Electronic Supplementary Material (ESI) for Natural Product Reports.

Natural disesquiterpenoids: an update

Supplementary Information

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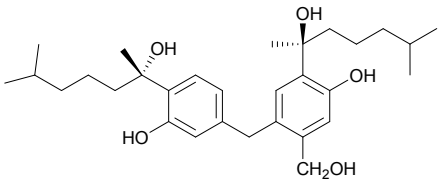
2 True-disesquiterpenoids

2.1 Bisabolane sesquiterpenoid dimers (compounds 1–6)



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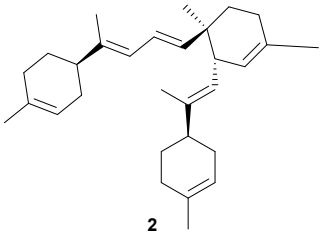

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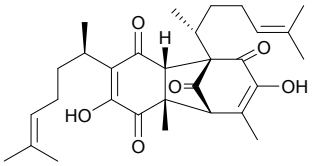

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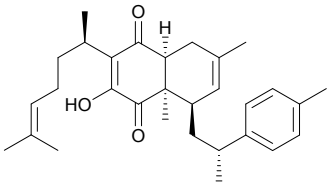

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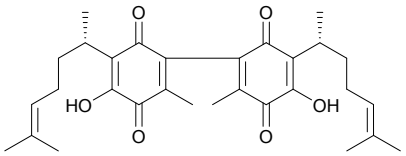

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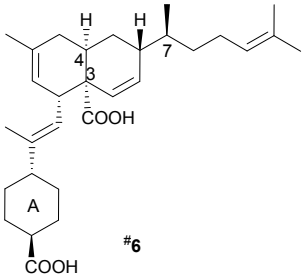

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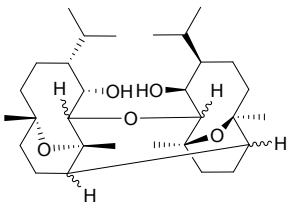

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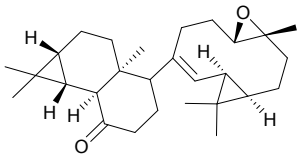

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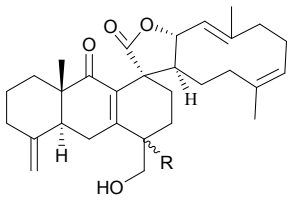
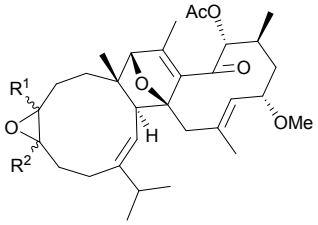
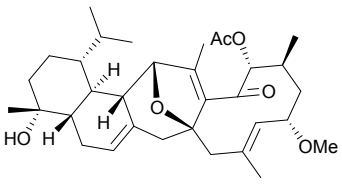


9 R = αH
10 R = βH



11 R^1 = αH R^2 = αMe
12 R^1 = βH R^2 = βMe



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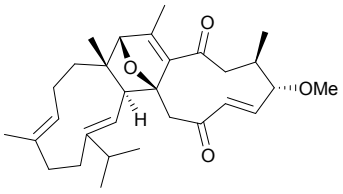

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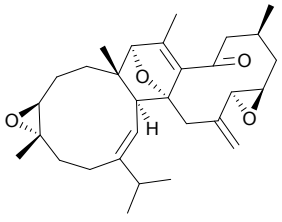

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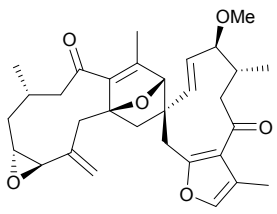

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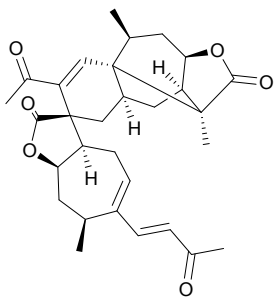
2.3 Xanthane sesquiterpenoid dimers (compounds 17–35)



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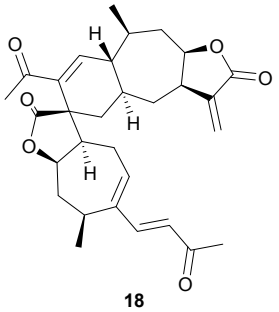

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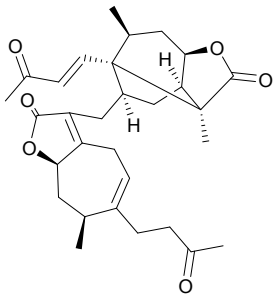

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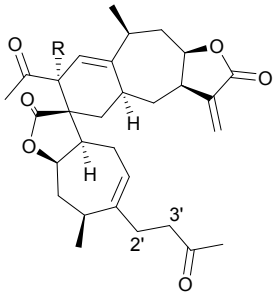
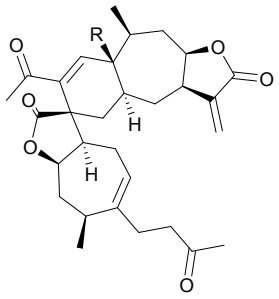
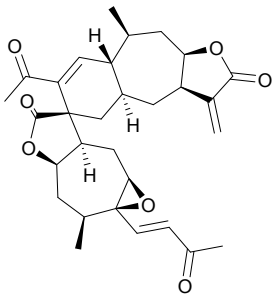


20 R = H
21 R = OH $\Delta^{2'(3')}$
22 R = OH



23 R = OAc
24 R = H



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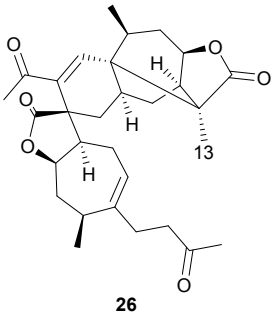

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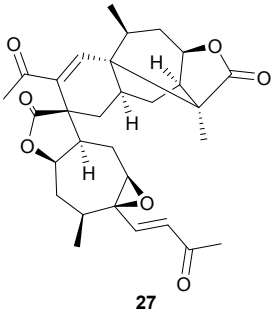

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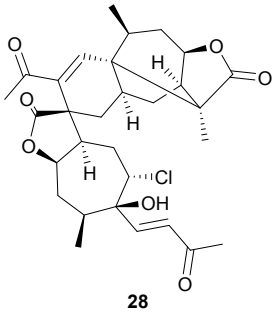

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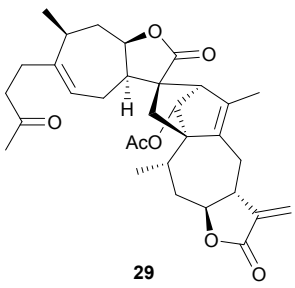

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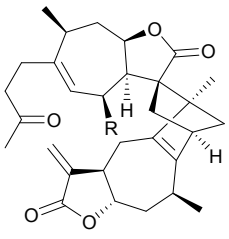
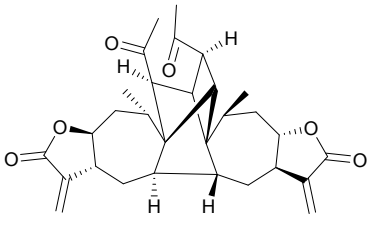


30 R = H
31 R = OAc



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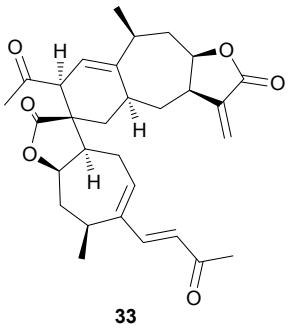

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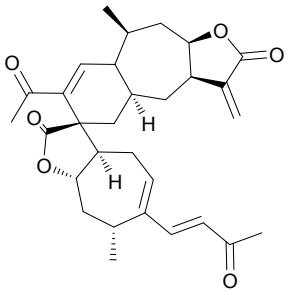

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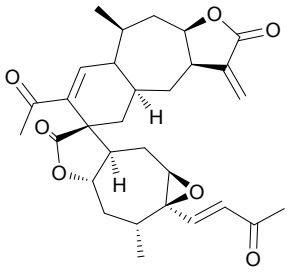

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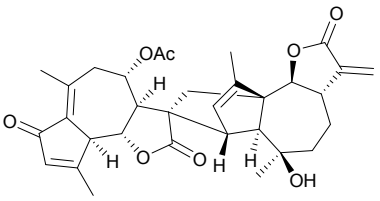
2.4 Guaiane and pseudoguaiane sesquiterpenoid dimers (compounds 36–181)



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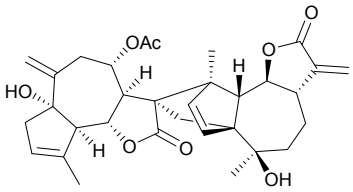

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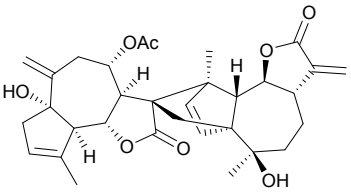

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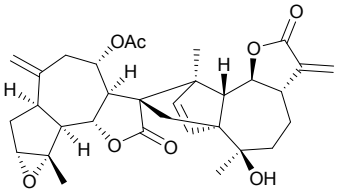

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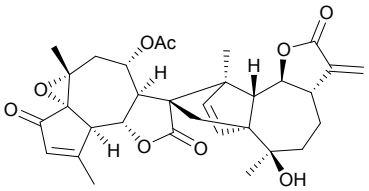

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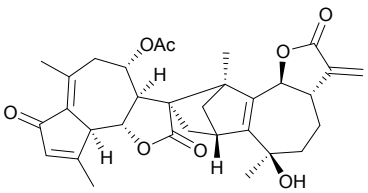

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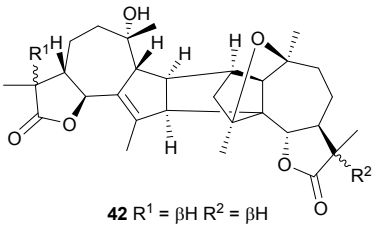
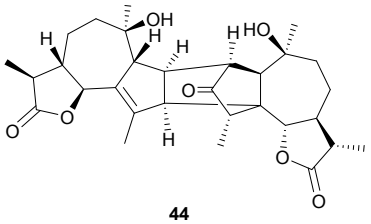


42 R^1 = βH R^2 = βH
43 R^1 = αH R^2 = αH



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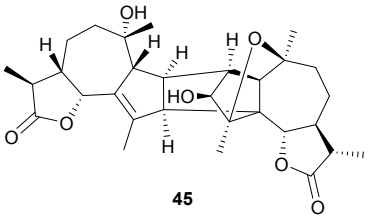

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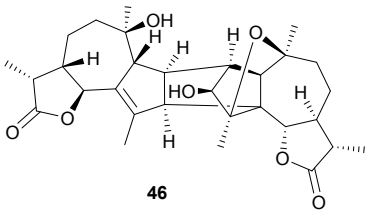

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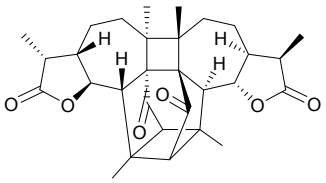

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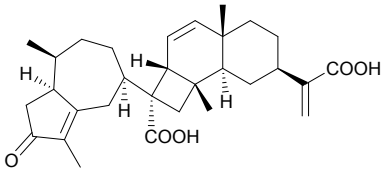

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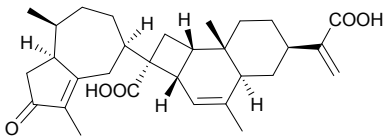

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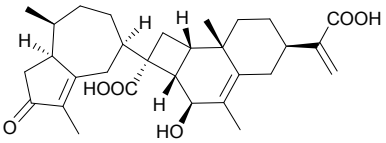

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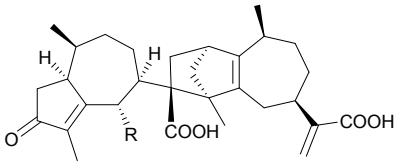
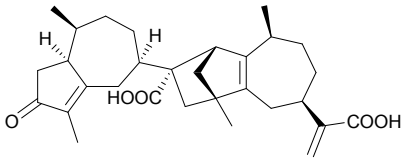


51 R = H
55 R = OH



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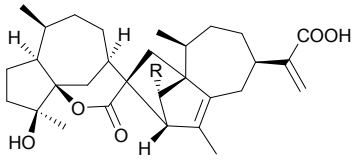
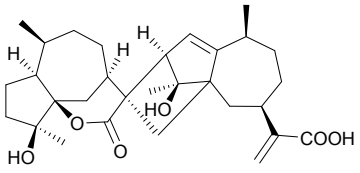


53 R = H
56 R = OH



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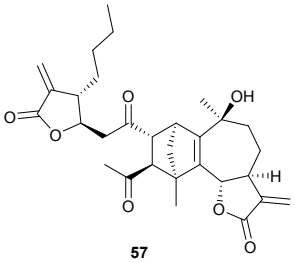

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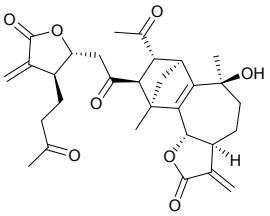

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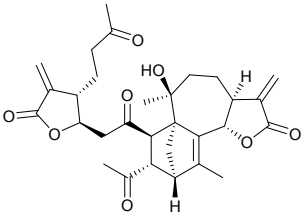

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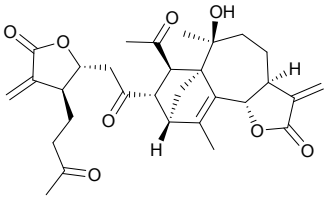

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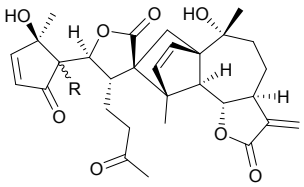
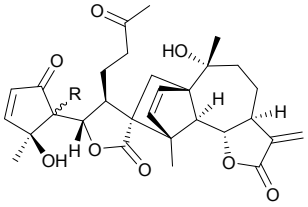
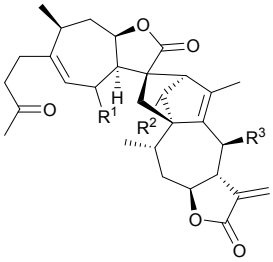


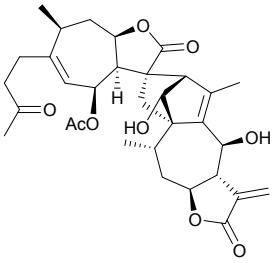
61 R = βH
63 R = αH



62 R = αH
64 R = βH



65 R^1 = βOAc R^2 = OAc R^3 = H
66 R^1 = αOH R^2 = OAc R^3 = OH
67 R^1 = βOAc R^2 = OH R^3 = OH



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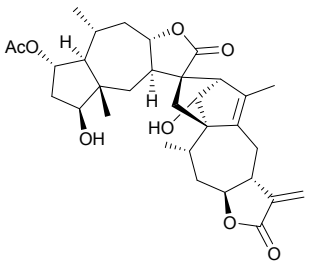

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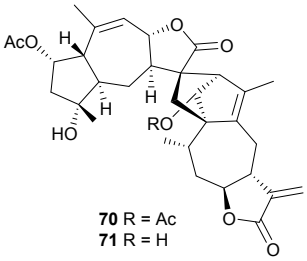
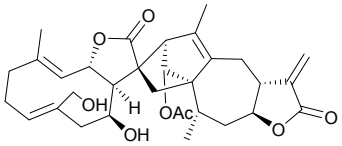


70 R = Ac
71 R = H



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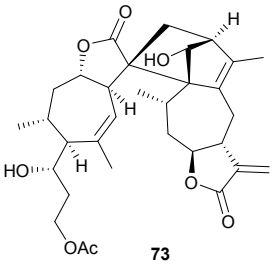

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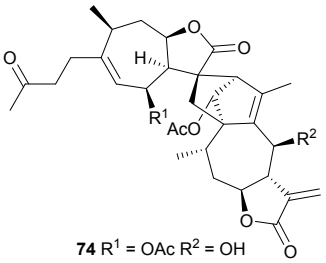
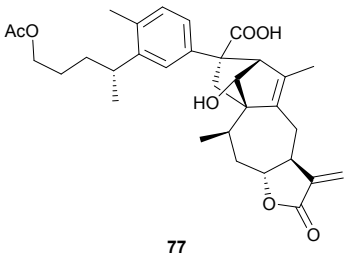


74 R^1 = OAc R^2 = OH
75 R^1 = H R^2 = OH
76 R^1 = OH R^2 = H



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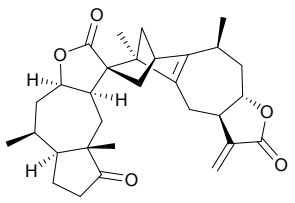

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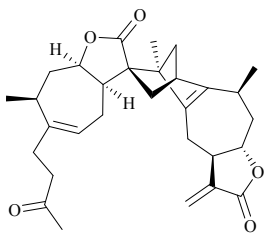

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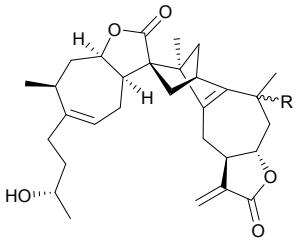
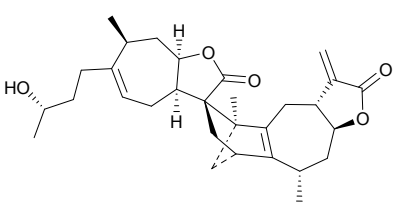


80 R = αH
81 R = βH



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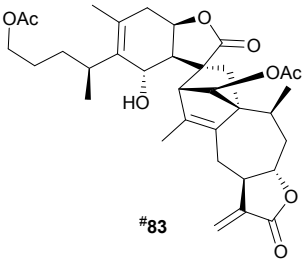
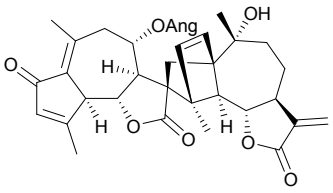


#83



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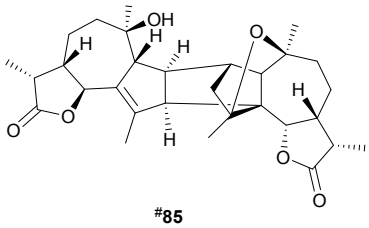

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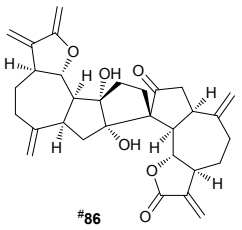

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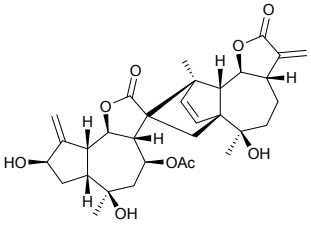

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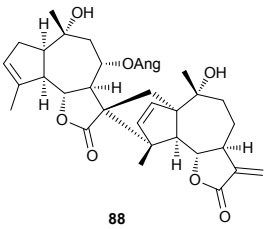

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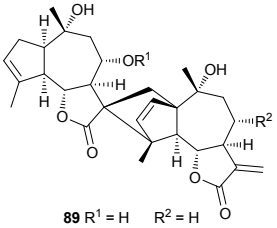
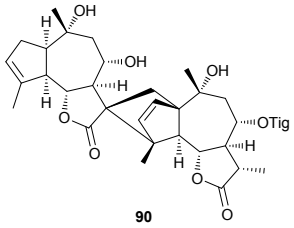


89 R^1 = H R^2 = H
91 R^1 = H R^2 = OTig
92 R^1 = Ang R^2 = OH
93 R^1 = Tig R^2 = OTig
94 R^1 = Tig R^2 = H



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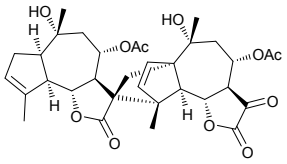

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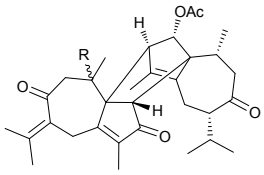
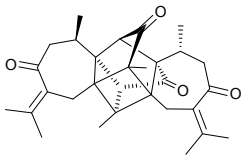


#96a R = βH
#96 R = αH



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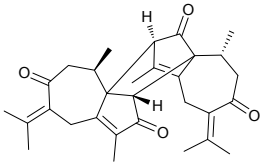

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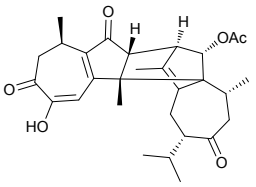

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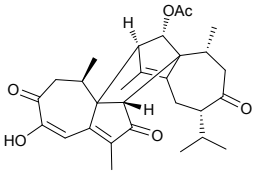

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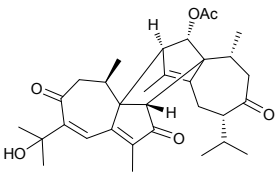

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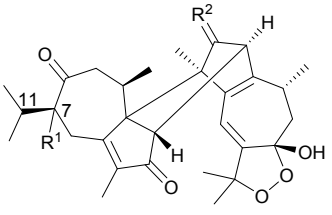
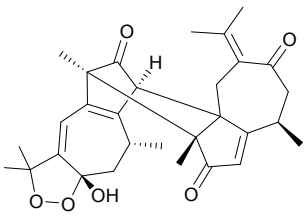


102 R^2 = O $\Delta^{7,11}$
103 R^2 = O R^1 = αH
104 R^2 = αOAc $\Delta^{7,11}$



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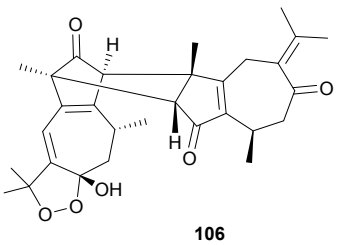

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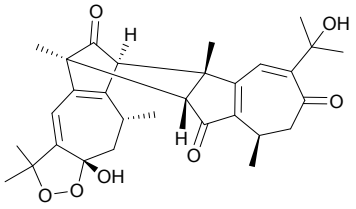

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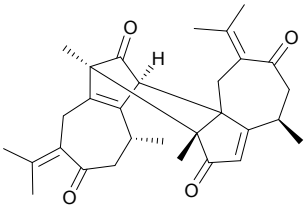

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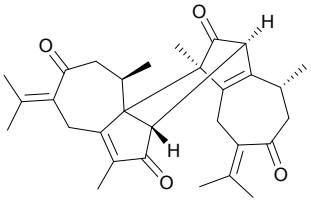

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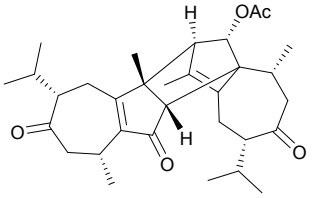

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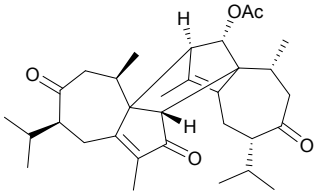

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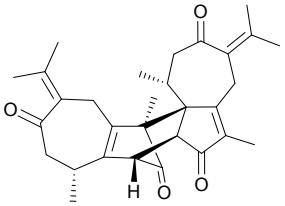

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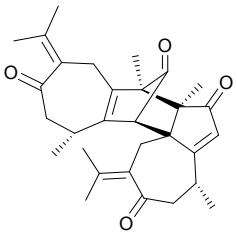

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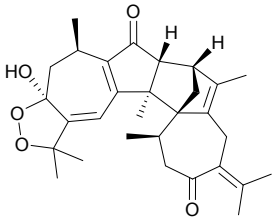

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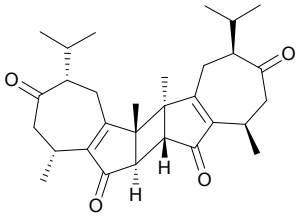

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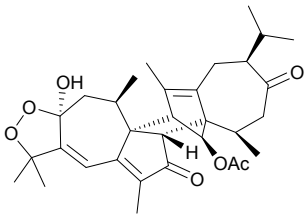

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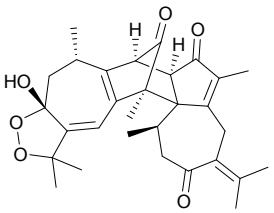

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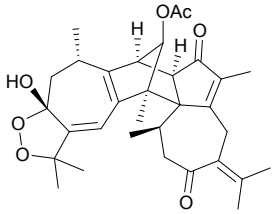

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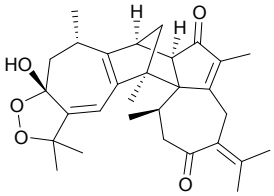

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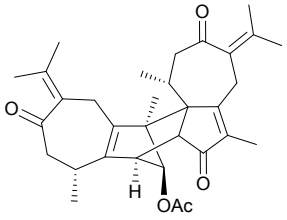

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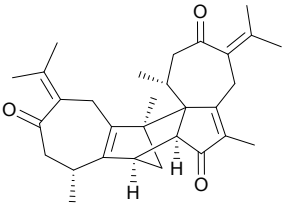

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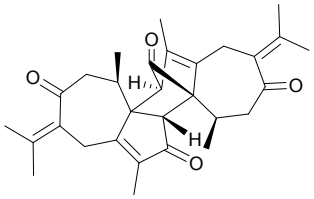

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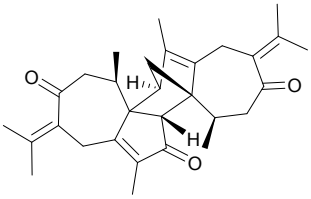

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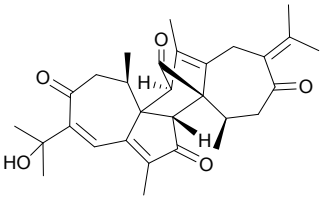

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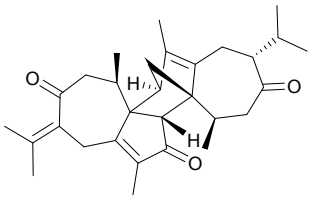

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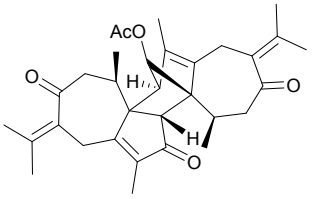

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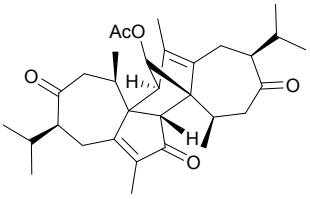

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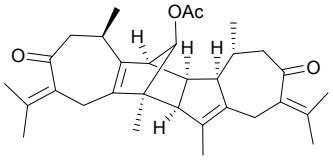

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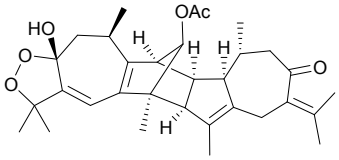

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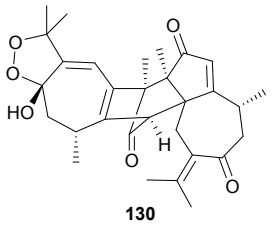

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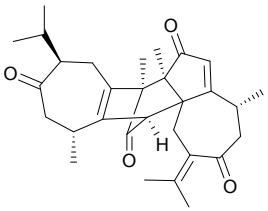

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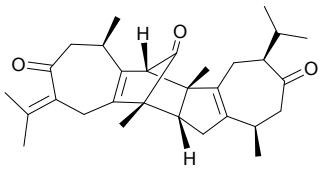

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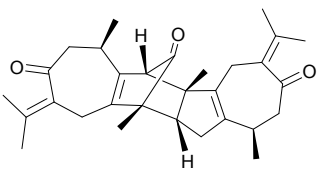

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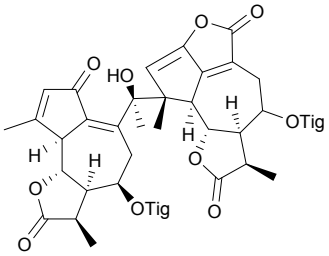

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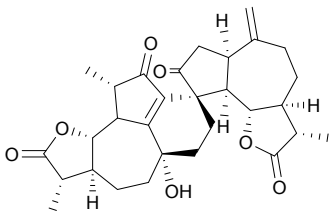

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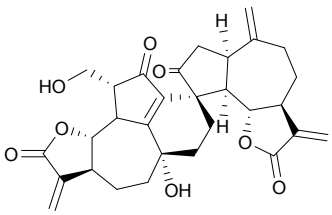

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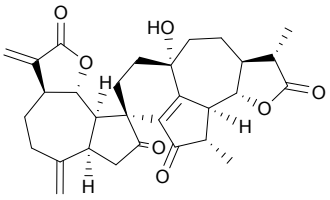

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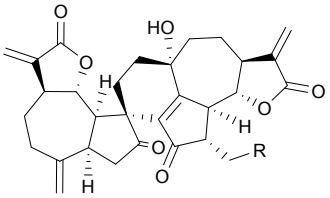
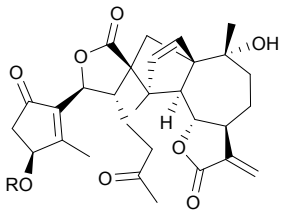
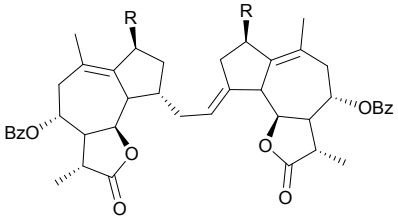


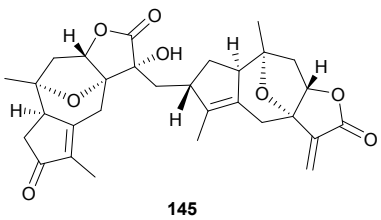
138 R = OMe
139 R = OEt
140 R = H



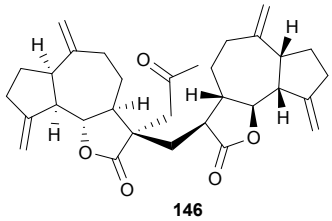
141 R = Me
142 R = H



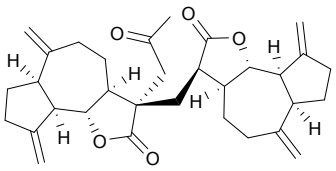
143 R = OAc
144 R = H



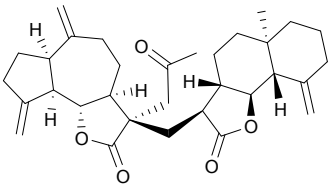
145



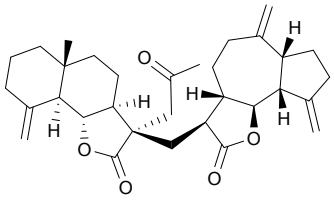
146



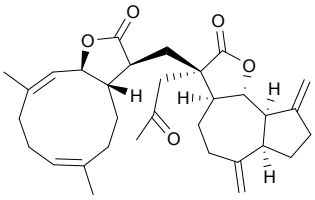
147



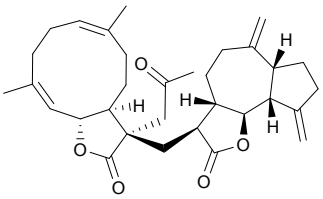
148



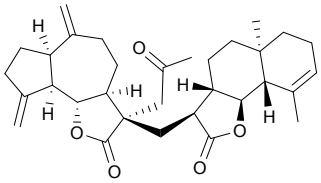
149



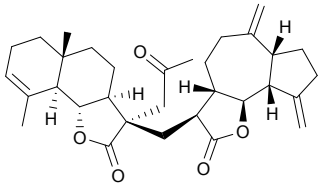
150



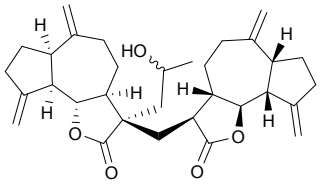
151



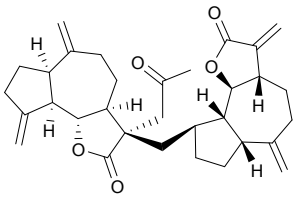
152



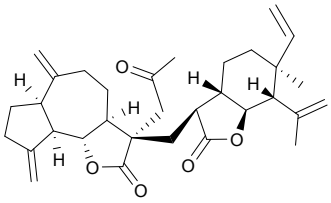
153



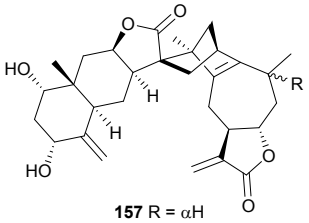
154



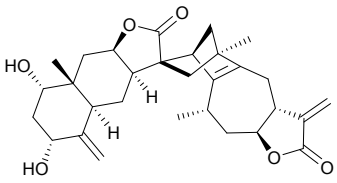
155



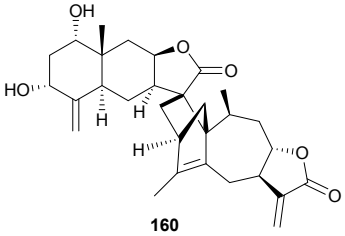
156



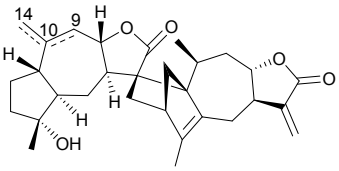
157 R = αH
158 R = βH



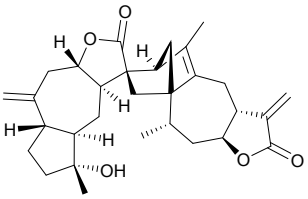
159



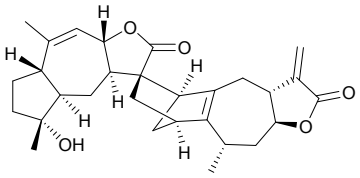
160



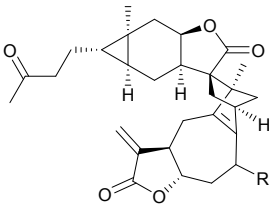
161 $\Delta^{10,14}$
163 $\Delta^{9,10}$



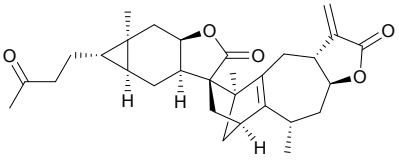
162



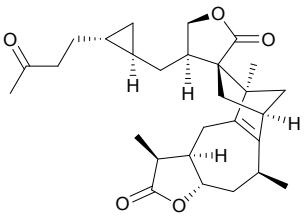
164



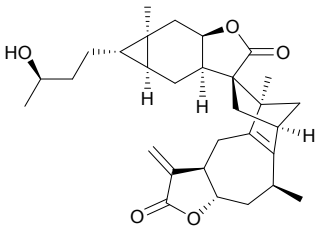
165 R = βMe
167 R = αMe



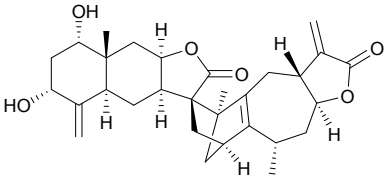
166



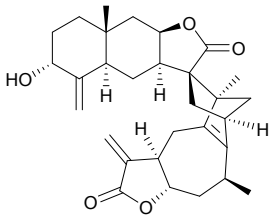
168



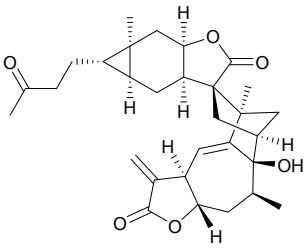
169



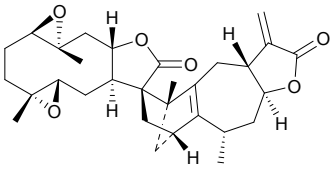
170



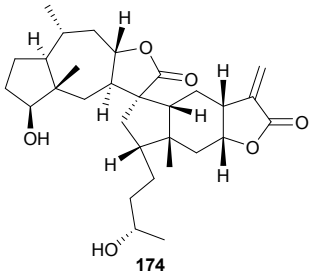
171



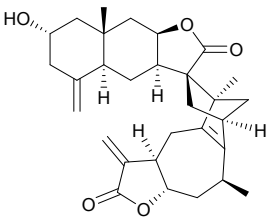
172



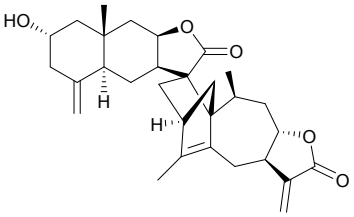
173



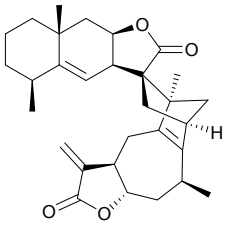
174



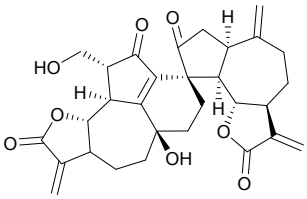
175



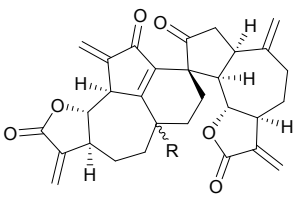
176



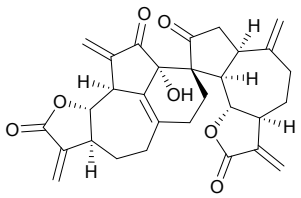
177



#178

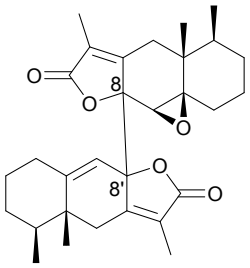


#179 R = αOH
#180 R = βOH
#181 R = αH

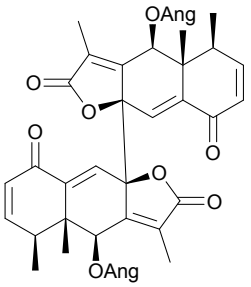


#180a

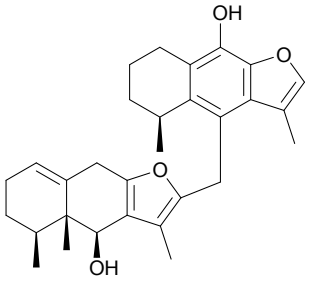
2.5 Eremophilane and nardosinane sesquiterpenoid dimers (compounds 182–206)



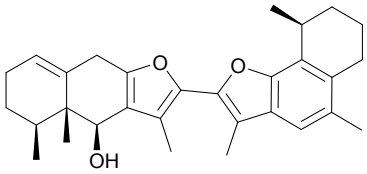
182 8(*R*), 8'(*S*)
183 8(*S*), 8'(*R*)



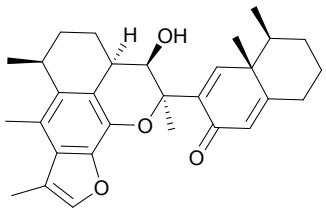
184



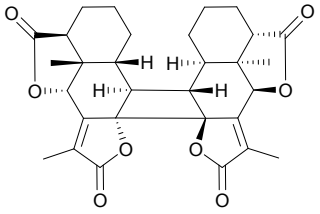
185



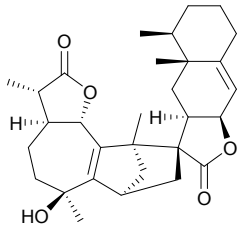
186



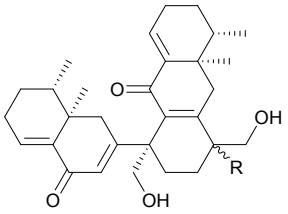
187



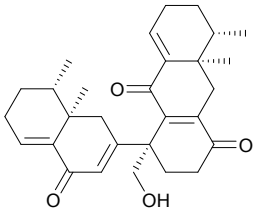
188



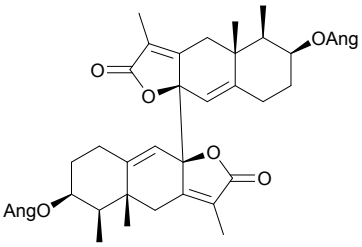
189



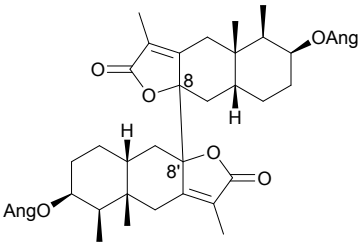
190 R = αOH
191 R = βOH
192 R = αH



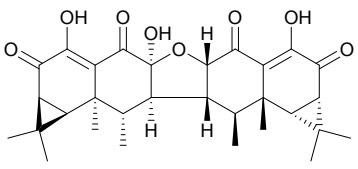
193



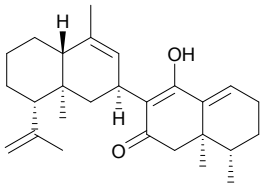
194



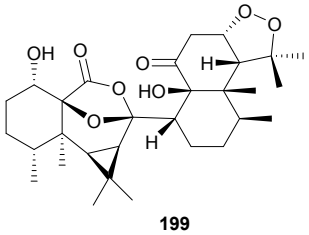
195 8(*S*), 8'(*R*)
196 8(*R*), 8'(*S*)



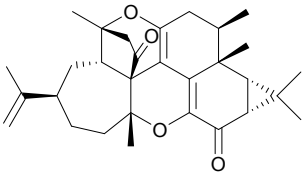
197



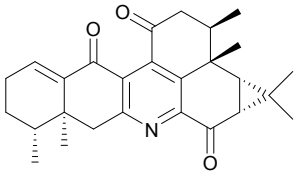
198



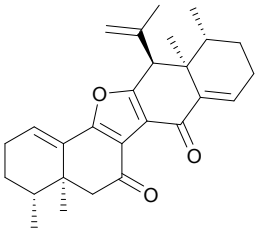
199



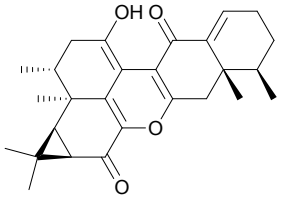
200



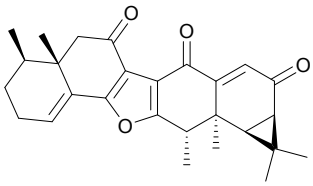
201



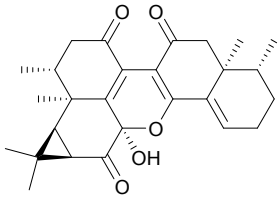
202



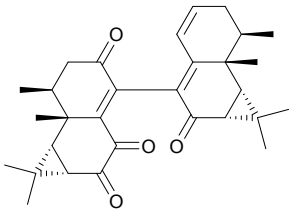
203



204

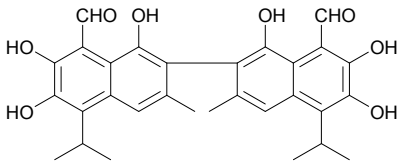


205

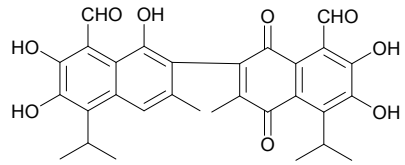


206

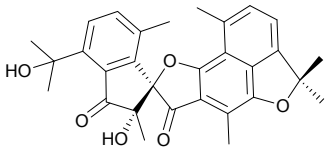
2.6 Cadinane sesquiterpenoid dimers (compounds 207–222)



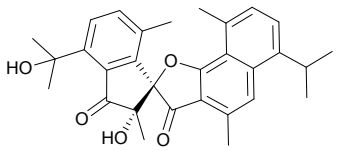
#207



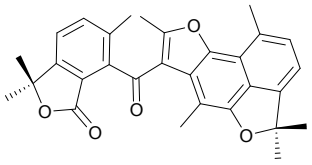
208



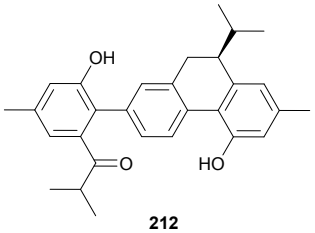
209



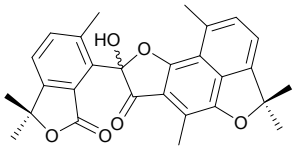
210



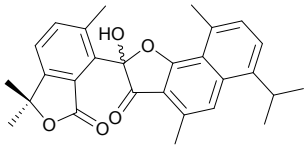
211



212



213



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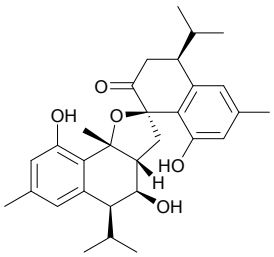
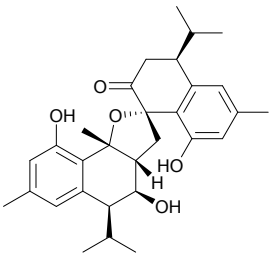
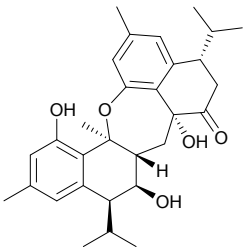


215



216



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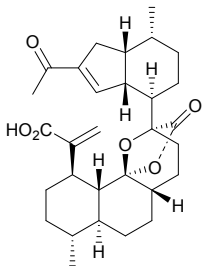

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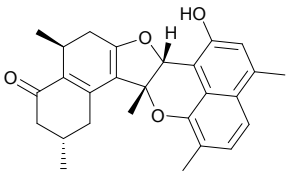

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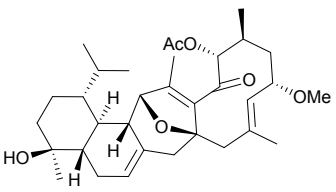

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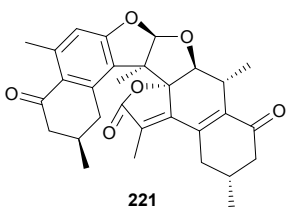
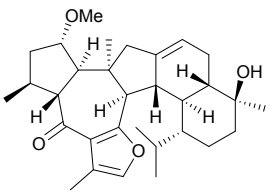
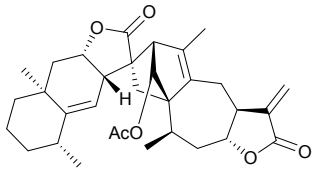


221

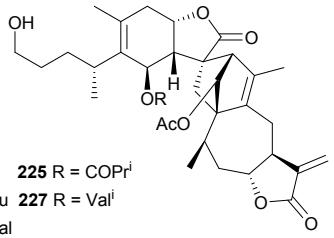


222

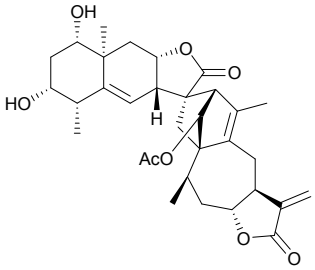
2.7 Eudesmane and elemane sesquiterpenoid dimers (compounds 223–250)



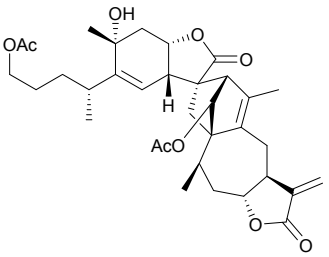
#**223**



224 R = Ac **225** R = COPr^{i}
226 R = MeBu **227** R = Val^{i}
228 R = MeVal



229



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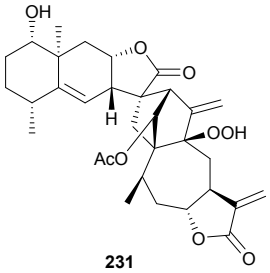
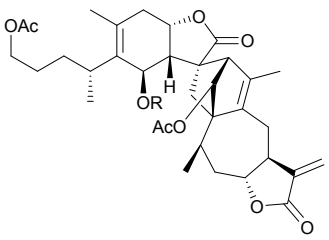
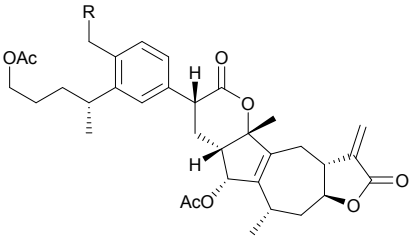


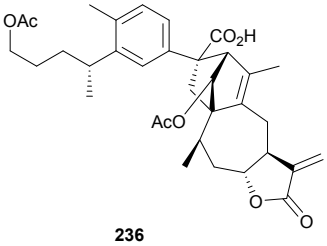
231



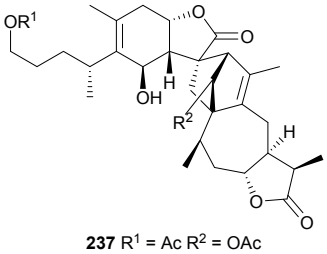
232 R = COPr^{i}
233 R = MeVal



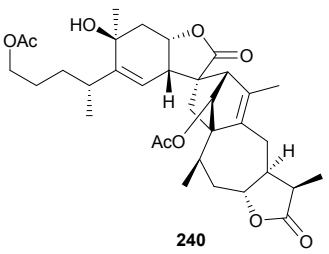
234 R = OH
235 R = H



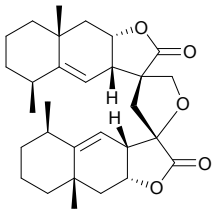
236



237 R^1 = Ac R^2 = OAc
238 R^1 = H R^2 = OAc
239 R^1 = Ac R^2 = H



240



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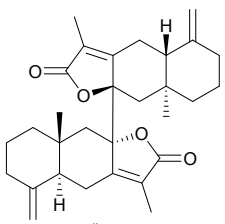
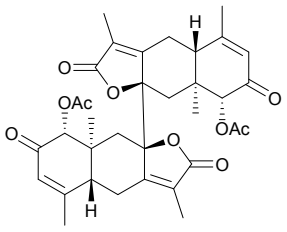
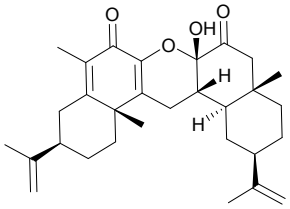


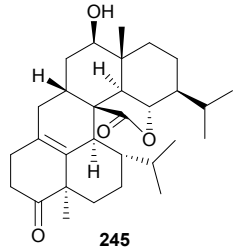
#**242**



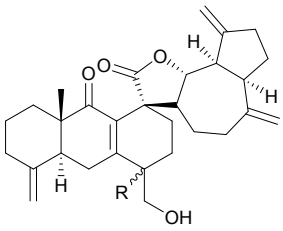
243



244

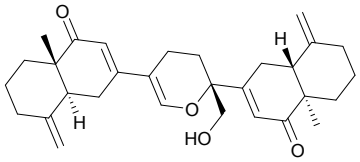


245

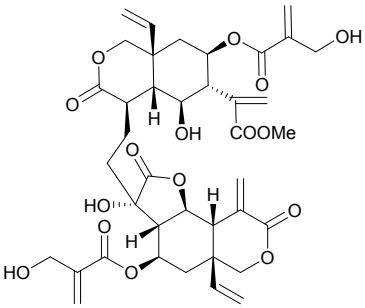


246 R = βH

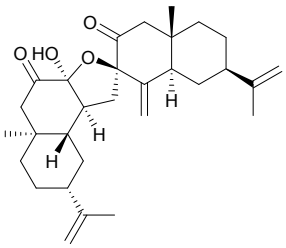
247 R = αH



248

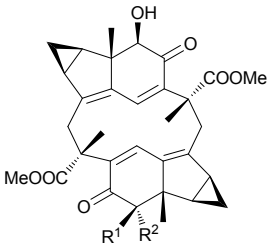


249

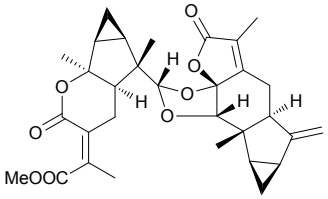


250

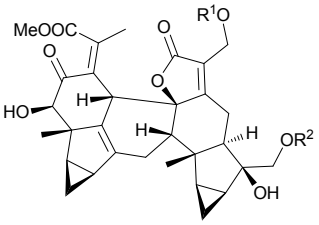
2.8 Lindenane sesquiterpenoid dimers (compounds 251–341)



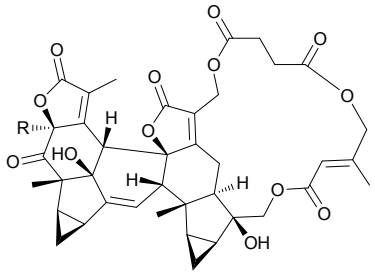
251 R^1 = H R^2 = H
252 R^1 + R^2 = O
253 R^1 = H R^2 = OH



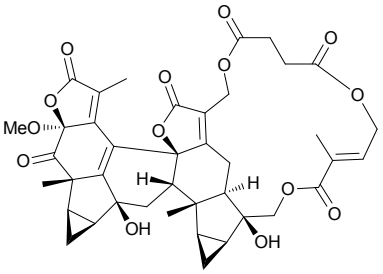
254



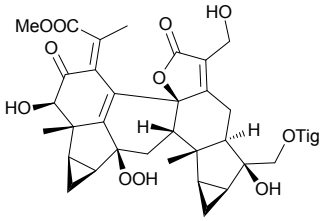
255 R^1 = Mesuc R^2 = Ang
258 R^1 = Mesuc R^2 = (*Z*)-Hysen



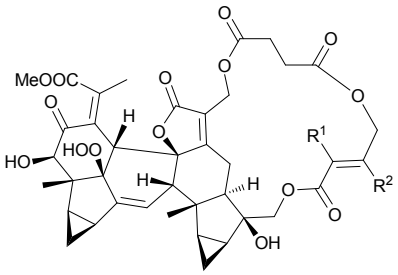
256 R = H
257 R = OH



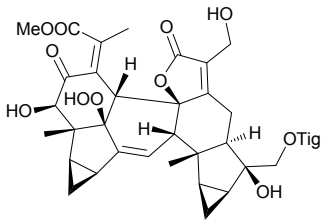
259



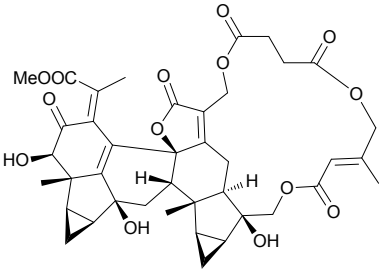
260



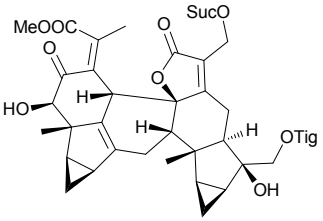
261 R^1 = Me R^2 = H
264 R^1 = H R^2 = Me



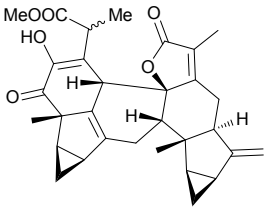
262



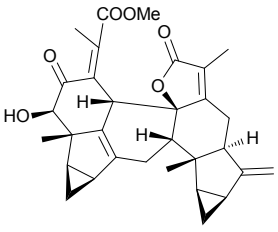
263



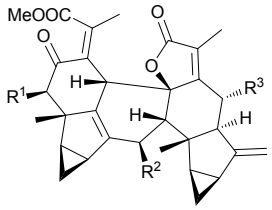
265



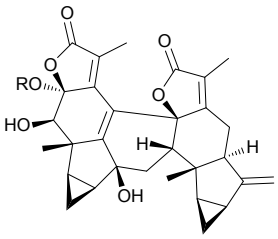
266



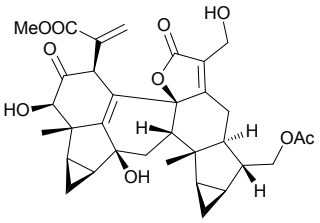
267



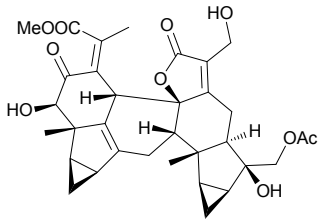
268 R^1 = OH R^2 = H R^3 = OAc
269 R^1 = OH R^2 = OH R^3 = H
270 R^1 = R^2 = R^3 = H



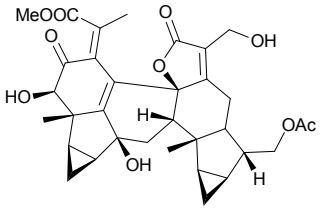
271 R = H
272 R = Bu



273



274



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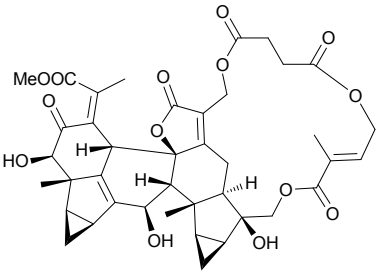
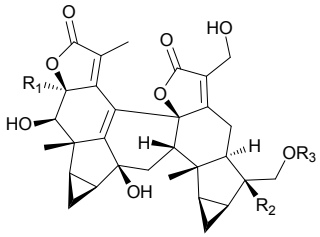
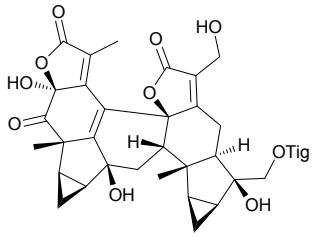


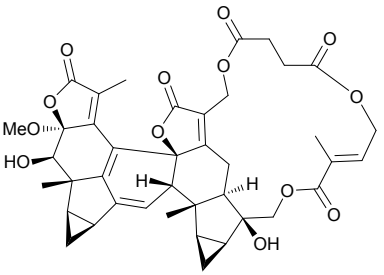
276



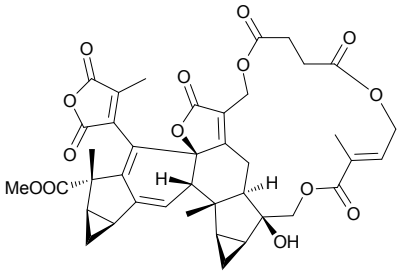
277 R_1 = OH R_2 = OH R_3 = H
278 R_1 = OMe R_2 = OH R_3 = Tig
280 R_1 = OH R_2 = H R_3 = Ac



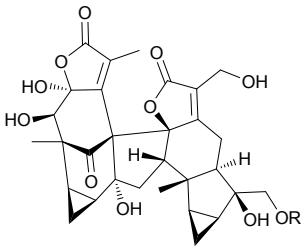
279



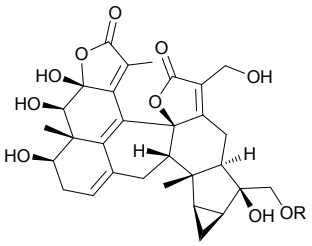
281



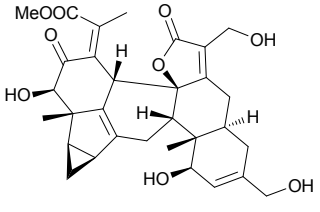
282



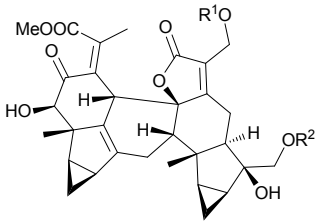
283 R = (*E*)-Hysen



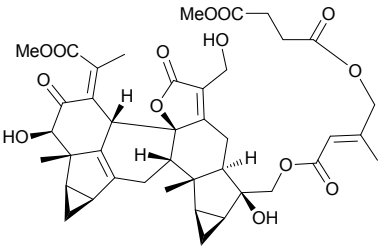
284 R = (*E*)-Hysen



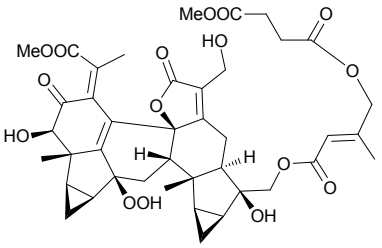
285



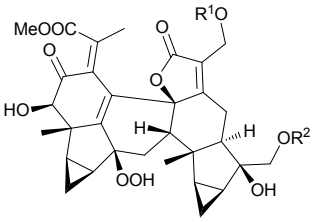
286 R^1 = Mesuc R^2 = Oxsen
288 R^1 = H R^2 = Sen



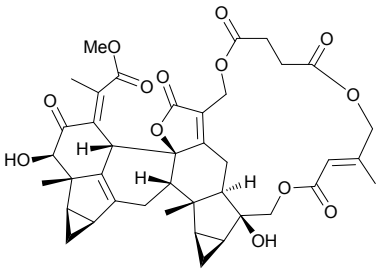
287



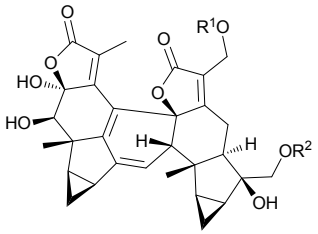
289



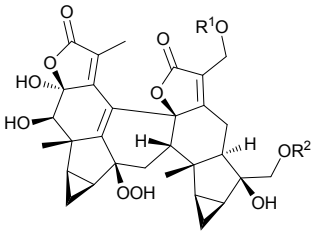
290 R^1 = Mesuc R^2 = (*E*)-Hysen
291 R^1 = R^2 = H



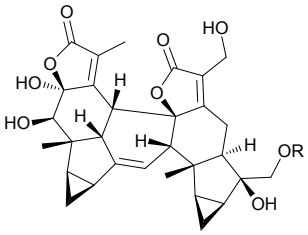
292



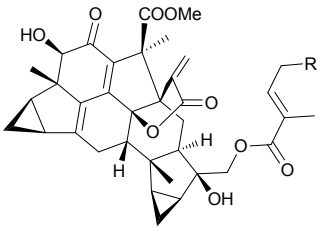
293 R^1 = Mesuc R^2 = (*E*)-Hysen



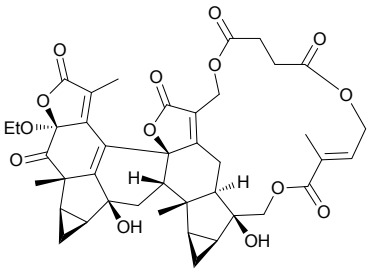
294 R^1 = Mesuc R^2 = (*E*)-Hysen



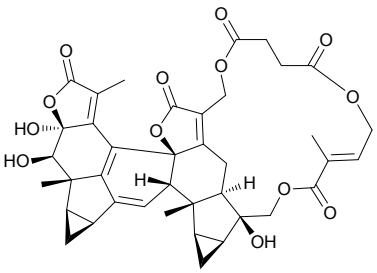
295 R = (*E*)-Hysen



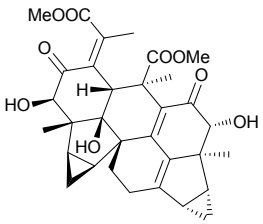
296 R = H
297 R = OMesuc



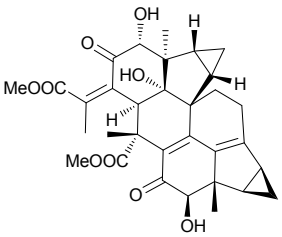
298



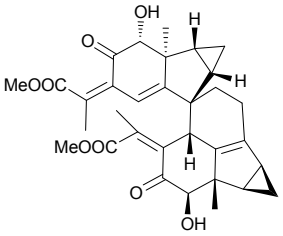
299



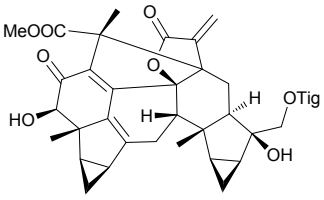
300



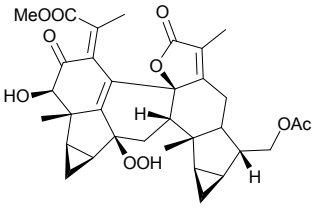
301



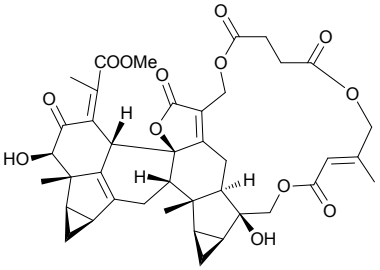
302



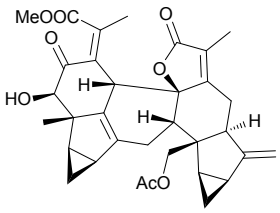
303



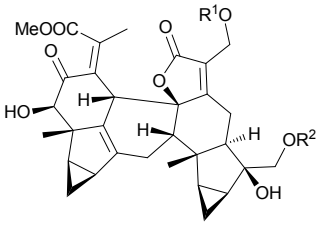
304



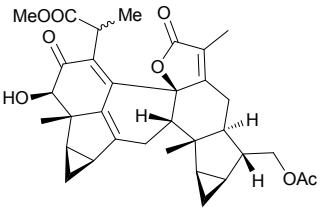
305



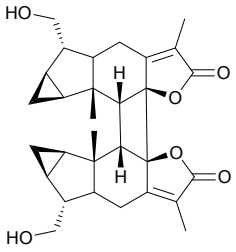
306



307 R^1 = Suc R^2 = (*E*)-Hysen
308 R^1 = Mesuc R^2 = (*E*)-Hysen



309



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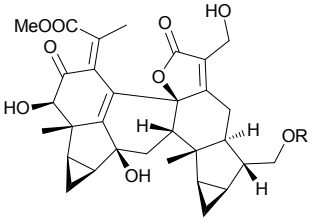
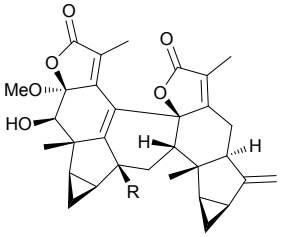
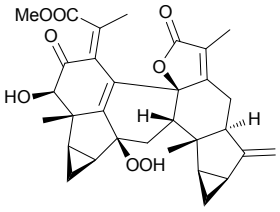


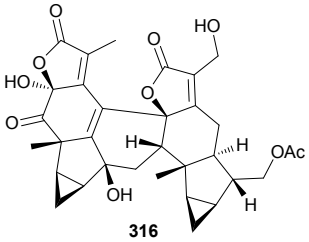
311 R = Ac
315 R = Tig



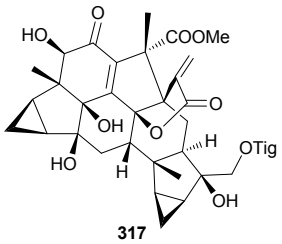
312 R = OH
313 R = OOH



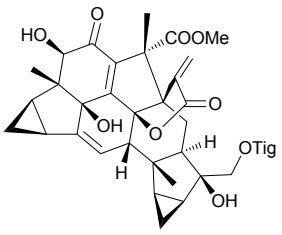
314



316



317



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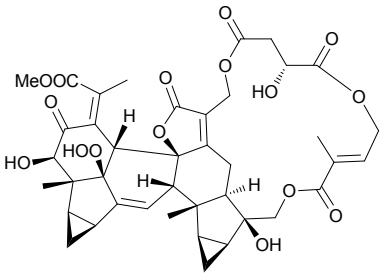
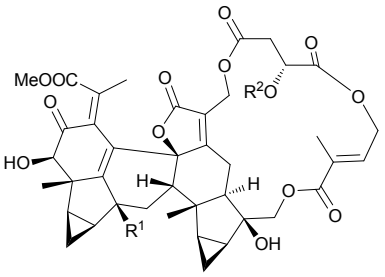
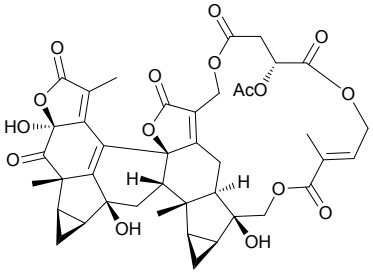


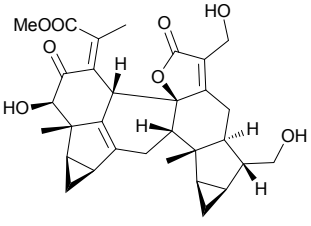
319



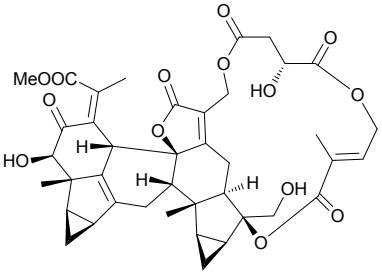
320 R^1 = OOH R^2 = H
321 R^1 = OH R^2 = Ac



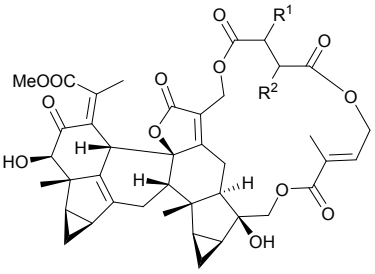
322



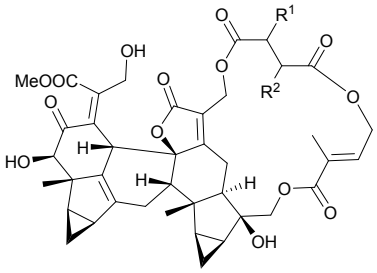
323



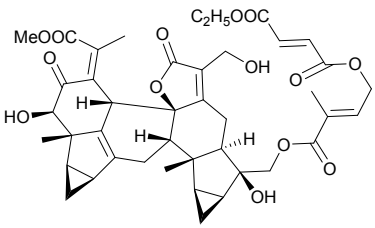
324



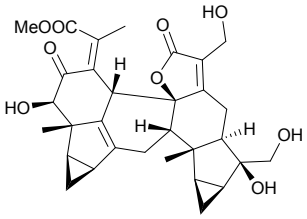
325 R^1 = H R^2 = αOH
326 R^1 = αOH R^2 = H
328 R^1 = βOH R^2 = βOH



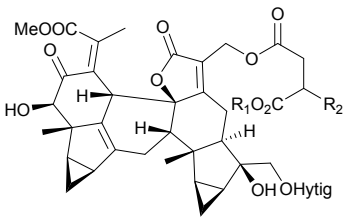
327 R^1 = H R^2 = βOH
329 R^1 = βOH R^2 = βOH
330 R^1 = H R^2 = H



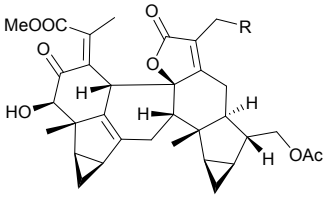
331



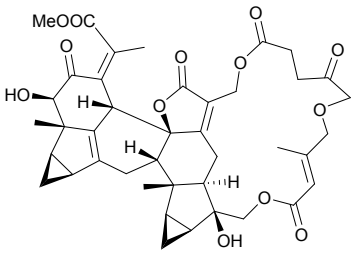
332



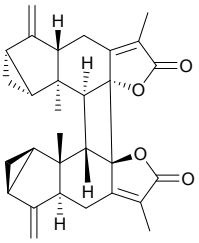
333 R^1 = Me R^2 = αOH
334 R^1 = Et R^2 = βOH



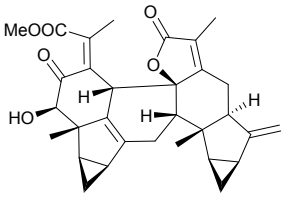
#**335** R = OH
#**339** R = H



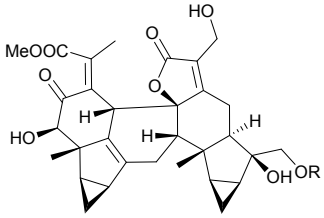
#**336**



#**337**

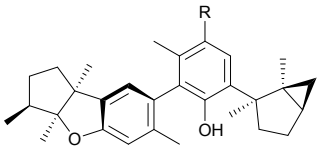


#**338**

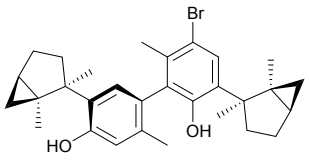


#**340** R = Tig
#**341** R = Hysen

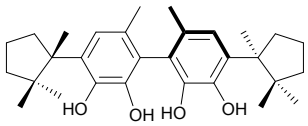
2.9 Cuparane, laurane and cyclolaurane sesquiterpenoid dimers (compounds 342–345)



342 R = Br
343 R = H

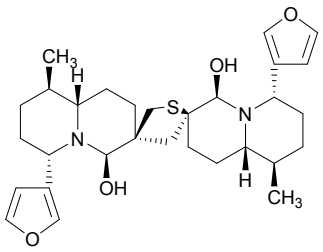


344

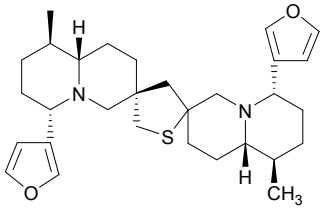


#345

2.10 Sesquiterpenoid alkaloid dimers (compounds 346–347)

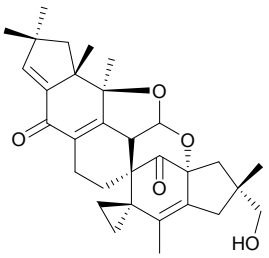


#346

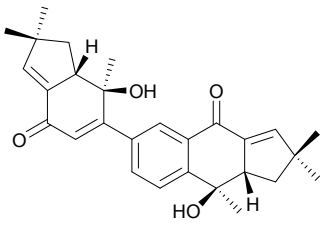


#347

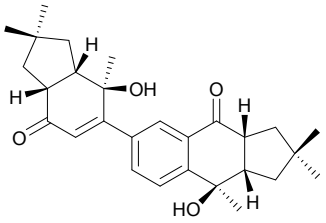
2.11 Miscellaneous sesquiterpenoid dimers (compounds 348–366)



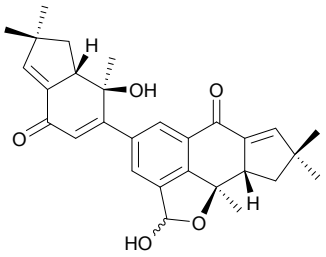
348



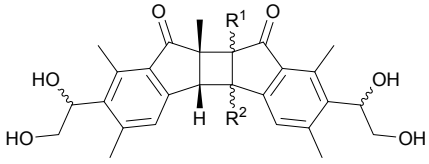
349



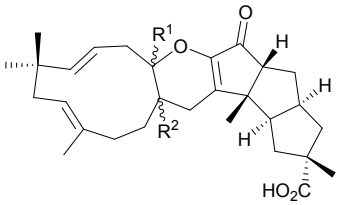
350



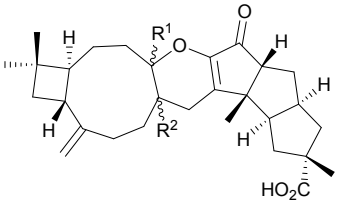
351



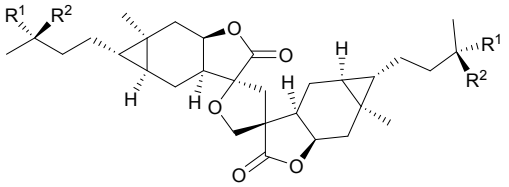
352 R^1 = αMe R^2 = αH
353 R^1 = βMe R^2 = βH



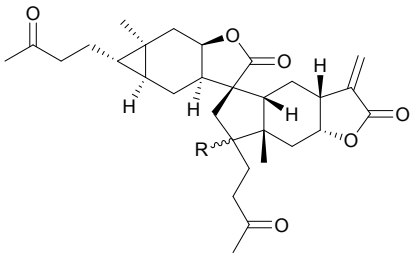
354 R^1 = αMe R^2 = βH
355 R^1 = βMe R^2 = αH



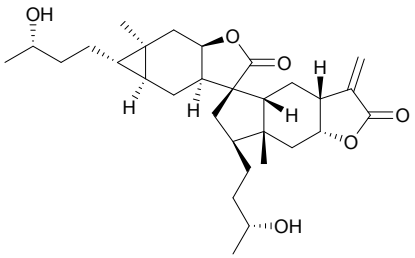
356 R^1 = αMe R^2 = βH
357 R^1 = βMe R^2 = αH



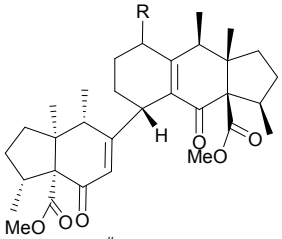
358 R^1 = OH R^2 = H
359 R^1 + R^2 = O



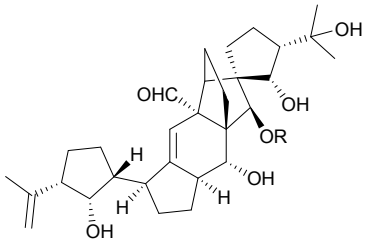
360 R = αH
361 R = βH



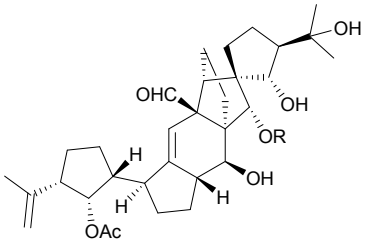
362



#**363** R = β-OH
#**364** R = α–OH



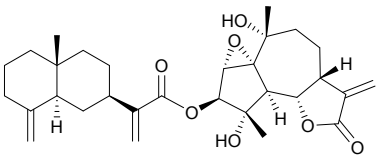
#**365a** R = Ac
#**366a** R = H



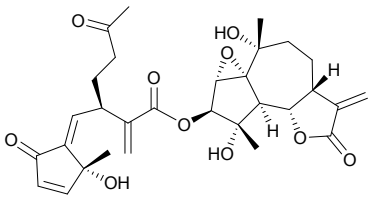
#**365** R = Ac
#**366** R = H

3 Pseudo-disesquiterpenoids

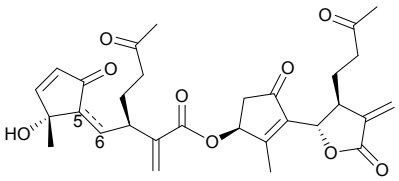
3.1 Ester linkage (compounds 367–401)



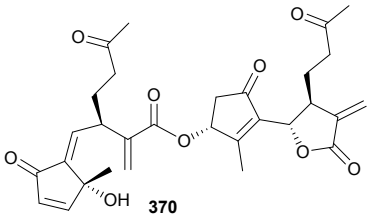
367



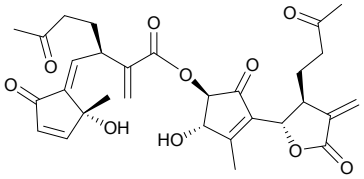
368



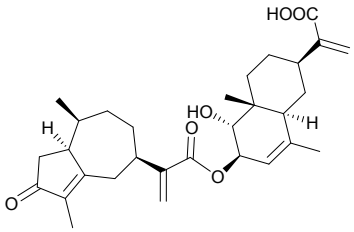
369 $\Delta^{5(6)}$ = *Z*
372 $\Delta^{5(6)}$ = *E*



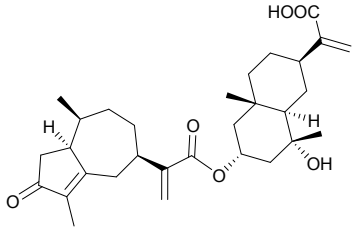
370



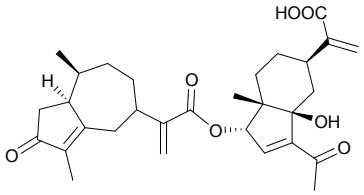
371



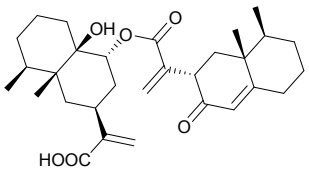
373



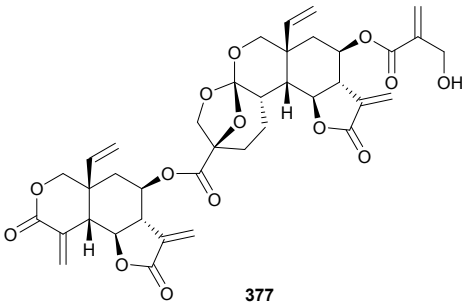
374



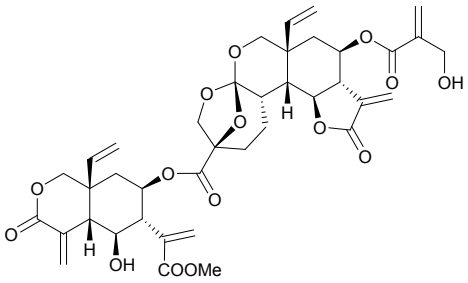
375



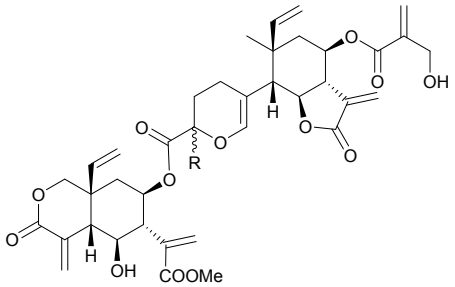
376



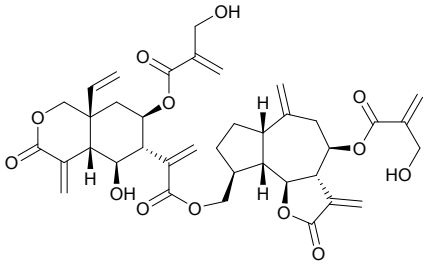
377



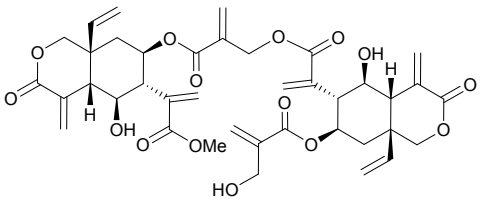
378



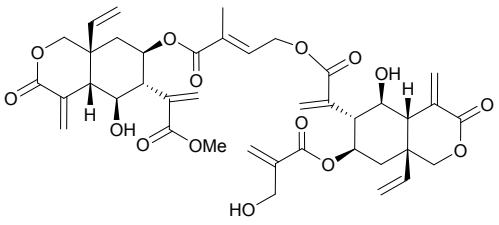
379 R = βCH_2OH
380 R = αCH_2OH



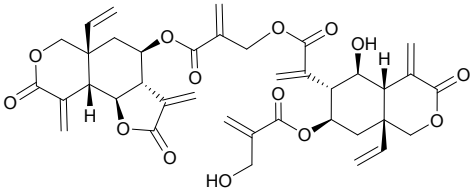
381



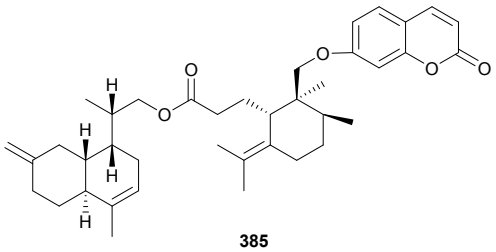
382



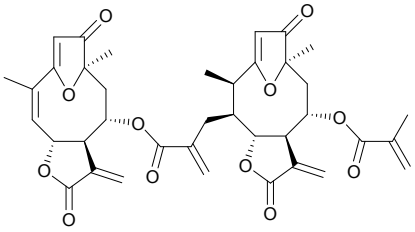
383



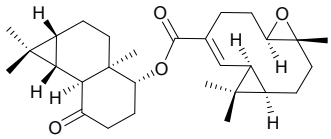
384



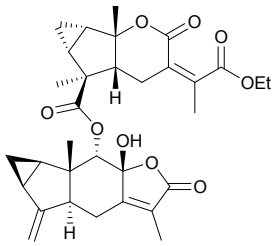
385



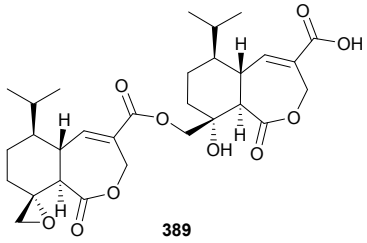
386



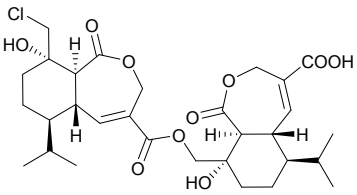
387



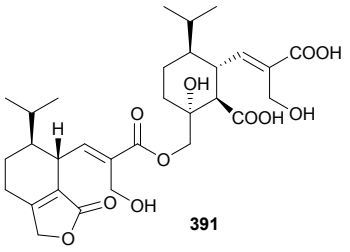
388



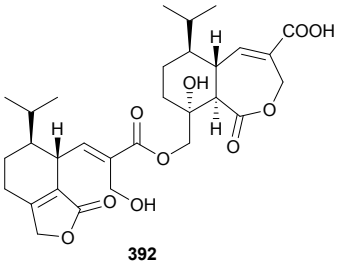
389



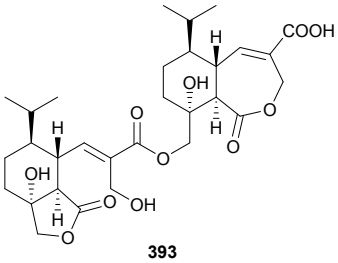
390



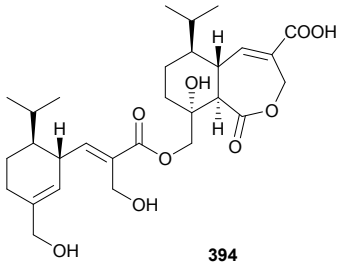
391



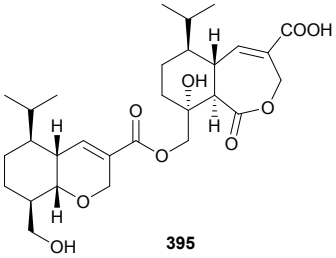
392



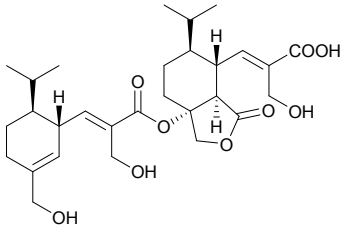
393



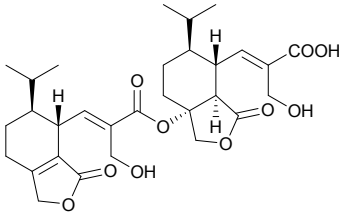
394



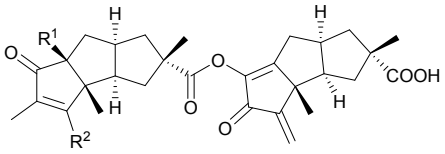
395



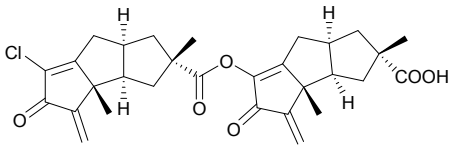
396



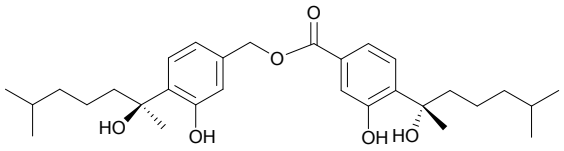
397



398 R^1 = OH R^2 = CH_3
400 R^1 = H R^2 = CH_2OCH_3

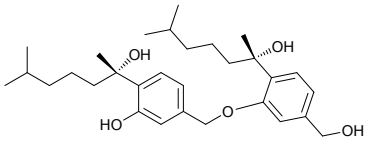


399

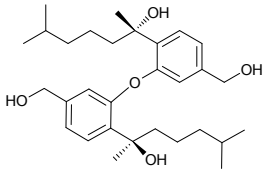


401

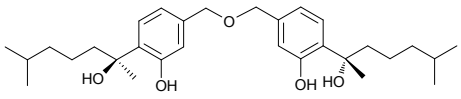
3.2 *O*-ether linkage (compounds 402–416)



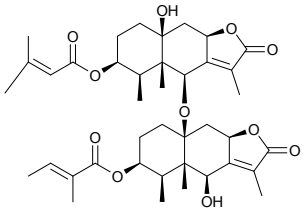
402



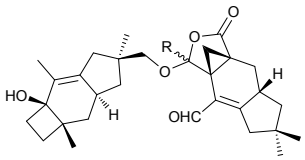
403



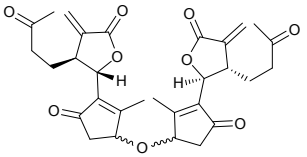
404



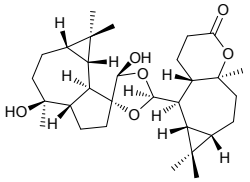
405



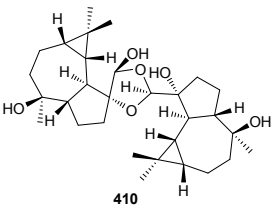
406 R = αH
407 R = βH



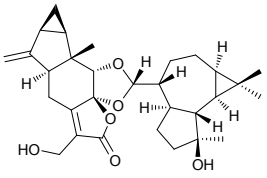
408



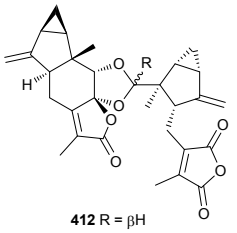
409



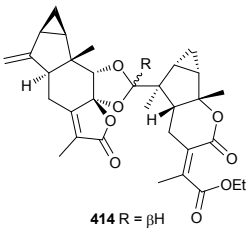
410



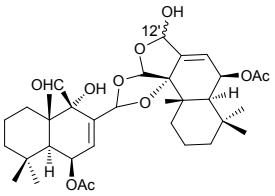
411



412 R = βH
413 R = αH

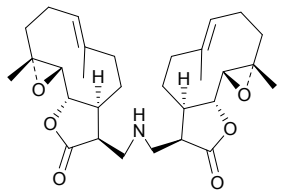


414 R = βH
415 R = αH

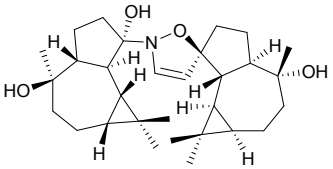


#**416**

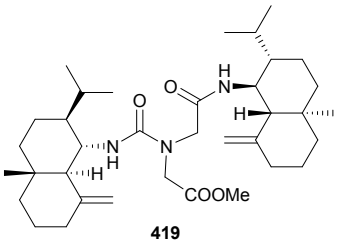
3.3 Nitrogen and urea linkage (compounds 417–427)



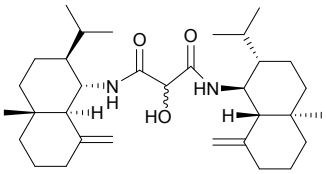
417



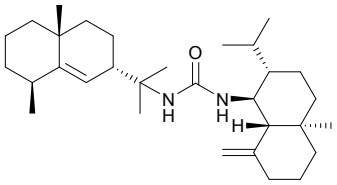
418



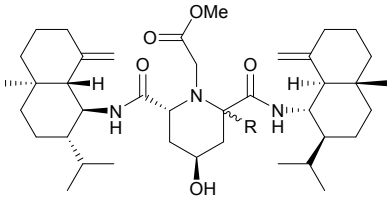
419



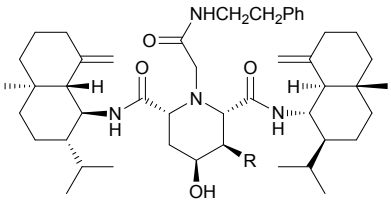
420



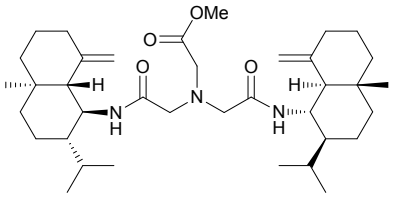
421



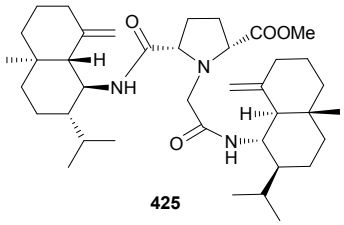
422 R = βH
427 R = αH



423 R= H
426 R = OH

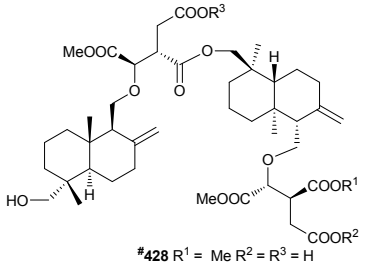


424

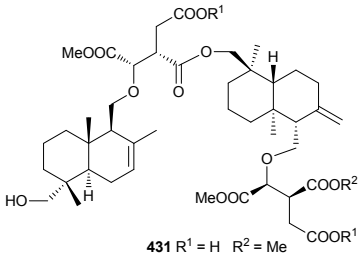


425

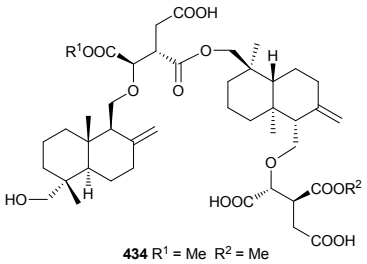
3.4 Isocitric acid linkage (compounds 428–437)



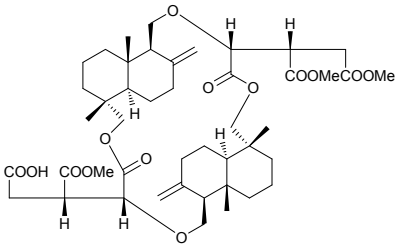
#428 R^1 = Me R^2 = R^3 = H
429 R^1 = H R^2 = R^3 = Me
430 R^2 = H R^1 = R^3 = Me



431 R^1 = H R^2 = Me
432 R^1 = Me R^2 = Me
433 R^1 = H R^2 = H

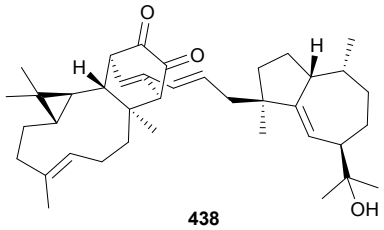


434 R^1 = Me R^2 = Me
435 R^1 = H R^2 = Me
436 R^1 = H R^2 = H

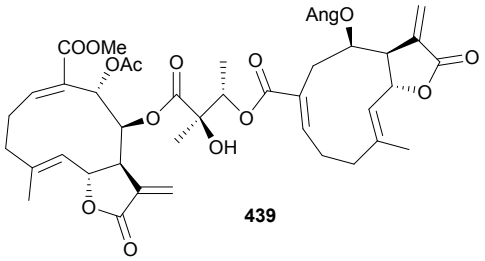


437

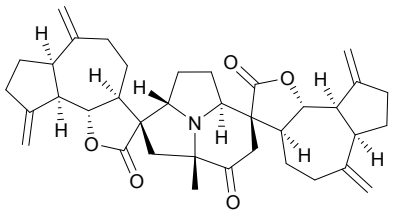
3.5 Others (compounds 438–447)



438



439



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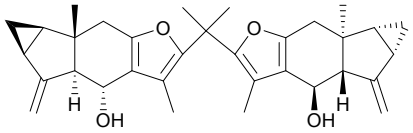

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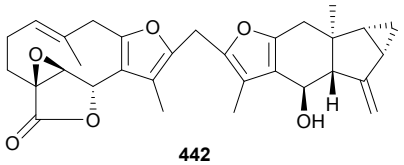

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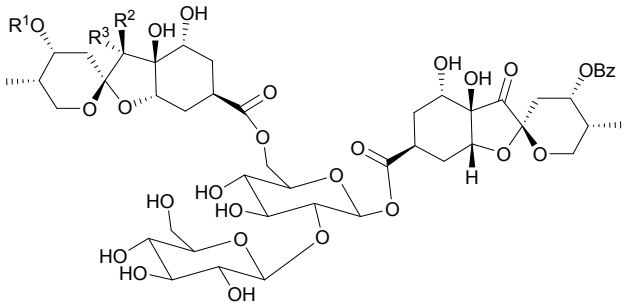
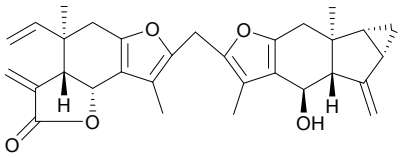


445 R^1 = Bz R^2 = OH R^3 = H
446 R^1 = p-Hpa R^2 + R^3 = O



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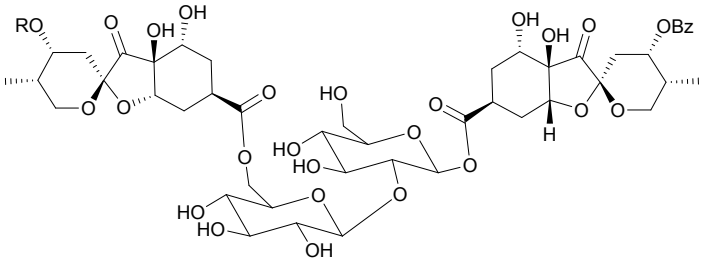
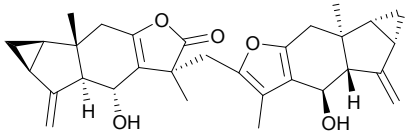
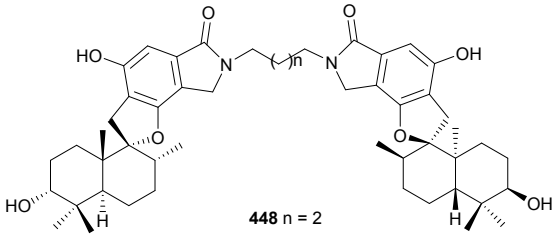


447 R = p-Hpa

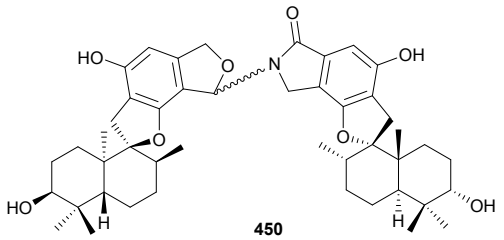


444

4 Merosesquiterpenoid dimers



448 n = 2
449 n = 3



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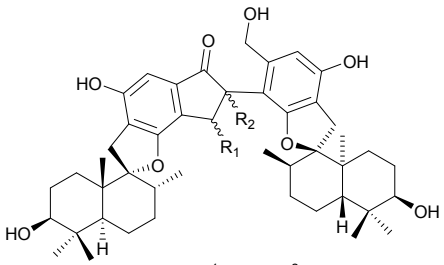
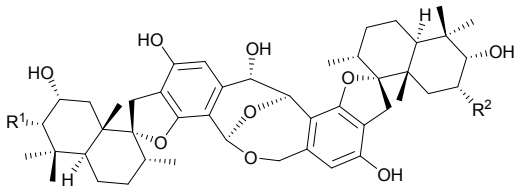
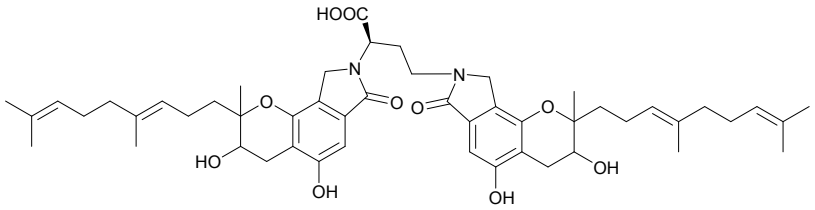


451 R^1 = βOH R^2 = βH
452 R^1 = αOH R^2 = αH



453 R^1 = OH R^2 = H
454 R^1 = OAc R^2 = H
455 R^1 = OH R^2 = OH



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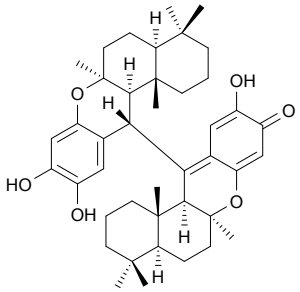

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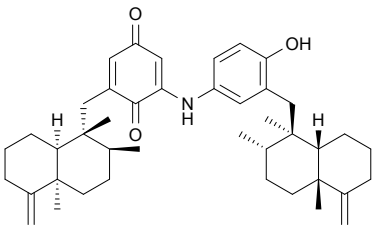

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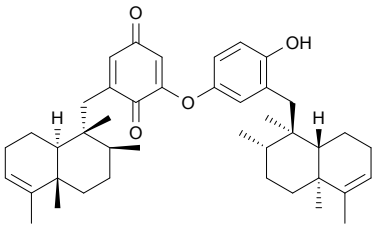

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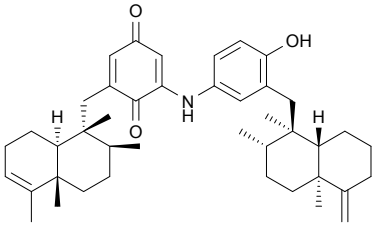

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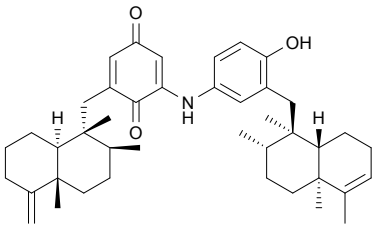

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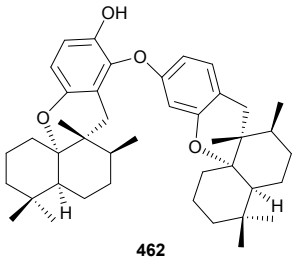

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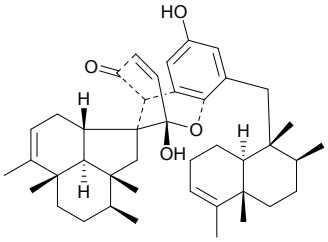

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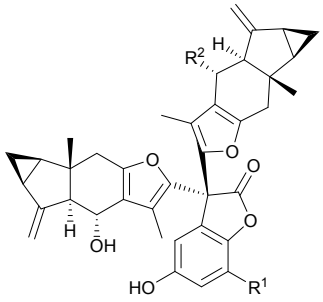
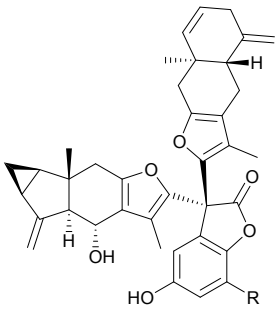
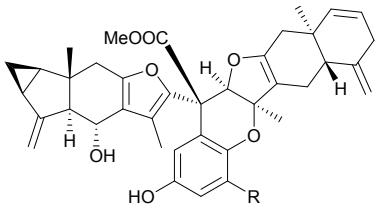


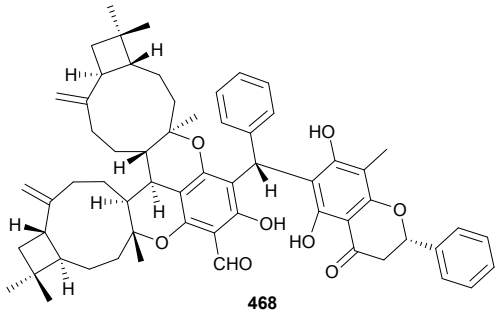
464 R^1 = **A** R^2 = OH
465 R^1 = **A** R^2 = H



466 R = **A**



467 R = **A**



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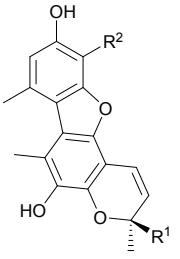
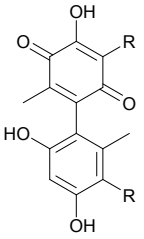
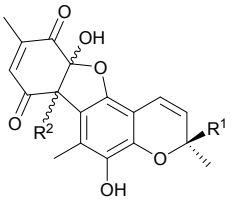


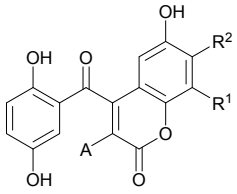
469 R^1 = **A** R^2 = **B**



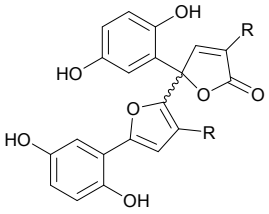
470 R = **B**



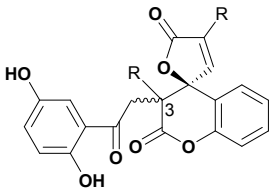
471 R^1 = **A** R^2 = **C**



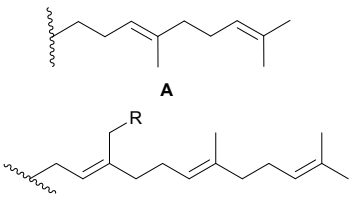
472 R^1 = **C** R^2 = H
473 R^1 = H R^2 = **C**



474 R = **A**

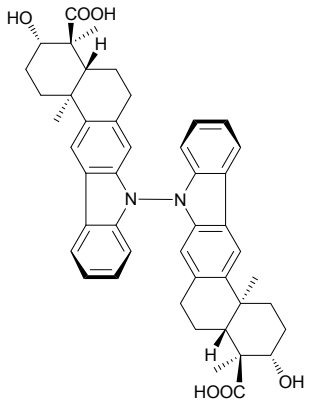


475 R = **A** 3*R*
476 R = **A** 3*S*



A

B R = H
C R = OH



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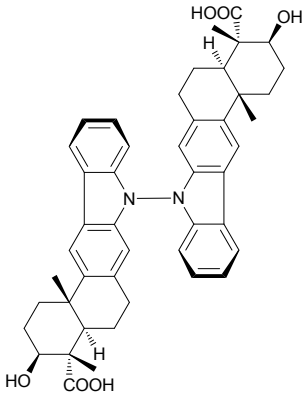

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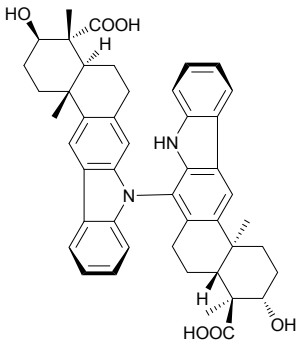

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