# Open Briefing 6 December 2017









# ONCOLOGY

Noxopharm



NOX66

Idronoxil (lipophilic form)

#### **ABOUT IDRONOXIL**

Multiple anti-cancer actions

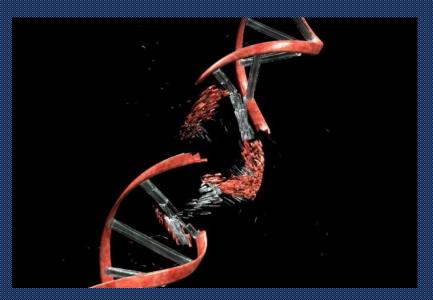
### 1. Inhibits DNA repair

(inhibits PARP-1, topoisomerases 1 and 2)

# 2. Promotes anti-tumour immunity

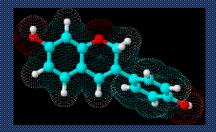
(Increases NK (natural killer) cell activity)





#### Noxopharm

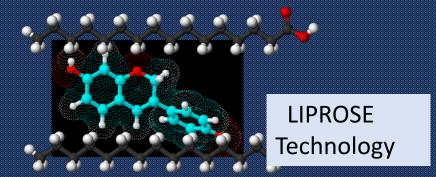
## **Oral Idronoxil**



Excreted quickly (45 min)

Does NOT cross BBB

## NOX66



Excreted slowly (10 hours)

**Crosses BBB** 

Noxopharm

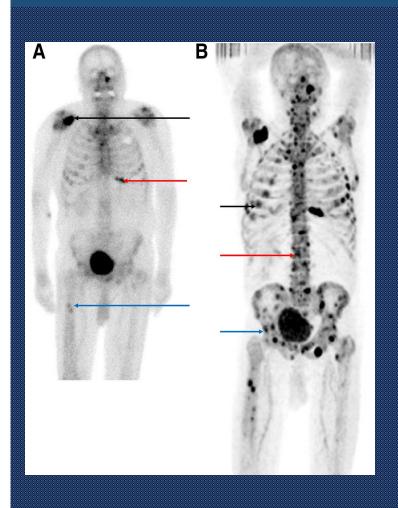
# DARRT

Direct and Abscopal Response to Radio-Therapy

# Limitation of radiotherapy Metastatic cancer too extensive for radiation

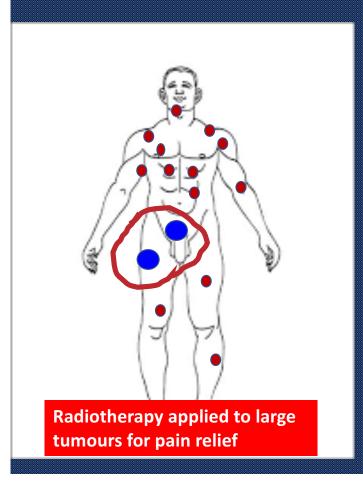


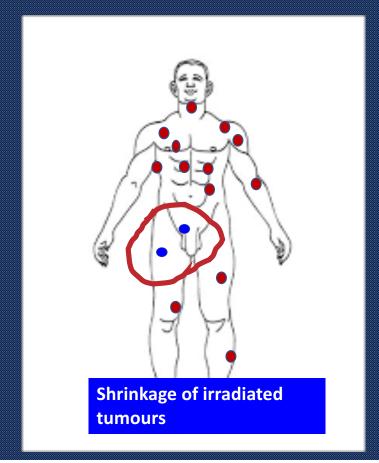
Noxopharm



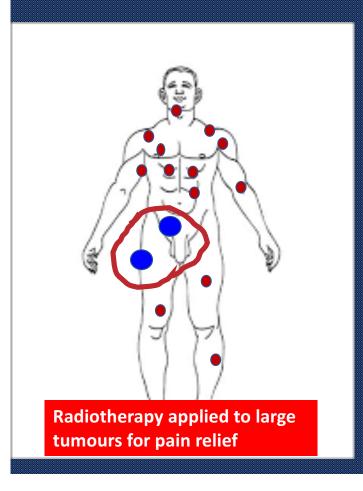


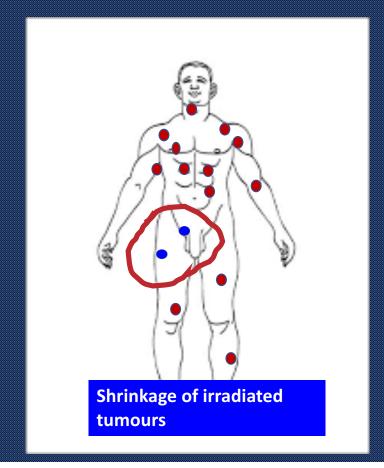
# **DIRECT** Response to Radio-Therapy

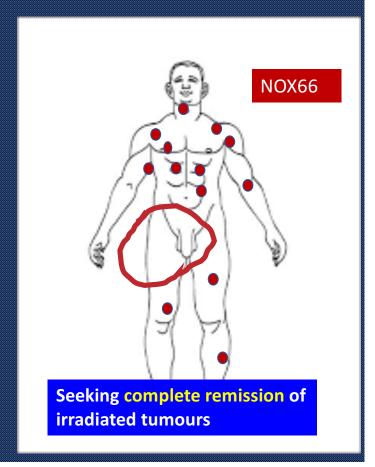




# **DIRECT** Response to Radio-Therapy



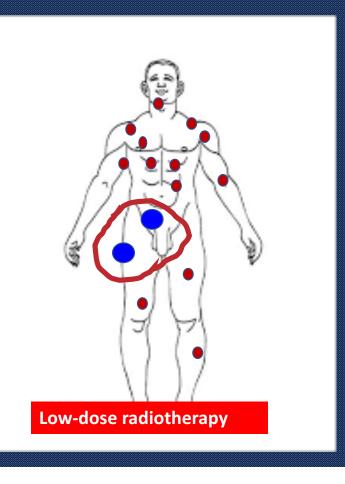


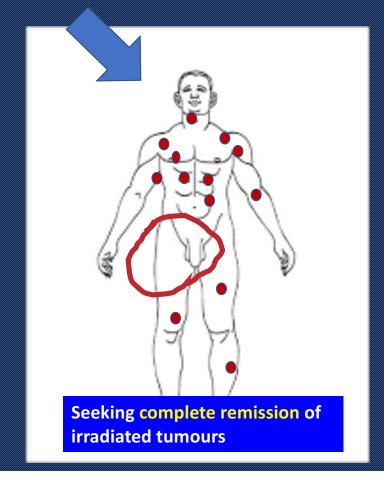


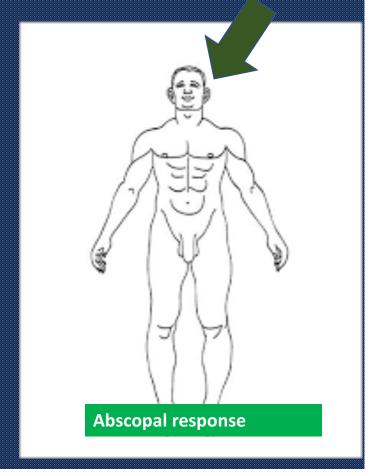
# **ABSCOPAL** Response to Radio-Therapy

Exposed tumours respond









## Features of an abscopal response

Rare

Complete

**Durable** 

**Unrestricted** 

Short treatment

Low toxicity

very rare phenomenon

primary AND secondary tumours respond

potentially permanent

range of cancers reportedly involved

single course of treatment (7-14 days)

low-grade radiation sickness

# **DARRT**

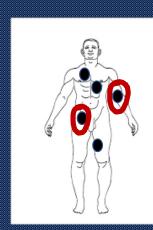
#### **Direct Effect**

# Abscopal Effect



**External Beam RT** 

- > Patients with multiple (>3) tumours
- Irradiate 1-2 tumours (5 days)
- NOX66 14 days
- Scan + 2 months and 4 months



# DARRT

### **Direct Effect**

# Abscopal Effect



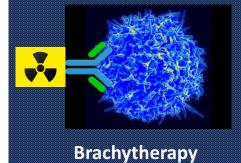
**External Beam RT** 

- Prostate cancer (metastatic castrate-resistant)
- Solid common cancers (eg. lung, breast, melanoma)
- Rare cancers (eg. sarcomas)

# **DARRT**

#### **Direct Effect**

# Abscopal Effect



- ► <sup>177</sup> Lutetium-PSMA-617
- 4 x monthly intravenous injections of LuPSMA/10 days NOX66
- Prostate cancer (metastatic castrate-resistant)

#### Noxopharm

# **DARRT**

Where NOX66 + Radiotherapy needs a boost ........

NOX66-001 Phase 1b Study Georgia

+ Low-dose carboplatin (AUC4 - monthly)

400 mg NOX66

5 patients: 1 progressive; 4 non-progressive

800 mg NOX66

7 patients: 1 progressive; 5 non-progressive; 1 partial response

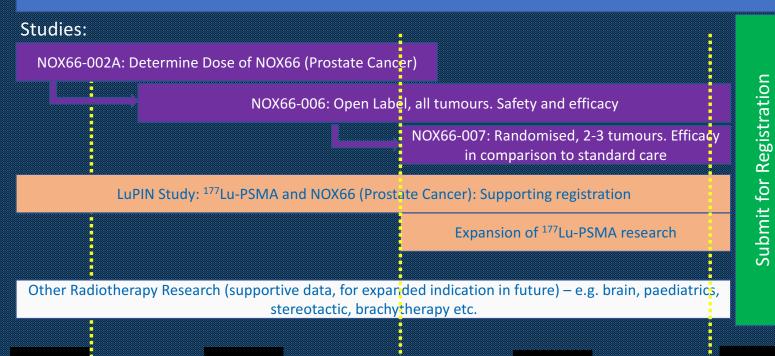
# What will a 'good response' look like?

- Lung Cancer trial (582 patients evaluated)
- Opdivo vs standard chemotherapy
  - Survival of 50% of patients 12.2 months v 9.4 months
  - Time to disease progression 2.3 months v 4.2 months
  - Overall Response Rate 19% v 12%
    - Four Complete Responses v One
  - Adverse Reactions (>20% of patients) fatigue, musculoskeletal pain, cough, breathing difficulty, decreased appetite

- US\$150,000 treatment cost
- Sales for first 6 months 2016 = US\$1.6 billion

# Moving towards first registration

Target Indication: NOX66 in combination with Radiotherapy for the treatment of patients with metastatic cancer



#### Notes:

- Different Global Regulators may modify indication for specific tumour types
- Indication may also list when treatment can be used
- Indication will discuss how to use Radiotherapy with NOX66
- Rare cancers may not be included in indication, however evidence is important
- Reimbursement is as important as Registration

2017 2018 2019 2020/21

### Beyond the trials to reach registration

- Manufacturing and formulation: Optimise NOX66 formulation; GMP Manufacturing
- **Pre-clinical / non-clinical**: *in vitro* and animal studies to meet regulatory and other requirements for registration and marketing
- Medical Affairs: Liaison with oncologists, advisory boards, congress attendance and presentation
- Marketing: Develop Noxopharm presence, brand-naming, commercialization (including pricing) strategy

### Communicating Trials Progress 2018

- Progress based on Data Safety Monitoring Committee Review
  - Independent body researchers and statisticians
  - Regular meetings during trials expect ~6 across trials in 2018
  - Review overall progress → decisions on continuation
  - Findings of DSMBs will be communicated
- Trial Data at conferences
  - Contingent on significant milestones in trials (end of study, all patients through a pre-defined time point) – expect ~4 in 2018
  - Requires considerable planning (e.g. ASCO meeting June, submit presentation in February)
  - Requirement that data are embargoed until presented
  - Where significant outcomes, top line result may be released as per ASX requirements prior to conference





#### 2 technologies





#### 3 drugs







#### rugs



Severe epilepsy

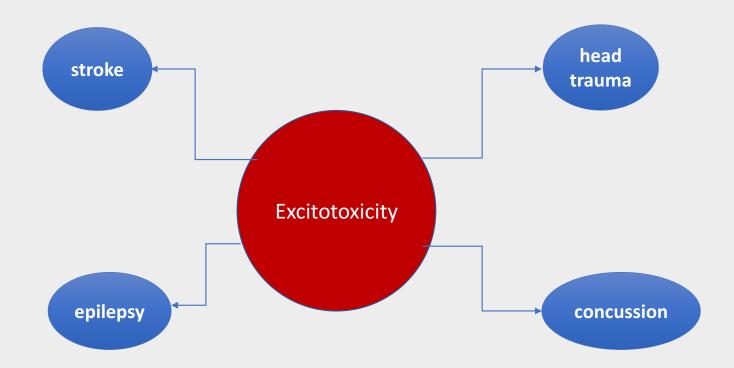
3 indications

Peripheral neuropathy

Hypercholesterolaemia

#### Inhibitor of *excitotoxicity*



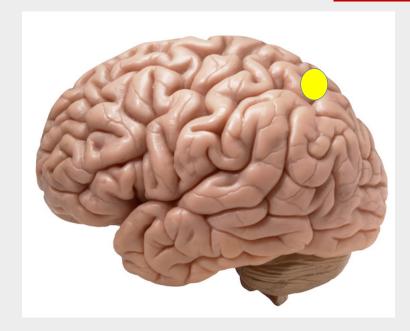




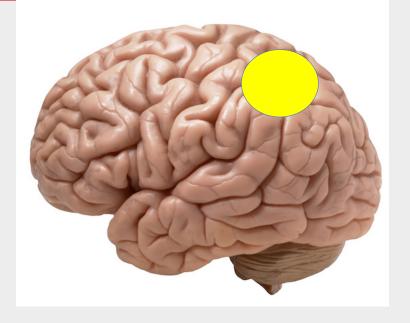




#### Excitotoxicity



Size of original area of damage from stroke or concussion



Days to weeks later, excitotoxicity has increased area of damage up to **10-times** 



1. University of NSW Translational Neuroscience Facility:

Breakthrough identification of key protein promoting excitotoxicity (**TrpC3 isotope**)

2. In vitro screen of NOX compounds:
NYX-104 inhibits TrpC3

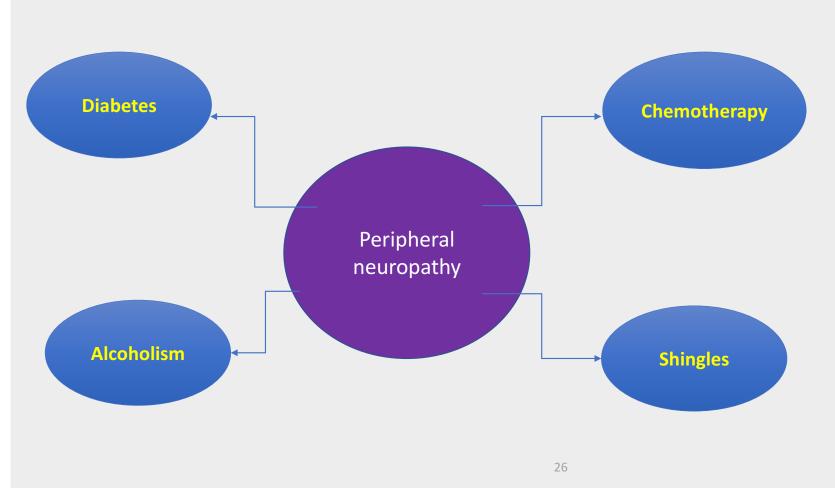
3. Mouse model of human stroke:

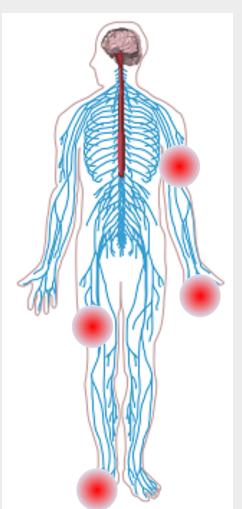
NYX-104 is potent inhibitor of excitotoxicity.

70% reduction in area of brain death post-stroke.

# Anti-inflammatory Designed to cross the blood-nerve barrier







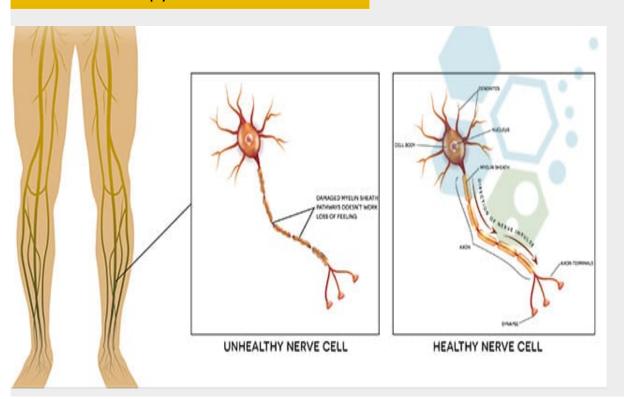
#### Peripheral neuropathy

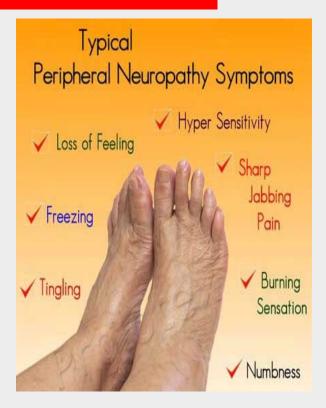


#### Incidence in US estimated at 20 million:

- Diabetes
- Alcohol abuse
- Chemotherapy

Blood-nerve barrier is major obstacle to effective treatment. NYX-205 designed to cross this barrier.





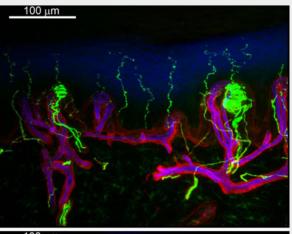
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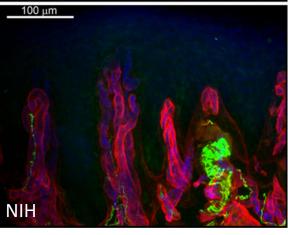


Targeting peripheral neuropathy in cancer patients receiving chemotherapy

60% incidence at 3 months 30% incidence at 6 months

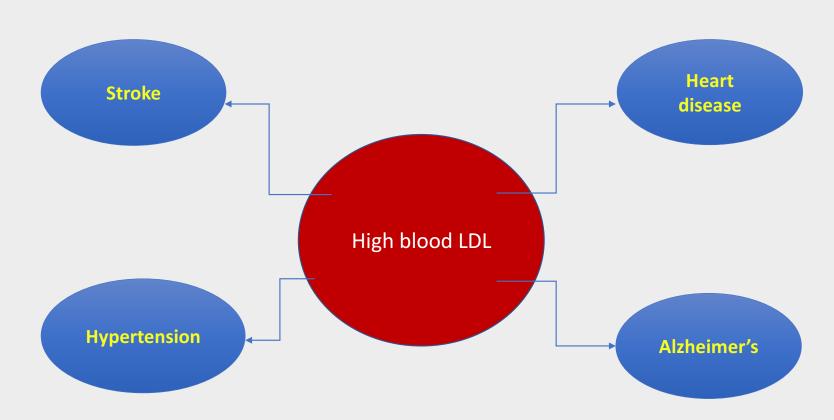
Currently no effective treatment





#### Hypercholesterolemia

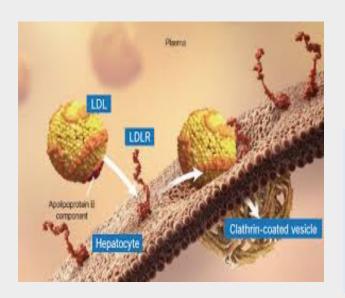




#### Hypercholesterolemia



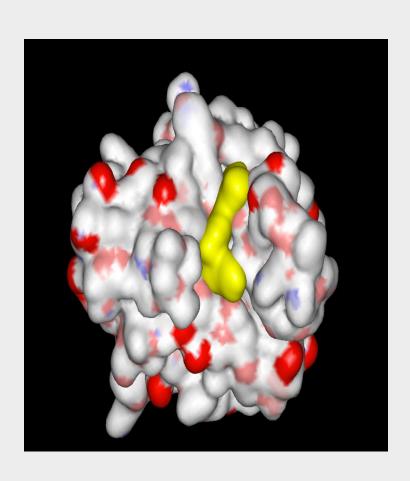
- PCSK9 identified as superior drug target compared to statin drugs for lowering blood LDL levels.
- PCSK9 is plasma protein that binds to the LDL-LDL receptor complex, preventing recycling of the LDL receptor and thereby increasing LDL levels.



**PCSK9** declared an unsuitable target for small molecule drug. Amgen develops monoclonal antibody. *Repatha* comes to market in 2015.

#### Hypercholesterolemia





Suitable binding site identified on **PCSK9** for attachment of small molecule.

**NYX-330** blocks binding of PCSK9 to LDL- LDL receptor complex.



- US-registered
- Focus on small molecules, non-oncology
- > 67% owned by NOX; 33% Altnia Holdings
- Currently public unlisted; proposed US listing in 12-18 months



#### **OFFER:**

- > Raise = AUD\$6,000,000
- Seed capital = 1,500,000 New Shares(A\$4 each; 2 Options per 3 Shares)
- Capital structure post-exercise of Options
  - NOX 50%
  - Altnia 25%
  - Seed investors 25%

Application for Shares by sophisticated investors, non-US residents only. Information Memorandum available: info@nyrada.com

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