



WA Bioprospecting Workshop

Hosted by ChemCentre and WABSI

22nd July 2019



Aims of this workshop

- Identify local interest and capacity for bioprospecting
- Consensus (or not!) on reasons why bioprospecting industry is valuable for WA
- Appetite for involvement in development of business case
 - Participation in a working group
 - Contributing funds (~\$10k)
- Determine an agreed time frame for
 - Funding for business case
 - Business case



Who is in the room?

Two sentences:

1. Your name and current organisation
2. What is your (or your organisation's) interest in bioprospecting?



Questionnaire

Are you (or your organisation) actively involved in bioprospecting of diverse flora and fauna?

YES: What are your research capabilities and interests in bioprospecting?

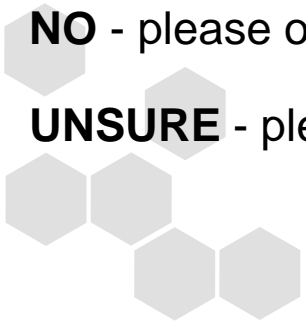
NO: Do you have any interest in becoming active in bioprospecting?

Should the State Government invest in a coordinated effort to establish a bioprospecting industry based on WA's diverse flora and fauna?

YES - please outline reasons....

NO - please outline your reasons....

UNSURE - please outline your reasons....



Total responses = 8

Questionnaire

Are you (or your organisation) actively involved in bioprospecting of diverse flora and fauna?

YES: What are your research capabilities and interests in bioprospecting? 5

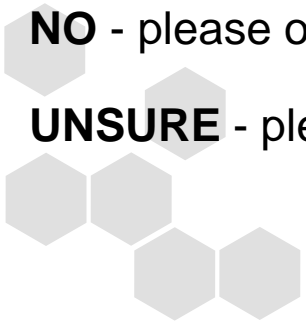
NO: Do you have any interest in becoming active in bioprospecting? 3

Should the State Government invest in a coordinated effort to establish a bioprospecting industry based on WA's diverse flora and fauna?

YES - please outline reasons.... 7

NO - please outline your reasons....

UNSURE - please outline your reasons.... 1



Are you (or your organisation) actively involved in bioprospecting of diverse flora and fauna?

YES

- Existing collections of terrestrial and aquatic fauna collections, WA Marine Bioresources Library
- Isolation and identification of natural compounds from WA plants
 - cell-based assays for screening bioactive compounds
 - abundant complex molecules which could be used as building blocks for the chemical and pharmaceutical industries
- Genomics and synthetic biology to identify bioactive small molecules from diverse microorganisms and plants
- Harry Butler Institute (co-existence of business and biodiversity, conservation and environmental management)
- Australian National Phenome Centre (disease treatment, significant analytical capability)
- Potential CRC Bid (Murdoch)

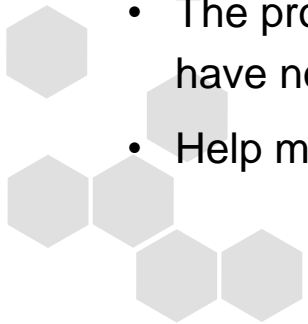
NO (but interested because...)

- Bioprospecting has been flagged as a significant opportunity for WA
- Untapped resource with great potential for discovering novel compounds valuable to drug discovery and medical sciences
- Existing programs of biodiversity knowledge and information management enable development of a systematic approach to the storage and protection of the data necessary for the development of a bioprospecting industry.

Should the State Government invest in a coordinated effort to establish a bioprospecting industry based on WA's diverse flora and fauna?

Yes

- Economic/Policy
 - Economic and social opportunities (whilst currently hard to measure and define) are potentially significant
 - Provides opportunities for innovation, jobs and the overall economy including international trade.
 - Need for the State to provide a level of confidence and encourage private sector investment into R&D and other activities is required
 - Without Government investment and co-ordination there is a risk the broader benefits may not materialise
 - Previous attempts to undertake this type of activity without Government support have been unsuccessful (e.g. Bioprospect Limited)
 - The proposed change in legislation brings are significant opportunity for bioprospecting as most of the biodiversity have not been explored
 - Help manage the ethical side of the enterprise



Should the State Government invest in a coordinated effort to establish a bioprospecting industry based on WA's diverse flora and fauna?

Yes

- Environmental/Conservation
 - WA has a very large and richly biodiverse natural flora and fauna, with many unique species, but an estimated 70% are undescribed.
 - Opportunity to coordinate effort to catalogue and prioritise those flora and fauna (and microflora) that are endemic to WA.
 - Non-vascular plants (e.g. fungi, algae), vertebrate and invertebrate terrestrial and marine fauna will also provide biomolecular and other opportunities in the medical, food, agriculture and other industries.
 - WA has valuable untapped resources, this is a unique life sciences opportunity for WA.
- Infrastructure/ Skills
 - Leverage existing in-state Chemistry expertise and “small-scale” screening facilities, facilitate access to resources.
 - Investment in research facilities and relevant infrastructure would significantly increase output and discovery of bioactive compounds for the benefit of the state.
 - Investment in human resources bring young talented scientists who are trained (locally or abroad) to WA. Retainment of skills and knowledge in academic in bioprospecting would significantly improve our capabilities at WA to do large scale bioprospecting.
 - Collaborative effort, cross-discipline, with shared resources is best coordinated by one body, a central body keeps projects on track.

Should the State Government invest in a coordinated effort to establish a bioprospecting industry based on WA's diverse flora and fauna?

Unsure

- A WA government sponsored industry based on the traditional bioprospecting approach is high risk with little reward.
 - Most large pharmaceutical companies do not believe that crude natural product screening is a viable approach to drug discovery and have even stopped screening microbiological extracts.
 - There are many examples where screening activities have been unsuccessful (e.g. AMRAD in Australia, EVOTEC in Germany) as most “hits” obtained in screening are “false positives”.
- **However**, the state government can foster activity in the area by creating an environment where researchers, industry and stakeholders of WA biodiversity can engage with each other

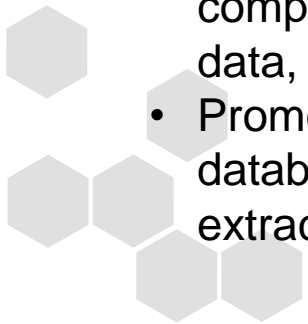
Discussion – Why, What

- Why do we need to develop a bioprospecting industry for WA? (Why hasn't it worked before?)
- What programs/activities would be undertaken?



Model and Suggested Activities

- Economic/Policy
 - Economic analysis of the opportunity for WA
 - Development of appropriate commercial arrangements to ensure the State receive appropriate benefits from the initiative
 - Simplified procedure for permits to collect plant material for 'blue skies' natural products research, with the caveat that the results are reported on a generally accessible database. If a natural product of commercial value is found, then the commercialisation with the stakeholders can be discussed.
 - Comprehensive (legal) documentation detailing traditional medicinal use of WA plants and other biological resources by indigenous communities to aid discussions of benefit sharing, and remove any confusion/hesitation a company or individual may have on ownership issues
- Environmental/Conservation
 - A coordinated effort to build bioprospecting resources and infrastructure, such as culture collections, compound collections, fraction libraries as well as information bank biogeography and taxonomy, genomic data, chemical profiles, dereplication libraries, bioactivity profiles etc
 - Promote identification of chemical constituents of WA plants and link the information with the State Herbarium database, making the database on known species readily available. Would a systematic analysis of crude extract of WA plants (e.g. using LCMS) kickstart this process?



Model and Activities

- Infrastructure/ Skills
 - Investment in cell-based testing facilities including relevant infrastructure and personnel (postdocs/technicians).
- Model
 - Projects should be run as a commercial enterprise, opportunities to engage VC funds for project translation, example project models successfully running in Victoria and Brisbane
 - A small grant scheme could promote collaboration between industry, universities and indigenous communities.



Next Steps

- Workshop information to be summarised and circulated
 - Further feedback/input welcome
- ChemCentre will seek funding for developing business case
 - Royalties for Regions Concept Brief
 - Opportunity to participate in a working group
 - Partner contribution (~\$10k)
 - Timeframe



Business case will identify opportunities and best economic model for further organisation