

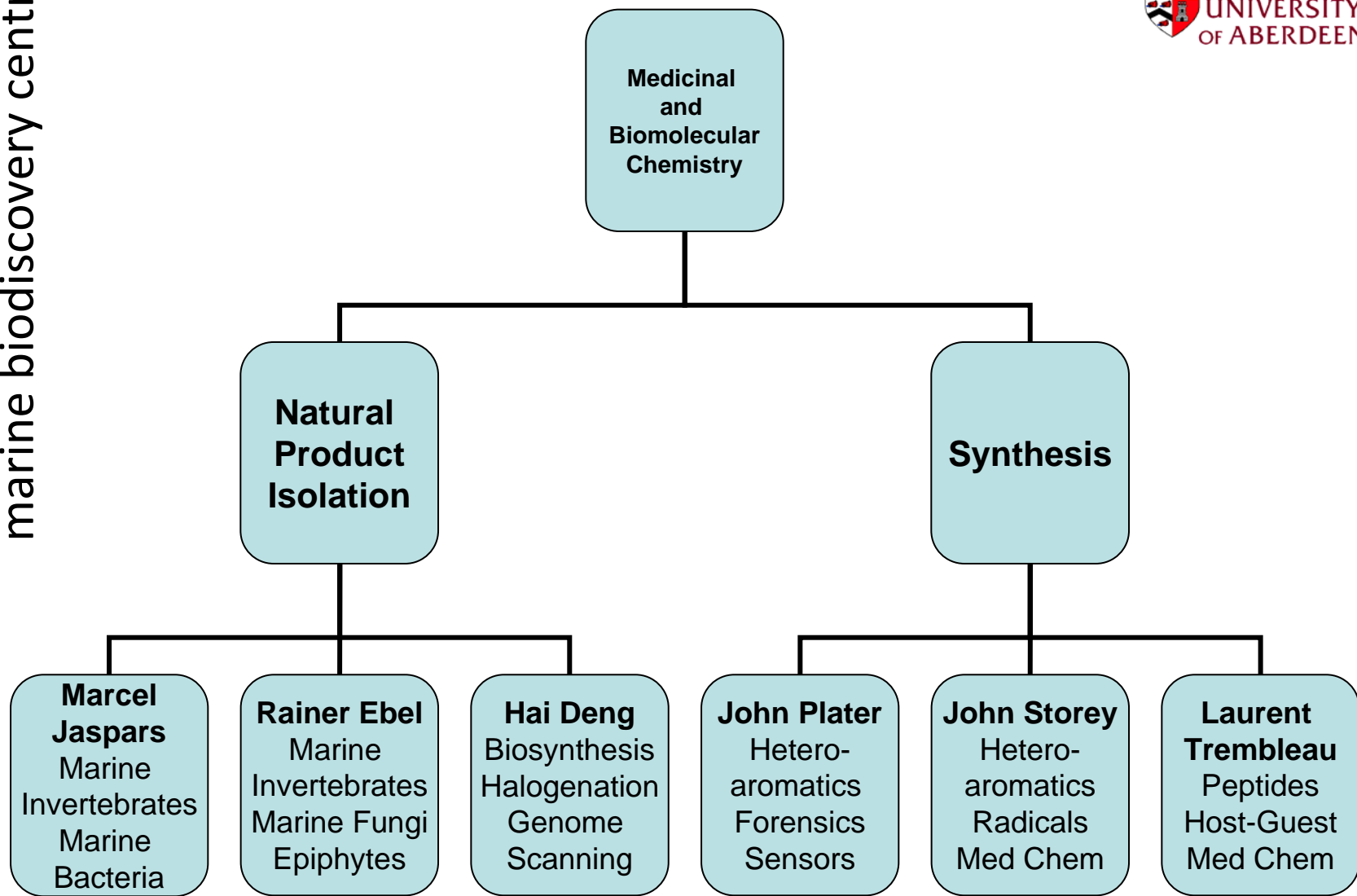


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Natural Product Library

Marcel Jaspars

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Current Collaborations

Rod Scott, Maggie Smith, Gail Ferguson
Janet Liversidge, Steve Woodward,
Jörg Feldmann, Eva Krupp

Current Collaborations

Tau Therapeutics: Claude Wischik & Charlie Harrington. Roger Pertwee, Ruth Ross, Tim Smith, Abbie McLaughlin.

Marine Biodiscovery at Aberdeen

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Tools

Chromatography
Spectroscopy
(Synthesis)
(Molecular biology)
(Molecular modelling)

People

Marcel Jaspars
Jorg Feldmann
Rainer Ebel
Hai Deng
Eva Krupp

**Marine invertebrates
Marine microorganisms
& Symbionts**

Support:

Dr Andrea Raab (MS)
Mr Russell Gray (NMR)

Functions

Chemical ecology
Symbiosis
Biosynthesis
Bioinorganic chemistry

Applications:

Pharmaceutical

Cancer
Infection
Inflammation
Parasites
Drug delivery

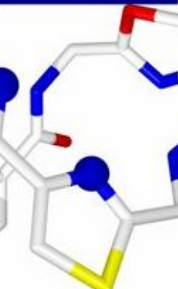
Research tools

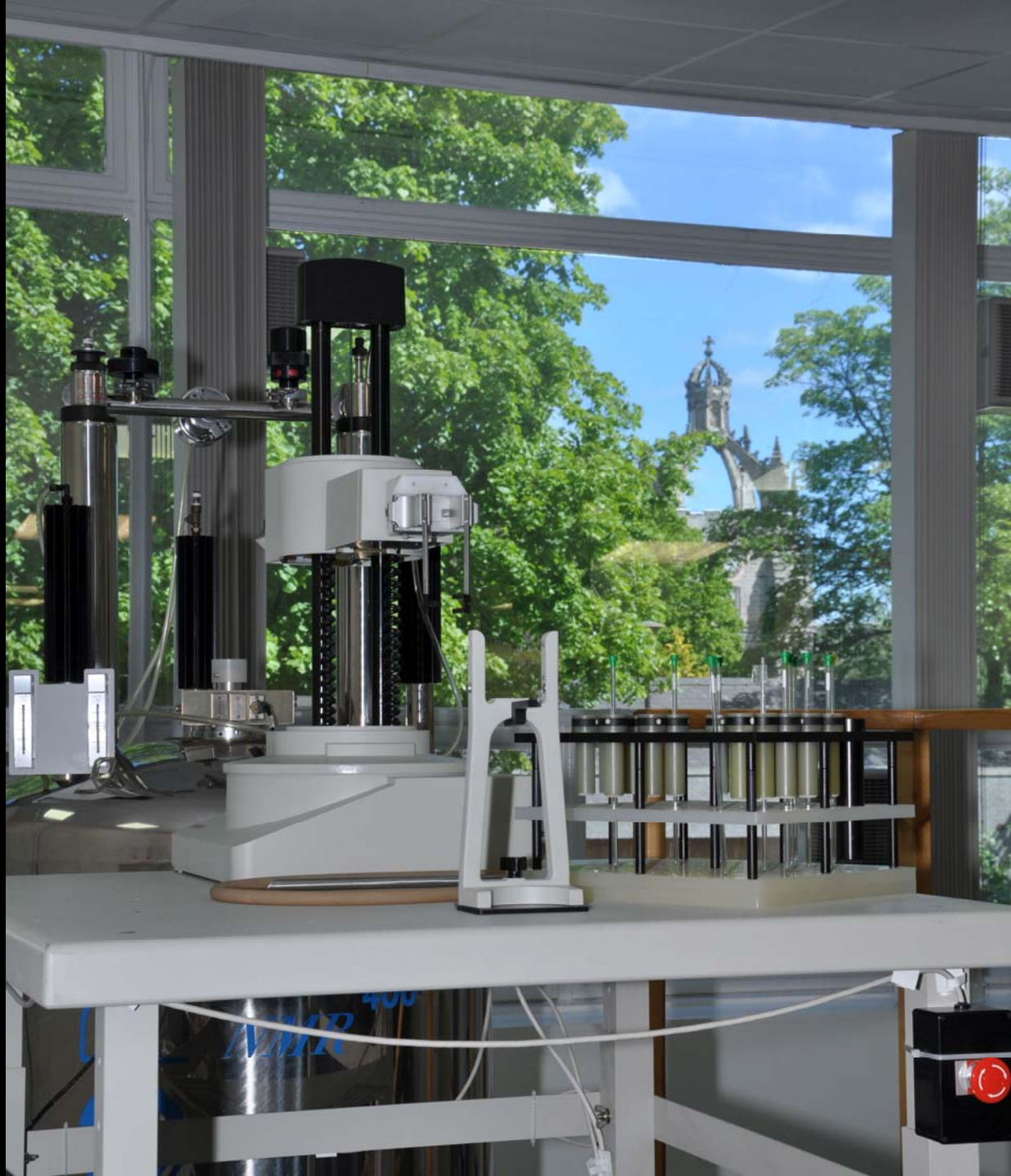
Transfection
Electrophysiology

Facilities

- 600 & 400 MHz Nuclear Magnetic Resonance
- High and low resolution LC-MS
- High and low resolution ICP-MS
- Parallel LR and HR HPLC - ESMS/ICPMS
- Fully equipped microbial culture suite
- Separations/chromatography suite (eg SPE, SEC, HPLC)
- Fully equipped organic synthesis laboratories.

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VARIAN

Varian 600 MHz
Premium Shielded

VARIAN





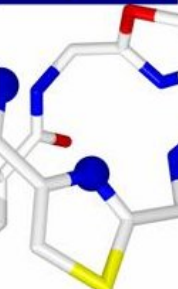




Capabilities

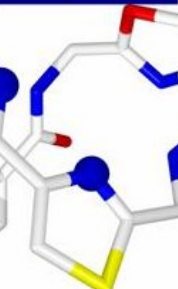
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- Structural characterisation of organic compounds and element/isotope-tagged biomolecules
- Spectroscopic expertise:
 - Nuclear magnetic resonance
 - Liquid chromatography - mass spectrometry
 - Inductively coupled plasma - mass spectrometry (ICPMS)
 - Elemental Imaging: laser ablation ICPMS
 - Gas chromatography - ICPMS
- Small molecule synthesis (custom or novel)



Natural Products as Medicines

- 61% of 877 small molecule NCEs introduced between 1981-2002 originated from NP:
 - 6% NP
 - 27% NP derivatives
 - 5% synthetic with NP pharmacophores
 - 23% NP mimics
- 78% of antibacterials originated from NP
- 74% of anticancer agents originated from NP

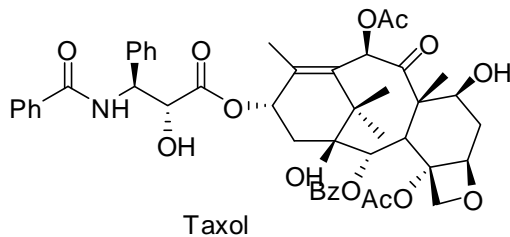


Anti-Cancer Agents from Nature

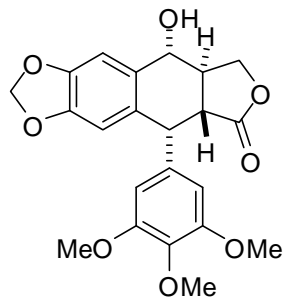
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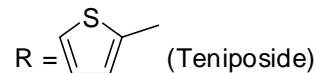
Taxus brevifolia



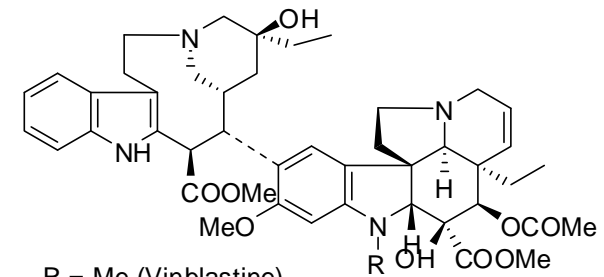
Podophyllum peltatum



R = Me (Etoposide)



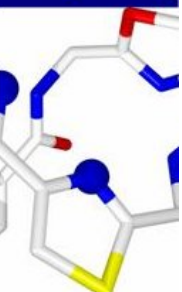
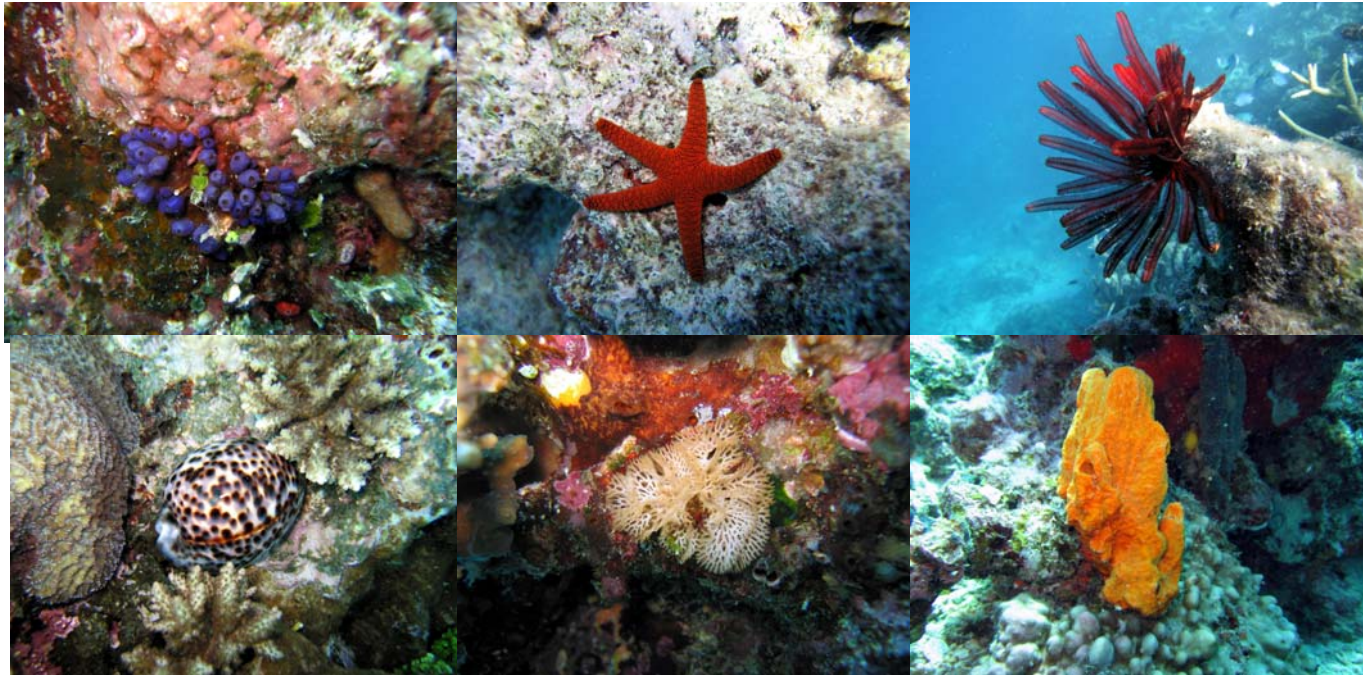
Catharanthus roseus



R = Me (Vinblastine)
R = CHO (Vincristine)

Why investigate marine invertebrates?

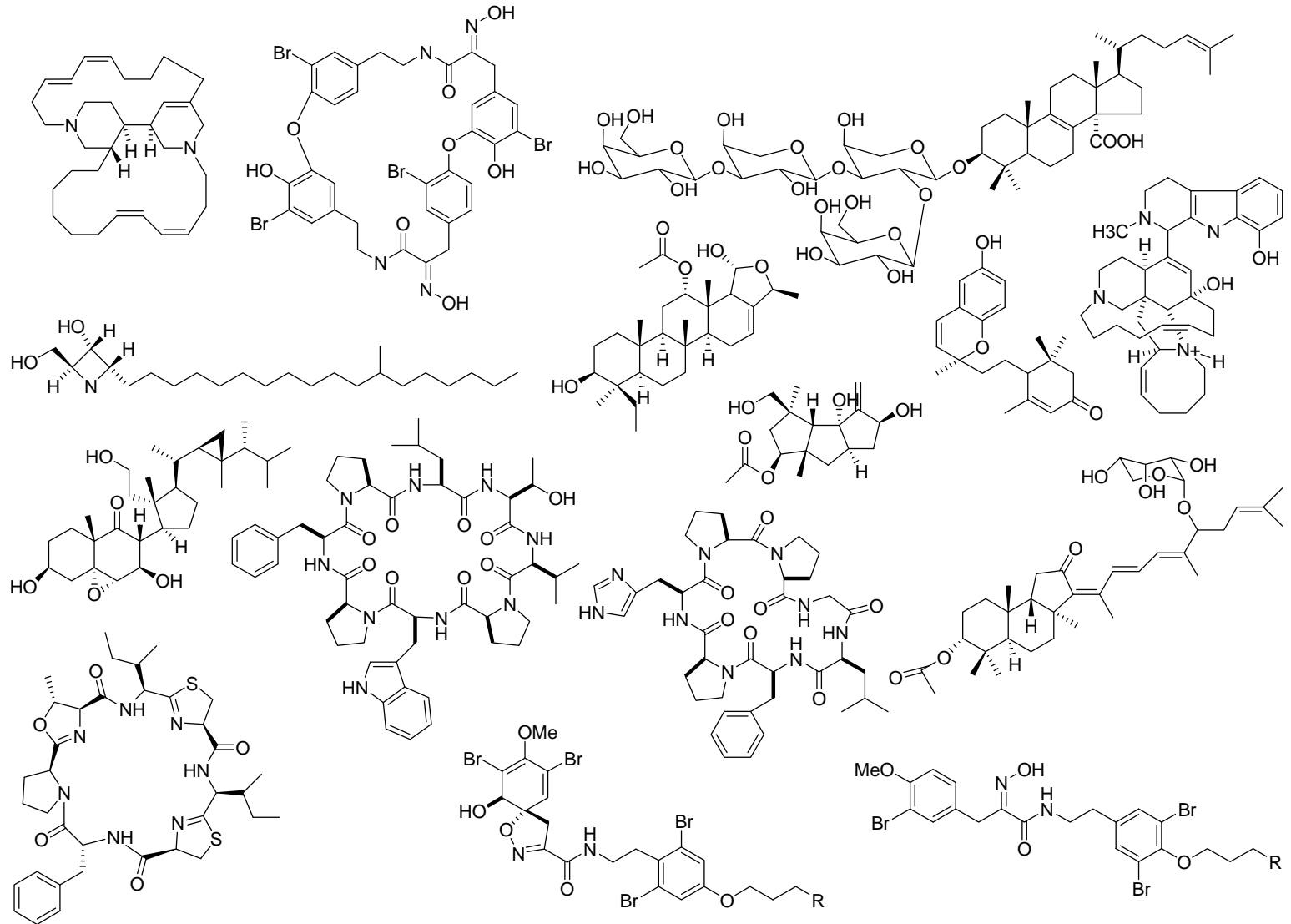
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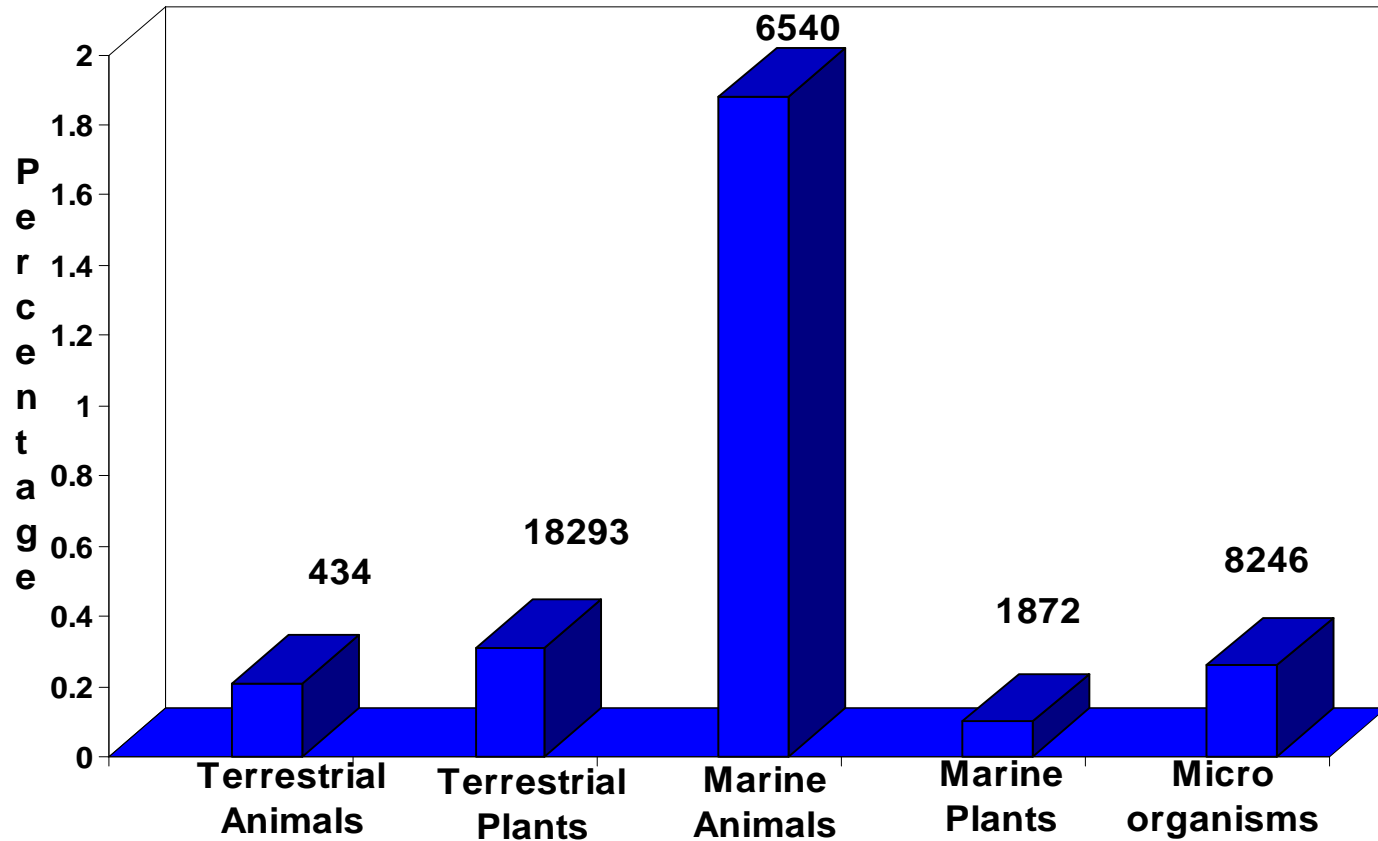
Biological Diversity = Chemical Diversity





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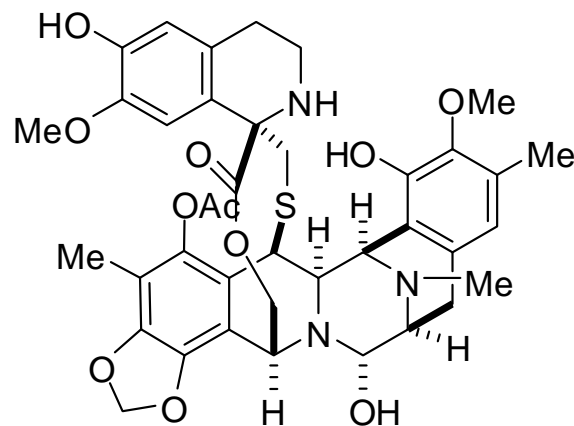
Percentage of organisms showing anti-cancer activity



Garson in *Sponges in Time and Space*, 1994, Balkema, Amsterdam

Ecteinascidin-743

Yondelis/Trabectedin (Pharmamar)



Ecteinascidia turbinata.

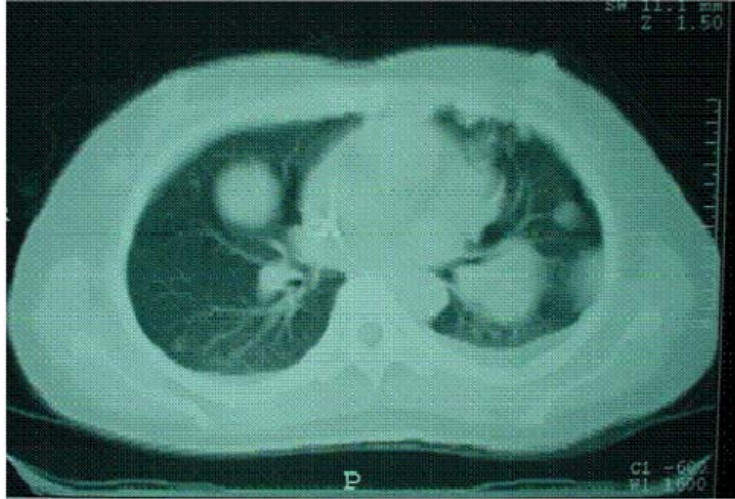
- “Yondelis is indicated for the treatment of patients with advanced soft tissue sarcoma after failure to anthracyclines and ifosfamide, or who are unsuited to receive these agents” - EMEA approval July 2007.
- 1st compound approved for sarcoma in 25 years.

Wright *et al* JOC, **1990**, *55*, 4508; Rinehart *et al* JOC, **1990**, *55*, 4512

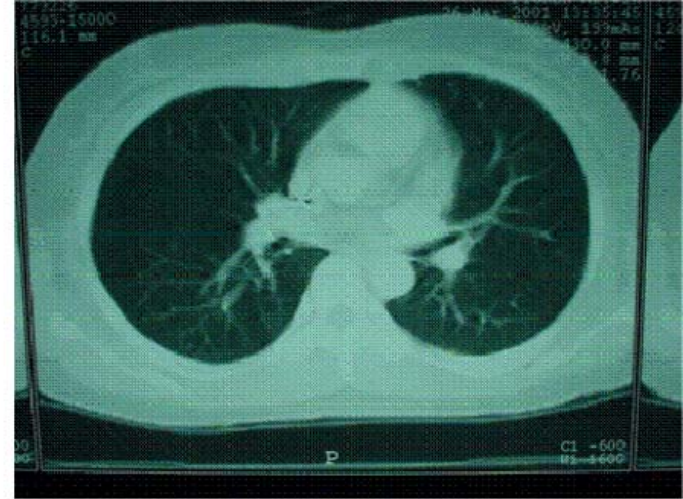


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Trabectedin Long Lasting Response in Advanced Uterine Leiomyosarcoma

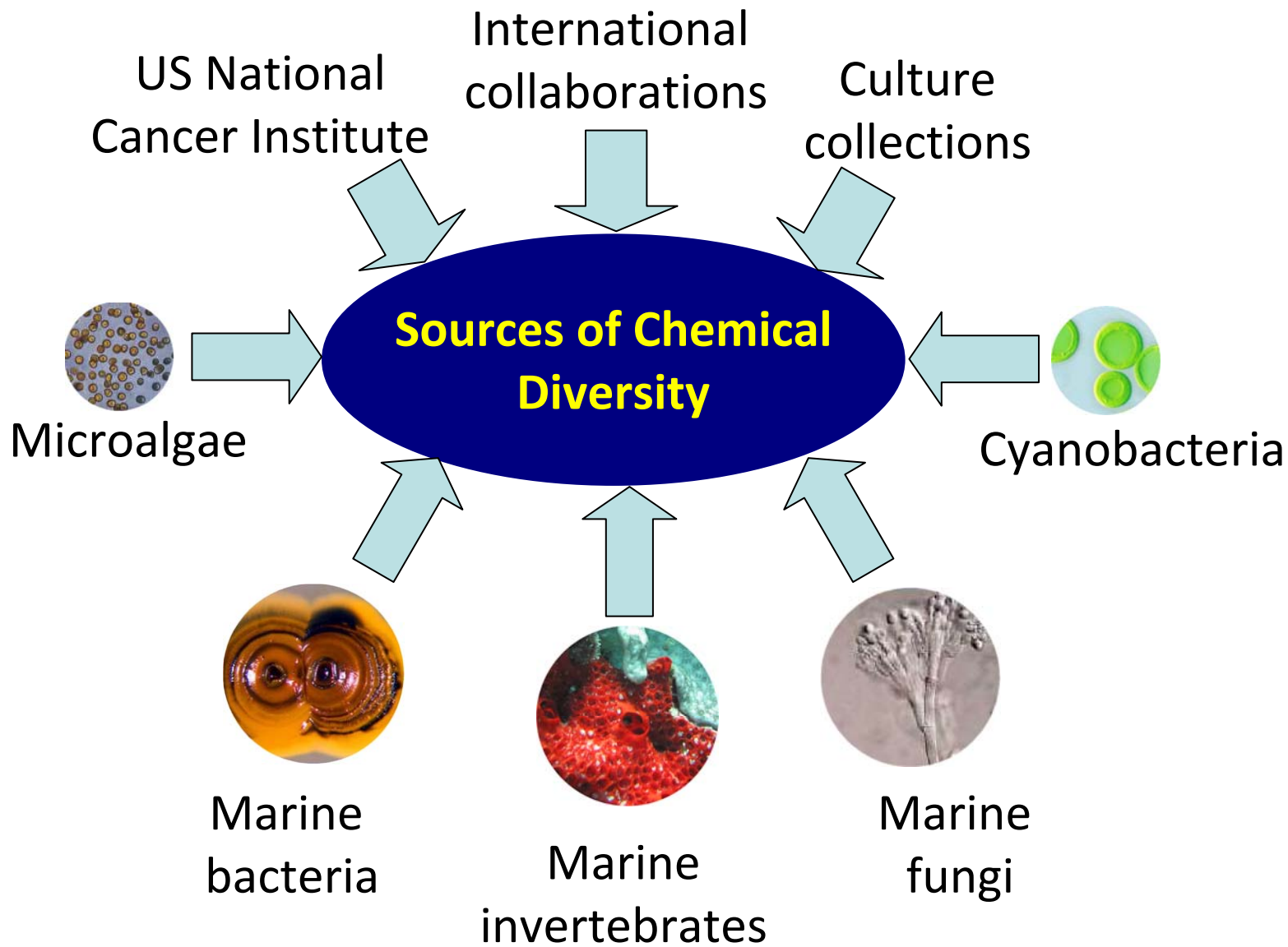


Baseline



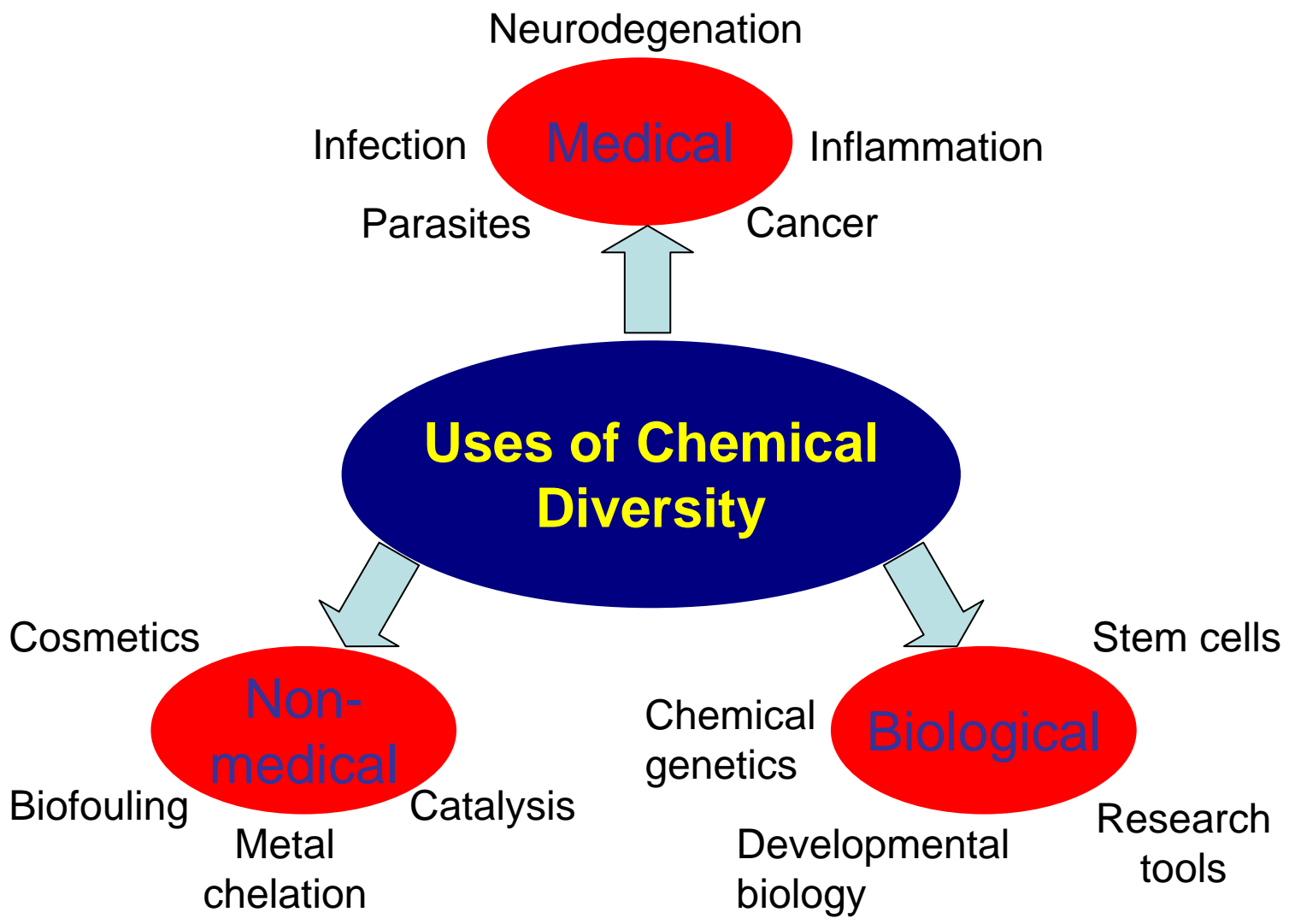
>18 Cycles

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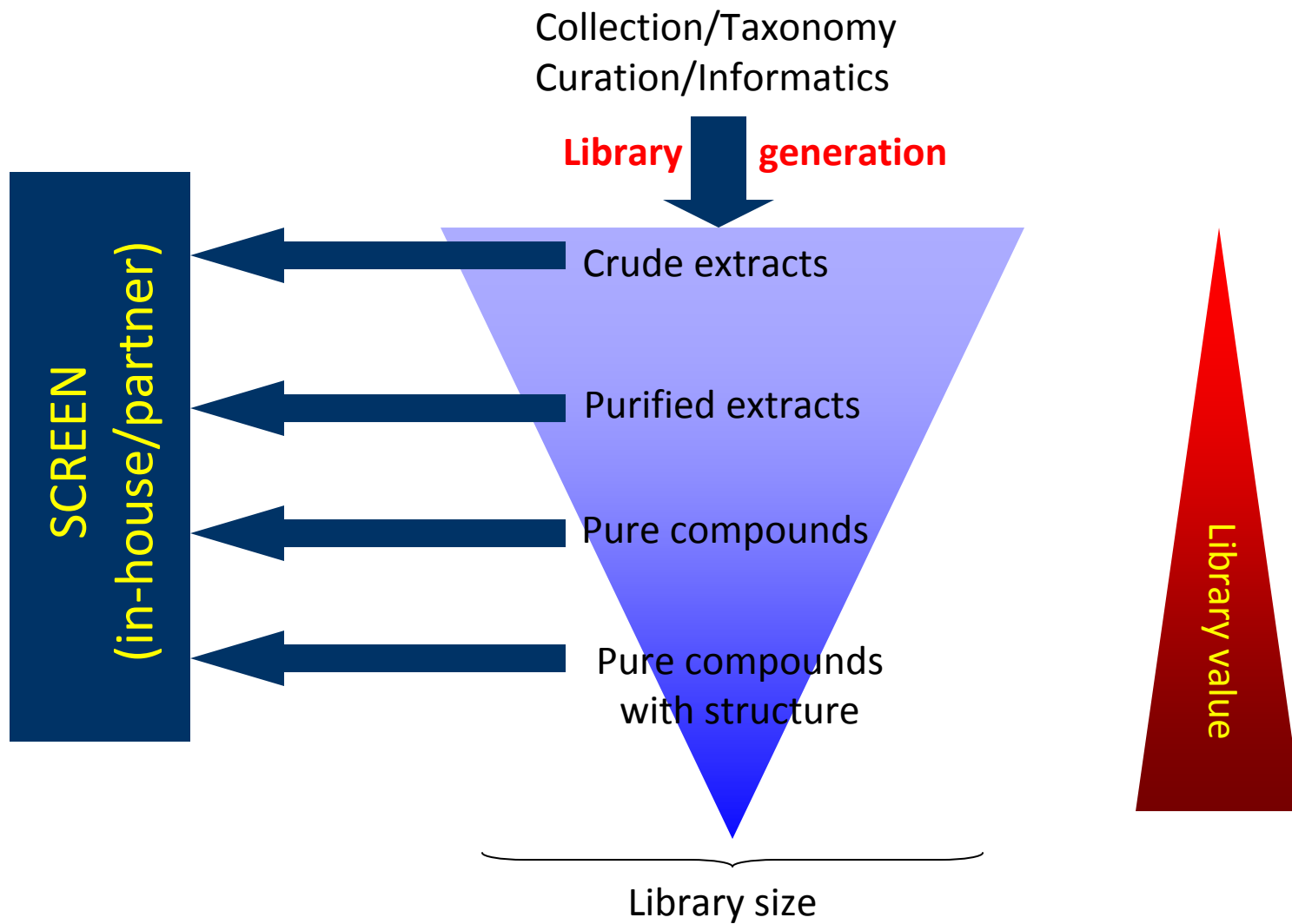


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Compound and Extract Diversity

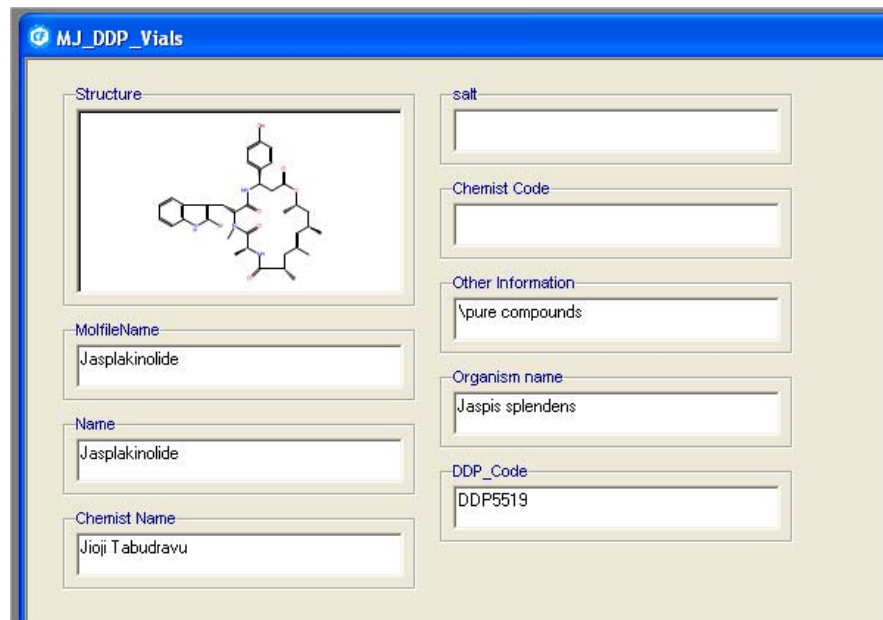
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Compound/Extract Libraries

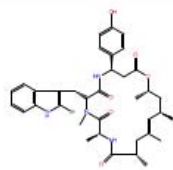
MBC Library

- *Ca* 200 pure compounds available
- More compounds being added
- Compounds from plants and marine organisms.
- Purified extract library being developed (EU Funding)
- Library available to be used for biological research and drug discovery under licence.
- Specimen material transfer agreement available



M.J_DDP_Vials

Structure



MolfileName
Jasplakinolide

Name
Jasplakinolide

Chemist Name
Jioji Tabudravu

salt

Chemist Code

Other Information
\pure compounds

Organism name
Jaspis splendens

DDP_Code
DDP5519

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