.







- a first-in-class immunotherapy (based on S1P inhibition)
- is the answer to unlocking the power of the immune system to fight cancer

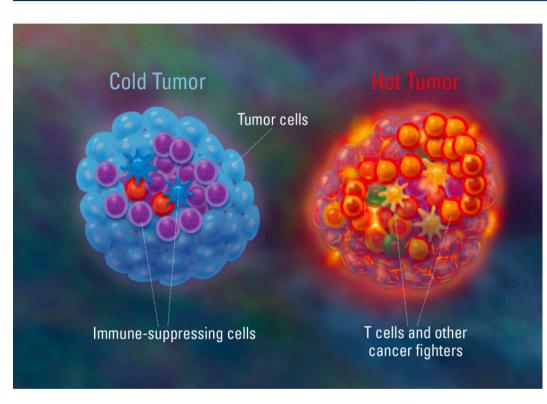
### Immunotherapy-oncology (I-O) therapy ......



- aims to restore the body's immune system to fight cancer
  - **■** is the acknowledged future of cancer therapy
  - but with only about 5% of patients responding, current 1<sup>st</sup> gen I-O therapies are in urgent need of assistance
- revertheless has a current market value of ~ US\$30 billion
  - but with 95% of patients remaining unresponsive, has a projected potential of **US\$150+ billion** p.a. if the response rate could be lifted

# Converting US\$30 B into US\$150+ B





Source: Enhancing Immunotherapy: The Race to Make "Cold" Tumors "Hot". https://blog.dana-farber.org/insight/2018/06/enhancing-immunotherapy-race-make-cold-tumors-hot/)

Cancers use a range of tricks to avoid immune attack.

Expelling immune cells from the tumour seen as the key one.

Referred to as **COLD tumours** 

Any attempt by I-O therapy to re-enable the immune system is set to fail if there is no immune function present in the tumour to take advantage

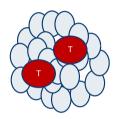
Great majority of human tumours are **COLD**, believed to account for the very high I-O non-response rate

The race is on to find a way of restoring immune function to all tumours.

Known as converting **COLD** to **HOT** 

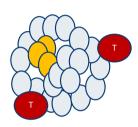
### **COLD** to HOT explained simply





All healthy tissues contain immune cells (T cells)

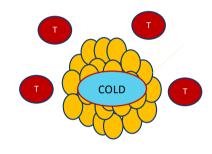
whose role is to detect and eliminate any abnormal cells



**Emerging cancer cells** 



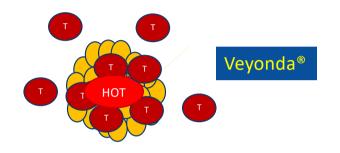
produce high levels of S1P (sphingosine-1-phosphate) that drive the immune cells out of the tissue



With tumour now fully established, ongoing high S1P levels keep immune cells excluded

Cancer cells now free to grow in the absence of immune cells

**= COLD tumour** 



**Veyonda** is first-in-class inhibitor S1P production by cancer cells

With S1P levels down, immune cells now enter and repopulate tumour

Restored immune function kills cancer cells

= HOT tumour

# **Veyonda®** I-O strategy



To use the **COLD** HOT effect of **Veyonda** to boost the efficacy of two 1<sup>st</sup> generation I-O therapies in **solid cancers** 

**Checkpoint inhibitor** 





**IONIC Program** 









**DARRT Program** 

## **Veyonda® IONIC Program**



### **IONIC-1**

Veyonda® + checkpoint inhibitor



Bristol-Myers Squibb (NYSE:BMY)
Market cap US\$145 billion

Pharma ranking 11<sup>th</sup>

2019 sales US\$26 billion
2019 Opdivo sales US\$8 billion
2019 Celgene acquisition US\$74 billion

# Immuno-Oncology With Veyonda® In Combination

Veyonda® + nivolumab (Opdivo®)
(Bristol Myers Squibb)

A study involving both NOX and Bristol-Myers Squibb

## **Veyonda® IONIC Program**



### **IONIC-1**

Veyonda® + checkpoint inhibitor

#### **Clinical objectives:**

- 1. Improve the modest (10-30%) response rates in responsive cancers (eg. lung, melanoma, bladder, kidney)
- 2. Achieve responses in remaining cancers where Opdivo® not currently used due to very poor response rates (eg. prostate, ovarian, pancreatic, sarcoma etc)

#### **Commercial objectives:**

- 1. To make Veyonda® + Opdivo® combo a standard of care for many cancer types
- 2. To make Opdivo® the most favored and most valuable checkpoint inhibitor
- 3. To lift sales of Opdivo® well above current US\$8 billion
- 4. Thereby making Veyonda® a highly prized asset

A study involving both NOX and Bristol-Myers Squibb

## **Veyonda® IONIC Program**



### **IONIC-1**

Veyonda® + checkpoint inhibitor Phase I/II study
Investigator-initiated
30 patients
3 Australian hospitals
Early-Q1 2021 start

#### **Two Cohorts:**

**Cohort 1**. Patients recently treated with Opdivo® with mild disease progression

Cohort 2. Opdivo® naive patients

#### **Three End-points:**

- Safety of Veyonda® + Opdivo® combo
- Clinical response
- Biomarker response

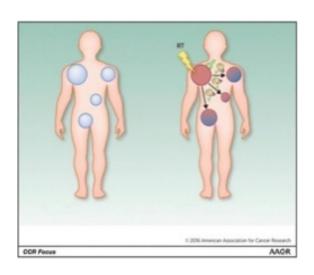
A study involving both NOX and Bristol-Myers Squibb

# **Veyonda® DARRT Program**



### **DARRT Program**

Radiotherapy



# <u>Direct and Abscopal Response</u> to <u>Radiotherapy</u>



Veyonda® + external beam radiotherapy

Transforming a local anti-cancer effect of radiation into a whole-of-body anti-cancer effect (abscopal response)

### **Veyonda® DARRT Program**



### **DARRT Program**

Radiotherapy

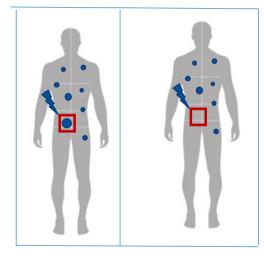
#### **4-step DARRT process:**

Step 1. Radiation applied to single tumour

Step 2. Radiation activates immune cells

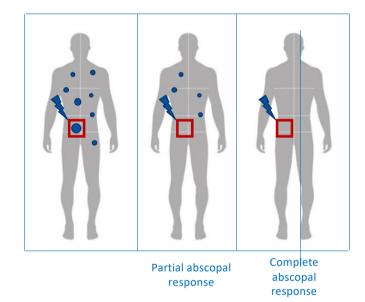
**Step 3.** Veyonda augments that local immune response

**Step 4.** Veyonda then spreads that immune response to all other tumours throughout the body



Resolution of Irradiated tumour

Standard response



Abscopal response

## **Veyonda® DARRT Program**



### **DARRT Program**

Radiotherapy

#### **Clinical objectives:**

- 1. To convert the **abscopal response** from a very rare phenomenon (< 1 in 100,000) to a more commonplace event (~50% of cancer patients)
- 2. To produce long-term remission in metastatic cancers where survival prospects currently are poor

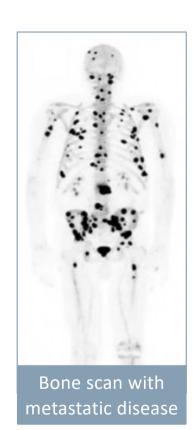
#### Features of DARRT therapy:

- Very well tolerated treatment
- Highly accessible (external beam RT widely available globally)
- Potential for <u>all</u> solid cancer types
- Expected to be most cost-effective I-O therapy (vs \$230K \$1M costs)

# Veyonda® DARRT-1 Completed



- DARRT-1 **Completed** 25 men late-stage progressive **prostate cancer**
- Metastatic castration-resistant prostate cancer (mCRPC)
  - No remaining standard treatment options
    - Low-dose (palliative) radiotherapy (RT) to single soft tissue tumour
    - Treatment with low-dose RT (5 days) and Veyonda® (14 days)



### **Veyonda® DARRT-1**

#### **Completed**



In patients evaluable after 6 months\* .....

Over 50%
drop in
PSA in
5/16
patients

Over 30% drop in pain levels in 10/16 patients

No tumour growth in 10/15 patients

Abscopal response in 4/15 patients

<sup>\* 15</sup> patients eligible for RECIST; 16 for PSA and pain

### **Veyonda® DARRT-2**

### Starting 2021



Phase 2 study 150 - 200 patients multi-national Parexel CRO

Late-stage cancer. No remaining standard treatment options

#### Final planning current. Enrolment to start H1 2021

Main focus on prostate cancer; exploratory cohort of breast and lung cancer

Boosted therapy compared to DARRT-1 (up to 2400 mg vs 1200 mg; multiple cycles of Veyonda vs 1 cycle



### **Secondary questions ......**



1. Will **Veyonda**<sup>®</sup> boost the anti-cancer effect of <sup>177</sup>Lu-PSMA-617 in late-stage prostate cancer?

2. Could one of the anti-cancer functions of **Veyonda®** (STING antagonism) be used to prevent **septic shock** in **COVID-19 patients**?

## **Veyonda® LuPIN program**



- LuPIN program = Veyonda + 177 lutetium-PSMA-617 for late-stage prostate cancer
  - <sup>177</sup>lutetium-PSMA-617 acquired by Novartis in 2018 in US\$6 billion transaction
  - St Vincent's Hospital Sydney testing ability of LuPIN therapy to boost modest survival effect of Novartis drug alone
- **LuPIN-1** = Phase 2 study in 56 men with late-stage cancer that has progressed on all forms of therapy
- First report of median overall survival from first 32 men (400/800 mg Veyonda) highly encouraging at 17.1 months
  - Median overall survival from all 56 men (400/800/1200 mg Veyonda) to be reported Feb 2021

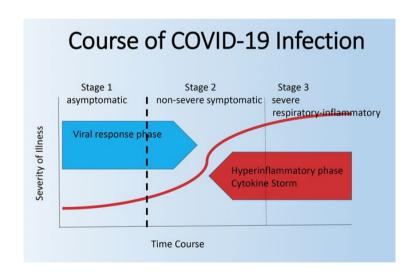
# Veyonda® Septic shock



#### NOXCOVID-1 Study.

#### Phase 1 study:

- ~40 patients; moderate lung damage; supplementary oxygen
- Veyonda® treatment for up to 28 days
- Measuring safety, clinical response, cytokine levels





The aim is to use Veyonda® to prevent progression of patients with early-stage lung damage requiring supplementary oxygen, into ICU care requiring mechanical ventilation



# pharmorage



Wholly-owned NOX subsidiary focused on novel targets in the STING signalling pathway. Emerging as important new drug target in inflammation and autoimmunity

Collaboration with Hudson Institute of Medical Research and John Curtin School of Medical Research, ANU

Initial focus on a safe, effective treatment for septic shock that is responsible for est. 11 million deaths p.a.

### **Objectives**

Over the next 2.5 years, with a modest investment of shareholder funds, to show that ....

IONIC

Veyonda increases the response rate to <u>nivolumab</u> (<u>Opdivo</u>) (BMS), establishing its potential to boost checkpoint inhibitor drug sales well above current US\$30 billion p.a.

DARRT

Veyonda + radiotherapy and the abscopal response is a valid, cost-effective alternative form of I-O treatment for a range of solid cancers

LUPIN

Veyonda boosts the response rate in advanced prostate cancer to 177 Lu-PSIMA-617 (Novartis)

**PHARMORAGE** 

The Company's technology platform holds the potential to develop a family of new drugs for the treatment of septic shock, inflammatory diseases and autoimmune diseases

So building a highly valuable and compelling acquisition/partnering target

# **Key Metrics**

Number of Shares	213.24 M
Outstanding options	76.38 M (\$0.30-\$1.19) (expiry 27/11/20 – 16/12/23)
Board shareholding	19.8%
Share price	<b>A\$0.64</b> (16 Nov 2020)
Market cap	<b>A\$135 M</b> (16 Nov 2020)
Cash position	<b>AU\$3.9 M</b> (30 Sept 2020) [ <i>R&amp;D Rebate</i> > <i>\$4M due Q4</i> ]











# A second generation I-O therapy to transform the management of cancer

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