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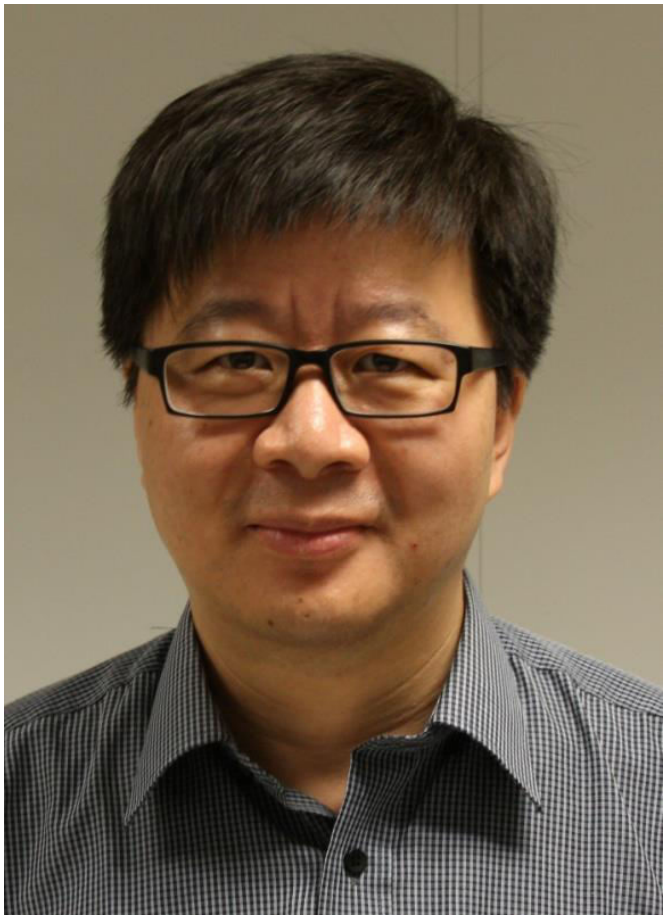


Tao YE (葉濤)

tao_ye35@hotmail.com

Hong Kong Polytechnic University

Tao Ye received his B.Sc. (1983) and M.Sc. (1986) from East China University of Science & Technology. He obtained his Ph.D. (1993) from Queen's University, Belfast, under the supervision of Professor Tony McKervey. After pursuing a post-doctoral stay at QUB (1993-1994) and ROPA-postdoctoral work with Professor Gerald Pattenden at University of Nottingham (1994-1998), he joined the University of Hong Kong in 1998, then moved to The Hong Kong Polytechnic University in 2001 and was promoted to Associate Professor in 2005. He has completed the total syntheses of 38 marine natural products. He received "Xiaoyu Hu Memorial Award" (2014) and “WuXi PharmaTech Life Science and Chemistry Award” (2012), Asian Core Program Lectureship Award 2012 (To deliver a series of lectures in Japan) and Asian Core Program Lectureship Award 2012 (To deliver a series of lectures in Mainland China)

Research Interests

Our laboratory is dedicated to the discovery and development of new agents of medicinal value. We are working in two main areas:

(1) **Total Synthesis and Biological Evaluation of Natural Products and Their Analogues.** Natural products have provided considerable value to the pharmaceutical industry over the past half century. In particular, the therapeutic area of oncology has benefited from numerous drug classes derived from natural product sources. In fact, over 60% of the anticancer agents approved have been of natural origin. Chemical synthesis of natural products and their analogues has been a key tool in drug discovery and development. The synthesis allows verification of primary structure proposed on the basis of studies of natural product, and presents opportunities to modify the structure, with the ultimate aim of improving activity or physicochemical/biological properties of the lead molecule. Synthesis is also crucial in the establishment of structure-activity relationships, as the ability to make analogues of the lead compound chemically is a prerequisite of such studies.

We are particularly devoted to the exploration of natural-products-based novel antitumor agents. Large part of our research program is dedicated to the training and research in synthesis and biological evaluation of natural products with known anticancer activities.

(2) **Design and Syntheses of Novel Small Molecule Bioprobes and Drugs.**

In the second area, our research centers on rationally designed molecular probes and their application to biological problems, especially in cancer biology and neurodegenerative disorders. Protein–protein interactions have a key role in most biological processes, and offer attractive opportunities for therapeutic intervention. The targeted manipulation of protein-protein interactions by small molecules is rapidly gaining importance in the development of biological tools for dissecting living processes on a molecular level and for the discovery of conceptually novel drugs. We have been focusing on the discovery of small molecules/peptidomimetics to prevent the degradation of p27, p53 and to regulate histone methylation process and epigenetic control.

Recent Publications in Total synthesis of Natural Products:

- "Total Synthesis of Largamide B" *Chem. Comm.* **2015**, *51*, DOI: 10.1039/C4CC08901D
- "Total Synthesis and Stereochemical Reassignment of Mandelalide A", *Angew. Chem. Int. Ed.* **2014**, *53*, 6533.
- "Synthesis of the Macrocyclic Core of Rhizopodin" *Chem. Asian J.* **2013**, *8*, 2955.
- "Total Synthesis and Biological Evaluation of Grassypeptolide A" *Chem. Eur. J*, **2013**, *19*, 6774.
- "Total Synthesis of Padanamides A and B"*Chem. Comm.* **2013**, *49*, 2977.
- "Total Synthesis and Stereochemical Revision of Lagunamide A" *Chem. Comm.* **2012**, *48*, 8697.
- "Total Synthesis and Absolute Configuration of Nocardioazine B" *Chem. Comm.* **2012**, *48*, 4344.
- "Total Synthesis of Hoiamide C" *Org. Lett.* **2011**, *13*, 2506.
- "Total Synthesis of Grassypeptolide" *Chem.Comm.* **2010**, *46*, 7486.
- "Synthesis of the Macrocyclic Core of Iriomoteolide-1a"*Chem. Comm.* **2010**, *46*, 4773.
- "Total Synthesis and Stereochemical Reassignment of Bisebromoamide" *Org. Lett.* **2010**, *12*, 3018.
- "Synthesis of the C9−C23 (C9'-C23') Fragment of the Dimeric Natural Product Rhizopodin", *Org. Lett*. **2010**, *12*, 2036.
- "Total Synthesis of Sintokamide C" *Org. Lett*. **2010**, *12*, 1100.
- "Towards the Stereochemical Assignment of Natural Lydiamycin A" *Chem. Comm.* **2010**, *46*, 574.
- "Total Synthesis of Largamide H" *Chem. Comm.* **2010**, *46*, 153.

Structure elucidation of natural products

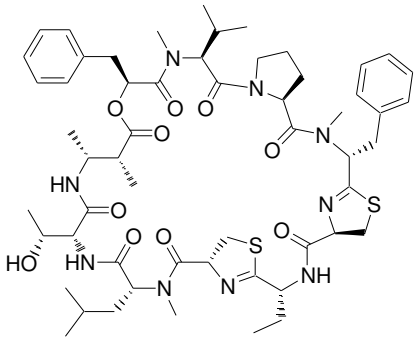
- Prior to the 1960's, structure elucidation heavily relied on chemical degradation or derivatization followed by partial or total synthesis.
- Structure elucidation of increasingly limited quantities of components from marine natural product extracts heavily rely on advanced nano-scale NMR technologies.
- Chemical degradation and derivatization were somewhat less involved.
- Certain stereochemical issues are often difficult or impossible to be determined by spectral methodology alone

Structure elucidation

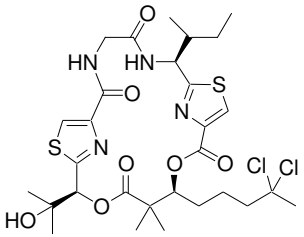
1. NMR based methods
   - 1D and 2D NMR
   - **The ^{13}C NMR acetonide method (Rychnovsky)**
   - **Universal NMR database (Kishi)**
   - **Chiral derivatizing agents (Mosher's method)**
   - **J-Based configurational analysis (Murata's method)**
2. Chiroptical methods
   - Polarimetry
   - UV-vis and electronic circular dichroism
   - The exciton chirality method (Nakanishi)
   - Infrared and vibrational circular dichroism
3. Chromatographic methods (e.g. **Marfey's method**)
4. Biosynthetic methods
5. X-ray crystallography
6. Chemical synthesis including **total synthesis**

Stereochemical analysis methods

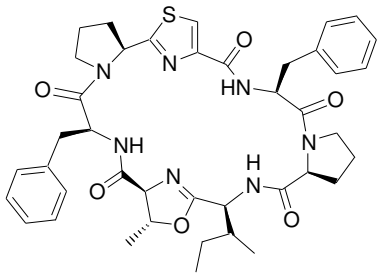
Structures of Completed Natural Products:



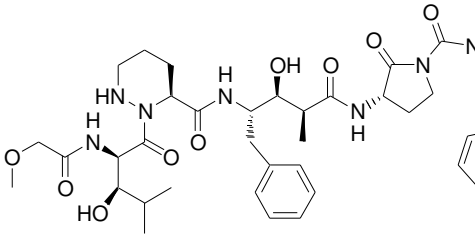
Grassypeptolide



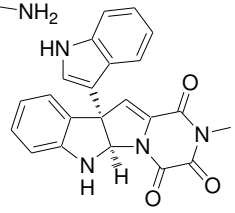
Lyngbyabellin A



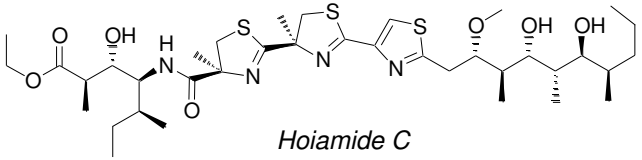
Ceratospongamide



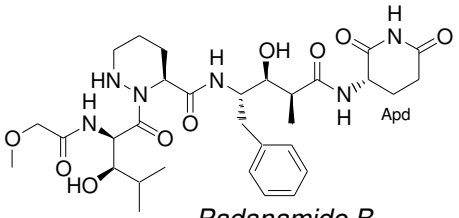
Padanamide A



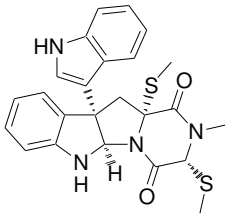
Gliocladin C



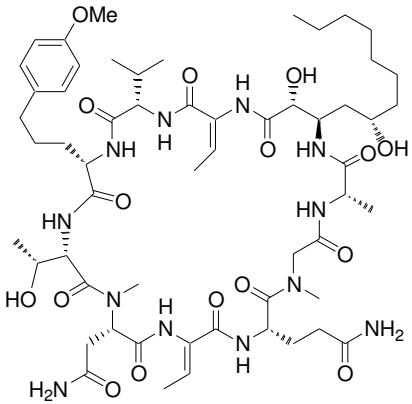
Hoiamide C



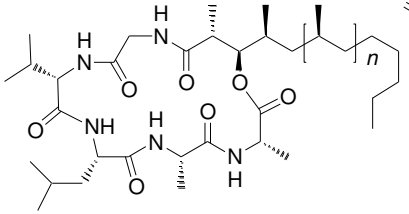
Padanamide B



Gliocladin B



Largamide H



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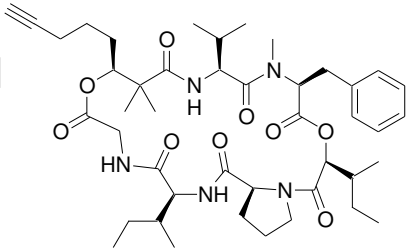
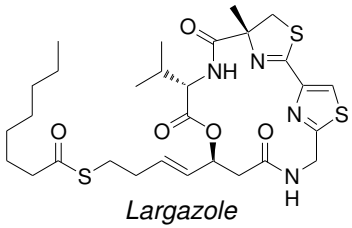
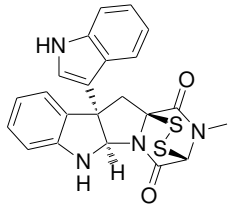
Emericellamide B, *n* = 1



Pitipeptolide A



Largazole



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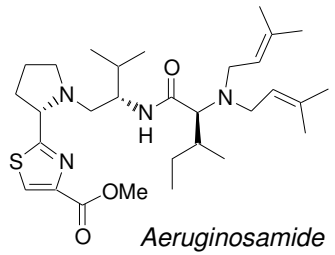
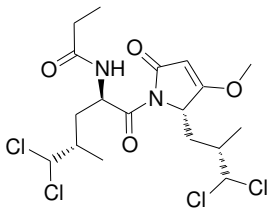


Aeruginosamide



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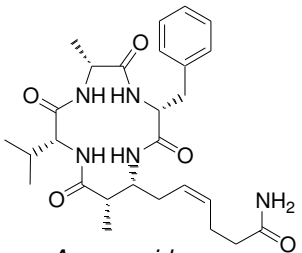
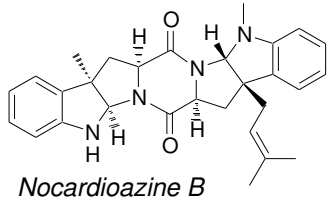
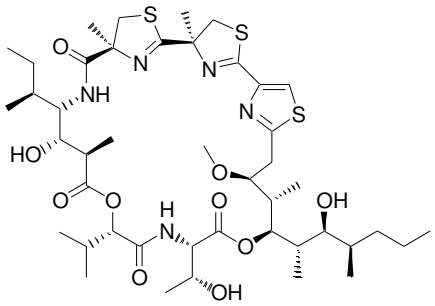


Azumamide

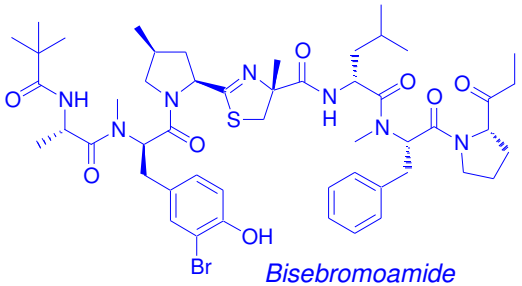


Nocardioazine B

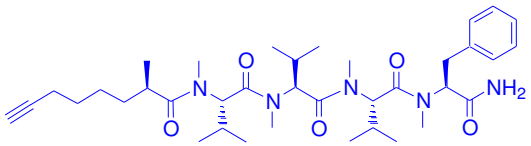


Hoiamide A

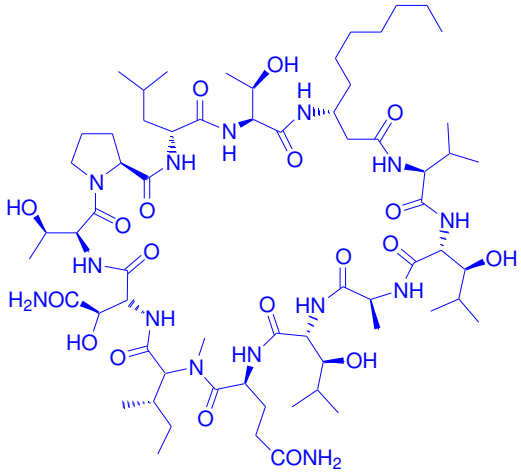
Structures of Completed Natural Products:



Bisebromoamide



Dragonamide



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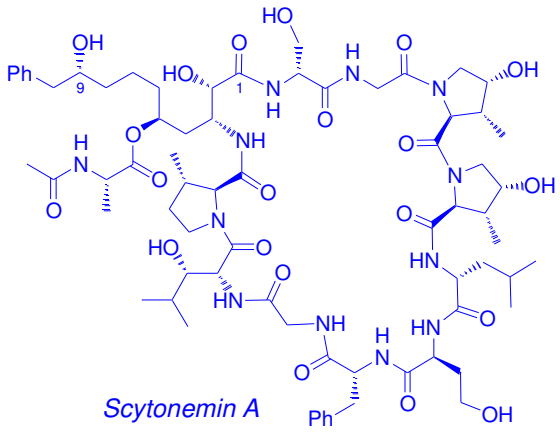

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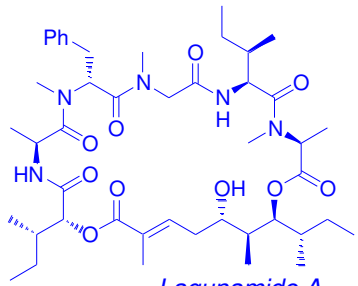
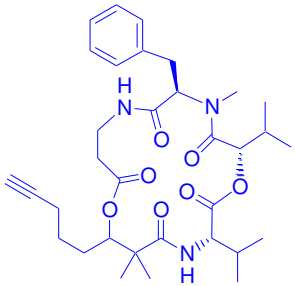


Lagunamide A



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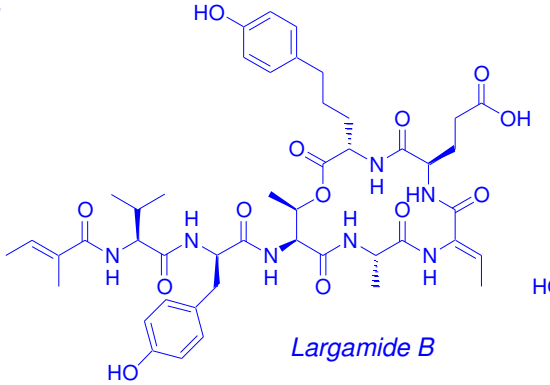
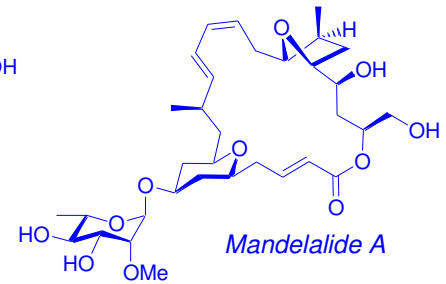
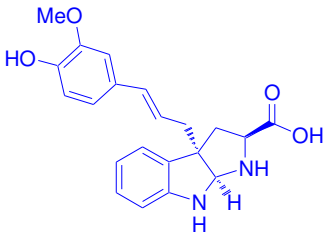


Largamide B



Mandelalide A



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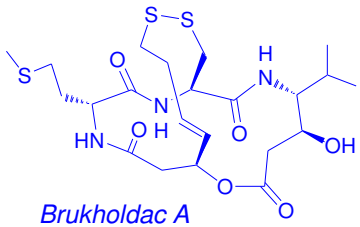
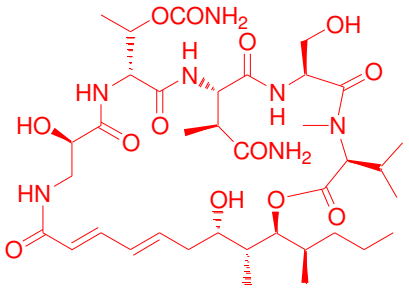
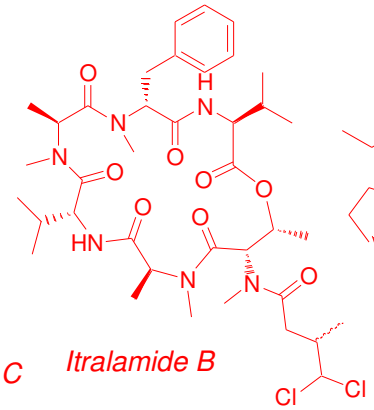


Brukholdac A

Structures of Completed Natural Products:



Celebeside C



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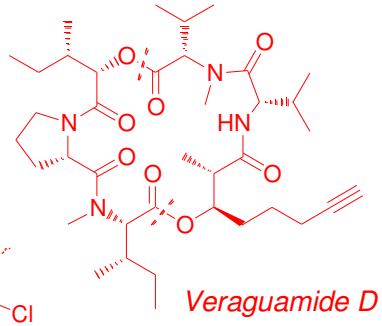
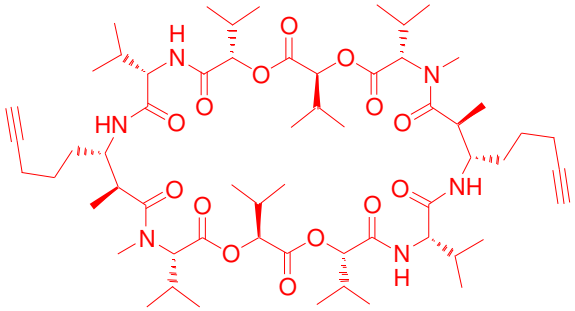


Veraguamide D



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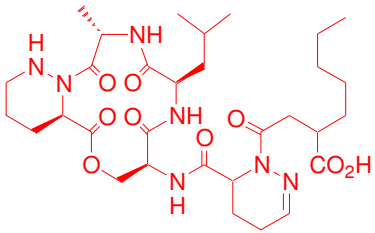
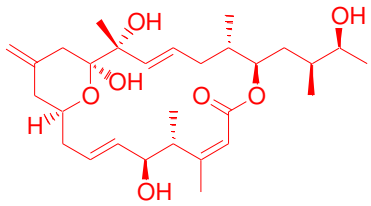
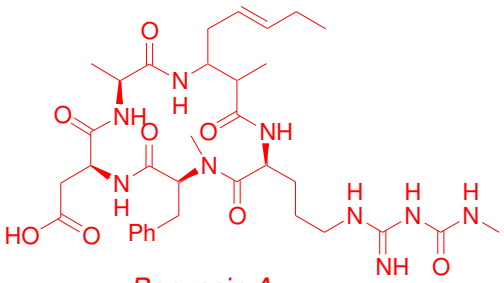


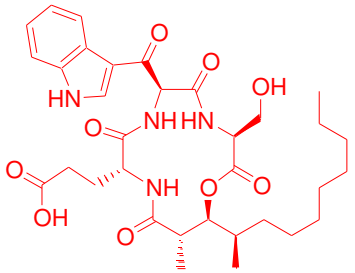
Lydiamycin A



Iriomoteolide A

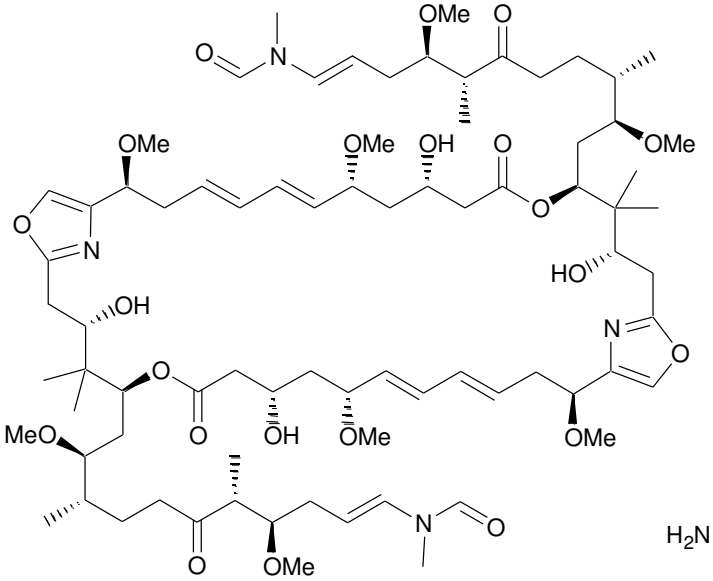


Banyasin A

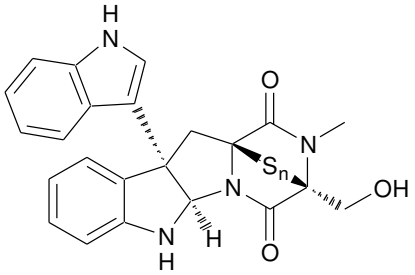


LL15G256γ

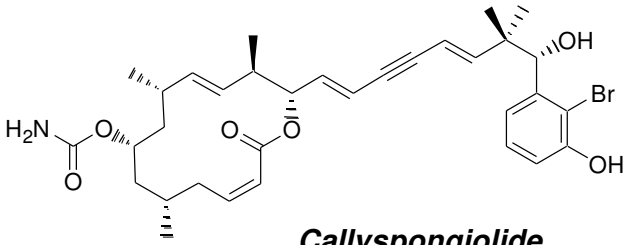
Current Targets



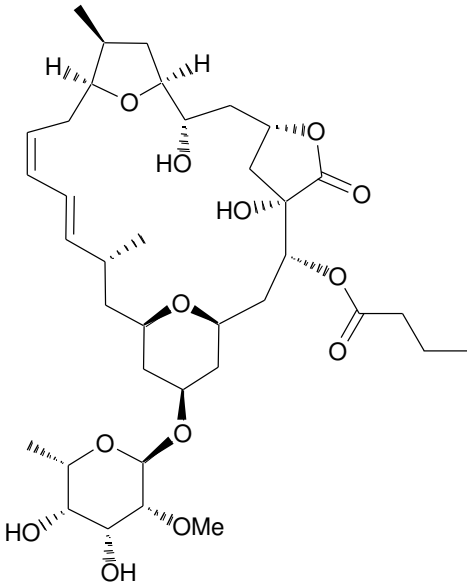
Rhizopodin



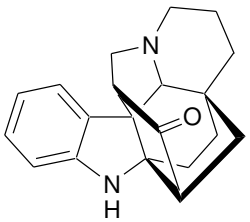
***Luteoalbustin A* (n = 2)**
***Luteoalbustin B* (n = 3)**



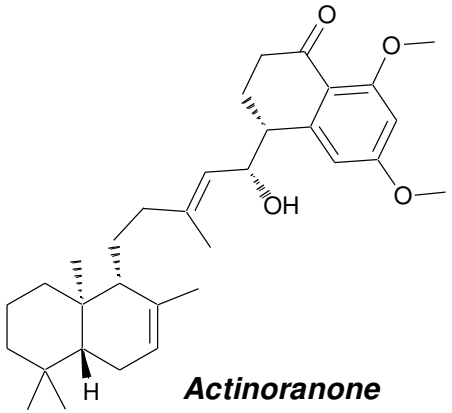
Callyspongiolide



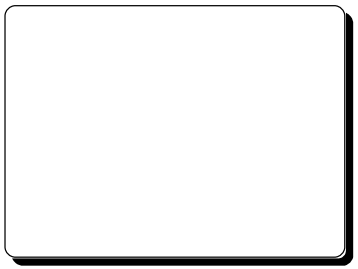
Mandelalide B



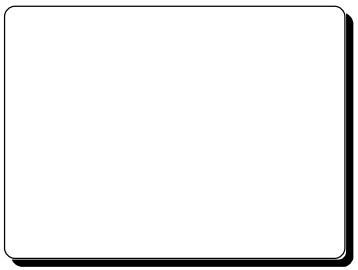
Kopsanone



Actinoranone



Cocosolide



Looekeyolide C

Structures of cocosolide and looekeyolide C will be published in 2015

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