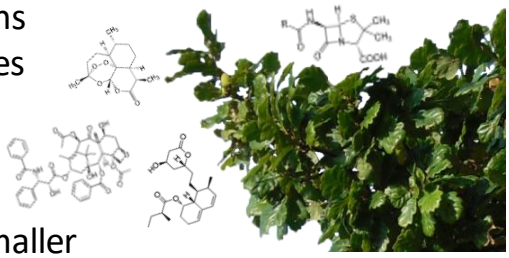
Puretitre

Caithness BIOTECHNOLOGIES

Natural compound library

Drug discovery is evolving….

Natural products have historically been the most successful source of new drugs.[1] Indeed, although the 1990s and early 2000s saw a refocus towards greater interest in the screening of large libraries of synthetic compounds, experience has shown that the success rate of natural product library screens remains superior.[2] As a result, natural product libraries are once again returning to the forefront of drug discovery.



But the landscape of early-stage drug discovery is also undergoing another major transformation, as smaller research groups in academia and spinouts are now expected to develop the next generation of therapeutic targets and drug leads. *Puretitre*, a uniquely focused and optimised natural compound library, has been developed to meet the specific challenges of this new paradigm.

Key features of the *Puretre* library

- Unique focus on compounds found in natural products used as traditional medicines, or as the basis of modern drugs, maximises potential for 'hit' finding
- 200 pure natural compounds are supplied at 10 mM in DMSO
- Focus on high bioactivity with relatively low toxicity, maximises potential for translation
- You keep all the IP you generate, no licensing or MTAs required
- Published use in successful screens [ref 3]

Potential uses

• *Drug discovery* - particularly where low toxicity over the longer term is desirable

• *Antimicrobials* - potential for the discovery of new antibiotic and anti-fungal agents [3]

• *Agrochemicals* - potential for the discovery of new insecticides and pest repellents

• *Cosmetic industry* - to help meet consumer demand for natural product-derived cosmetics

What are the advantages of natural compounds over combinatorial compound libraries?

Natural compounds occupy a chemical space with a far greater structural diversity than synthetic compound libraries, and tend to be more 'drug-like', with superior ADME/T (absorption, distribution, metabolism, excretion and toxicity) properties. The typical 'hit-rate' of natural product library screens also tends to be far higher,[1] largely due to their inherent enrichment in molecules that interact with conserved protein domains, and the millennia of intense selective pressure faced by plants to develop secondary metabolites that target specific pathways in microbes or herbivores, including mammals. Accordingly, more than half of new drugs approved between 1981 and 2010 were derived or inspired from nature.[4]

The *Puretitre* library

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Natural compound library

Will I be able to generate IP?

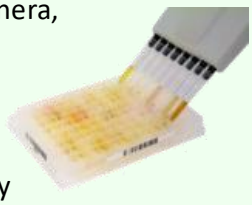
The *Puretitre* library contains some compounds which are well studied , and others which are relatively less studied. However, it must be remembered that in terms of novelty, the true value of the screen is in the new target and the assay based upon it. Derivatives of these compounds or their scaffolds also offer excellent opportunities for intellectual property (IP) generation, especially if a series of derivatives can be tested. This model has yielded some of the most profitable drugs of all time (e.g. the statins, with global sales of >$130 Bn), and continues to be a fruitful source of IP (>50% of new drugs from 1981-2010 were nature-inspired).[4]

Key advantages of *Puretitre*

High-throughput screening of natural product libraries, especially by smaller research groups, has traditionally faced a number of challenges. *Puretitre* addresses these in the following ways:

1) Balancing diversity with library size

Most natural product libraries are very large (hundreds of plates), thus requiring very costly reagent and labour inputs for preliminary screens. However, because many phytochemicals are expressed widely across genera, optimum structural diversity can be obtained without a very large library size.[5] By focussing on compounds with high biological activity, and relatively low toxicity, *Puretitre* balances excellent molecular diversity with manageable workflow for independent laboratories.



2) Ease of resupply

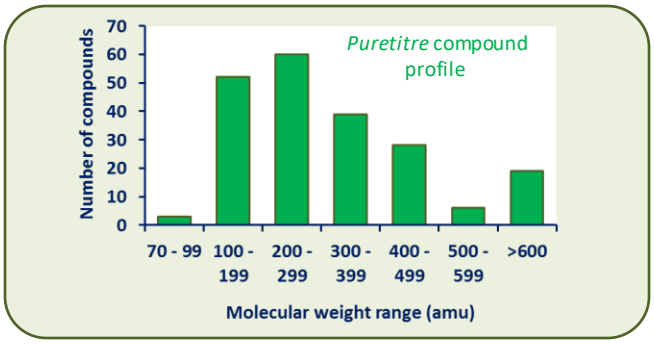
All compounds in the library are readily available commercially, so scaling up rapidly to larger studies is easily acheved.

3) Accessibility to smaller research groups

Most compound libraries are sized and priced beyond the means and throughput of smaller laboratories. By focusing on maximal hit rate, the *Puretitre* library offers class-leading value for money.

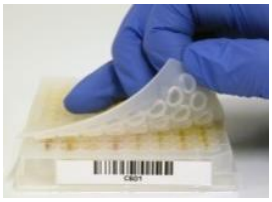
Making new targets accessible

To date, only about 400 targets are targeted by drugs. By contrast, tens of thousands of potential protein targets have never been screened before. These targets, and the bioassays of their function, offer vast potential for new drug discovery. In other words, your assay holds the key value and novelty. *Puretitre* aims to bring accessible high-quality screening to these new targets and assays.



Library format

- 200 pure natural compounds are supplied at 10 mM in DMSO in SBS compliant 96-well round bottom polypropylene microplates
- Each plate contains 80 (or 40) compounds with two empty columns for positive and negative controls
- Bar codes (code 128) and human readable plate numbers are printed on one long and one short side of all plates
- DMSO-resistant re-sealable cap mats maximise sample integrity and ease of use
- SDF file available



Pricing

200 compound *Puretitre* library, 100 µl of each compound at 10 mM in DMSO:

£700 + VAT

Pricing valid to 31/07/21

References: [1] Li JW, *et al*. Science 325:161-5 (2009) [2] Scannell JW, *et al*. Nat Rev Drug Discov 11:191-200 (2012) [3] Jenic D, *et al*. Nat Prod Bioprospect (2020) [4] Newman DJ, *et al*. J Nat Prod 75:311-335 (2012) [5] Tulp M, *et al*. Trends Pharmacol Sci 5:225-231 (2002)

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