

Supporting Information

Title: Biomonitoring Human Albumin Adducts: The Past, the Present and the Future

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Figure S1. Alb adducts of naphthalene.

Table S1. In vitro modification of human serum albumin (Alb) with chemicals and determination of the reacting amino acid by MS in tryptic digests.

	^{a)} MDI ¹	MDI ²	TDI ³	HDI ⁴	TDI-GSH ⁵	TOCP ⁶	OP ⁷	Nap ⁸	Tol ⁹	Ben ¹⁰	Zom ⁹	ASA ¹¹	Pen ^{12,13}	Nevp ¹⁴	AX ¹⁵	HNE ¹⁶	Glc ¹⁷	Glc ¹⁸	Glc ¹⁹	But ²⁰	Peroxy ²¹	MG ²²	Met ²³⁻²⁵	H ₂ O ₂ ¹⁹	Cu-II ¹⁹	MDA ²⁶	
^{b)} Chem/Alb	1:1/5:1/10:1/40:1	160:1	1:1/5:1/10:1/40:1		60:1	40:1	~1:1	2.2:1	40:1	50:1	40:1	5.3:1	60:1	1:1/ 5:1/10:1	9:1/ 90:1	1:4/ 1:2/ 5:1 5:1 ¹⁹	^{c)} HSA	333:1	333:1	1:10		<2:1 ²¹ 110:1 ¹⁹	5:1	34:1 ²³ 165:1 ²⁴	167:1	83:1	^{h)} 1-100:1
Lys-439	o / o / o / x		o / o / x / x														^{d)} x										
His-440																x ¹⁹											
Lys-444	o / o / o / x		x / x / x / x															x	x				x				
Met-446																								x			
Tyr-452							x																				
His-464																										x	
Ser-470										x																	
Arg-472																	^{f)} x						x				
Ser-480										x																	
Pro-486																							x				
Ser-489										x																	
Tyr-497																											
His-510																	o / o / x x ¹⁹									x	
Lys-519																			x								
Lys-524	o / x / x / x		x / x / x / x						x														x				
ⁱ⁾ Lys-525	x / x / x / x	x	x / x / x / x		x	x		x									o / o / x	x	x	x							X
Thr-527																							x				
Lys-534	o / x / x / x		o / x / x / x																								
Lys-536	x / x / x / x		o / x / x / x						x										x								
Lys-538																	^{d)} x										
ⁱ⁾ Lys-541	o / o / o / x	x	o / x / x / x					x					x		x / x								x				x
Lys-545			o / x / x / x										x		o / x			x	x								
Met-548																									x		
Lys-557			o / o / x / x																								
Lys-560			o / o / x / x																								
Thr-566																							x				
Lys-573			x / x / x / x																x								
Lys-574			x / x / x / x																								

a) MDI=4,4'-Methylenediphenyl diisocyanate, TD=2,4-and 2,6-toluenediisocyanate, HDI=1,6-hexamethylene diisocyanate, TDI-GSH=adduct of glutathione with TDI, TOCP= tri-ortho-cresyl phosphate, OP= 10-fluoroethoxyphosphinyl-N-biotinamidopentyldecanamide (FP-biotin), Nap= naproxen acyl coenzyme A thioester, Tol=tolmetin acylglucuronide, Ben= benoxaprofen acyl glucuronide, zomepirac acyl glucunoride, ASA= acetylsalicylic acid, Pen=benzyl penicillin, Nevp= 12-Sulfoxyl-nevirapin, AX= amoxicillin, HNE=4-hydroxy-trans-2-nonenal, Glc=glycation adducts, But= epoxybutanediol, Peroxy= peroxyxynitrite, MG= methylglyoxal, Met=ascorbic acid metal catalyzed oxidation, Cu-II= CuSO₄ + ascorbic acid, MDA=malondialdehyde.

b) Chem/Alb= molar ratio of chemical to albumin. c) Minimally glycosylated HSA from Sigma-Aldrich. d) Fructosyl. e) Pyrraline. f) Nε-(5-hydro-4-imidazolone-2-yl) ornithine. g) Nε-[5-(2,3,4-trihydroxybutyl)-5-hydro-4-imidazolone-2-yl]ornithine or tetrahydropyrimidine. h) The number modified Lys increases with amount of MDA. i) Prolonged treatment of pure human albumin with chlorpyrifos oxon yielded also adducts with Tyr-150 and Tyr-16. j) several compounds reacting with Cys34 have not been included in this table but have been mentioned in the text; acetaminophen, sulfur mustard, benzene, naphthalene, aromatic amines, heterocyclic aromatic amines, styrene. k)

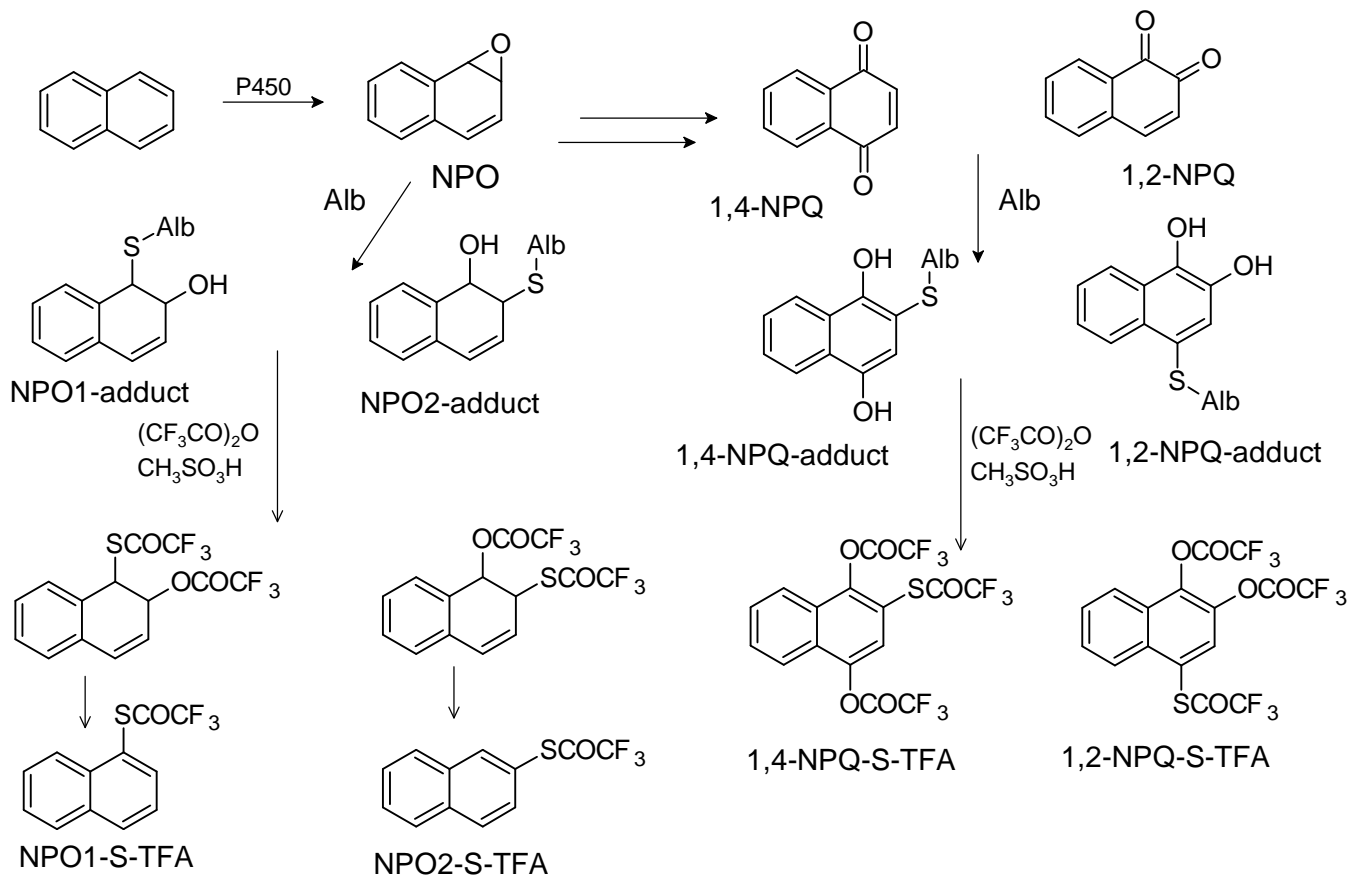


Figure S1. Alb adducts of naphthalene.³¹

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