

*A look at the life of the sponge *Jaspis**



Vanderloos, Rob. Sponges wage chemical warfare in the Indo-Pacific. 1997.

Cassandra Re & Nicole McIntosh
Department of Natural Sciences & Mathematics
Dominican University of California
February 13th 2015

Outline



- Background
- Secondary Metabolite Chemistry
- Biological activity reported
- Conclusion
- Acknowledgements
- References
- Interesting Fact

Background

- *Jaspis* (coll. no 95654)
 - Sponge has been collected at various locations
- Selected examples in the Indo Pacific include:
 - The South China Sea
 - Parts of the Indian Ocean
 - Fiji Islands



Photo by Chris Ireland



Google Images, Indo-Pacific Ocean Map



Rob Vanderloos

Vanderloos, Rob. Sponges wage chemical warfare in the Indo-Pacific. 1997.

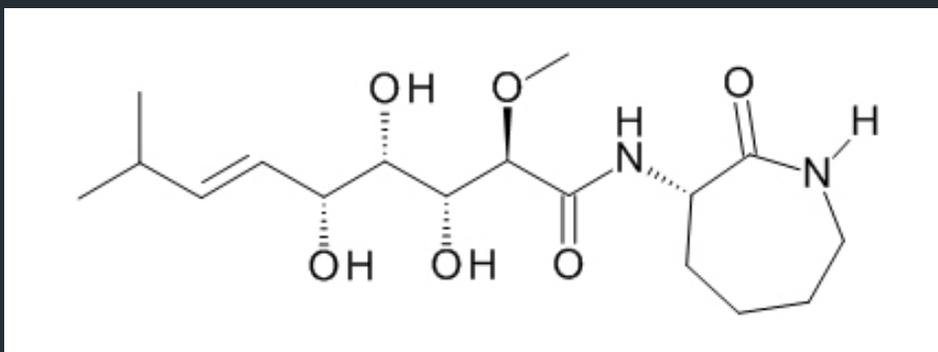
Outline



- Background
- Secondary Metabolite Chemistry
- Biological activity reported
- Conclusion
- Acknowledgements
- References
- Interesting Fact

Secondary Metabolic Chemistry

Chemotype: **Bengamide E**



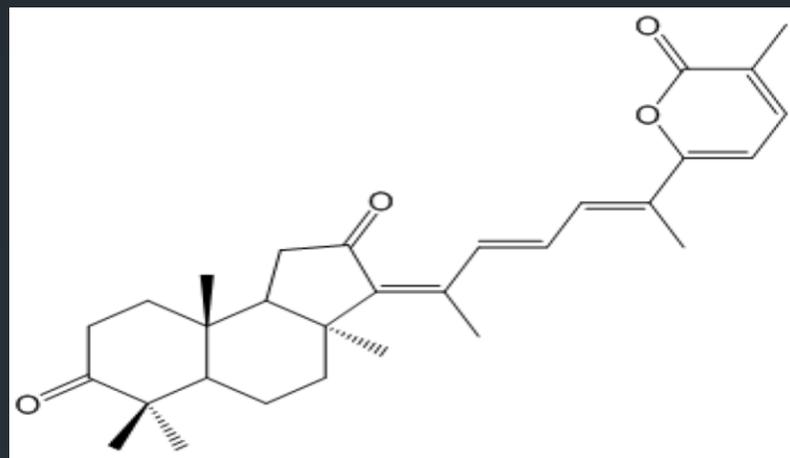
Molecular formula: $C_{17}H_{30}N_2O_6$

Polarity index = **3.12**

Polar Chemistry

(Aqueous solvent soluble)

Chemotype: **Stelletin B**



Molecular formula: $C_{30}H_{40}O_4$

Polarity index = **7.5**

Non polar Chemistry

(Organic solvent soluble)

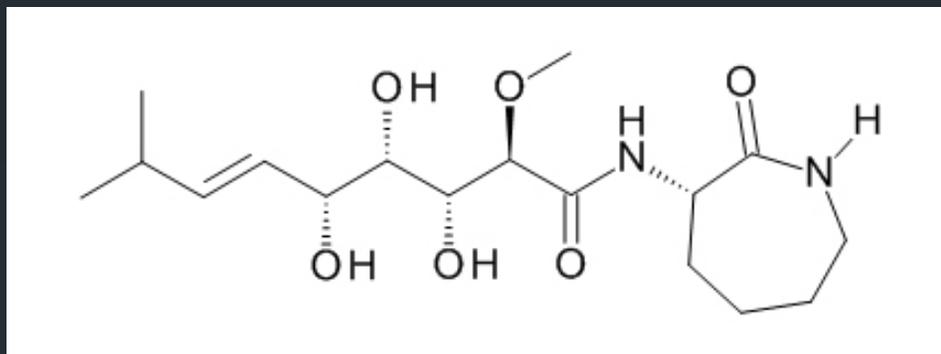
Outline



- Background
- Secondary Metabolite Chemistry
- Biological activity reported
- Conclusion
- Acknowledgements
- References
- Interesting Fact

Biological Activity

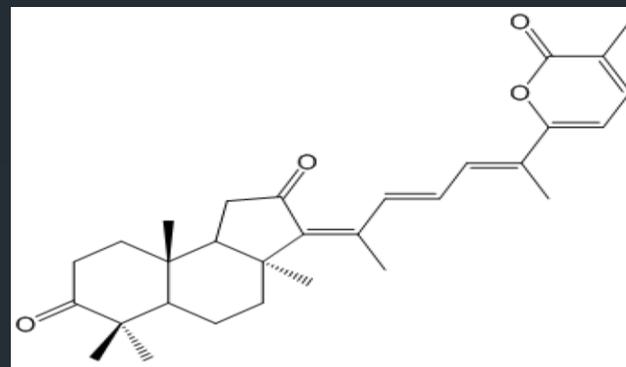
Chemotype: **Bengamide E**



Biological activity:

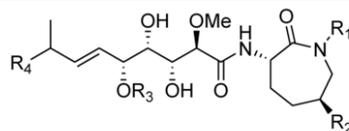
Toxicity to cancer cells:
human mammary carcinoma

Chemotype: **Stelletin B**

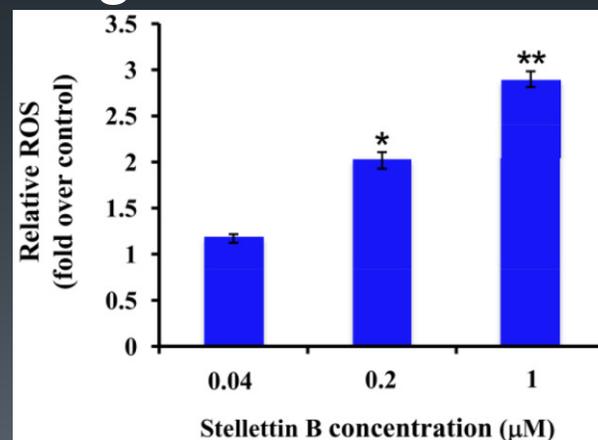


Biological activity:

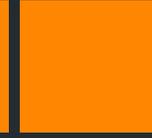
Toxicity to cancer cell lines:
human glioblastoma cells



| Compound | R ₁ | R ₂ | R ₃ | R ₄ | NF-κB Inhibition (IC ₅₀ , μM) |
|-------------------|----------------|--|----------------|---------------------------------|--|
| Bengamide A (64) | H | OC(CH ₂) ₁₂ CH ₃ | H | Me | 0.075 |
| Bengamide B (65) | Me | OC(CH ₂) ₁₂ CH ₃ | H | Me | 0.085 |
| Bengamide E (66) | H | H | H | Me | 7.5 |
| Bengamide F (67) | Me | H | H | Me | 0.7 |
| Bengamide E' (68) | H | H | H | CH ₂ CH ₃ | 2.0 |
| Bengamide F' (69) | Me | H | H | CH ₂ CH ₃ | 2.0 |



Outline



- Background
- Secondary Metabolite Chemistry
- Biological activity reported
- Conclusion
- Acknowledgements
- References
- Interesting Fact

Conclusion

- *Jaspis* is a source of the Bengamide E and Stelletin B chemotypes
- They have been reported from:
 - The South China Sea
 - Parts of the Indian Ocean
 - Fiji Islands
- These compounds may serve as therapeutic lead structures for treating:
 - A) human mammary carcinoma
 - B) human glioblastoma
- The % yields of our extracts of *Jaspis* (coll. no. 95654) were:
 - 15.90mg
 - 15.98mg
- This indicated that our specimen was enriched with:
 - More organic nonpolar chemistry

Outline



- Background
- Secondary Metabolite Chemistry
- Biological activity reported
- Conclusion
- Acknowledgements
- References
- Interesting Fact

Acknowledgments

Special Thanks to...



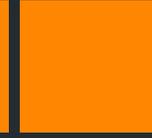
Dr. Spain

Dr. Johnson

Dr. Hall

BIO 2990 - Research Methodology

Outline

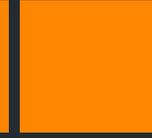


- Background
- Secondary Metabolite Chemistry
- Biological activity reported
- Conclusion
- Acknowledgements
- References
- Interesting Fact

References

- García-Ruiz, C.; Sarabia, F. Chemistry and Biology of Bengamides and Bengazoles, Bioactive Natural Products from *Jaspis* Sponges. *Mar. Drugs* **2014**, *12*, 1580-1622.
- Ireland, Chris. "Ireland Research Lab." *Department of Medicinal Chemistry*. University of Utah, n.d. Web. 13 Feb. 2015
- Tang, S.-A.; Zhou, Q.; Guo, W.-Z.; Qiu, Y.; Wang, R.; Jin, M.; Zhang, W.; Li, K.; Yamori, T.; Dan, S.; Kong, D. *In Vitro* Antitumor Activity of Stelletin B, a Triterpene from Marine Sponge *Jaspis stellifera*, on Human Glioblastoma Cancer SF295 Cells. *Mar. Drugs* **2014**, *12*, 4200-4213.
- Vanderloos, Rob. Sponges wage chemical warfare in the Indo-Pacific. 1997.

Outline



- Background
- Secondary Metabolite Chemistry
- Biological activity reported
- Conclusion
- Acknowledgements
- References
- Interesting Fact

Interesting Fact

- Salicin is an extract from the inner bark of a willow.
- Salicin can be hydrolyzed into salicylic acid with a synthetic derivative of acetylsalicylic acid.
- Used for pain relieving properties
- Aspirin



- "Salicylic Acid." *Wikipedia*. Wikimedia Foundation, n.d. Web. 13 Feb. 2015.
- "Dr.S.Venkatesan MD." *DrSVenkatesan MD*. N.p., n.d. Web. 13 Feb. 2015.