PERKIN 1 ABSTRACTS

Perkin 1 Abstracts: Natural Product Synthesis

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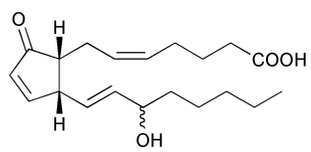
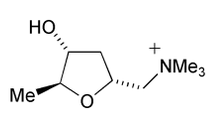
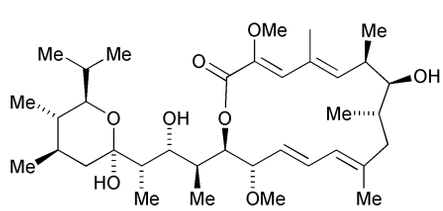
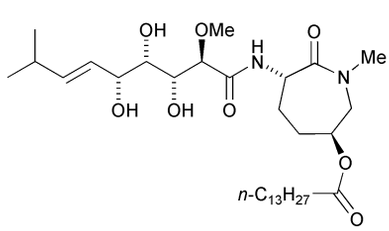
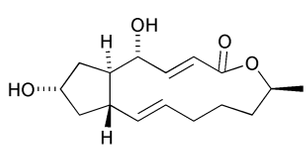
Perkin 1 Abstracts: Natural Product Synthesis aims to highlight syntheses that have been recently published. It includes brief descriptions of *biological activity* and *key steps*. A more comprehensive list of Natural Product syntheses and isolations can be found in *Natural Product Updates*.

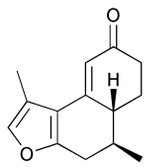
A_2 Isoprostane *Biological activity*: not reported. *Key steps*: Julia-Lythgoe olefination. G. Zanoni, A. Porta and G. Vidari, *J. Org. Chem.*, 2002, **67**, 4346.	
(–)-Allomuscarine *Biological activity*: (a) lowering blood pressure; (b) slowing of heart rate; (c) miosis; (d) bronchoconstriction; (e) cholinomimetic activity. *Key steps*: (a) Lewis acid mediated diastereoselective [3+2] cycloaddition of an allylsilane to an aldehyde; (b) Tamao-Fleming oxidation. S. R. Angle and N. A. El-Said, *J. Am. Chem. Soc.*, 2002, **124**, 3608.	
(–)-Bafilomycin A_1 *Biological activity*: (a) potent vacuolar H^+-ATPase inhibitor; (b) broad antibacterial activity; (c) antifungal agent. *Key steps*: (a) diastereoselective double asymmetric crotylboration; (b) diastereoselective α-alkoxypropargylation; (c) Suzuki cross-coupling; (d) Mukaiyama aldol. K. A. Scheidt, T. D. Bannister, A. Tasaka, M. D. Wendt, B. M. Savall, G. J. Fegley and W. R. Roush, *J. Am. Chem. Soc.*, 2002, **124**, 6981.	
Bengamide B *Biological activity*: antitumour activity in NCI 60 cell line. *Key steps*: (a) Gennari-Mukaiyama aldol reaction; (b) chiral phase transfer catalyst-mediated enantioselective alkylation. R. K. Boeckman Jr., T. J. Clark and B. C. Shook, *Org. Lett.*, 2002, **4**, 2109.	
(+)-Brefeldin A *Biological activity*: (a) dissembler of the Golgi apparatus; (b) induces DNA fragmentation associated with apoptosis in cancer cells. *Key steps*: (a) highly stereoselective Pd(0)-catalysed cyclisation; (b) direct introduction of a *trans*-acrylate moiety to a lactone via a novel vinylogous acyl anion equivalent; (c) ring-size selective macrolactonisation; (d) stereoselective reduction. Y.-G. Suh, J.-K. Jung, S.-Y. Seo, K.-H. Min, D.-Y. Shin, Y.-S. Lee, S.-H. Kim and H.-J. Park, *J. Org. Chem.*, 2002, **67**, 4127.	

1,5-Dimethyl-5,5a,6,7-tetrahydro-4*H*-naphtho[2,1-*b*]furan-8-one

Biological activity: fish toxicant.

Key steps: tandem carbene addition to an aldehyde and a Diels-Alder pyrone formation.

Y. Zhang and J. W. Herndon, *J. Org. Chem.*, 2002, **67**, 4177.

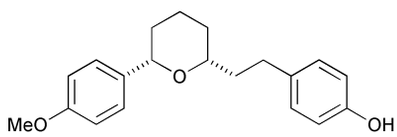


(–)-Centrolobine

Biological activity: not reported.

Key steps: (a) intramolecular cyclisation of a hydroxyketone with EtSiH and TMSOTf; (b) stereoselective reduction of a β-ketosulfoxide.

F. Colobert, R. Des Mazery, G. Solladié and M. C. Carreño, *Org. Lett.*, 2002, **4**, 1723.

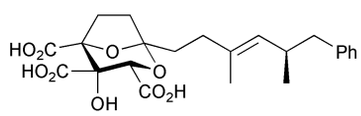


6,7-Dideoxysqualestatin H5

Biological activity: (a) fungal metabolite; (b) potent inhibitor of squalene synthase; (c) inhibitor of farnesyl protein transferase.

Key steps: stereoselective intramolecular vinylogous aldol reaction.

S. Naito, M. Escobar, P. R. Kim, S. Liras and S. F. Martin, *J. Org. Chem.*, 2002, **67**, 4200.

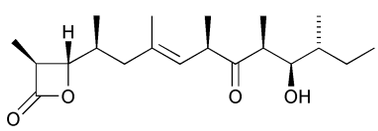


(–)-Ebelactone A

Biological activity: (a) inhibitor of lipases; (b) inhibitor of *N*-formylmethionine aminopeptidase.

Key steps: (a) Evans *syn* aldol reaction; (b) stereoselective hydroboration of an alkene; (c) Suzuki-Miyaura cross-coupling reaction; (d) silylcupration on a nonterminal acetylene.

A. K. Mandal, *Org. Lett.*, 2002, **4**, 2043.

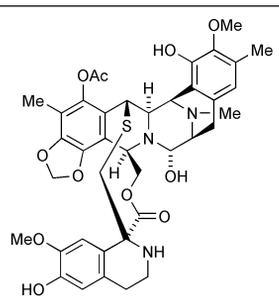


Ecteinascidin 743

Biological activity: potent antitumour agent.

Key steps: (a) DuPHOS mediated asymmetric hydrogenation; (b) Ugi condensation; (c) biomimetic transamination reaction; (d) Pictet-Spengler reaction; (e) intramolecular Heck reaction.

A. Endo, A. Yanagisawa, M. Abe, S. Tohma, T. Kan and T. Fukuyama, *J. Am. Chem. Soc.*, 2002, **124**, 6552.

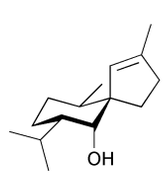


(–)-Gleenol

Biological activity: (a) termiticidal activity; (b) antihelmintic activity; (c) growth regulation effects on plant seeds.

Key steps: olefin metathesis.

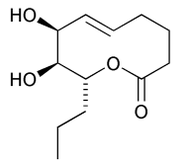
K. Oesterreich and D. Spitzner, *Tetrahedron*, 2002, **58**, 4331.



Herbarumin I

Biological activity: (a) phytotoxic effects in an assay monitoring germination and growth of *Amaranthus hypochondriacus* seedlings (IC_{50}= 5.43x10^{-5}).

Key steps: ring-closing metathesis.

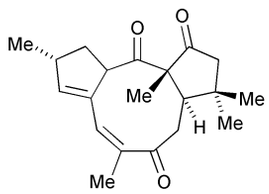


A. Fürstner, K. Radkowski, C. Wirtz, R. Goddard, C. W. Lehmann and R. Mynott, *J. Am. Chem. Soc.*, 2002, **124**, 7061.

Jatrophatrione

Biological activity: potent antileukaemic activity.

Key steps: (a) sequential anionic oxy-Cope rearrangement, α-methylation of an enolate anion and transannular ene reaction; (b) Grob fragmentation.

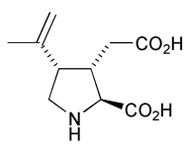


L. A. Paquette, J. Yang and Y. O. Long, *J. Am. Chem. Soc*, 2002, **124**, 6542.

(–)-Kainic acid

Biological activity: (a) anthelmintic activity; (b) insectide; (c) binds strongly to the kainate class of neurotransmitter receptors.

Key steps: (a) enantioselective dearomatising cyclisation; (b) regioselective Baeyer-Villiger reaction.

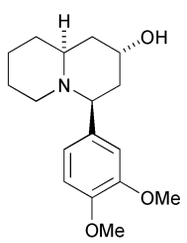


J. Clayden, C. J. Menet and K. Tchabanenko, *Tetrahedron*, 2002, **58**, 4727.

(–)-Lasubine II

Biological activity: not reported.

Key steps: (a) photoinitated free-radical selenosulfonation; (b) conjugate addition of an amino ester to an acetylenic sulfone; (c) LDA-promoted intramolecular acylation.

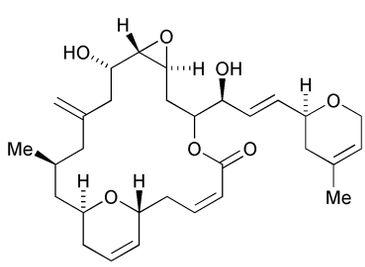


T. G. Back and M. D. Hamilton, *Org. Lett.*, 2002, **4**, 1779.

(–)-Laulimalide

Biological activity: potent cell growth inhibitor with low nanomolar IC_{50} values.

Key steps: (a) asymmetric glycolate alkylations; (b) diastereoselective allylstannane addition; (c) Mitsunobu lactonisation.

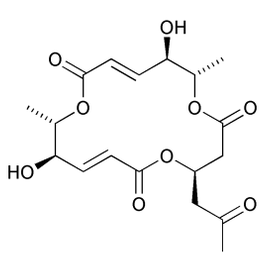


M. T. Crimmins, M. G. Stanton and S. P. Allwein, *J. Am. Chem. Soc.*, 2002, **124**, 5958.

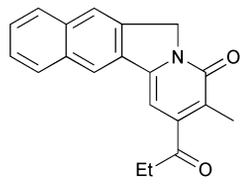
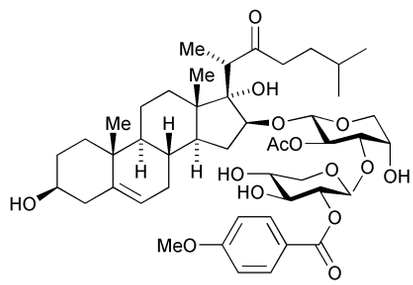
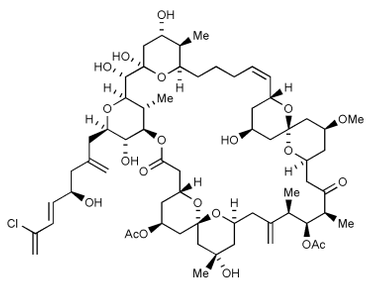
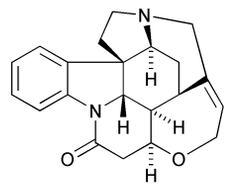
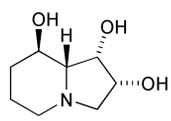
Macrosphelide H

Biological activity: selectively inhibit adhesion of human-leukaemia HL-60 cells to human-umbilical vein endothelial cells.

Key steps: (a) two step furan ring oxidation; (b) Yamaguchi macrolactonisation; (c) Wacker oxidation.



Y. Kobayashi and Y.-G. Wang, *Tetrahedron Lett.*, 2002, **43**, 4381.

Nothapodytine B *Biological activity*: antiviral properties. *Key steps*: (a) Suzuki coupling; (b) [3+3] decyanidative aromatisation. L. Carles, K. Narkunan, S. Penlou, L. Rousset, D. Bouchu and M. A. Ciufolini, *J. Org. Chem*., 2002, **67**, 4304	
OSW-1 *Biological activity*: (a) potent cytostatic activity against human proyelocytic leukaemia HL-60 cells (IC_{50} = 0.1-0.3 nM); (b) potent cytostatic activity against human malignant tumour cells. *Key steps*: (a) SeO_2-mediated allylic oxidation; (b) 1,4-addition of an α-alkoxy vinyl cuprate to a steroid moiety. W. Yu and Z. Jin, *J. Am. Chem. Soc.*, 2002, **124**, 6576.	
Spongistatin 1 *Biological activity*: inhibits growth of chemoresistant tumour types in the NCI panel of 60 human cancer cell lines. *Key steps*: (a) asymmetric aldol; (b) Yamaguchi lactonisation. M. T. Crimmins, J. D. Katz, D. G. Washburn, S. P. Allwein and L. F. McAtee, *J. Am. Chem. Soc.*, 2002, **124**, 5661.	
(–)-Strychnine *Biological activity*: not reported. *Key steps*: (a) palladium-catalysed asymmetric allylic substitution; (b) intramolecular Heck coupling. M. Nakanishi and M. Mori, *Angew. Chem., Int. Ed.*, 2002, **41**, 1934.	
(–)-Swainsonine *Biological activity*: (a) inhibitor of α-D-mannosidases; (b) antimetastatic activity; (c) antitumor-proliferative activity; (d) anticancer activity; (e) immunoregulating activity. *Key steps*: (a) Ru-catalysed ring rearrangement; (b) Sharpless asymmetric dihydroxylation. N. Buschmann, A. Rückert and S. Blechert, *J. Org. Chem.*, 2002, **67**, 4325.	
(+)-Tabersonine *Biological activity*: not reported. *Key steps*: (a) enantioselective Cr(III)-catalysed [4+2] cycloaddition; (b) ring closing metathesis. S. A. Kozmin, T. Iwama, Y. Huang and V. H. Rawal, *J. Am. Chem. Soc*, 2002, **124**, 4628.