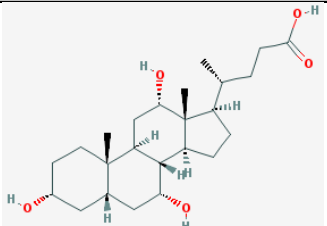
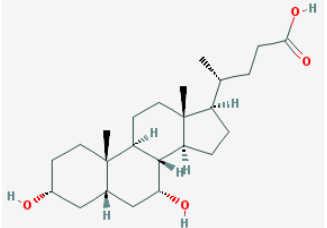
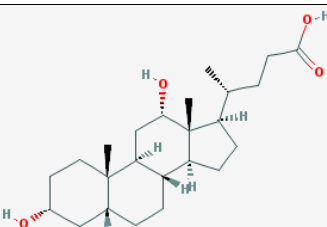
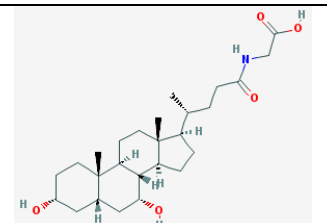
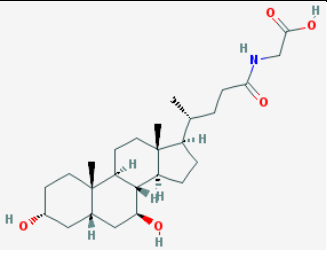
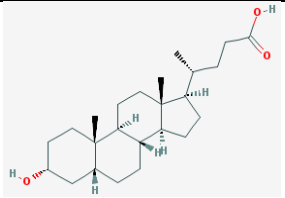
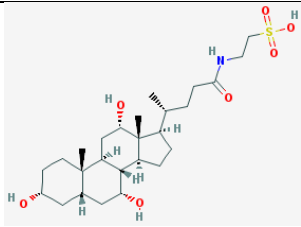
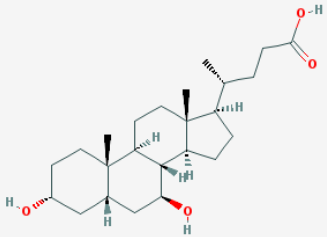
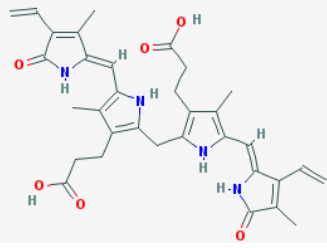
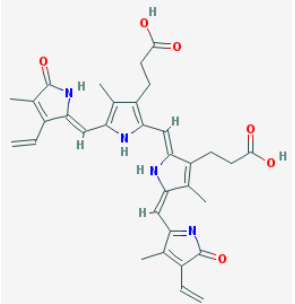


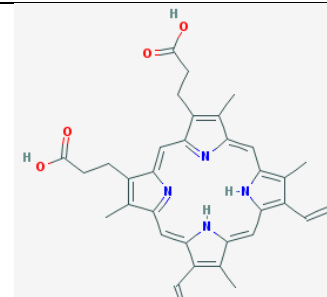
SUPPORTING INFORMATION AVAILABLE

Supporting Table T1. Structures of compounds discussed in this work or tested on

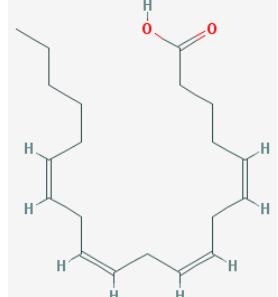
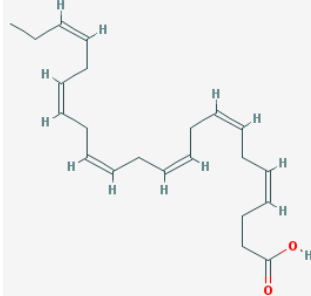
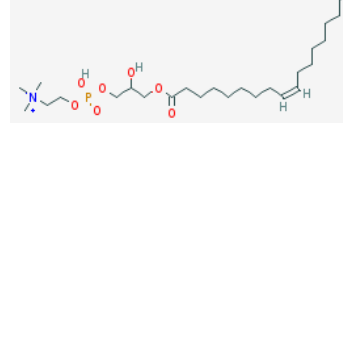
RsCcO. The solvents for the compounds tested were: ^{AE}acidified ethanol (20% [v/v] 1N HCl in ethanol); ^{AW}alkaline water (pH adjusted with KOH to 9-13); ^DDMSO; ^Eethanol, ^L100mM CHES pH8.8 with 20% [v/v] ethanol; ^Wwater. Compounds without a superscript notation were discussed but not assayed in this work.

Additive	Synonyms	PubChem Reference	PubChem Structure
Bile acids			
cholate ^{AW}	cholanic acid, cholalic acid	http://pubchem.ncbi.nlm.nih.gov/summary/summary.cgi?cid=221493&loc=ec_rcs	
cheno-deoxycholate ^{AW}	chenodiol, chenic acid, gallo-deoxy-cholic acid	http://pubchem.ncbi.nlm.nih.gov/summary/summary.cgi?cid=10133&loc=ec_rcs	
deoxycholate ^W	desoxy-cholic acid, choleic acid	http://pubchem.ncbi.nlm.nih.gov/summary/summary.cgi?cid=222528&loc=ec_rcs	
glycocheno-deoxycholate ^{AW}	cheno-deoxycholyl glycine	http://pubchem.ncbi.nlm.nih.gov/summary/summary.cgi?cid=12544&loc=ec_rcs	

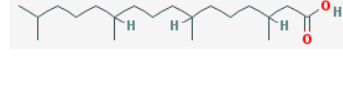
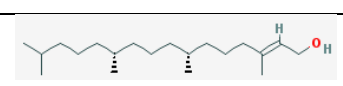
glycourso-deoxycholate ^{AW}	glycylurso-deoxy-cholate	http://pubchem.ncbi.nlm.nih.gov/summary/summary.cgi?cid=12310288	
lithocholate ^L	3 α -hydroxy-5 β -cholan-ic acid	http://pubchem.ncbi.nlm.nih.gov/summary/summary.cgi?cid=9903&loc=ec_rcs	
taurocholate ^{AW}	cholyl-aurine, cholaic acid, taurine	http://pubchem.ncbi.nlm.nih.gov/summary/summary.cgi?cid=6675&loc=ec_rcs	
urso-deoxycholate ^{AW}	ursodiol	http://pubchem.ncbi.nlm.nih.gov/summary/summary.cgi?cid=31401&loc=ec_rcs	
Heme synthesis and breakdown products			
bilirubin ^{AW}	hematoidin	http://pubchem.ncbi.nlm.nih.gov/summary/summary.cgi?cid=5280352&loc=ec_rcs	
biliverdin	uteroverdine dehydro-bilirubin, protobiliverdin IXa	http://pubchem.ncbi.nlm.nih.gov/summary/summary.cgi?cid=5353439&loc=ec_rcs	

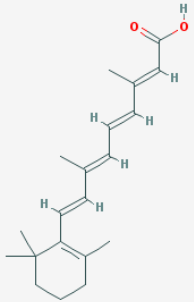

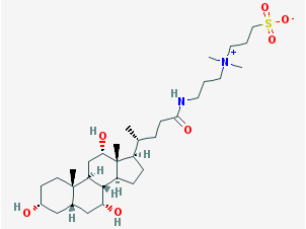
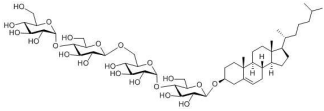
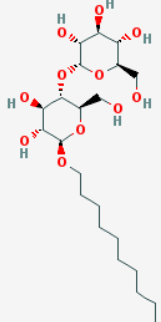
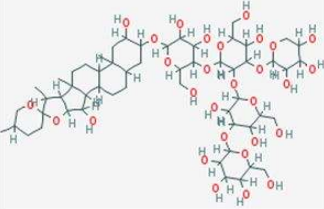
protoporphyrin IX ^D	porphyrinogen IX	http://pubchem.ncbi.nlm.nih.gov/summary/summary.cgi?cid=4971&loc=ec_rcs	
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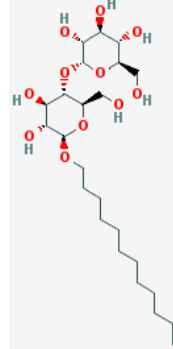
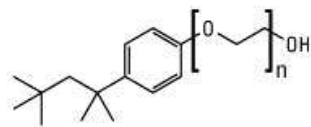
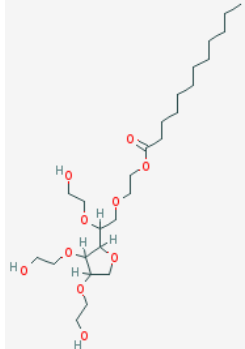
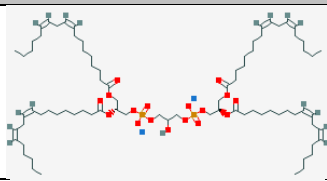
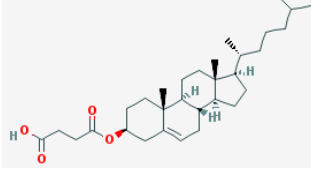
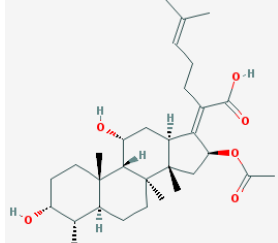
Long-chain fatty acids

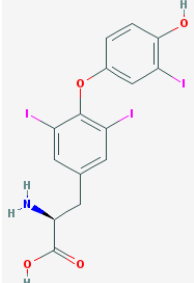
arachidonic acid ^E	5,8,11,14-eicosatetraenoic acid	http://pubchem.ncbi.nlm.nih.gov/summary/summary.cgi?cid=444899&loc=ec_rcs	
docosahexanoic acid ^E	doconexent, cervonic acid	http://pubchem.ncbi.nlm.nih.gov/summary/summary.cgi?cid=445580	
lyso-PC ^W	18:1 lyso-phosphatidylcholine, lyso-oleoyl phosphatidylcholine, 1-oleoyl-glycero-phosphocholine	http://pubchem.ncbi.nlm.nih.gov/summary/summary.cgi?cid=6449974&loc=ec_rcs	

Branched-chain fatty acids and precursors

phytanic acid ^E	3,7,11,15-tetramethylhexadecanoic acid	http://pubchem.ncbi.nlm.nih.gov/summary/summary.cgi?cid=26840	
phytol ^E	trans-phytol, (E)-phytol, 3,7,11,15-tetramethylhexadec-2-	http://pubchem.ncbi.nlm.nih.gov/summary/summary.cgi?cid=5280435&loc=ec_rcs	

	en-1-ol		
retinoic acid ^D	vitamin A acid, retin-A	http://pubchem.ncbi.nlm.nih.gov/summary/summary.cgi?cid=444795	
Detergents			
C12E8 ^W	dodecyl-octaethylene glycol monoether	http://pubchem.ncbi.nlm.nih.gov/summary/summary.cgi?cid=123921	
CHAPS	3-[(3-cholamidopropyl)dimethylammonio]-1-propanesulfonate	http://pubchem.ncbi.nlm.nih.gov/summary/summary.cgi?cid=107670&loc=ec_rcs	
CHOBIMALT ^W	β-cholesteryl-(maltosyl-β-(1,6)-maltoside)	from supplier Anatrace: http://www.affymetrix.com/estore/browse/brand/anatrace/product.jsp?navMode=34000&productId=prod220028&navAction=jump&aId=productsNav#1_1 (no PubChem entry available)	
decyl maltoside ^W	decyl β-D-maltopyranoside	http://pubchem.ncbi.nlm.nih.gov/summary/summary.cgi?cid=5288728	
digitonin ^W	digitin, digitogenin	http://pubchem.ncbi.nlm.nih.gov/summary/summary.cgi?cid=409778&loc=ec_rcs	

dodecyl maltoside ^W	dodecyl- β -D-maltoside, lauryl maltoside	http://pubchem.ncbi.nlm.nih.gov/summary/summary.cgi?cid=114880&loc=ec_rcs	
Triton X100 ^W	polyethylene glycol p-(1,1,3,3-tetramethylbutyl)-phenylether, octoxynol-9	http://pubchem.ncbi.nlm.nih.gov/summary/summary.cgi?cid=5590 (picture is from supplier Pierce)	 Triton* X-100 Detergent n = 9-10
Tween 20 ^W	polyoxyethylene sorbitan monolaurate	http://pubchem.ncbi.nlm.nih.gov/summary/summary.cgi?cid=443314&loc=ec_rcs	
Other molecules of interest			
cardiolipin from bovine heart		http://pubchem.ncbi.nlm.nih.gov/summary/summary.cgi?cid=46891777&loc=ec_rcs	
cholesteryl hemisuccinate ^E	cholesterol hemisuccinate	http://pubchem.ncbi.nlm.nih.gov/summary/summary.cgi?cid=65082&loc=ec_rcs	
fusidic acid	ramycin, fucidin, fucithalamic	http://pubchem.ncbi.nlm.nih.gov/summary/summary.cgi?cid=3000226&loc=ec_rcs	

thyroid hormone ^{AE}	3,5,3'-triiodo-tyronine, lio-tyronine, tresitopine, T3	http://pubchem.ncbi.nlm.nih.gov/summary/summary.cgi?cid=5920&loc=ec_rcs	
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Supporting Table T2: Bovine CcO and RsCcO bile acid/steroid site characterization.

Protein	<i>RsCcO</i> (PDB: 3DTU [²⁷ Qin Biochem2008])	<i>BovCcO</i> (PDB: 2DYZ [⁵ Shinzawa-Itoh EMBO2007])
Ligand	Deoxycholate	Cholate
Common Protein- Ligand Interactions	E101 _{II} I102 _{II} T105 _{II} Cd ²⁺	E62 _{II} T63 _{II} T66 _{II} R14 _{VI} R17 _{VI}
Unique Contacts	P315 _I Y318 _I A319 _I P358 _I I361 _I	A58 _{II} Q59 _{II} E60 _{II} V61 _{II} I64 _{II} W65 _{II} I67 _{II}