



QSAR Toolboxの概要・操作説明

(独)製品評価技術基盤機構化学物質管理センター堀田 麻子

QSAR Toolboxの概要



QSAR Toolboxとは?

- ✓ OECDがECHA(欧州化学品庁)と共同で開発を行っている るカテゴリーアプローチを支援するためのソフトウェア。
- ✓ 物理化学的性状、分解性、蓄積性、生態毒性、反復投与 毒性などの様々なエンドポイント*に関する<u>データベース</u> と化学物質をグループ分けするために必要な機能など が備わっている。
- ✓ 2008年3月にver.1.0が公開され、現行の最新版である ver.4.6 が2023年5月に公開。
- ✓ <u>フリーソフトウェア</u>(OECDのHP上にて公開。ユーザー 登録が必要。)
- 公開サイト: https://qsartoolbox.org/

*化学物質の評価の指標とする項目



QSAR Toolboxの開発の経緯

- ✓ 2005年頃の開発当初は、各種QSARモデルを集め たライブラリの構築を計画。
- ✓ 開発メンバー間における議論において、QSARモデ ルの予測結果のみでは行政利用における判断根拠 としては不十分であるとの認識が高まる。
- ✓ 最終的には、カテゴリー作成を支援する機能及びカ テゴリーアプローチによるデータギャップ補完を支 援する機能と共に、カテゴリー化の根拠を第三者に 明確に示す機能が主体のシステムとして公開。

"for Grouping chemicals into categories"

QSAR Toolboxの機能概要

- ✓ グルーピングを行うための、<u>毒性発現の原因となる部分構造を認識する機</u>、 <u>能(プロファイラー)</u>と、各国から提供された<u>各種エンドポイントの実測試験</u> <u>データベース</u>が実装されている。
- ✓ プロファイラーにより、毒性発現の原因となる共通の部分構造を有する、カ テゴリーの候補物質群を効率よく探すことができる。また、実測試験データ ベースから、これら物質群の実測試験データを収集できる。
- ✓ 収集した実測試験データを基に毒性発現の傾向を解析することにより、カ テゴリーを構築し、未試験物質のデータを予測(データギャップ補完)するこ とができる。

nite



QSAR Toolboxでできること

実測試験データベース

・物理化学的性状、環境中運命と移送、生態毒性情報、人健康有害性分野における62データベース に、10万物質、300万件の実測データを収載 ・日本からは化審法データ(分解性、蓄積性、生態毒性、人健康有害性)、光感作性データを提供

<u>プロファイラー</u> ・70 プロファイラー ・日本からはHISSSカテブリーを提供	QSAR ・254 QSARモデル	<u>その他</u> ・11インベントリー(約318,000物質)
・ロ本からはHESSカナコリーを提供	・ロ本からはKAIEを提供	



実測試験データの検索



類似物質の検索とカテゴリ 構築



代謝産物の探索やシミュ レート



QSAR 予測の 実行





類似物質データからデータ ギャップ補完

データマトリックス・レポート の作成

QSAR Toolbox 4.6の操作説明



立ち上げ(1)





QSAR Toolbox WebSuite

	QSAR Toolbox Server			-		Х
②表示される→			About the Too	box Server		
E-32/1/2/10/0		Version:	4.6	Server Mode:		
		Listening on:				
		Database:				
		Service State:	Initialization			
			Execution	Statistics		
		Sessions:	0/0			
		Documents:	0/0			
		Lists:	0/0	Errors: 0		
		Tasks:	0/0	Server Uptime:		
		Tree nodes:	0/0	Used Memory:		
			System Info	ormation		
		Operating System:	Microsoft Windo	ws 10.0.19045		
		Processor:	Intel(R) Core(TM)) i5-8250U CPU @ 1.600	GHz	
		Platform:	64-bit	System Memory: 8 GB	3	
				CONTRACTOR OF A		



立ち上げ(2)



nite

立ち上げ(3)



リードアクロスの操作例



QSAR Toolboxのワークフロー









nite



評価対象物質の入力(結果)



操作説明

Profilingモジュール 画面構成



nite

プロファイラーによる該当するカテゴリーの特定 皮膚感作性のための蛋白結合アラートプロファイラー



毒性発現の原因となる部分構造を特定



プロファイリング





プロファイリング





操作説明

プロファイリング結果の詳細の確認



nite

操作説明



nite

試験データの取得



nite

操作説明

試験データの取得

① クリック(選択したデータベースから評価対象物質の試験データを取得する)





操作説明

Category Definitionモジュール 画面構成

Category Definition: 類似物質データの抽出 (類似物質:選択したプロファイラーにより、同じカテゴリーに属する物質)

QSAR Toolbox 4.6 [Document 1]										- 0	×
QSAR TOOLBOX		01010 01 0 10100								X 8 5 7 8 25	
Categorize C	Profiling > Data Category definition ategory consistency	▶ Data Gap Filling	► Report							The OECD QSAR Too for Grouping Chemi into Categories	olbox cals
Define Define with metabolism Subcategorize Combine Clustering	Category elements									Developed by LMC,	Bulgaria
Occuments	Filter endpoint tree 🖣	1 [target]	2	3	4	5	6	7	8	9	10 ^
 Document 1 # [C: 1;Md: 0;P: 0] CAS: 5856779 [C: 12;Md: 16;P: 0] Acylation <and>Acylation >> Direct acy</and> 	Structure	H3C CH3		H ₃ C H ₃	æ	<i>>-</i> 0	-9-6	H95	a contraction of the second se	and the second s	١
	Structure info	J									
	Additional Ids	EC Number:2274785		EC Number:2219216	EC Number:2603308	EC Number:2027108		EC Number:2121312	EC Number:2108904	EC Number:2531684	EC
	CAS Number	5856-77-9	816431-72-8	3282-30-2	56677-60-2	98-88-4	65055-17-6	764-85-2	625-36-5	36727-29-4	11
	CAS-SMILES relation	High	High	High	High	High	Low	High	High	High	Hiç
	Chemical name(s)	2,2-Dimethyl-butyryl c	4-{[(2-methoxyphenyl).	2,2-Dimethylpropanoy	/ Carbonochloridic acid,.	Benzoyl chloride	3-Chloro-4-fluorobenz	Nonanoyl chloride	3-chloropropanoyl chl.	3,3,5-trimethylhexano	He
	Identity	Sources:7	Sources:5	Sources:12	Sources:8	Sources:22	Sources:2	Sources:12	Sources:10	Sources:13	So
	Molecular formula	Mono constituent	Mono constituent	Mana constituent	Mono constituent	Mono constituent	Mono constituent	Mono constituent	Mono constituent	Mono constituent	- Me
			COcleaner(C)=O)NS(CIC(=O)c1ccccc1	Felcer(cc1Cl)C(Cl)=O				
	+ Parameters	000(0)(0)0(0)=0	0001000010(=0)115(Terece(cerei)e(ei)=0				
	Physical Chemical Properties										
	Environmental Fate and Transport										-
	Ecotoxicological Information										
<	🖵 Human Health Hazards										
	Acute Toxicity										
Or ons 4 1 Selected	- + ADME							<u></u>			_
f Select All Unselect All Invert About Option	Carcinogenicity	•		ハしに	ノーノ	57 1	/—I~/	とう			_
Carcinogenicity (genotox and nongenotox) alerts by ISS	Developmental loxicity / leratogenicity	•									
DART scheme		•	- -T	あっけタ	物智	ト日I *	ᆂᆕᆋ	<u> </u>			
DNA alerts for AMES, CA and MNT by OASIS		•		叫八彡	、17月(/」/ —	ーノート	-		
Eye irritation/corrosion Inclusion rules by Bit	- Neurotoxicity				tern all the	· N	1 1 3 1	1			
in vitro mutagenicity (Ames test) alerts by ISS	Photoinduced toxicity		(田)	オム地	1 小】 生勿 名		-クガエ	由用さ	カス		_
in vivo mutagenicity (Micronucleus) alerts by ISS Keratinocyte gene expression	Repeated Dose Toxicity		「「「「」	7 つ 万5	2 12/ 12/ 3	ح /	~/J']	щщς	1000		
Oncologic Primary Classification	Sensitisation AW SW AOP										
Protein binding alerts for Chromosomal aberration by OASIS	Skin										
Protein binding alerts for skin sensitization according to GHS Protein binding alerts for skin sensitization by OASIS	- F in Vivo										_
Protein Binding Potency h-CLAT					11.00%						
Respiratory sensitisation Rotinois Acid Recenter Rinding	EC3 11/10	5 	M: Negative	M: Strongly positive	M: 2.9 %	M: 0.23 %	M: 7.8 %	M: 1.8 %	M: Strongly positive	M: 2.7 %	- M:
rtER Expert System - USEPA	Toxicity to Reproduction	•									
Skin irritation/corrosion Exclusion rules by BfR	Toxicokinetics. Metabolism and Distribution	•					11・中治				
Skin irritation/corrosion Inclusion rules by BfR	Profiling						IVI ・ 天沢	.			
Chemical elements	General Mechanistic						D • D • •				
uns of elements	<						кікеа	a-acros	;S		>
							т. т	d and			×
2							i : iren	ia analy	/SIS		
nito							0.001	D			
IIILE							U:USA	R		9	7
										2	. /

抽出される類似物質

皮膚感作性のための蛋白結合アラートプロファイラー





nite





on fragments (BioWIN MITI)	ADME							
ity (genotox and nongenotox) alerts	Carcinogenicity							
TREE CA and MNT by OASTS	Developmental Toxicity							
corrosion Exclusion rules by BfR	Genetic Toxicity	10 sharrisel(s) favord						
/corrosion Inclusion rules by BfR	Immunotoxicity	12 chemical(s) found.						
genicity (Ames test) alerts by ISS	Irritation / Corrosion			うち (抽出型	気をした かいたい かいちょう しっかい しんちょう しんしょう しんしょ しんしょ			
genicity (Micronucleus) alerts by ISS	Neurotoxicity				川貝茲マノルED心			
imary Classification	Photoinduced toxicity							
ing alerts for Chromosomal aberration	Repeated Dose Toxicity	Conv	ОК					1
ing alerts for skin sensitization accordir	+ Sensitisation			Read data?			X	
ing alerts for skin sensitization by OAS.	ToxCast							
sensitisation	Toxicity to Reproduction			1				
Receptor Binding	🕂 🕂 Toxicokinetics, Metabolism a	and Distribution		All endpoint	ts 🔾 Choose			
System - USEPA	📮 Profiling							
Corrosion Exclusion rules by BTR	🖵 🖵 Endpoint Specific			1				
rectrosion inclusion fulles by bit	Protein binding alerts for	skin sensitiz Acylation		-		ок	Cancel	-
monte								

② クリック(全てのエンドポイントの試験データを抽出)

		Сору		ОК	③ クリック(試験データ数の確認)	
automers unstable cological epeated dose (HESS) com xample Prioritization Scheme (PBT)	XI.	Gather data	— 16 points added across 11 chemicals.	×	×	
tructure similarity					1	



 \odot

Biodegradat Carcinoge DART sche DNA alerts Eye irritatio Eye irritatio in vitro mut in vivo muta Keratinocy Oncologic Protein bin Protein bind Protein bir Protein Bin Respiratory Retinoic A rtER Exper Skin irritatio Skin irritatio piric Chemical ele Lipinski Rule Oasis

Organic functional groups (nested) Organic functional groups (US EPA) Organic functional groups, Norbert H

nite

類似物質の試験データの確認

QSRR TOOLBOX	Pput ► Profiling	Data	01010 01 0 10100 • Data Gap Filling	► Report							
Categorize	Category consistency Category elements										for Grouping Chemicals into Categories
- Documents	Filter endpoint tree	💙 1 [target]	2	3	4	5	メトリツ		8	9	10
ation >> Direct acylation involving a leaving group	Structure	HJC U	0-1-0	H3C H5C	76~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	<u>}-0</u>	-9-6	нус~~~~~~	d d	and the second	×~~~~~%°
	CAS Number	EC Number:227478 5856-77-9	816431-72-8	EC Number:2219216 3282-30-2	EC Number:2603308 56677-60-2	EC Number:2027108 98-88-4	65055-17-6	EC Number:2121312 764-85-2	EC Number:2108904 625-36-5	EC Number:2531684 36727-29-4	EC Number:2039967 112-67-4
	CAS-SMILES relation Chemical name(s) Identity	High 2,2-Dimethyl-buty Sources:7	High yl c <mark>4-{[(2-methoxypheny</mark> Sources:5	High I) 2,2-Dimethylpropano Sources:12	High y., Carbonochloridic acid, Sources:8	High Benzoyl chloride Sources:22	Low 3-Chloro-4-fluorobenz Sources:2	High Nonanoyl chloride Sources:12	High 3-chloropropanoyl chl. Sources:10	High 3,3,5-trimethylhexano. Sources:13	High Hexadecanoyl chloride Sources:12
	Molecular formula Predefined substance type SMILES	C6H11CIO Mono constituent CCC(C)(C)C(CI)=O	C15H12CINO5S Mono constituent COc1ccccc1C(=O)NS	C5H9CIO Mono constituent (CC(C)(C)C(CI)=O	C15H29ClO2 Mono constituent CCCCCCCCCCCCCCCCC	C7H5CIO Mono constituent (CIC(=O)c1ccccc1	C7H3Cl2FO Mono constituent Fc1ccc(cc1Cl)C(Cl)=O	C9H17CIO Mono constituent CCCCCCCCC(CI)=O	C3H4CI2O Mono constituent CICCC(CI)=O	C9H17CIO Mono constituent CC(CC(CI)=O)CC(C)(C)	C16H31CIO Mono constituent C CCCCCCCCCCCCCC(
	 + Parameters + Physical Chemical Properties + Environmental Fate and Transport 										
Contrain binding shart for this constitution by OA	Ecotoxicological Information Human Health Hazards Acute Toxicity	:									
Diptions ⊿ 1 Selected f Select All Unselect All Invert About Option iodegradation fragments (BioWIN MITI)	Carcinogenicity Carcinogenicity Developmental Toxicity / Teratog	enicity									
arcinogenicity (genotox and nongenotox) alerts ART scheme NA alerts for AMES, CA and MNT by OASIS ye irritation/corrosion Exclusion rules by BfR vi irritation/corrosion Inclusion rules by BfR	Immunotoxicity Irritation / Corrosion Neurotoxicity	 クリック 	ッ(ツリーを	を展開)							
vitro mutagenicity (Ames test) alerts by ISS vivo mutagenicity (Micronucleus) alerts by ISS eratinocyte gene expression incologic Primary Classification rotein binding alerts for Chromosomal aberration	Repeated Oose Toxicity	AW SW AOP									
rotein binding alerts for skin sensitization accordir rotein binding alerts for skin sensitization by OAS; rotein Binding Potency h-CLAT espiratory sensitisation	EC3	11/16	M: Negative	M: Strongly positive	M: 2.9 %	M: 0.23 %	M: 7.8 %	M: 1.8 %	M: Strongly positive	M: 2.7 %	M: 8.8 %
ethnor, Acia Receptor Binding ERE Expert System - USEPA kin irritation/corrosion Exclusion rules by BfR kin irritation/corrosion Inclusion rules by BfR trac	Toxicity to Reproduction Toxicokinetics, Metabolism and I Topfiling	Distribution	このエン	ドポイント	いは、			試験デー	-9		
	Control Contro		11物質に	対し160	り試験			(M:は実	測の意味	未)	×

<mark>操作説明</mark>

類似物質の試験データの確認

J QSAR Toolbox	: 4.6 [Document 1]					24040								
QSAR	TOOLBOX				h	01010 01 0 10100								
	Catagoriza	Input	Profiling	► Data	Category definition	Data Gap Filling	Report							The OFCD OSAR Toolbox
		I II (istency										for Grouping Chemicals into Categories
efine Define	with metabolism Subcategorize	Combine Cluste	ring Category ele	ments										Developed by LMC Bulgar
\$	Documents	Filter end	point tree	٦	1 [target]	2	3	4	5	6	7	8	9	10
							∠H ₃							
ation >> Direct	t acylation involving a leaving gr	our Structur	e		HJC CHJ	5	H ₃ C C		YO	-9-6	Hac	G C C C C C C C C C C C C C C C C C C C	of the current of the	**************************************
		Struct	ıre info		-									
		- Ad	ditional lds		EC Number:2274785	016421 72 0	EC Number:2219216	EC Number:2603308	EC Number:2027108	GEOFE 17 6	EC Number:2121312	EC Number:2108904	EC Number:2531684	EC Number:2039967
			5 Number S-SMILES relation		5850-77-9 High	810431-72-8 High	3282-30-2 High	50077-00-2 High	98-88-4 High	00000-17-0	764-85-2 High	High	30727-29-4 High	High
			emical name(s)		2,2-Dimethyl-butyryl c	., 4-{[(2-methoxyphenyl).	2,2-Dimethylpropano	y., Carbonochloridic acid,	. Benzoyl chloride	3-Chloro-4-fluorobe	nzNonanoyl chloride	3-chloropropanoyl chl	3,3,5-trimethylhexano	Hexadecanoyl chloride
		Ide	ntity		Sources:7	Sources:5	Sources:12	Sources:8	Sources:22	Sources:2	Sources:12	Sources:10	Sources:13	Sources:12
		— Ма	lecular formula		C6H11CIO	C15H12CINO5S	C5H9CIO	C15H29CIO2	C7H5CIO	C7H3Cl2FO	C9H17CIO	C3H4CI2O	C9H17CIO	C16H31CIO
		Pre	defined substance t	уре	Mono constituent	Mono constituent	Mono constituent	Mono constituent	Mono constituent	Mono constituent	Mono constituent	Mono constituent	Mono constituent	Mono constituent
		SM	ILES		CCC(C)(C)C(CI)=O	COc1ccccc1C(=O)NS(CC(C)(C)C(CI)=0	ccccccccccccccccccc	CIC(=O)c1ccccc1	Fc1ccc(cc1Cl)C(Cl)=C	CCCCCCCCC(CI)=O	CICCC(CI)=O	CC(CC(CI)=O)CC(C)(C)C	c cccccccccccccc
		Param Physic	eters al Chemical Properti	iec.										
		Enviro	nmental Fate and Tr	ansport										
		🛨 Ecotox	icological Informati	on .										
		🔉 📮 Humai	n Health Hazards											
a contrat a	and the second second second	Ac	ute Toxicity											
Options	ng alerts for skin sensitization by 1 Select	ted	ME 											
f Select All	Unselect All Invert About Opt	tion Ca	cinogenicity	v / Toratogonicity	•									
iodegradation f	fragments (BioWIN MITI)	Ge	netic Toxicity	y / Teratogenicity	•									
arcinogenicity (ART scheme	(genotox and nongenotox) alert	S Im	nunotoxicity											
NA alerts for Al	MES, CA and MNT by OASIS	Irri	tation / Corrosion											
ye irritation/cor ve irritation/cor	rrosion Exclusion rules by BfR	Ne Ne	urotoxicity					- · · · ·						
i vitro mutageni	nicity (Ames test) alerts by ISS	Ph	otoinduced toxicity					(2) ダブ	ルクリッ	ク(デー・	タの詳細	の確認)		
i vivo mutageni	icity (Micronucleus) alerts by ISS	Re	peated Dose Toxicity	/	·					· · · ·	· · · · · · · · · · · · ·			
incologic Primar	ry Classification		Skin	AW SW AOF	•									
rotein binding a	alerts for Chromosomal aberration	n 1						•						
rotein binding a rotein binding a	alerts for skin sensitization accord alerts for skin sensitization by OA	Si alla	L _Q ILNA											
rotein Binding P	Potency h-CLAT		EC3	11/1	6	M: Negative	M: Strongly positive	M: 2.9 %	<mark>/:</mark> 0.23 %	M: 7.8 %	M: 1.8 %	M: Strongly positive	M: 2.7 %	M: 8.8 %
espiratory sensi etinoic Acid Red	itisation ceptor Binding	Too	(Cast											
ER Expert Syst	tem - USEPA	Too	cicity to Reproduc	Data points									_	
kin irritation/cor kin irritation/cor	rrosion Exclusion rules by BfR		cicokinetics, Metal	E) Data points										
iric			ing	Datap	oints #	ŧ Va	lue	Original v	alue	Assay Assigned	SMILES	Comments	(Database ^
		> <	point specific											>
														×
				Human Health	Chimin	M: 2.9 % (Skin	sensitization EC3	2.0.% (Shin annihim)			According	to Skin sensitisation	II Skin Ser	nsitization OAS
				Vivo:11NA·FC3	n,əkin,in	(ratio))		2.9 /0 (Skin sensiuzai	lion ecs(ratio))		Negative:	FC3 > = 50%	(normal	ized)
					Å		A						4	\sim
				<										>
				Hierarchical mo	de Find									ОК
ni	+~													
	Le							2	ギータの	主任の上が	キテナセ	Z		20
1000	6								/ / /	「十不田ノ」、	広小C1 し	6		00

操作説明

Data Gap Fillingモジュール 画面構成

Data Gap Filling: データギャップ補完 QSAR Toolbox 4.6 [Document 1] 🗙 🏟 🥱 🖉 🚺 $\left(\right)$ Ð Ŧ OSAR TOOLBOX 1 1 Report Input Profiling Data Category definition The OECD OSAR Toolbox Gap Filling Workflow Edite for Grouping Chemicals into Categories Frend analysis Read across (O)SAR Automated Standardized New Import Export Delete pped by LMC. Bu Filter endpoint tree.. 0 Document Document 1 0-20-5 # [C: 1;Md: 0;P: 1] CAS: 5856779 [C: 12;Md: 16;P: 1] Acylation < AND > Acylation >> Direct acyl Yorker CH Structure IC: 12:Md: 16:P: 1] Enter GF(RA) **Repeated Dose Toxicity** Sensitisation AW SW AOP 🖵 🖓 Skin - in Vivo - CILLNA M: 0.23 % M: 7.8 % - ECE : Negative M: Strongly positive M: 2.9 % M: 1.8 % M: Strongly positive M: 2.7 % ToxCast Toxicity to Reproduction Toxicokinetics, Metabolism and Distribution Profiling 評価対象物質の値を General Mechanistic — Protein binding by OASIS Acvlation 🕀 Endpoint Specific 似物質の試験データから予測 Protein binding alerts for skin sensitiz... Acylation - Empiric - Organic functional groups Acyl halide Acyl halide Acyl halide Haloformate Acyl halide Acyl halide Acyl halide Acyl halide Acyl halide Only endpoint relevant At this position: Read-across prediction for EC3, based on 6 values Select / filter dat Descriptors Predicted: Positive Select a cell with a rigid (bold) path Gap filling appro Prediction Descriptors / dat Ċ Positiv Model/OSAR ü Read-across prediction for EC3, based on 6 value Predicted: Positive Negative 0.5 1.5 いない) Active descriptor X log Kow Read-across prediction for EC3, base 毒性影響が類似する ようにサブカテゴリ化 類似物質の試験データ確認 (毒性影響が類似していない場合には、 nite サブカテゴリー化による類似物質の検討が必要) 34



皮膚感作性のための蛋白結合アラートプロファイラー



nite

操作説明

① Data Gap Fillingクリック





操作説



QSAR Toolbox 4.6 [Document 1] ø X 8 5 # 8 Ð **OSAR TOOLBOX** Input Profiling ► Data Report Gap Filling Workflow Editor The OECD QSAR Toolbox for Grouping Chemicals 2 9 1 1 1 into Categories Frend analysis Read across (Q)SAR Delete Automated Standardized New Import Export Developed by LMC, Bulg Y 1 [target] Filter endpoint tree... 0 Document 1 # [C: 1;Md: 0;P: 0] CAS: 5856779 205 C: 12;Md: 16;P: 0] Acylation < AND > Acylation >> Direct acyla Structure 0 (C: 12:Md: 16:P: 0) Enter GF(RA) El Subcategorization \times **Optionをクリック** Options 🖌 Profilers 0 Selected CAS-SMILES relation High High Adjust options High Unselect All Invert Chemical name(s) Group by: Category yl chl., 3,3,5-trimethylhexano..., He Target redefined Identity Sources:13 Sor Sort Group by: Category abase Affiliation C9H17CIO C1 Molecular formula entory Affiliation Colo Sort by: Name \times 💽 Legend Mono constituent Me Predefined substance type CD HPV Chemical Categorie CC(CC(CI)=0)CC(C)(C)C CC SMILES tance type Color by: Target endpoi ~ Legend Target endpoint PA New Chem Parameters eneral Mechanistic Physical Chemical Properties Color byでTarge (2) Biodeg BioHC half-life (Biowin) Suitable Environmental Fate and Transport Biodegradation primary (Biowin 4) Plausible Biodegradation probability (Biowin 1) Ecotoxicological Information endpointを選択し Biodegradation probability (Biowin 2) Unclassified Human Health Hazards Biodegradation probability (Biowin 5) Legendをクリック - Acute Toxicity Biodegradation probability (Biowin 6) OK - ADME Biodegradation probability (Biowin 7) Differ from target by Biodegradation ultimate (Biowin 3) Carcinogenicity At least one catego [STOP] DNA binding by OASIS Developmental Toxicity / Teratogenicity All categories 0 Genetic Toxicity Metabolisms Options 🖌 0 Selected Analogues Immunotovicity Unselect All f Select All Inver Only endpoint relevant Do not account metabolism At this position: Select / filter data Observed Mammalian metabolism Descriptors QSARs Observed Microbial metabolism Observed Rat In vivo metabolism Gap filling approach Prediction Observed rat liver metabolism with quantitative data Observed Rat Liver S9 metabolism Descriptors / data In nodes below: Positive ▲ Simulated Model/QSAR QSARs utoxidation simulato Automated workflows itoxidation simulator (alkaline med S Dissociation simulator Calculation options Standardized workflows Hydrolysis simulator (acidic) Hydrolysis simulator (basic) Selected Visual options lydrolysis simulator (neutr Negative Select different Information in vivo Rat metabolism simulator Microbial metabolism simulator Remove selected Miscellaneous 5.5 0.5 1.5 2 2.5 3 3.5 4.5 5 6.5 7.5 log Kow Accept prediction Active descriptor X log Kow

操作説明

QSAR Toolbox 4.6 [Document 1]							- 0 ×	ŝ
QSAR TOOLBOX	rin LiJ Profiling ► Data ► 0	Category definition > Da	01010 01 C 10 CO 10 CO Nta Gap Filling > Report				ו•••	
Cap Filling Workfl	low Editor						The OECD QSAR Toolbox for Grouping Chemicals into Categories	
rend analysis kead across (Q)SAK Automated Standardized New	v import Export Delete	8					Developed by LMC, Bulgar	iria
Occuments Document # C 1,Md: 0;P:0] CAS: 5856779 # [C 1,Md: 16;P:0] Acylation <and>Acylation >> Direct acyls [C 12;Md: 16;P:0] Enter GF(RA) [C 12;Md: 16;P:0] Enter GF(RA)</and>	Filter endpoint tree Structure ① Option	をクリック	et 2 3	Profilers 0.5	6 7 - X		9 10 9 7 7 7 7 10	~
	CAS-SMILES relation Chemical name(s) Identity Molecular formula	High 2,2-Dim Sources C6H110	Predefined Database Affilic Inventory Affili Color by: Target endpoi Substance type	Group by Carget	Target	High loride 3-chloropropanoyl chl. Sources:10 C3H4CI2O tuent Mono constituent	High Hig 3,3,5-trimethylhexano He Sources:13 Soi C9H17CIO C1 Mono constituent Mc	
	SMILES None Parameters Adopted Adopted Authors Physical Chemical Prop. Environmental Fate and Ecotoxicological Inform Human Health Hazards Acute Toxicity Version Website Carringoencity	, selected in the data matri idpoint	UseEPA New Lnemcal Lategores General Mechanistic Biodeg BioHc half-life (Biowin) Biodegradation pribability (Biowin 1) Biodegradation probability (Biowin 2) Biodegradation probability (Biowin 5) Biodegradation probability (Biowin 5) Biodegradation probability (Biowin 6) Biodegradation probability (Biowin 7) Biodegradation untimate (Biowin 3) DNA binding by OASIS	endpointを選択し、 Legendをクリック	Differ from target by	c()=0 C(CCC(C)=0	CC(CC(CI)=O)CC(C)(C)C CC	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1
Data Gap Filling Settings Only endpoint relevant	Developmental Toxicity / Tera Genetic Toxicity Immunotovicity	togenicity	Options f Select All Do not account metabolism Documented Observed Mammalian metabolism	Metabolisms 0 S Unselect All	Invert Analogues			~
At this position: QSARs 0 Automated workflows 7 Standardized workflows 8	Descriptors Prediction		Observed Microbial metabolism Observed Rat In vivo metabolism Observed rat liver metabolism with quantit Observed Rat Liver S9 metabolism	tive data			Select / filter data Gap filling approach	0
In nodes below: QSARs 0	Positive	•	 Simulated Autoxidation simulator Autoxidation simulator (alkaline medium) Dissociation simulator 			•	Descriptors / data Model/QSAR	
Automated workflows 0 Standardized workflows 0	g		Hydrolysis simulator (acidic) Hydrolysis simulator (basic)		Coloria		Calculation options	
			Hydrolysis simulator (neutral)		Select different		Visual options	
	Negative	+	Microbial metabolism simulator		✓ Remove selected		Information	
							Miscellaneour	
		0 0.5	1 1.5 2 2.5	3 3.5 4 4.5 log Kow	5 5.5 6	6.5 7 7.5		~
	Active descri	ptor X log Kow 🗸					Accept prediction	'n
							×	

<mark>操作説明</mark>

操作説明

OSAR Toolbox 4.6 (Document 1) П 🗙 🙆 🥎 👘 Ð гh OSAR TOOLBOX цu Input Profiling Data Category definition
Data Gap Filling Report The OECD QSAR Toolbox Gap Filling Workflow Edito for Grouping Chemicals \sim into Categories rend analysis Read across (O)SAR Automated Standardized New Import Export Delete Developed by LMC, Bulgaria ү 1 [target] Filter endpoint tree... 6 Documents 😚 Document 1 0-20-5 # [C: 1;Md: 0;P: 1] CAS: 5856779 C: 12;Md: 16;P: 1] Acylation < AND > Acylation >> Direct acyla Y Josef Structure (C: 12:Md: 16:P: 1] Enter GF(RA) L EC3 12/17 R: Positive M: 0.23 % M: 7.8 % M: 1.8 % M: Strongly positive M: 2.7 % M: Negative I: Strongly positive M: 2.9 % ToxCast Toxicity to Reproduction - Toxicokinetics, Metabolism and Distribution 🖵 Profiling - General Mechanistic - Protein binding by OASIS Aculation Acylation Acylation Acylation Acylation Acylation Acylation Acylation Acylation Endpoint Specific Acid Halides Aquatic toxicity classification by ECOS... Acid Halides Aci Keratinocyte gene expression Not possible to classif... Not possible to classif... Not possible to classif... Not po classif... No 💽 Subcategorization フロ \times Protein binding alerts for skin sensitiz... Skin sensitization Cate... No alert found Skin sensitization Cate... Ski n Cate..<mark>.</mark> Ski Protein binding alerts for skin sensitiz... Acylation Acylation Acyla Options 🖌 Adjust options - Empiric f Select A Target Group 14 - Carbon C Chemical elements Group 14 - Carbon C Group 14 - Carbon C Group oon C Gro ∡ Suitable Halogens Halog Ha Halogens Halogens Groups of elements Acylation rotein binding alerts for skin sensitization according to GHS ~ **Data Gap Filling Settings** Halofo Organic functional groups Acyl halide Acyl halide Acyl halide Ac in sensitization by OASIS Acylation >> Direct acy I-CH Organic functional groups (US EPA) Aliphatic Carbon I-CH Aliphatic Carbon I-CH Aliphatic Carbon I-CH Aliphy Alla ng by OASIS Only endpoint relevant Acylation >> Direct acy ▲ Plausipi At this position: quatic toxicity classification by ECOS (1) Protein binding by Read-across prediction Descriptors **Predicted:** Positive QSARs Chemical elements Automated workflows Groups of element OASISをクリック Prediction Standardized workflows eratinocyte gene expressio In nodes below: ipinski Rule Oasis Positive OECD HPV Chemical Categor **OSARs** otor value Organic functional groups Automated workflows Differ from tar ü Organic functional groups (nested Standardized workflow ditions At least or [STOP] Droanic functional groups (US EPA All catego ical Negative Options 🖌 Metabolisms 0 Selected Analogues nts f Select All Unselect All Invert (11) Acylation Do not account metabolism ▲ Documented 0.5 1.5 2.5 3.5 (11) Acylation >> Di ks Observed Mammalian metabolism (11) Acylation >> Di Observed Microbial metabolism (1) Acylation >> Dire Active descriptor X log Kow liction Observed Rat In vivo metabolism Observed rat liver metabolism with guantitative data × 📃 Subcate... 🗇 Observed Rat Liver S9 metabolism (1) SN2 >> Nucleo ∡ Simulated (1) SN2 >> Nucleop :評価対象物質(予測) utoxidation simulato utoxidation simulator (alkaline mediur issociation simulato Selected 2 (9/11) ●:類似物質(実測;Read-acrossに使用) Hydrolysis simulator (acidic) Select different Hydrolysis simulator (basic) ●:異なる作用機序を示すと予想された類似物質 Hydrolysis simulator (neutral Remove selected nite :削除対象とされた物質 40







グラフで特性の類似性/規則性を再確認する

操作説明

8

Input Data Repo . 10 8 2 2 . IOISAR 1 [target] Iter endpoint tree. ⑦ Document 1
 № 230816 demo.tb4
 # [C: 1:Md: 0:P: 1] CAS: 5856779 tructur 🕼 [C: 11;Md: 15;P: 1] Subcatego C: 9:Md: 12:P: 1] Subcate C 9 Md 12 P 11 Sub ToxCast **Toxicity to Reproduction** Toxicokinetics, Metabolism and Distribution Profiling Predefined - OECD HPV Chemical Categories Acid chloride category Acid chloride category Chloroformates Acid chloride category Not categorized Acid chloride category Acid chloride category Acid chloride category Acid chloride cate Discrete chemical Substance type Discrete chemical Discrete chemical Discrete chemical Discrete chemical Discrete chemical Discrete chemical Discrete chemica Discrete chemical - US-EPA New Chemical Categori cid Chlorides Not categorized Acid Chloride cid Chloride General Mechanistic Protein binding by OASIS Acylation Aculation Acylation Aculation Grey zone 9-21% (DPR., Grey zone 9-21% (DPR., Out of mecha o... Out of mec ... Out of mechanistic do... Grey zone 9-21% (DPR., Out of mechan do... Grey zone 9-21% (DPR., Out of mechanistic do Protein binding potency Lys (DPRA 13%) Non concern for unco... Non concern for unco... Undefined Undefined Undefined Undefined Undefined Uncouplers (MITOTOX) Non concern for unco... Undefined - Endpoint Specific - Acute aquatic toxicity cl Class 3 (unsnerific real Class 3 (unsnerific r Acute Oral Toxicity Not categorized Aquatic toxicity classificatio Keratinocyte gene expression Not possible to classif... Not possible to class Protein binding alerts for skin sensitiz Skin sensitization Cate... Skin sensitization Cate... Skin sensitization Cate... kin sensitization Cate... Skin sensit Protein binding alerts for skin sensitiz... Empiric Group 14 - Carbon C _ Group 14 - Carbon C _ Group 14 - Carbon C _ Group 14 - Carbon C Chemical elements Group 14 - Carbon C Groups of elements Halogens Halogens Halonens Halogens Halogens Halogens Halogens Halogens Halogens Lipinski Rule Oasis Bioavailable Bioavailable Less bioavailable Bioavailable Rioavailabl Bioavailabl Less bioavailable Bioavailable Less bioavailable At this posit Acyl halide Acyl halide Acyl halide Organic functional groups Acyl halide Acyl halide Haloformate Acyl halide Acyl halide Acyl halide Organic functional groups (nested) Acyl halide Acyl halide Haloformate Acyl halide Acyl halide Acyl halide Acyl halide Acyl halide Acyl halide Organic functional groups (US EPA) Aliphatic Carbon [-CH..., Aliphatic Carbon [-CH..., Aliphatic Carbon [-CH..., Aliphatic Carbon [-CH..., Aliphatic Carbon [-CH. "Aliphatic Carbon [-CH., Aliphatic Carbon [-CH., Aliphatic Carbon [-CH., Aliphatic Carbon [-CH., Acyl chloride Organic functional groups, Norbert Ha... Acyl chloride Carbonic acid ester hal., Acyl chloride Acyl chloride Acyl chloride Acyl chloride Acyl chloride Acyl chloride [90%,100%] (60%,70%) (20%.30%) (30%.40%) [2096.3096] (40%.50%) (20%.30%) (20%.30%) [20%.30%] Structure similarity Metabolism/Transformation - Autoxidation simulator 0 metabolite/s () metabolite(s) () metabolite(s) () metabolite(s) 0 metabolite(s) 0 metabolite/s () metabolite(s) () metabolite(s) 0 metabolite/s - Empiric — Organic functional groups No metabolite No metabolite No metabolite No metaboliter No metabolites No metabolite No metabolites No metaboliter No metabolite Autoxidation simulator (alkaline medi... 0 metabolite(s) metabolite(s) 0 metabolite(s) 0 metabolite(s) 0 metabolite(s) 0 metabolite(s) 0 metabolite(s) 0 metabolite(s 0 metabolite(s) - Condensite Constitu

QSAR TOOLBOX

100

 \sim



データギャップ補完(結果)

	Input Profiling Workflow Editor	Data	► Category definit	01010 01 0 10100 • Data Gap Filling	► ► Report										X O S A C
analysis Read across (Q)SAR Automa	ted Standardized New Import	Export Delete													for Grouping Chem into Categories Developed by LMC.
Documents 20016 d.emo.td 20016 d.emo.td #1 (C.1446 02.2165 S366779 ID (C.1546 22.2165 S366779 ID (C.1546 22.2165 S366779 ID (C.1546 22.2165 S366779 ID (C.1546 22.2165 S366779 ID (C.1546 23.2165 S366779 ID (C.1546 23.2165 S366779 ID (C.1546 125.2156 S366789 ID (C.1546 125.2156 S366789) ID (C.1546 125.2156 S366789) ID (C.1546 125.2156 S366789) ID (C.1546 125.2156 S366789)	Filter endpoint tree Structure Structure Structure info Physical Chemical Properties First endpoint Chemical Properties Extensionmental Fate and Trans ExtensionCogical Information Human Health Nazarda	port	1 [target]	ع ج ^{رز ور}	3 HgC CHg	4	s >-0	6 -9~5	7 **È	8	9 	10	11 ****	12 **ge	
	Actue toxicity Actue toxicity Carcinogenicity Carcinogenicity Developmental Toxicity /' Genetic Toxicity Instructorized Instructorized Neurotoxicity Photoinduced toxicity Repeated Ose Toxicity Section Section	Teratogenicity AW SW AOP	- 3 ↓ (۶測デ- R:はR	ータ ead ac	rossØ)意味)								
Data Gap Filing Settings Only endpoint relevant this position: GGA% OAutomated workflows Standardzed workflows B nodes below:	2 LINA EG3 ToxCast ToxCast Toxicity to Reproduction E Toxicity to Reproduction Frofiling E Profiling E Protein binding alerts	12/ n and Distribution for skin sensitiz	R: Positive	M: Negative	M: Strongly positive	M: 2.9 %	M: 0.23 %	. M: 7.8 %	M: 1.8 %	. M: Strongly positive	M: 2.7 %	.M:88%	M:2.7 %	_M: 2.3 %	
GSABs 0 Automated workflows 0 Standardized workflows 0										e s	uccess			- 🗆 X	
											ору	Prediction accep	ted successfully	ОК	① クリック
	C														

<mark>操作説明</mark>

Reportモジュール 出力イメージ

Prediction of EC3 for 2,2-Dimethylbutyryl chloride

1/9

QSAR Toolbox prediction for single chemical

Date: 2 8 2021 マトリックス形式で出力可 Author(s): 1/6 Contact details Target information Structural information Numerical identifiers Chemical names γ 自動保存 👥 🗍 🗁 🕱 🗸 🔞 👻 Data matrix_2_8_21__19_09_36.xlsx 🗸 竹内 健祐 😣 ○ 検索 CAS#: 5856-77-9 SMILES: 2.2-dimethylbutanovl ホーム 挿入 描画 ページレイアウト 数式 データ 校開 表示 ファイル 間登 アドイン ヘルプ ChemOffice19 1UST PDF 3 IS #有 PDFelement 0=(D)(C)(C)200 Other: EC Number:2274785 chloride 4 2,2-Dimethylbutyryl ĥ Σ· Ar 開挿入 ~ Х Q Calibr 標準 chloride Structure 一部 前除 ~ **V** ~ 条件付き テーブルとして セルの 書式 ~ 書式設定 ~ スタイル ~ 貼り付け アイ デア 秘密 度 > 2,2-Dimethyl-butyryl 3 |■書式 ~ chloride H₂C かいプポード い スタイル 編年 アイデア 秘密度 フォント 711. $H_{2}($ manually editable field A1 X 🗸 fx C D E F G н I J ĸ L М Ν Target chemical Neighbour #2 Neighbour #1 Neighbour #3 Substance identity manually editable field Prediction summary Predicted endpoint: EC3: No effect specified: No species specified: No duration specified: No quideline specified Structure Predicted value: Positive Unit/scale: Skin sensitisation II (ECETOC) Data gap filling method: Read-across analysis tructure 4 CAS number 5856-77-9 3282-30-2 36727-29-4 57077-36-8 Summary: manually editable field 5 Chemical name O=C(CC(CC(C)(C)C)C)C 2,2-Dimethylbutyryl chloride pivaloyl chloride Isononanoyl chloride Not provided by the user 6 Other identifier 7 SMILES CCC(C)(C)C(CI)=O CC(C)(C)C(CI)=C CC(CC(CI)=O)CC(C)(C)C CC(C)CCCCC(CI)=O 9 Profilers 10 Profiles used for arouping/subcategorization 11 Acylation >> Direct acylation involving a leaving Acylation >> Direct acylation involving a 12 OECD HPV Chemical Categories Acid chloride category Acid chloride category Acid chloride category Acid chloride category 13 Organic functional groups (nested) with Acvl halide Acyl halide: Acvl halide: Acvl halide: 14 Predefined 15 Substance type Discrete chemical Discrete chemical Discrete chemical Discrete chemical 16 US-EPA New Chemical Categories Acid Chlorides Acid Chlorides Acid Chlorides Acid Chlorides 17 Substance type, with Autoxidation simulator 18 US-EPA New Chemical Categories, with 19 OECD HPV Chemical Categories, with 20 General Mechanistic 21 Protein binding potency Lys (DPRA 13%) Grey zone 9-21% (DPRA 13%) 22 Protein binding by OECD Acylation Acylation Acylation Acylation 23 Protein binding potency Cys (DPRA 13%) DPRA above 21% (DPRA 13%) - - - h 24 Protein binding potency GSH Not possible to classify according to these. 25 Protein binding by OASIS, with Autoxidation 26 Protein binding by OECD, with Autoxidation 27 Endpoint Specific TPRE v4 4 1 QSAR Toolbox 4.4.1 OSAR TOOLBOX 28 Respiratory sensitisation Aculation Aculation Aculation Aculation Database version: 4.4.1 irameters Sheet1 (+) III II ----manually editable field 準備完了 📧 -+ 100% Purity / Impurity

評価結果をPDFのレポートやデータ

QSAR Toolbox 4.4.1 Database version: 4.4.1

QSAR TOOLBOX

TPRF v4.4.1

レポート作成

① Reportクリック

nite



操作説明





QSAR Toolbox 4.6 (230816_demo.tb4)	Proper										- C >
											for Grouping Chemicals into Categories
Customize report content and Customize report content and Dot 220 Wizard pages	appearance The section provides detailed information about the Data Matrix chemicals, including parameters, profiles and experimental data. The information will be provided in a separate MS Excel file.	× 5	6 	7	8 °~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	9	10 **	11 ***	12		Developed by LMC, Bulg
Data matrix Options	 ✓ Include profiles ✓ Select profiles to report ✓ Include measured and predicted data ✓ Select experimental data to report ✓ Include predictions 										
	① クリック(レポート	M: 0.23 %	,: 🗨 Ger	erated repo	rt files	- [- ×	2.7 %	M 245 1	 . 10	
	TFI及V7天1」) Cancel Create rep	ort	The foll Select a	owing files a file to oper atrix	were gener n or save.	ated.		1/F	成され ファイ	1るレホ- ルのリス	-1-
			Data in		2	保存し	たいフ	アイル	を選択		
				Op	en	Save as					
<					3 7	リック	(作成	された	レポー	トを開く)	*

nite



<mark>操作説明</mark>

AutoSave 💽 🖪 🏷 🖓 🗸	Ŧ				Data m	matrix_17_8_23	3_13_23_39.xlsx - Exc	N				₽ Sea	rch	_	_														耀田	R7 🔗	Ð	- 0
le Home Insert Draw Pag	ge Layou	t Forr	nulas	Data Review Vi	iew A	Automate	Developer Help	Chem	Office20 Data	Streamer	Power Pivo	ot													_						🖵 Comn	ients 🖻 Shar
Cut Cut		10	Δ^ Δ	= = - %	ab More T	Tout.	Canand			Normal	Bad		Good	Net	utral	Cal	culation		F	∑ AutoSum	× A	\bigcirc	- (1)-	68								
ste Copy ~		Δ	abc.			ext	General	.00 Con	ditional Format as	Check Cell	Exp	Manator	Input	Lin	ked Cell	Note		nsert Dele	te Format	👽 Fill 🗸	Zu, Sort & F	Find &	Analyze	Sensitivity								
Format Painter		v A v	~A *		👥 Merge (& Center Y	₩ <u>₩</u> ~ % 7 100	→0 Form	natting 👻 Table 👻								•	× ×	×	🛇 Clear 🗸	Filter Y S	elect ~	Data	× -								
Clipboard 🕰	Font		ß	Alignme	int	12	Number	5					Styles					Cells	ls	6	diting		Analysis	Sensitivity								
\cdot : $\times \checkmark f_x$																																
A	В	с	D	E	F	G	н	1	J	к	L	м	N		0	P	Q	R	s	т		U	v	w		x	Y		z	AA	AB	AC
Substance identity			Ch	emical #1		Chem	ical #2		Chemical #3			Che	mical #4			Chem	iical #5		Ch	emical #6			Cher	nical #7			Chr	emical #8			Chem	cal #9
Substance identity																																
Structure			н ₃ с	СНЗ		^{H3C} H3C	CH3		⁴ / ⁶ /	•		нас	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		c	~	C		~				" <i>j</i> ¢~~~~~	~~~~~ ⁶⁰			н₃сү	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	F		=¢~~~~~	~~~~ ⁶⁰
CAS number			58	356-77-9		3282	-30-2		56677-60-2			76	54-85-2			625-	-36-5		36	727-29-4			112	-67-4			57	077-36-8			112-	76-5
Chemical name		2,2	2-Dimeth	ylbutyryl chloride		pivaloyl	chloride	Т	etradecyl chlorofor	rmate		Nonan	oyl chloride		3-chl	loroprop	anoyl chloride	3,3	8,5-trimeth	ylhexanoyl chlori	de		palmito	yl chloride			Isonona	anoyl chloric	le		stearoy	chloride
SMILES			CCC(:)(C)C(Cl)=O		CC(C)(C)C(CI)=O	co		:(CI)=O		CCCCC	CCCC(CI)=O			CICCC	:(CI)=O		cc(cc(c	l)=0)CC(C)(C)C		CCC	000000	cccccc(cl)	j=0		CC(C)C	ccccc(cl)-	D	CCC	0000000	.cccccc(cl)-0
																								1-1								
Profilers Predefined																																
OECD HPV Chemical Categories			Acid chl	oride category		Acid chlorid	de category		Chloroformates	s		Acid chlo	oride category			Not cate	egorized		Acid chl	oride category		А	Acid chlor	ide category	1		Acid chl	oride catego	ory		Acid chlorid	le category
US-EPA New Chemical Categories			Acid	Chlorides		Acid Ch	nlorides		Not categorized	d al		Acid	Chlorides to chomical			Acid Ch	hlorides		Acid	Chlorides			Acid C	hlorides			Acid	Chlorides			Acid Ch	forides
General Mechanistic			Discre	Re chemical		Discrete	chemical		Discrete themica	ai		Discret	te chemical			Discrete	chemical		Discre	rte chemicai			Discrete	chemical			Discre	ste chemicai			Discrete	mernical
Protein binding by OASIS			A	cylation		Acyla	ation		Acylation			Ac	ylation			Acyl	ation		A	cylation			Acy	lation			A	cylation			Acyla	ition
Uncouplers (MITOTOX)		Non cor	ncern for	uncoupling of OxPhos	Non co	oncern for un	coupling of OxPhos	0	Undefined	e en e la	0	Un	defined		Non conce	ern for un	acoupling of OxPhos		Ur	ndefined		0.1	Und	efined	a ba	6	Ur	ndefined	1.200	-	Unde	tined
Protein binding by OASIS, with Hydrolysis		GI	2 x No	alert found	0	2 x No al	ert found	0	4 x No alert four	nd	0	Z x No	alert found		out	1 x Ac	vlation	6	Z x No	alert found		out	2 x No a	lert found	10	G	2 x Nc	alert found	1370)	00	2 x No al	art found
Endpoint Specific																																
Aquatic toxicity classification by ECOSAR		cl	Aci	d Halides		Acid H	falides	Ch	Acid Halides	. M	6	Acid	d Halides		cl	Acid H	Halides		Aci	d Halides		1	Acid	Halides	and the second second	-	Aci	d Halides	at to A	Charles F. D.	Acid H	alides
Acute aquatic toxicity classification by veri Protein binding alerts for skin sensitization	naar h by	Cla	ass 3 (un: A	specific reactivity)	U	lass 3 (unspe. Acyli	ation	Class 5 (P	Acviation	sity according	U.	ass 3 (uns Ac	pecific reactivity) vlation)	Class	a (unspe Acvl	ation	(Liass 3 (un: A	specific reactivity; cylation		Iass 5 (No	DT POSSIDI Acy	e to classify lation	according	u	ass 3 (uns	specific react	tivity)	Class 5 (N	ot possible Acvla	to classify accordi
Keratinocyte gene expression	,	Not possi	ible to cla	assify according to these	Not pos	sible to classi	ify according to these	Not possi	ible to classify accor	rding to these	Not possi	ible to cla	ssify according to	o these	Not possible	e to class	ify according to these	Not pos	ssible to cl	assify according to	these N	lot possibl	le to clas	sify accordin	ig to these	Not pos	sible to cl	assify accord	ding to these	Not possi	ole to classi	fy according to the
Protein binding alerts for skin sensitization	1	Skir	n sensitiz	ation Category 1B	Sk	kin sensitizati	ion Category 1B	Skir	n sensitization Cate	gory 1B	Ski	in sensitiza	ation Category 1	B	Skin s	ensitizati	ion Category 1B	SI	kin sensitiz	ation Category 1	3	Skin s	sensitizat	tion Categor	y 1B	Ski	in sensitiz	ation Categ	ory 1B	Skin	sensitizati	on Category 1B
Acute Oral Toxicity Protein binding alerts for skin sensitization	h by		Not o	ategorized		Not cate No met	egorized abolites		Not categorized No metabolites	t 1		Not c	ategorized etabolites			Not cate No met	egorized tabolites		Note	ategorized			Not ca No me	tegorized tabolites			Not o	netabolites			Not cate No met	abolites
Protein binding alerts for skin sensitization	n by		6 x No	alert found		5 x No al	ert found	2	2 x Schiff base form	, ation		14 x No	alert found			1 x	SN2		2 x Nucle	ophilic addition			29 x No	alert found			1 x Nucle	ophilic addi	tion		33 x No al	ert found
Protein binding alerts for skin sensitization	n by		Non	netabolites		No met	abolites		No metabolites	5		No m	etabolites			No met	tabolites		Non	netabolites			No me	tabolites			Nom	netabolites			No met	bolites
Protein binding alerts for skin sensitization Empiric	n by		2 x No	alert found		2 x No al	ert found		4 x No alert foun	nd		2 x No	alert found			1 x Ac	ylation		2 x No	alert found			2 x No a	lert found			2 x No	alert found			2 x No al	rt found
Structure similarity			[90	9%,100%]		[60%	,70%)		(20%,30%)			(30	96,40%)			[20%	i,30%)		[4	0%,50%)			(209	6,30%)			[2	:0%,30%)			[20%	30%)
Organic functional groups			Ac	yl halide		Acyl I	halide		Haloformate			Acy	/l halide			Acyl I	halide		Ac	yl halide			Acyl	halide			Ac	yl halide			Acyl I	.alide
Chemical elements			Group	alogens 14 - Carbon C		Group 14	- Carbon C		Group 14 - Carbo	n C		Group 1	alogens 14 - Carbon C		6	Halo Group 14	- Carbon C		Group	alogens 14 - Carbon C		(Group 14	ogens I - Carbon C			Group	alogens 14 - Carbon	c		Group 14	Jens - Carbon C
Lipinski Rule Oasis			Bio	available		Bioava	ailable		Less bioavailable	e		Bioa	available			Bioav	ailable		Bio	available			Less bio	oavailable			Bic	available	-		Less bio	wailable
Organic functional groups (nested)			Ac	yl halide		Acyl I	halide		Haloformate			Acy	/l halide			Acyl I	halide		Ac	yl halide			Acyl	halide			Ac	yl halide			Acyl H	alide
Organic functional groups (US EPA) Organic functional groups, Norbert Haider			Aliphatic	Carbon [-CH2-]		Aliphatic Ca	irbon [-CH2-] bloride		Aliphatic Carbon [-C arbonic acid ester h	CHZ-] balide		Aliphatic	Carbon [-CH2-]		Ali	Acid d	irbon [-CH2-] bloride		Aliphatic	Carbon [-CH2-]		Ali	liphatic C	arbon [-CH2- ploride	4		Aliphatic	Carbon [-Ch	{2-]	A	Acyl ch	bon [-CH2-]
Organic functional groups, with Autoxidati	ion		No n	netabolites		No met	abolites		No metabolites	5		No m	etabolites			No met	tabolites		Non	netabolites			No me	tabolites			Non	netabolites			No met	abolites
Organic functional groups, with Dissociatio	on		No n	netabolites		No met	abolites		No metabolites	s		No m	etabolites			No met	tabolites		Non	netabolites			No me	tabolites			No m	netabolites			No met	bolites
Organic functional groups, with Hydrolysis Organic functional groups, with Autoxidati	ion		Non	netabolites		1 x Carbo No met	abolites		1 x Alcohol No metabolites	s		1 x Car No m	etabolites			1 x Acy No met	tabolites	1 x Al	No n	icned with quater netabolites	mary		No me	tabolites		1 x Alkar	No n	netabolites	tiary carbon		No met	abolites
Measured and predicted data																																
Human Health Hazards#Sensitisation																																
sublevel en	ndpoint	value	unit	species, duration, test type, type of method, assay, strain, test	value	sp ty unit	pecies, duration, test ype, type of method, assay, strain, test	value	species, d type, type unit assay, s	duration, test e of method, strain, test	value	unit	species, duration type, type of me assay, strain, t	n, test ethod, test v	value u	s; t] nit	pecies, duration, test ype, type of method, assay, strain, test	value	unit	species, duration type, type of me assay, strain,	n, test ithod, test vi	alue u	unit	pecies, dura type, type of assay, stra	tion, test i method, sin, test	value	unit	species, du type, type assay, st	ration, test of method, train, test	value	sp ty unit	ecies, duration, te: pe, type of methor assay, strain, test
				guideline, year, reference, database		.	guideline, year, reference, databar-		guidel	line, year, ce. databasa			guideline, ye	tar,			guideline, year, reference, databar-			guideline, ye	ar,			guideline,	year,			guidelir	ie, year,		. I.	guideline, year,
				rejerence, autabase		Tes	st organisms (species)		rejerenc	e, databasé			rejerence, data	and26		Tes	st organisms (species)			rejerence, data	10038			rejerencê, d	urubuse			rejerence,	, outabase			ijerence, aaidbase
							mouse										mouse															
						Tu	Endpoint: EC3					1	lest organisms (s	species):		т.,	Endpoint: EC3			Test organisms (s	pecies):		Te	est organism	s (species):			Test organis	ms (species)			
						Ty	Assay: LLNA						mouse			TV	Assay: LLNA			mouse	-			mou	Je Co			me	Juse			
							Year: 2007						Endpoint: El Type of method:	in Vivo			Year: 2007			Endpoint: E Type of method:	in Vivo		т	Endpoin vpe of meth	od: in Vivo			Endpo Type of me	thod: in Vivo			
						D	Reference source:						Assay: LLN	A		D	Reference source:			Assay: LLN	A			Assay: I	LINA			Assar	C LLNA			
> Sheet1 (+)							Constant Lowerpionsy		Tort organ	irme lenneineb			Tect mideline:	OFCD			: .	•		Test mideline:	OFCD			Tect midelis	Set DECD	_	_	Test mide	line: OFCD	_		-
ly 🔞 🎇 Accessibility: Investigate																											G.	Display Setti	ngs 🏢			+ 1

nite

レポート作成(結果)





QSAR Toolbox Website

https://www.oecd.org/chemicalsafety/risk-assessment/oecd-qsartoolbox.htm

- ・QSAR Toolboxのダウンロード
- Guidance Documents and Training Materials
- Webinar
- Help Desk
- Public Discussion Forum *etc.*

The OECD QSAR Toolbox

To increase the regulatory acceptance of (Q)SAR methods, the OECD is developing a QSAR Toolbox to make (Q)SAR technology readily accessible, transparent, and less demanding in terms of infrastructure costs.

Download the Toolbox Guidance Documents and Training Materials Webinar Help Desk Public Discussion Forum

WHAT'S NEW?

16 May 2023 – A new version of the OECD QSAR Toolbox is now available: New Toolbox offers extended connectivity with IUCLID, better docking capacity for external models and explicit references to the test material identity for REACH database.

The OECD QSAR Toolbox 4.6 is now available for download.

This update includes, among others, an extended IUCLID connectivity and searches, optimised execution of external QSARs, and an update to the Web Client and report functionalities. Furthermore, it offers a new perspective on the REACH database, where experimental results can now be consulted according to the material that was tested.

15 years of work on the OECD QSAR Toolbox have led to the development of a freely available software that supports and transparent chemical hazard assessment without new tests on animals. Co-developed by ECHA and OECD also with great support from member countries and QSAR community, the QSAR Toolbox has now over 30 000 users from private and public sector across the world and it is widely used under REACH and beyond.

The release of the Toolbox 4.6 is yet another step forward for the reduction of animal testing in chemical hazard assessment.

For the complete list of changes, please see the <u>release notes</u>, Download the QSAR Toolbox and find more information on the <u>QSAR Toolbox website</u>, and <u>access the new repository</u>.

ユーザーマニュアル(和訳)

当機構HPにおいてユーザマニュアル・インストールマニュアル等の和訳を公開 (<u>https://www.nite.go.jp/chem/qsar/toolbox.html</u>)

QSAR Toolboxマニュアル類

<NITEの仮訳>

OECDの<u>QSAR Toolbox</u> IPページに公開されている一部のマニュアルをNITEで仮訳いたしました。ぜひご活用ください。

🔟 <u>OECD QSAR Toolbox v.4の操作マニュアル 【ZIP:33MB】</u> 🗖

(QSAR Toolbox v4.1に基づいたマニュアル)

🖸 (原文)OECD QSAR Toolbox v.4の操作マニュアル 🖻

OECD QSAR Toolboxユーザーマニュアルスタートガイド 【PDF:4MB】
G
(OSAR Toolbox v3.0に基づいた使い方マニュアル)

🖸 (原文)OECD QSAR Toolboxユーザーマニュアルスタートガイド 🖻

 <u>OECD QSAR Toolbox4.4のインストールマニュアル 【PDF:2MB】</u>
 (QSAR Toolbox v4.4に基づいたインストールマニュアル)
 OECD QSAR Toolbox4.6のインストールマニュアル □

<NITEのマニュアル>

QSAR Toolboxの使用方法について、NITE独自でマニュアルを作成しております。こちらもご覧ください。

🔤 <u>OECD QSAR Toolbox version 3.2を用いた公開データの活用方法に関するマニュアル 🛛 (PDF:3MB)</u> 📑



QSAR Toolbox のHelp Desk

次のようなトラブルについては、下記URLのへ ルプデスクに照会して下さい。

- ユーザー登録

- ソフトウェアのダウンロード及びインストール
- ソフトウェアの基本的な使い方
- バグなどの情報

OECDのHP:

http://www.oecd.org/chemicalsafety/risk-

assessment/oecd-qsar-toolbox.htm#Helpdesk

動画講習/学習教材サイト

リードアクロス講習の動画等の 学習教材を公開しています。

1. リードアクロス講習 2. リードアクロス関連ガイダンスとサイトのご案内

NITEのHP: <u>https://www.nite.go.jp/chem/qsar/ReadAcrossTraini</u> <u>ng.html</u>



ご清聴ありがとうございました

安全とあなたの未来を支えます **National Institute of Technology and Evaluation** 独立行政法人製品評価技術基盤機構

お問い合わせ先 hess@nite.go.jp