FIGURES

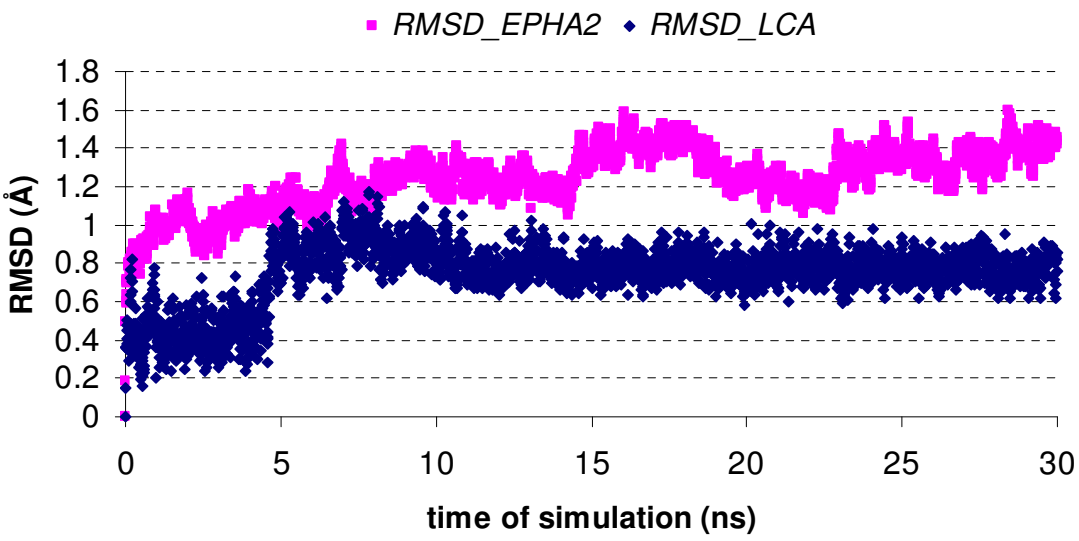


Figure S1. Root mean square deviations of lithocholic acid (blue distribution) and EphA2 receptor (pink distribution) calculated from MD simulation trajectory.

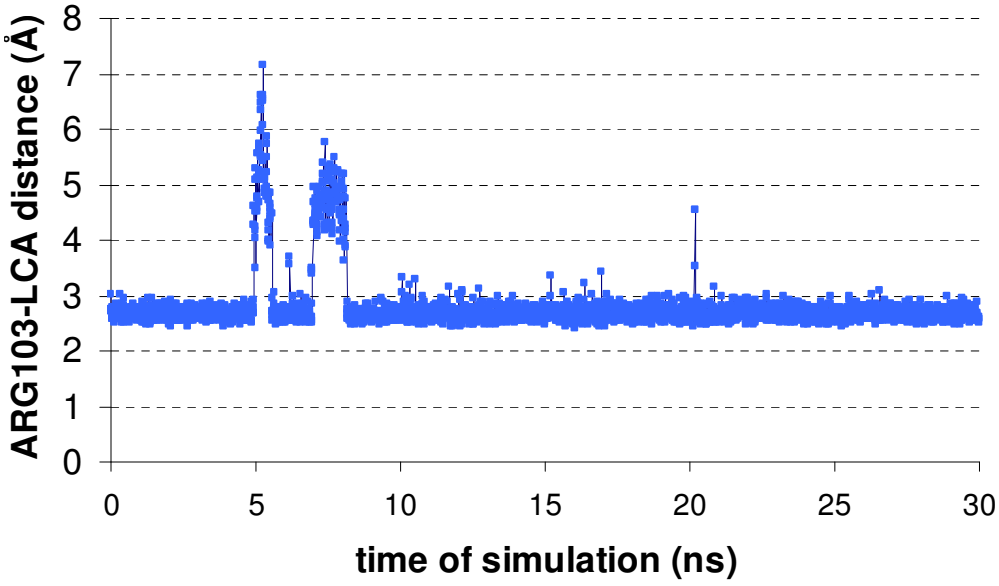


Figure S2. Time series of the interaction between lithocholic acid and Arg103. For each frame the shortest of the six possible distances between the three nitrogen atoms of the guanidinium group of Arg103 and the two oxygen atoms of the carboxylic group of lithocholic acid has been taken and plotted .

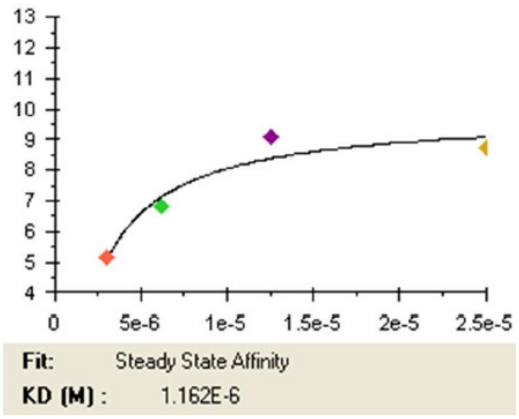


Figure S3. Steady state affinity for cholanic acid on EphA2-Fc, immobilized on a sensor chip.

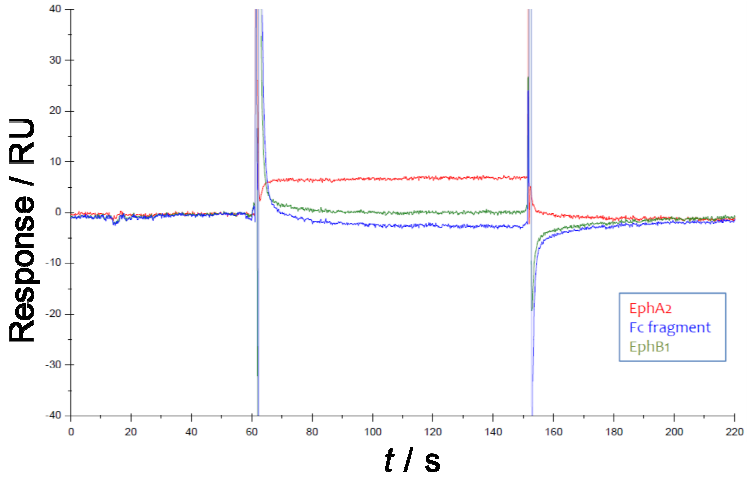


Figure S4. SPR sensorgrams for the interaction of cholanic acid (6 µM) with immobilized EphA2-Fc, EphB1-Fc or Fc alone on sensor chips.

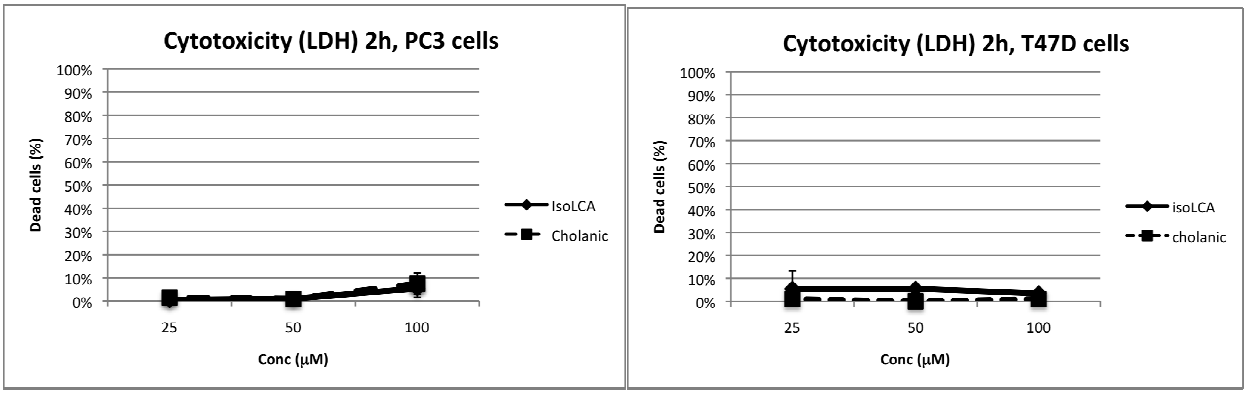


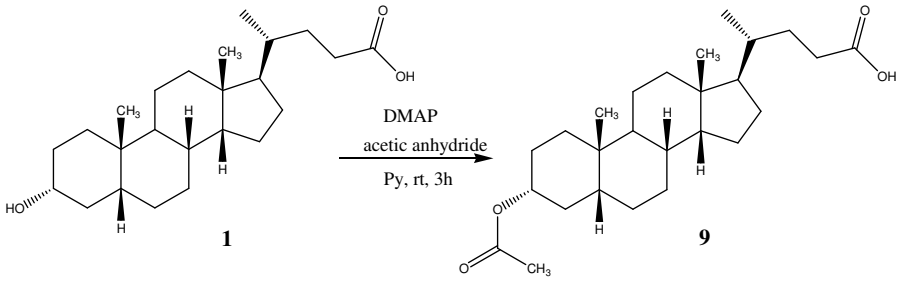
Figure S5.Isolithocholic (isoLCA) and cholanic acids up to 100µM are not cytotoxic when incubated for 2 hours without medium and tested for LDH activity. 0.5% DMSO and 0.5% triton were considered as 0% and 100% toxicity, respectively.

TABLES

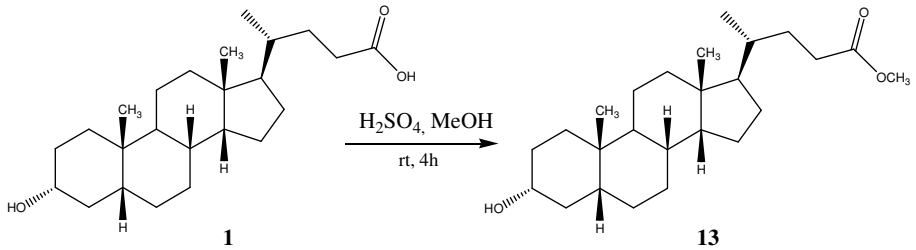
Table S1. Elemental analysis for commercial compounds **1-8** and **12**.

compound	Formula	C % calcd.	C % found	H % calcd.	H %found
1	$C_{24}H_{40}O_3$	76.55	76.32	10.71	10.52
2	$C_{24}H_{40}O_5$	70.55	70.38	9.87	9.74
3	$C_{24}H_{40}O_4$	73.43	73.21	10.27	10.19
4	$C_{24}H_{40}O_4$	73.43	73.14	10.27	10.20
5	$C_{24}H_{38}O_4$	73.81	73.78	9.81	9.70
6	$C_{24}H_{38}O_4$	73.81	73.68	9.81	9.65
7	$C_{24}H_{38}O_3$	76.96	76.87	10.23	10.11
8	$C_{24}H_{36}O_4$	74.19	74.09	9.34	9.20
12	$C_{24}H_{40}O_2$	79.94	79.81	11.18	11.10

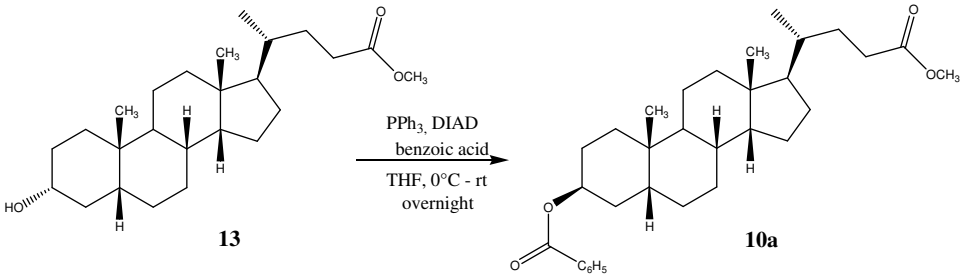
SCHEMES



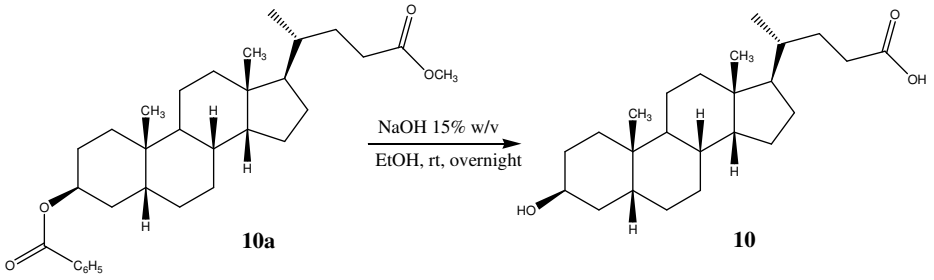
Scheme S1. Synthesis of (3α5β)-3-Acetoxycholan-24-oic acid (9)



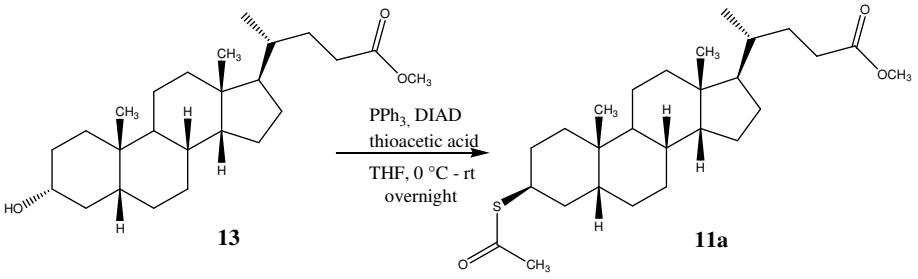
Scheme S2. Synthesis of Methyl (3α,5β)-3-hydroxycholan-24-oate (13)



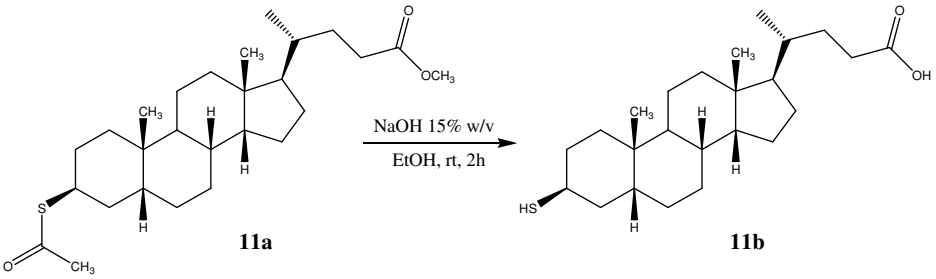
Scheme S3. Synthesis of Methyl (3β,5β)-3-benzoyloxycholan-24-oate (10a)



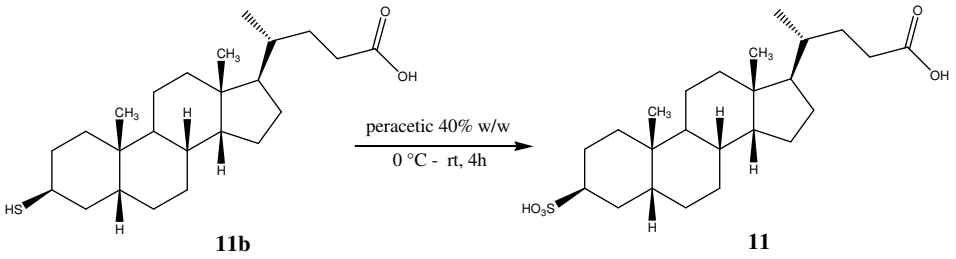
Scheme S4. Synthesis of (3β,5β)-3-Hydroxycholan-24-oic acid (10)



Scheme S5. Synthesis of Methyl (3β,5β)-S-acetyl-3-mercaptocholan-24-oate (11a)

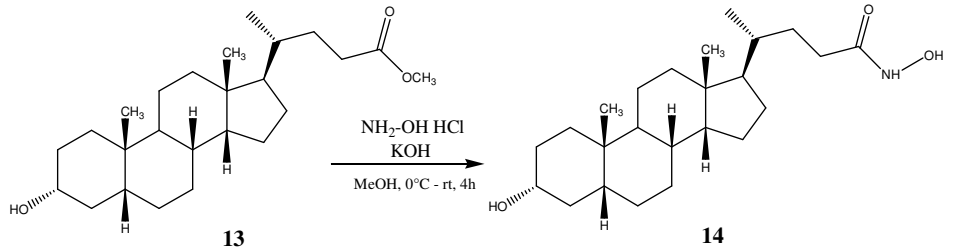


Scheme S6. Synthesis of (3β,5β)-3-Mercaptocholan-24-oic acid (11b)



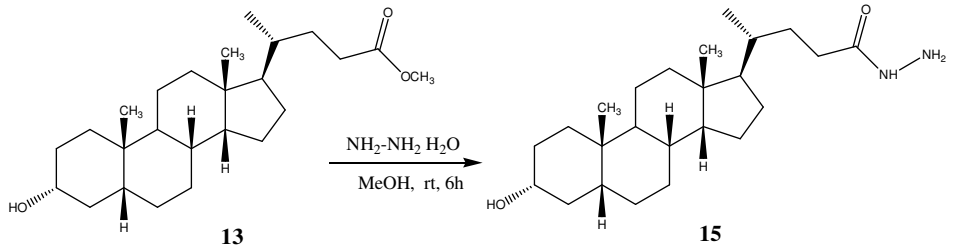
11b **11**

Scheme S7. Synthesis of (3β,5β)-3-Sulfocholan-24-oic acid (11)



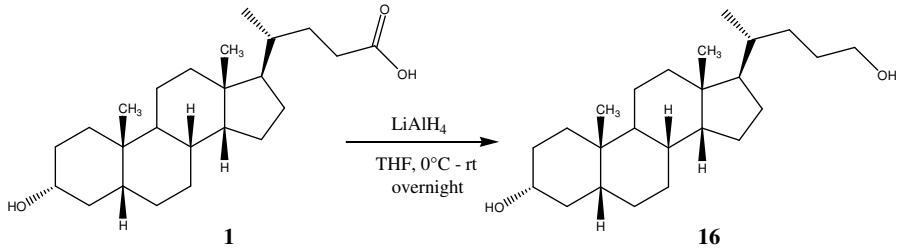
13 **14**

Scheme S8. Synthesis of (3α,5β)-3-Hydroxycholan-24-hydroxamic acid (14)



13 **15**

Scheme S9. Synthesis of (3α,5β)-3-Hydroxycholan-24-hydrazide (15)



1 **16**

Scheme S10. Synthesis of (3α,5β)-Cholan-3,24-diol (16)