The LC-MS analysis of 28 compounds was performed on an Agilent 1290 Infinity LC / 6530 Q-TOF MS (Agilent, USA) using a Unitary C18 (150×4.6 mm i.d. , 5 μm, Acchrom, Beijing, China). The mobile phases were water (A) and (B) ACN.

The mass spectrometer was operated either in positive or negative mode, parameter settings used for the measurement were as follows: capillary voltage: 4kV (positive ion mode) and 3.5 kV (negative ion mode); Nozzle voltage: 0 kV (positive ion mode) and 1 kV (negative ion mode); nebulizer pressure: 50 psi; drying gas: 6 L/min; gas temperature: 300 ◦C; skimmer voltage: 65 V; OCT1 RF Vpp: 750 V; fragmentor voltage: 135 V. Data were acquired using the extended dynamic range mode (2 GHz) and collected in the full-scan mode from m/z 100 to 1000 in centroid mode. The TOF was calibrated every day before sample analysis using reference masses at m/z 112.9885, 1033.9881 (positive ion mode) and 119.0362、980.0164 (negative ion mode) to obtain high-accuracy mass measurements.

Compound 1

Pellitorine, $C_{14}H_{25}NO$, $[M+H]^+$: 224.1976

^{1}H-NMR($CDCl_3$,600MHz):0.879(3H,t,J=7.2Hz,H-10),0.917(6H,d,J=6.6Hz,H-3',4'),1.241-1.331(4H,m),1.384-1.433(2H,m,H-7),1.759-1.826(1H,m,H-2'),2.133(2H,dt,J=7.2Hz,7.2Hz,H-6),3.155(2H,t,J=6.6Hz,H-1'),5.558(1H,br.s,H-N),5.753(1H,d,J=15Hz,H-2),6.035-6.141(2H,m,H-4,5),7.182(1H,dd,J=14.4Hz,10.2Hz,H-3)

^{13}C-NMR($CDCl_3$,600MHz):13.980(C-10),20.098(C-3',4'),22.445(C-9),28.454(C-2'),28.600(C-7),31.339(C-8),32.889(C-6),46.907(C-1'),121.670(C-2),128.164(C-4),141.316(C-5),143.238(C-3),166.414(C-1)

Compound 2

N-[(2E, 4E)-decadienoyl]-piperidine, $C_{15}H_{25}NO$, $[M+H]^+$: 236.1967

^{1}H-NMR($CDCl_3$,600MHz):0.881(3H,t,J=7.2Hz,H-10),1.270-1.298(4H),1.406(2H,q,J=7.2Hz,H-7),1.561(4H,m,H-3',5'),1.647(2H,m,H-4'),2.134(2H,dt,J=7.2Hz,7.2Hz,H-6),3.492(2H,br.s,H-2'or6'),3.598(2H,br.s,H-2'or6'),6.055(1H,dt,J=15Hz,7.2Hz,H-5),6.166(1H,dd,J=15Hz,10.8Hz,H-4),6.247(1H,d,J=15Hz,H-2),7.225(1H,dd,J=15Hz,10.8Hz,H-3)

^{13}C-NMR($CDCl_3$,600MHz):13.989(C-10),22.461(C-9),24.642(C-4'),25.637,26.618(C-3',5'),28.477(C7),31.349(C-8),32.881(C-6),43.022,46.763(C-2',6'),118.458(C-2),128.772(C-4),142.637(C-5),142.853(C-3),165.724(C-1)

Compound 3

N-isobutyl-2E, 4E-hendecadienamide, $C_{15}H_{27}NO$, $[M+H]^+$: 238.2128

^{1}H-NMR($CDCl_3$,600MHz):0.879(3H,t,J=6.6Hz,H-11),0.912(6H,d,J=6.6Hz,H-3',4'),1.267-1.417(8H,m),1.792(1H,m,H-2'),2.132(2H,dt,J=6.6Hz,6.6Hz,H-6),3.269(2H,m,H-1'),5.544(1H,br.

s,H-N),5.728(1H,d,J=15Hz,H-2),6.0132-6.111(2H,m,H-4,5),7.177(1H,m,H-3)
^{13}C-NMR($CDCl_3$,600MHz):13.979(C-11),20.100(C-3',4'),22.440(C-10),28.453(C-2'),28.779-29.342(C7-8),31.339(C-9),32.883(C-6),45.172(C-1'),121.660(C-2),128.171(C-4),141.207(C-5),143.186(C-3),166.312(C-1)

Compound 4

Piperlonguminine, $C_{16}H_{19}NO_3$, $[M+H]^+$: 274.1419
^{1}H-NMR($CDCl_3$,600MHz):0.947(6H,d,J=6.6Hz,H-3',4'),1.797-1.852(1H,m,H-2'),3.192(2H,t,J=6.6Hz,H-1'),5.766(1H,br.s,H-N),5.968(1H,m,H-2),5.974(2H,s,-OCH_2O-),6.611-6.696(1H,m,H-5),6.751-6.776(2H,m,H-2",5"),6.880(1H,d,7.8Hz,H-6"),6.966(1H,s,H-4)7.362(1H,dd,J=15Hz,10.8Hz,H-3)
^{13}C-NMR($CDCl_3$,600MHz):20.117(C-3',4'),28.601(C-2'),46.970(C-1'),100.247(-OCH_2O-),105.654(C-2"),108.432(C-5"),122.527(C-6"),123.271(C-2),124.646(C-4),130.837(C-1"),138.705(C-5),140.875(C-3)148.143(C-3",4"),166.164(C-1)

Compound 5

Dihydropiperlonguminine , $C_{16}H_{21}NO_3$, $[M+H]^+$: 276.1575
^{1}H-NMR($CDCl_3$,600MHz):0.912(6H,d,J=6.6Hz,H-3',4'),1.784-1.806(1H,m,H-2'),2.437(2H,dd,H-4),2.670(2H,t,J=7.2Hz,H-5)3.133(2H,t,J=6Hz,H-1'),5.556(1H,br.s,H-N),5.771(1H,d,J=15Hz,H-2),5.910(2H,s,-OCH_2O-),6.610(1H,d,J=7.8Hz,H-6"),6.656(1H,s,H-2"),6.714(1H,d,J=7.8Hz,H-5"),6.883(1H,dt,J=15,7.8Hz,H-3)
^{13}C-NMR($CDCl_3$,600MHz):20.080(C-3',4'),28.531(C-2'),34.036(C-5),34.330(C-6),46.820(C-1'),100.166-OCH_2O-),108.158C-2"),108.745(C-5"),120.114(C-6")124.220(C-2),134.836C-1"),143.259(C-3) ,145.749(C-4"),147.565(C-3"),165.878(C-1)

Compound 6

Piperanine, $C_{17}H_{21}NO_3$, $[M+H]^+$: 288.1562
^{1}H-NMR($CDCl_3$,600MHz):1.511(4H,m,H-2',4'),1.609(2H,m,H-5'),2.433(2H,m,H-4),2.656(2H,t,J=7.8Hz,H-5),3.396(2H,br.s,H-1'or5'),3.536(2H,br.s,H-1'or5'),5.875(2H,s,H-OCH_2O-),6.185(1H.d,J=15Hz,H-2),6.592(1H,d,J=7.8Hz,H-6"),6.637(1H.m,H-2"),6.686(1H,d,J=7.8Hz,H-5"),6.764(1H,dt,J=14.4Hz,7.2Hz,H-3)
^{13}C-NMR($CDCl_3$,600MHz):24.481(C-3'),25.459(C-4'),26.343(C-2'),34.334(C-4),34.394(C-5),42.888(C-1'),46.654(C-5'),100.639(-OCH_2O-),107.998(C-5"),108.702(C-2"),121.074(C-2)121.273(C-6"),134.841(C-1"),143.878(C-3)145.593(C-3"),147.432(C-4"),165.318(C-1)

Compound 7

N-[(2E, 4E)-tetradecadienoyl]piperidine, $C_{19}H_{33}NO$, $[M+H]^+$: 292.2813
^{1}H-NMR($CDCl_3$,600MHz):0.875(3H,t,J=6.6Hz,H-13),1.255-1.291(12H),1.399(2H,q,J=7.2Hz,H-7),1.561(4H,m,H-3',5'),1.647(2H,m,H-4'),2.132(2H,dt,J=7.2Hz,7.2Hz,H-6),3.483(2H,br.s,H-2'or6'),3.607(2H,br.s,H-2or6'),6.041(1H,dt,J=14.4Hz,7.2Hz,H-5),6.164(1H,dd,J=15Hz,10.8Hz,H-4),6.246(1H,d,J=15Hz,H-2),7.225(1H,dd,J=14.4Hz,10.8Hz,H-3)
^{13}C-NMR($CDCl_3$,600MHz):14.094(C-14),22.655(C-13),24.651(C-4'),25.597,26.681(C-3',5'),28.813-29.509(C-7-11),31.867(C-12),32.927(C-6),43.164,46.857(C-2',6'),118.468(C-2),128.772(C-4),142.629(C-5),142.837(C-3),165.715(C-1)

Compound 8

N-[(2E, 4E)-tetradecadienoyl]piperidine, $C_{20}H_{37}NO$, $[M+H]^+$: 308.2902

^{1}H-NMR($CDCl_3$,600MHz):0.865(3H,t,J=6.6Hz,H-16),0.908(6H,d,J=6Hz,H-3',4'),1.243(16H,m),1.389(2H,m,H-7),1.785(1H,m,H-2'),2.128(2H,m,H-6),3.146(2H,m,H-1'),5.639(1H,br.s,H-N),5.758(1H,d,J=15Hz,H-2),6.037-6.132(2H,m,H-4,5),7.225(1H,t,J=12.6Hz,H-3)

^{13}C-NMR($CDCl_3$,600MHz):14.087(C-16),20.096(C-3',4'),22.655(C-15),28.594(C-2'),28.789-29.612(C7-13),31.883(C-14),32.931(C-6),46.905(C-1'),121.697(C-2),128.162(C-4),141.275(C-5),143.199(C-3),166.440(C-1)

Compound 9

Retrofractamide A $C_{20}H_{25}NO_3$, $[M+H]^+$: 328.3199

^{1}H-NMR($CDCl_3$,600MHz):0.924(6H,d,J=6.6Hz,H-3',4'),1.796(1H,m,H-2'),2.314(4H,m,H-6,7),3.161(2H,t,J=6Hz,H-1'),5.497(1H,br.s,H-N),5.763(1H,d,J=15Hz,H-2),5.931(2H,s,-OCH$_2$O-),6.015(2H,m,H-4,5),6.092(1H,dd,J=15.6,10.8Hz,H-8),6.306(1H,d,J=15.6Hz,H-9),6.723-6.757(2H,m,H-2'',5''),6.877(1H,m,H-6''),7.189(1H,dd,J=15,10.8Hz,H-3)

^{13}C-NMR($CDCl_3$,600MHz):20.102(C-3',4'),28.602(C-2'),32.158(C-7),32.835(C-6),46.917(C-1'),100.934(-OCH_2O-),105.408(C-2''),108.219(C-5''),120.373(C-6''),122.153(C-2),127.674(C-4),128.765(C-8),130.164(C-9),132.062(C-1''),141.045(C-5),141.805(C-3),146.716(C-4''),147.925(C-3''),166.288(C-1)

Compound 10

Pipercallosine, $C_{20}H_{27}NO_3$, $[M+H]^+$: 330.2013

^{1}H-NMR($CDCl_3$,600MHz):0.920(6H,d,J=6.6Hz,H-3',4'),1.487(4H,m,H-7,8),1.779-1.802(1H,m,H-2'),2.186(4H,m,H-6,9),3.143(2H,t,J=6.6Hz,H-1'),5.495(1H,br.s,H-N),5.763(1H,d,J=16.2Hz,H-2),5.927(2H,s,-OCH_2O-),5.994-6.643(1H,m,H-5),6.279(1H,m,H-4),6.721-6.756(2H,m,H-2'',5''),6787-6.854(1H,m,H-6''),6.883(1H,m,H-3)

^{13}C-NMR($CDCl_3$,600MHz):20.109(C-3',4'),27.737(C-2'),28.561,28.906(C-7,8),31.833(C-9),32.632(C-6),46.823(C-1'),100.898(-OCH_2O-),105.358(C-2''),108.199(C-5''),120.210(C-6'')123.699(C-2),128.816(C-4),129.595(C-5),132.291C-1''),144.470(C-3)146.578(C-4''),147.908(C-3''),166.032(C-1)

Compound 11

(2E, 4E, 12Z)-N-Isobutyloctadeca-2, 4, 12-trienamide, $C_{22}H_{39}NO$, $[M+H]^+$: 334.3066

^{1}H-NMR($CDCl_3$,600MHz):0.869(3H,t,J=7.2Hz,H-18),0.905(6H,d,J=6.6Hz,H-3',4'),1.245-1.311(12H,m),1.403(2H,br.q,J=6.6Hz,H-7),1.788(1H,m,H-2'),2.002(4H,m,H-11,14)2.122(2H,dt,J=7.2Hz,7.2Hz,H-6),3.131(2H,t,J=6Hz,H-1'),5.329(2H,t,J=3Hz,H-12,13)5.463(1H,br.s,H-N),5.823(1H,d,J=15Hz,H-2),6.019-6.159(2H,m,H-4,5),7.161(1H,dd,J=15Hz,10.8Hz,H-3)

^{13}C-NMR($CDCl_3$,600MHz):13.873(C-18),20.029(C-3',4'),22.529(C-17),26.784(C-11),27.035(C-14),28.491(C-2'),28.703-29.593(C7-10,15),31.830(C-16),32.838(C-6),46.881(C-1'),121.834(C-2),128.181(C-4),129.659(C-12),129.772(C-13),141.027(C-5),142.898(C-3),166.590(C-1)

Compound 12

N-isobutyl-2E, 4E-octadecadienamide, $C_{22}H_{41}NO$, $[M+H]^+$: 336.4091

^{1}H-NMR($CDCl_3$,600MHz):0.875(3H,t,J=6.6Hz,H-18),0.921(6H,d,J=6.6Hz,H-3',4'),1.251(20H,m),1.401(2H,m,H-7),1.796(1H,m,H-2'),2.135(2H,dt,J=6.6Hz,6.6Hz,H-6),3.159(2H,t,J=6.6Hz,H-1'),5.517(1H,br.s,H-N),5.748(1H,d,J=15Hz,H-2),6.062-6.117(2H,m,H-4,5),7.186(1H,dd,J=14.4Hz,10.8Hz,H-3)

^{13}C-NMR($CDCl_3$,600MHz):14.105(C-18),20.104(C-3',4'),22.675(C-17),28.610(C-2'),28.779-29.664(C7-15),31.905(C-16),32.943(C-6),46.910(C-1'),121.630(C-2),128.152(C-4),141.317(C-5),143.258(C-3),166.394(C-1)

Compound 13

1-[9-(3', 4'-methylenedioxyphenyl)-4E, 6E, 8E-nonatrienoyl]piperidine,
$C_{21}H_{25}NO_3$, $[M+H]^+$: 340.1489

^{1}H-NMR($CDCl_3$,600MHz):1.514(4H,m,H-2',4'),1.640(2H,m,H-3'),2.224-2.260(2H,m,H-3),2.405-2.441(2H,m,H-2),3.433,3.565(4H,br.s,H-1',5'),5.713-5.759(1H,m,H-4)5.866(2H,s,-OCH_2O-),5.944-6.013(1H,m,H-5),6.096-6.133(1H,m,H-9)6.243-6.321(2H,m,H-6,7)6.663-6.710(2H,m,H-2",6"),6.829(1H,m,H-5"),7.161-7.207(1H,m,H-8)

^{13}C-NMR($CDCl_3$,600Hz):24.394(C-3'),25.363(C-4'),26.466(C-2'),27.695(C-3),32.456(C-2),43.003(C-1'),46.659(C-5'),100.690(-OCH_2O-),105.234(C-2"),107.953(C-5"),120.158(C-6")127.300,127.490(C-4,5)129.173,129.990(C-6,7),131.902(C-1"),136.935,137.994(C-8,9),146.440(C-3"),147.672(C-4"),165.371(C-1)

Compound 14

Dehydropipernonaline, $C_{21}H_{25}NO_3$, $[M+H]^+$: 340.1489

^{1}H-NMR($CDCl_3$,600MHz):1.560(4H,m,H-2',4'),1.645(2H,m,H-3'),2.305(4H,m,H-6,7),3.542(4H,br.s,H-1',5'),5.925(2H,s,H-OCH_2O-),5.993-6.041(1H.m,H-8),6.051-6.098(1H,m,H-5),6.210(1H.dd,J=15,11.4Hz,H-4),6.265(1H.d,J=15Hz,H-9),6.302(1H.d,J=15.6Hz,H-2),6.725(1H,d,J=14.4Hz,H-5"),6.747(1H,dd,J=7.8,1.2Hz,H-6"),6.875(1,s,H-2")7.232(1H,dd,J=14.4Hz,10.8Hz,H-3)

^{13}C-NMR($CDCl_3$,600MHz):24.614(C-3'),25.985(C-4'),26.342(C-2'),32.163(C-6),32.824(C-7),43.068(C-1'),46.572(C-5'),100.901(-OCH_2O-),105.386(C-2"),108.181(C-5"),118.965(C-2),120.338(C-6"),127.724(C-4),129.356(C-8)130.091(C-9),132.061(C-1"),141.127(C-3),142.505(C-5)146.675(C-3"),147.894(C-4"),165.570(C-1)

Compound 15

Pipernonatine, $C_{21}H_{27}NO_3$, $[M+H]^+$: 342.2009

^{1}H-NMR($CDCl_3$,600MHz):1.482(4H,m,H5-6),1.549(4H,m,H-2',4'),1.629(2H,m,H-3'),2.182(4H,m,H-4,7),3.463(2H,br.s,H-1'or5'),3.574(2H,br.s,H-1'or5'),5.912(2H,s,H-OCH_2O-),6.018(1H,dt,J=7.2Hz,7.2Hz,H-8)6.234(1H,d,J=15Hz,H-2)6.268(1H,d,J=15.6Hz,H-9)6.714(1H,d,J=7.8Hz,H-5"),6.736(1H,d,J=7.8Hz,H-6"),6.816(1H,dt,J=14.4,7.2Hz,H-3),6.870(1H,br.s,H-2".

^{13}C-NMR($CDCl_3$,600MHz):24.572(C-3'),25.502(C-4'),26.562(C-2'),27.860,28.887(C5-6),32.307(C-4),32.589(C-7),42.989(C-1'),46.744(C-5'),100.835(-OCH_2O-),105.298(C-2"),108.127(C-5"),120.144(C-6"),120.434(C-2),128.807(C-8),129.503(C-9),132.250(C-1"),145.547(C-3)146.506(C-3"),147.846(C-4"),165.474(C-1)

Compound 16

(E)-9-(benzo[d][1,3]dioxol-6-yl)-1-(piperidin-1-yl)non-2-en-1-one,
$C_{21}H_{29}NO$, $[M+H]^+$: 344.2900
^{1}H-NMR($CDCl_3$,600MHz):1.350(4H,m,H-2',4'),1.444(2H,m,H-3'),1.5121.619(8H,m),2.155(2H,dd,J=14.4,7.2HzH-4),2.298(2H,t,J=7.8Hz,H-9),3.371(2H,t,,J=5.4Hz,H-1'or5'),3.531(2H,t,J=5.4Hz,H-1'or5'),5.913(2H,s,H-OCH_2O-),6.000-6.049(1H.m,H-2),6.264(1H,d,J=7.8Hz,H-2''),6.715(1H,d,J=7.8Hz,H-6''),6.738(1H,d,J=7.8Hz,H-5''),6.875(1H,m,H-3)
^{13}C-NMR($CDCl_3$,600Hz):24.535(C-3'),25.357(C-4'),26.520(C-2'),28.928-29.317(4-8),32.777(C-3),33.374(C-9),42.523(C-1'),46.648(C-5'),100.639(-OCH_2O-),105.312(C-5''),108.126(C-2''),120.109(C-2,3)129.263(C-6''),132.390(C-1''),146.453(C-3''),147.841(C-4''),171.362(C-1)

Compound 17

1-(2E, 4E, 12Z)-octadecatrienoylpiperidine, $C_{23}H_{39}NO$, $[M+H]^+$: 346.3076
^{1}H-NMR($CDCl_3$,600MHz):0.863(3H,t,J=6.6Hz,H-18),1.258-1.296(12H),1.385(2H,q,J=7.2Hz,H-7),1.542(4H,m,H-3',5'),1.620(2H,m,H-4'),1.985(4H,br.s,H-11,14),2.102(2H,dt,J=7.2Hz,7.2Hz,H-6),3.459(2H,br.s,H-2'or6'),3.579(2H,br.s,H-6'or2'),5.313(2H,t,J=2.4Hz,H-12,13),6.024(1H,dt,J=15Hz,7.2Hz,H-5),6.139(1H,dd,J=15Hz,11.4Hz,H-4),6.222(1H,d,J=15Hz,H-2),7.198(1H,dd,J=14.4Hz,10.8Hz,H-3)
^{13}C-NMR($CDCl_3$,600MHz):14.010(C-18),22.554(C-17),24.561(C-4'),25.509,26.598(C-3',5'),26.809,27.060(C-11,14),28.714-29.616(C-7-10,15),31.857(C-16),32.832(C-6),43.094,46.764(C-2',6'),118.396(C-2),128.729(C-4),129.700,129.789(C-12,13),142.462(C-5),142.761(C-3),165.618(C-1)

Compound 18

Retrofractamide B, $C_{22}H_{29}NO_3$, $[M+H]^+$: 356.1814
^{1}H-NMR($CDCl_3$,600MHz):0.921(6H,d,J=6.6Hz,H-3',4'),1.465(4H,m,H-7,8),1.773-1.818(1H,m,H-2'),2.166-2.182(4H,m,H-6,9),3.160(2H,t,J=6.6Hz,H-1'),5.493(1H,br.s,H-N),5.747(1H,d,J=15Hz,H-2),5.928(2H,s,-OCH_2O-),5.982-6.085(2H,m,H-4,5),6.109-6.152(1H,m,H-10),6.280(1H,d,J=15.6Hz,H-11),6.721-6.758(2H,m,H-2'',5''),6.886(1H,d,J=1.2Hz,H-6''),7.186(1H,dd,J=15,10.8Hz,H-3)
^{13}C-NMR($CDCl_3$,600MHz):20.102(C-3',4'),28.564(C-2')28.609,28.921(C-7,8),32.658(C-9),32.764(C-6),46.906(C-1'),100.897(-OCH_2O-),105.368(C-2''),108.201(C-5''),120.213(C-6'')121.824(C-2),128.375(C-4)128.939(C-10),129.536(C-11),132.329(C-1''),141.218(C-3)142.799(C-5)146.568(C-4''),147.905(C-3''),166.338(C-1)

Compound 19

(2E, 4E, 14Z)-N-Isobutyleicosa-2, 4, 14-trienamide, $C_{24}H_{43}NO$, $[M+H]^+$: 362.3360
^{1}H-NMR($CDCl_3$,600MHz):0.919(3H,t,J=6.6Hz,H-20),0.948(6H,d,J=6.6Hz,H-3',4'),1.292-1.346(16H,m),1.428(2H,m,H-7),1.824(1H,m,H-2'),2.041(4H,m,H-13,16)2.162(2H,dt,J=7.2Hz,7.2Hz,H-6),3.187(2H,t,J=6Hz,H-1'),5.371(2H,t,J=4.8Hz,H-14,15)5.583(1H,br.s,H-N),5.781(1H,d,J=15Hz,H-2),6.063-6.169(2H,m,H-4,5),7.214(1H,dd,J=15Hz,10.2Hz,H-3)
^{13}C-NMR($CDCl_3$,600MHz):13.978(C-20),20.099(C-3',4'),22.321(C-19),26.890(C-13),27.168(C-16),28.604(C-2'),28.786-29.730(C7-12,17),31.942(C-18),32.935(C-6),46.909(C-1'),121.654(C-2),128.165(C-4),129.851(C-14),129.851(C-15),141.334(C-5),143.242(C-3),166.399(C-1)

Compound 20

N-isobutyl-2E, 4E-decyldecadienamide, $C_{24}H_{45}NO$, $[M+H]^+$:
^{1}H-NMR($CDCl_3$,600MHz):0.865(3H,t,J=6.6Hz,H-20),0.921(6H,d,J=6.6Hz,H-3',4'),1.250(24H,m),1.401(2H,m,H-7),1.797(1H,m,H-2'),2.135(2H,dt,J=6.6Hz,6.6Hz,H-6),3.160(2H,t,J=6.6Hz,H-1'),5.513(1H,br.s,H-N),5.749(1H,d,J=15Hz,H-2),6.038-6.143(2H,m,H-4,5),7.225(1H,dd,J=15Hz,10.8Hz,H-3)
^{13}C-NMR($CDCl_3$,600MHz):14.103(C-20),20.106(C-3',4'),22.675(C-19),28.612(C-2'),28.801-29.676(C7-17),31.908(C-18),32.947(C-6),46.913(C-1'),121.636(C-2),128.156(C-4),141.362(C-5),143.291(C-3),166.398(C-1)

Compound 21

(2E,4E,10E)-N-11-(3,4-Methylenedioxyphenylhmdecatrienoylpiperidine,
$C_{23}H_{29}NO_3$, $[M+H]^+$: 364.3464
^{1}H-NMR($CDCl_3$,600MHz):1.461(4H,m,H-7,8),1.556(4H,m,H-2',4'),1.635(2H,m,H-3'),2.162-2.168(4H,m,H-6,9),3.536(4H,br.s,H-1',5'),5.921(2H,s,H-OCH_2O-),5.997-6.067(2H.m,H-5,10),6.168(1H,dd,J=15Hz,10.8Hz,H-4),6.236-6.289(2H.m,H-2,11),6.723(1H,d,J=13.8Hz,8.4Hz,H-6"),6.746(1H,d,J=14.4Hz,8.4Hz,H-5")6.881(1H,m,H-2"),7.222(1H,dd,J=13.8Hz,11.4Hz,H-3)
^{13}C-NMR($CDCl_3$,600MHz):24.618(C-3'),25.426(C-4'),26.421(C-2'),28.283,28.900(C-7,8),32.644(C-6),32.726(C-7),43.129(C-1'),46.841(C-5'),100.866(-OCH_2O-),105.339(C-2"),108.165(C-5"),118.634(C-2),120.173(C-6"),128.934(C-4),128.969(C-10),129.491(C-11),132.309(C-1"),142.117(C-3),142.672(C-5)146.532(C-3"),147.878(C-4"),165.632(C-1)

Compound 22

piperchabamide B $C_{23}H_{31}NO_3$, $[M+H]^+$: 270.2353
^{1}H-NMR($CDCl_3$,600MHz):1.332(4H,m,H-5,6)1.484(4H,m,H-7,8),1.545(4H,m,H-2',4'),1.629(2H,m,H-3'),2.155-2.212(4H,m,H-4,7),3.522(4H,br.s,H-1',5'),5.912(2H,s,H-OCH_2O-),6.018(1H,dt,J=7.2Hz,6.6Hz,H-8),6.234(1H,d,J=15Hz,H-2),6.268(1H,d,J=15.6Hz,H-9),6.714(1H,d,J=8.4Hz,H-5"),6.736(1H,d,J=7.8Hz,H-6"),6.816(1H,dt,J=15,7.2Hz,H-3),6.870(1H,br.s,H-2")
^{13}C-NMR($CDCl_3$,600MHz):24.606(C-3'),25.599(C-4'),26.454(C-2'),28.296-29.291(C5-8),32.482(C-4),32.812(C-9),42.086(C-1'),46.833(C-5'),100.850(-OCH_2O-),105.328(C-2"),108.154(C-5"),120.133(C-6"),120.287(C-2),129.275(C-10,11),132.400(C-1"),145.861(C-3)146.482(C-3"),147.866(C-4"),165.591(C-1)

Compound 23

1-[(2E, 4E, 14Z)-1-oxo-2, 4, 14-eicosatrienyl]-piperidine, $C_{25}H_{43}NO$, $[M+H]^+$: 374.4381
^{1}H-NMR($CDCl_3$,600MHz):0.866(3H,t,J=6.6Hz,H-20),1.226-1.293(16H),1.373(2H,q,J=7.2Hz,H-7),1.535(4H,m,H-3',5'),1.613(2H,m,H-4'),1.983(4H,br.s,H-11,14),2.108(2H,dt,J=7.2Hz,7.2Hz,H-6),3.456(2H,br.s,H-2'or6'),3.576(2H,br.s,H-6'or2'),5.316(2H,t,J=4.8Hz,H-12,13),6.027(1H,dt,J=15Hz,7.2Hz,H-5),6.139(1H,dd,J=15.6Hz,11.4Hz,H-4),6.223(1H,d,J=15Hz,H-2),7.210(1H,dd,J=14.4Hz,10.8Hz,H-3)
^{13}C-NMR($CDCl_3$,600MHz):13.906(C-20),22.243(C-19),24.567(C-4'),25.524,26.604(C-3',5'),26.813,27.092(C-13,16),28.733-29.655(C-7-12,17),31.868(C-18),32.846(C-6),43.098,46.

771(C-2',6'),118.380(C-2),128.718(C-4),129.765,129.747(C-14,15),142.506(C-5),142.774(C-3),165.629(C-1)

Compound 24

Guineensine, $C_{24}H_{33}NO_3$, $[M+H]^+$: 384.2465

^{1}H-NMR($CDCl_3$,600MHz):0.912(6H,d,J=6.6Hz,H-3',4'),1.314(4H,m,H-8,9),1.409(4H,m,H-7,12),1.766-1.800(1H,m,H-2'),2.126-2.159(4H,m,H-6,11),3.145(2H,t,J=6.6Hz,H-1'),5.743(1H,br.s,H-N),5.767(1H,d,J=15Hz,H-2),5.915(2H,s,-OCH_2O-),6.002-6.064(2H,m,H-4,5),6.089-6.132(1H,m,H-12),6.268(1H,d,J=15.6Hz,H-13),6.712-6.749(2H,m,H-2'',5''),6.881(1H,m,H-6''),7.178(1H,dd,J=15,10.2Hz,H-3)

^{13}C-NMR($CDCl_3$,600MHz):20.077(C-3',4'),28.564(C-2'),28.666-29.268(C7-10),32.782(C-11),32.831(C-6),46.878(C-1'),100.830(-OCH_2O-),105.308(C-2''),108.144(C-5''),120.130(C-6'')121.813(C-2),128.239(C-13),129.259(C-4,5),132.390(C-1''),141.119(C-3)142.916(C-12)146.462(C-4''),147.843(C-3''),166.393(C-1)

Compound 25

(2E, 4E, 14Z)-N-Isobutyldocosa-2, 4, 14-trienamide, $C_{26}H_{47}NO$, $[M+H]^+$: 390.3337

^{1}H-NMR($CDCl_3$,600MHz):0.893(3H,t,J=7.2Hz,H-22),0.923(6H,d,J=6.6Hz,H-3',4'),1.253-1.326(20H,m),1.403(2H,m,H-7),1.797(1H,m,H-2'),2.012(4H,m,H-15,18)2.137(2H,dt,J=6.6Hz,6.6Hz,H-6),3.162(2H,t,J=6.6Hz,H-1'),5.346(2H,t,J=4.8Hz,H-16,17)5.467(1H,br.s,H-N),5.743(1H,d,J=15Hz,H-2),6.038-6.144(2H,m,H-4,5),7.187(1H,dd,J=15Hz,10.2Hz,H-3)

^{13}C-NMR($CDCl_3$,600MHz):14.989(C-22),20.107(C-3',4'),22.335(C-21),26.902(C-15),27.186(C-18),28.619(C-2'),28.804-29.755(C7-14,19),31.956(C-20),32.948(C-6),46.899(C-1'),121.660(C-2),128.158(C-4),129.839(C-16),129.891(C-17),141.332(C-5),143.253(C-3),166.354(C-1)

Compound 26

(2E, 4E, 12E)-13-(benzo[d] [1, 3] dioxol-6-yl)-1-(piperidin-1-yl)trideca-2,4,12-trien-1-one, $C_{25}H_{33}NO_3$, $[M+H]^+$: 396.2517

^{1}H-NMR($CDCl_3$,600MHz):1.314-1.443(8H,m,H-7-10),1.553(4H,m,H-2',4'),1.640(2H,m,H-3'),2.130-2.161(4H,m,H-6,11),3.474(2H,br.s,H-1'or5'),3.601(2H,br.s,H-1'or5'),5.915(2H,s,H-OCH_2O-),6.005-6.061(2H.m,H-5,12),6.162(1H,dd,J=15Hz,11.4Hz,H-4),6.257(2H.m,H-2,13),6.881(1H,m,H-6''),6.746(1H,d,J=14.4Hz,8.4Hz,H-5''),6.881(1H,m,H-2''),7.223(1H,dd,J=15Hz,11.4Hz,H-3)

^{13}C-NMR($CDCl_3$,600MHz):24.614(C-3'),25.561(C-4'),26.644(C-2'),28.699-229.275(C7-10),32.801(C-6),32.834(C-11),43.106(C-1'),46.803(C-5'),100.837(-OCH_2O-),105.314(C-2''),108.138(C-5''),118.529(C-2),120.119(C-6''),128.819(C-4),129.254(C-12),129.279(C-13),132.398(C-1''),142.366(C-3),142.701(C-5)146.465(C-3''),147.851(C-4''),165.614(C-1)

Compound 27

(2E, 4E, 13E)-14-(benzo[d][1,3]dioxol-6-yl)-N-isobutyltetradeca-2,4,13-trienamide $C_{25}H_{35}NO_3$, $[M+H]^+$: 398.2088

^{1}H-NMR($CDCl_3$,600MHz):0.923(6H,d,J=6.6Hz,H-3',4'),1.324-1.439(8H,m,H7-10),1.618(2H,m.H-11)1.797(1H,m,H-2'),2.128-2.182(4H,m,H-6,12),3.163(2H,t,J=6Hz,H-1'),5.458(1H,br.s,H-N),5.738(1H,d,J=15Hz,H-2),5.929(2H,s,-OCH_2O-),6.015-6.082(2H,m,H-4,5),6.122(

1H,dd,15.6,10.8Hz,H-13),6.278(1H,d,J=15.6Hz,H-14),6.723-6.760(2H,m,H-2",5"),6.8889(1H,m,H-6"),7.188(1H,dd,J=15,10.8Hz,H-3)
^{13}C-NMR($CDCl_3$,600MHz):20.106(C-3',4'),28.619(C-2'),28.706-29.314(C7-11)32.828(C-12),32.878(C-6),46.897(C-1'),100.888(-OCH_2O-),105.367(C-2"),108.203(C-5"),120.181(C-6"),121.723(C-2),128.242(C-4),129.306(C-13),129.344(C-14),132.457(C-1"),141.288(C-5),143.090(C-3),146.517(C-4"),147.898(C-3"),166.330(C-1)

Compound 28

Brachysamide $C_{26}H_{37}NO_3$, $[M+H]^+$: 412.3078
^{1}H-NMR($CDCl_3$,600MHz):0.922(6H,d,J=6.6Hz,H-3',4'),1.285(8H,m,H8-11),1.20(4H,m,H-7,12),1.795(1H,m,H-2'),2.119-2.167(4H,m,H-6,13),3.160(2H,t,J=6.6Hz,H-1'),5.488(1H,br.s,H-N),5.744(1H,d,J=15Hz,H-2),5.921(2H,s,-OCH_2O-)6.018-6.083(2H,m,H-4,5),6.100-6.142(1H,m,H-14),6.277(1H,d,J=15.6Hz,H-15),6.721-6.759(2H,m,H-2",5"),6.889(1H,m,H-6"),7.188(1H,dd,J=15,10.2Hz,H-3)
^{13}C-NMR($CDCl_3$,600MHz):20.105(C-3',4'),28.613(C-2'),28.770-29.406(C7-12),32.886(C-13),32.924(C-6),46.911(C-1'),100.880(-OCH_2O-),105.363(C-2"),108.192(C-5"),120.152(C-6"),121.640(C-2),128.179(C-8),129.212(C-14)129.480(C-15),132.486(C-1"),141.356(C-5)143.245(C-3)146.489(C-4"),147.890(C-3"),166.381(C-1)