## CompTox Chemicals Dashboard Version 3/2019 http://comptox.epa.gov/dashboard

Antony Williams National Center for Computational Toxicology

Disclaimer: The views expressed in this presentation are those of the author(s) and do not necessarily represent the views or policies of the U.S. Environmental Protection Agency, nor does mention of trade names or products represent endorsement for use.

## Overview of changes since August 2018 release

#### • Data

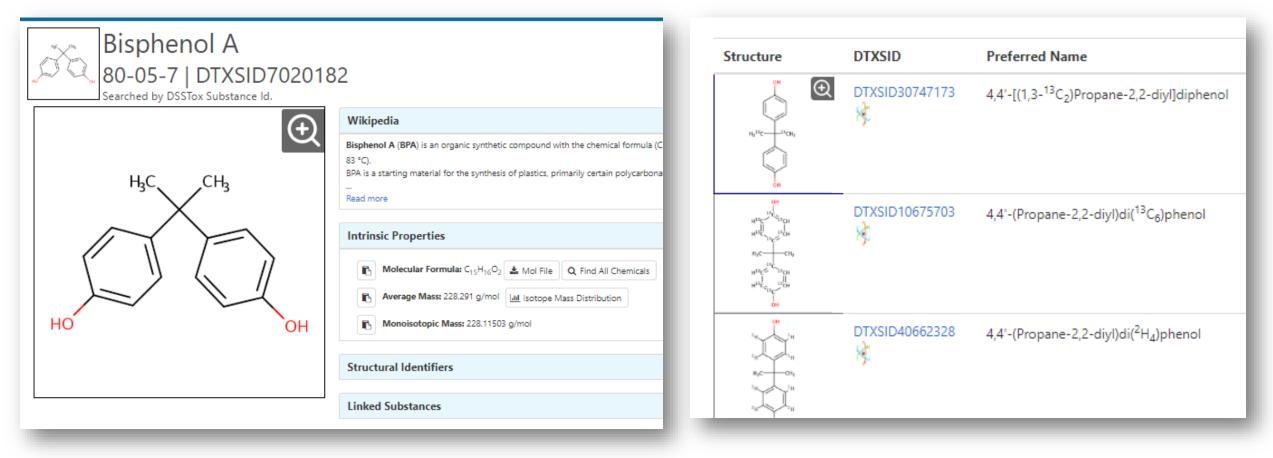
- 875k chemicals total. An additional 110k chemical substances added
- *InvitroDBv3.1* including updated assay descriptions
- ToxVal v7 data integrated includes enormous curation effort
- New OPERA predictions
- New User Interface elements
  - Reworked tables across the application
  - Reworked multiple chemical results page
  - Navigating concentration response plots for all AEIDs in *invitroDB\_v3* data, not just the EDSP21 assays
  - Enhanced batch search capabilities

#### pKa experimental data added – no predictions

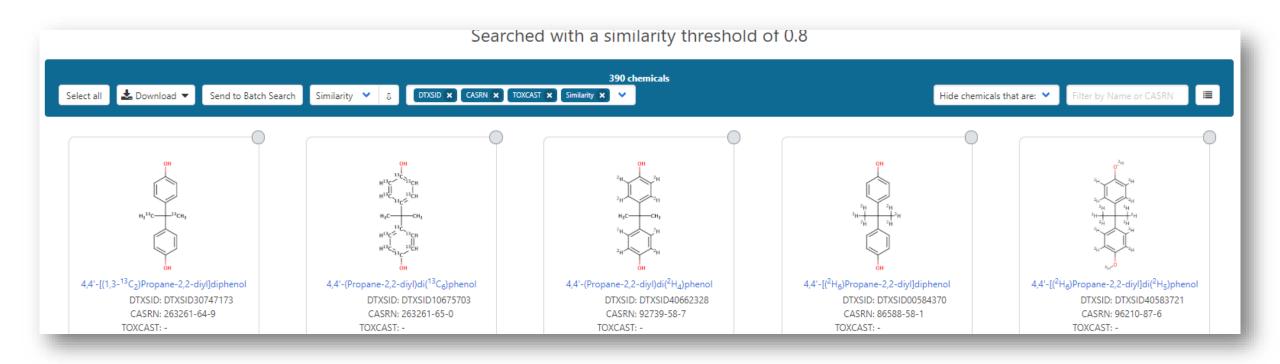
PROP	ITIVE SUMMARY	HO→ CH <sub>3</sub> Acetic acid 64-19-7   DTXS Searched by Approved Nam Property ■ pKa Acidic Apparent ▼	SID5024394 <sup>ne.</sup>		рКа Acidic Арр	parer	nt
ENV. F	ATE/TRANSPORT		\$	Average		¢ N	Media
ADME		Experimental		4.70		-	
► EXPOS	SURE	Predicted		-		-	
GENR	(http://www.openmolecules.org/ the pKa data is included in the D experimentally-measured pKa va SMILES strings. The providers of values representing different pro-	(). A file named "pKalnWater.dwar" containing DataWarrior download and contains alues in water for 7912 chemicals along with the original file collected and compiled pKa otonation states. Unfortunately, there are no the pKa values. Most of these values are given	\$	Result	Experimenta ¢ <sub>Expe</sub>	al	l Deta
SYNO	2 1 1	Data Warrior		4.70			

#### A new "Structure Zoom"

• On-click hover all over the dashboard as well as structure thumbnail



## Reworked multiple results page



#### Reworked multiple results page

• Use Ctrl to select multiple display

		390 chei
Similarity 🎽 🛛	DTXSID 🗙 PubChem 🗙 PubMed 🗙 💙	
	CASRN	
	DTXSID	
OF	TOXCAST	OF
H13C	PubChem	2н
 <sup>H13</sup> C	PubMed	2 <sub>H</sub>
нус	Sources	Н3С
н <sup>13</sup> с~	CPDAT	2H
н <sup>13</sup> с~13с~	Mass	2 <sub>H</sub>
0H	Molecular Formula	0H
4,4'-(Propane-2,2-d	Similarity	Propane-2,2-d
DTXSID: D	IXSID10675703	DTXSID: D

• Improved visual cues for loading large lists of chemicals

	Send to Batch Search Default	CASRN X	·	
Lood	ing of lor	ao liste P		
	ing of Lar	ge lists R	ETAINS	
orde	ring			
	TSCA Inventory, active nor	n-confidential portion 2		
	Q Search TSCAACTIVENONCONF Chemicals			
List Details	ldentifier substring search			
under TSCA. Information about what typ to designate chemical substances on th imported) or processed in the U.S This dashboard includes the active TSCA inv The curation of the non-confidential po	Substances Control Act (ISCA) requires EPA to complet, keep current and publish a per of Jubitance are on the TSCA investory can be found here. The Toos Substance reporting is used to defaulty which densities the the TSCA investory are entroly based on notifications through Feb. 7th 2018 and usbatances reported from toring of autor ESCA charactery is an originary process involving trained densits to toy is updated and more substances are curated. (Updated March 2019)	cs: Control Act (TSCA), as amended by the Frank R. Lautenberg Chemical rce. To accomplish this, EPA finalized a rule requiring industry reporting or active in U.S. commerce and help inform the prioritization of chemicals f Feb 8, 208 – March 30, 2018 that have been unambiguously mapped to	Safety for the 21th Century Act, requires BA d'hemicha mund-tured (including) or rak evaluation. The list contained in the BSDs using CASN and chemical rames. Lent of the list will change over time as both	
Select all 📩 Download 🔻 Senc	o to Batch Search Default • 0 0 000 A Court A •	The enemies she ar		
Select all Council Ser		СH3	CH <sub>3</sub> HOCH <sub>3</sub>	

## **Bioactivity Data**

-	BIOACTIVITY
	TOXCAST: SUMMARY
	EDSP21
	TOXCAST/TOX21
	PUBCHEM
	TOXCAST: MODELS

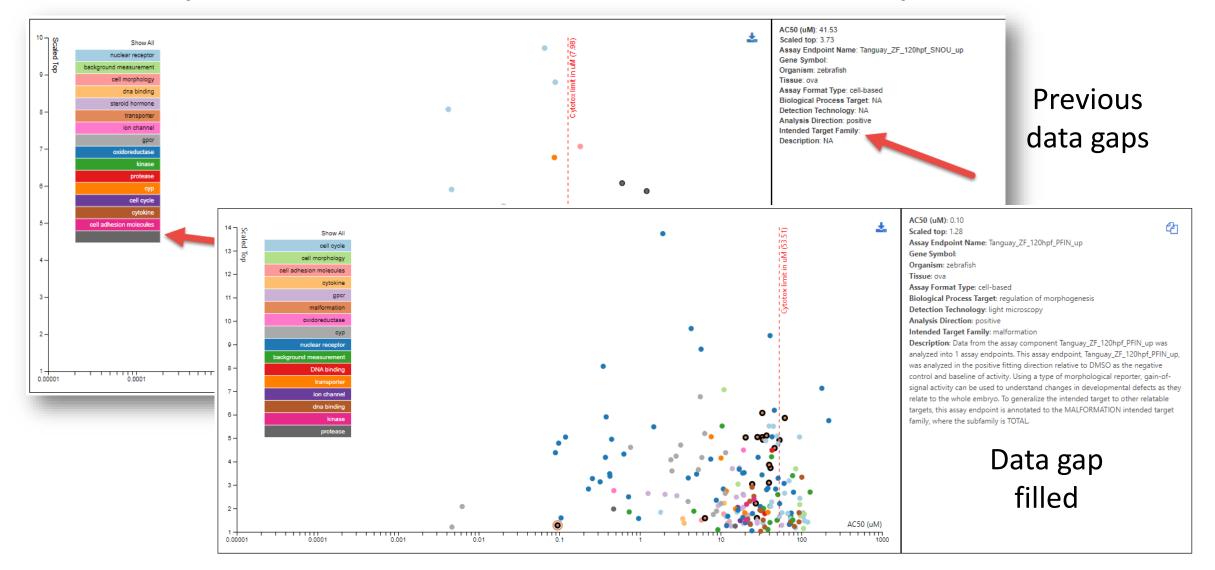
- Summary data now has "enhanced tables"
- EDSP21 subset of assays has grown
- Toxcast/Tox21 "all data" has been integrated
- PubChem data widget no change
- Subset of ToxCast "Models" extended to include "COMPARA" data

#### Tables Reworked – Column Selection

 Ability to select columns to show added for tables –Bioactivity most important – Pick your own preferred display

							102 90	tive of 83	9 assays							
🛓 Download 🔻	Columns 🗸 10 🔹	•											Search	query	Show Inactiv	ve 🔵 Show Background
	Name					-						-				
Name	Modal	\$	Modal	Description	SeqaPASS 🗘	Gene Name 🕈	AOP 🕈	Event 🕈	Hit Call	Top 🕈	AC50 🕈	logAC50 🗘	MaxMed 🗘	Cutoff +	ModIAcc 🕈	Intended Target Family
ACEA_ER_80hr	Description			2	NP_000116.2 📥	ESR1	200	1181	ACTIVE	112	0.373	-0.428	113	26.9	-0.686	nuclear receptor
APR_HepG2_Cell	✓SeqaPASS ✓Gene Name			-	-	-	-	-	ACTIVE	1.20	106	2.02	1.20	0.663	2.04	cell cycle
• APR_HepG2_Mite				-	-	-	-	-	ACTIVE	0.874	109	2.04	0.867	0.496	2.05	cell morphology
• APR_HepG2_Mite	<ul> <li>✓Event</li> <li>✓Hit Call</li> </ul>			-	-	-	-	-	ACTIVE	5.92	11.0	1.04	6.45	0.838	0.813	cell morphology
APR_HepG2_Oxic				-	-	-	-	-	ACTIVE	1.20	110	2.04	1.19	0.819	2.08	cell cycle
APR_HepG2_Cell	CELAC30			-	-	-	-	-	ACTIVE	4.49	95.2	1.98	4.43	0.889	1.75	cell cycle
APR_HepG2_Mite	✓logAC50 Bmad			-	-	-	-	-	ACTIVE	2.71	85.3	1.93	2.26	0.733	1.70	cell morphology
O APR_HepG2_Mite	MaxMed			-	-	-	-	-	ACTIVE	1.66	84.7	1.93	1.44	1.42	2.29	cell cycle
APR_HepG2_Oxic	■MaxMedConc ■Cutoff			-	-	-	-	-	ACTIVE	1.80	106	2.02	1.60	1.10	2.08	cell cycle
ATG_Ahr_CIS_up				-	NP_001612.1 📥	AHR	150	18	ACTIVE	1.31	23.4	1.37	1.28	0.994	1.56	dna binding
	ModIAcc															
	ModIAc10				First <	< < 1 2	3 4	5 6	7 8	9 10	> >>	Last				
	ModIAcb						Showing	g 1 to 10 of 18	35 records							
	Stock Concentration															
	Intended Target Family				Discover.			C	Connect.				Ask.			

#### Assay Annotations Filled a Lot of Gaps!



#### Toxcast: Models – COMPARA added

	DTXSID70201	82		
	ToxCast: N ToxCast Model			
Download ToxCast Model Prediction	ons 🔻			
-	ons ▼ Receptor	Agonist	Antagonist	Binding
lodel		Agonist	Antagonist	Binding
ToxCast Pathway Model (AUC) CoMPARA is a larger scale	Receptor collaboration between 35 interna	tional groups, u	sing QSAR models	Binding - -
Iodel         ToxCast Pathway Model (AUC)         CoMPARA is a larger scale         to predict androgen recept	Receptor	itional groups, u	sing QSAR models ompounds provided	Binding - - Active
to predict androgen recept by U.S. EPA. A key result is against the DSSTox chemic	Receptor collaboration between 35 interna tor activity using a common traini	itional groups, u ing set of 1746 o t and antagonist ded to be used in	sing QSAR models ompounds provided activity that is run n prioritization for	•

#### "EDSP Subset"

 New assays added – expanded all subsets. New set of steroidogenesis assays – including CEETOX data

	DETAILS	QC Data ID	Grade	Description	
	EXECUTIVE SUMMARY	Tox21_202992	Pass	Purity>90% and MW confirmed	
	PROPERTIES	Tox21_400088	Pass	Purity>90% and MW confirmed	
. D	ENV. FATE/TRANSPORT	Assay Selection 23 Selected	A Single Assay Can Have Multiple Charts	Number	of Charts: 80 🔢
<ul> <li>Previous</li> </ul>	HAZARD	Active Inactive All			
	▶ ADME	Y Filter assays		Submit Comment Save Chart Save Data	
	EXPOSURE	Assay Set: ER (17 of 18 Selected)	*	: 150∃ ACEA_T47D_80hr_Positive ¦ °¦⊗	
	▼ BIOACTIVITY	Assay Set: AR (5 of 11 Selected)	Activi	HITCALL: ACTIVE	
	TOXCAST: SUMMARY	Assay Set: ThR (1 of 4 Selected)		Bisphenol A (80-05-7) DTXSID7020182	
	PUBCHEM		2	TX009158	
	TOXCAST: DATA			a d	
					_
	DETAILS			EDSP21	-
	EXECUTIVE SUMMARY	QC Data ID	Grade	Description	
	PROPERTIES				
<ul> <li>Update</li> </ul>		Tox21_202992	Pass	Purity>90% and MW confirmed	_
	ENV. FATE/TRANSPORT	Tox21_202992 Tox21_400088	Pass Pass	Purity>90% and MW confirmed Purity>90% and MW confirmed	
opuace	HAZARD		Pass	Purity>90% and MW confirmed	Charts: 26 🗰
opuate	HAZARD	Tox21_400088	Pass	Purity>90% and MW confirmed	Charts: 26 🜐
opulle	HAZARD	Tox21_400088 Assay Selection 26 Selected	Pass	Purity>90% and MW confirmed	Charts: 26 📰
opulle	HAZARD	Tox21_400088  Assay Selection 26 Selected  Active Inactive All  Control observe Set: ER (15 of 29 selected)	Pass	Purity>90% and MW confirmed arts Representative Samples Only Bioactivity Summary  Number o	Charts: 26 📰
opuare	HAZARD ADME EXPOSURE	Tox21_400088 Assay Selection 26 Selected  Assay Selection 26 Selected All Set: ER (15 of 29 selected) Set: AR (4 of 19 selected)	Pass	Purity>90% and MW confirmed  arts Representative Samples Only Bioactivity Summary  Number of Submit Comment Save on Save Data	f Charts: 26 📻
opuare	HAZARD ADME EXPOSURE BIOACTIVITY	Tox21_400088  Assay Selection 26 Selected  Active Inactive All  Control observe Set: ER (15 of 29 selected)	Pass	Purity-90% and MW confirmed  arts Representative Samples Only Bioactivity Summary  Number of Submit Comment Save One Save Data	Charts: 26 📻

#### ToxCast/Tox21 Data – All data from invitroDBv3

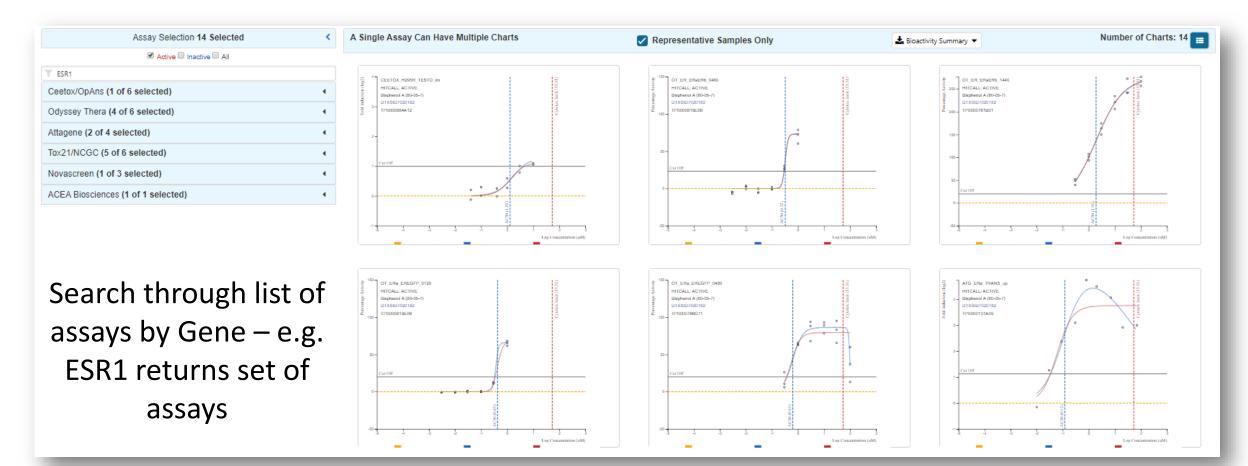
DETAILS			То	oxCast/Tox21		
EXECUTIVE SUMMARY						
PROPERTIES	QC Data ID			scription		
ENV. FATE/TRANSPORT	Tox21_202992			ity>90% and MW confirmed		
HAZARD	Tox21_400088		Pass Puri	ity>90% and MW confirmed		
	Assay Selection 136 Selected	< A Sir	ingle Assay Can Have Multiple Charts	✓ Representative Samples Only	📥 Bioactivity Summary 🔻	Number of Charts: 136
ADME	C Active Inactive All					
EXPOSURE	Filter assays			[	t Comment Save Chart Save Data	
BIOACTIVITY	Ceetox/OpAns (2 of 24 selected)			Submi	t Comment Save Chart Save Data	
TOXCAST: SUMMARY	Odyssey Thera (6 of 17 selected)		o 47			
EDSP21	Attagene (4 of 165 selected)			CEETOX_H295R_ANDR_dn HITCALL: ACTIVE	Cytoba: limit (33.51)	
	Tox21/NCGC (44 of 211 selected)		a tr	Bisphenol A (80-05-7) DTXSID7020182	s limit	
TOXCAST/TOX21	CellzDirect (3 of 48 selected)		년 3- T 평균	TP0001055G08	Cytoto	
PUBCHEM	Bioseek (4 of 174 selected)					
TOXCAST: MODELS	Apredica (8 of 107 selected)		2-			
SIMILAR COMPOUNDS	NHEERL Padilla Lab (1 of 1 selected)					
GENRA (BETA)	Novascreen (46 of 167 selected)		1-		0	
RELATED SUBSTANCES	NHEERL's Hunter Lab (0 of 4 selected)		C	ut Off		
SYNONYMS	NCCT's Lab (4 of 4 selected)			°	à	
LITERATURE	ACEA Biosciences (4 of 6 selected)		0	0 0 0	04)	
	Tanguay Lab (9 of 19 selected)				CS0 (2)	
LINKS	NHEERL Stoker & Laws Lab (1 of 2 selected)		-1 -5	-4 -3 -2 -1		
COMMENTS				Constant Model Gain-Loss Mode	el Hill Model	
				Constant Model Gain-Loss Mode	ei Hill Model	

#### Filtering – Gene annotation added

T Filter assays					
Ceetox/OpAns (2 of 24 selected)	•				
Odyssey Thera (6 of 17 selected)					
Attagene (4 of 165 selected)	-				
ATG_PBREM_CIS_up	NR113				
ATG_E2F_CIS_dn	E2F1				
ATG_HSE_CIS_dn	HSF1				
ATG_EGR_CIS_dn	EGR1				
ATG_ISRE_CIS_dn	IRF1				
ATG_GR_TRANS_dn	NR3C1				
ATG_p53_CIS_up	TP53				
ATG_Oct_MLP_CIS_dn	POU2F1				
ATG_Ets_CIS_up	ETS1				
ATG_EGR_CIS_up	EGR1				
ATG_RARb_TRANS_dn	RARB				
ATG_TGFb_CIS_up	TGFB1				
ATG_PPARa_TRANS_dn	PPARA				
ATG_M_19_CIS_up	ĥ				
ATG_PXRE_CIS_up	NR112				

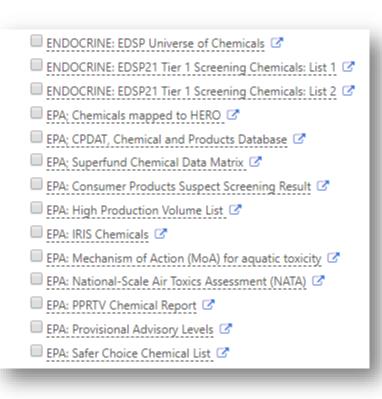
T PPARA						
Attagene (0 of 4 selected)						
ATG_PPARa_TRANS_dn	PPARA					
ATG_PPRE_CIS_up	3 Genes					
ATG_PPARa_TRANS_up	PPARA					
ATG_PPRE_CIS_dn	3 Genes					
Novascreen (1 of 1 selected)	-					
NVS_NR_hPPARa	PPARA					





## Lists of Chemicals/Lists of Assays

- Reworked Chemical List page lots of lists added including segregation
  - LIST: Algal Toxins, Amino Acids, Bisphenol Compounds, PAHs, Synthetic Cannabinoids and Psychoactives, Vitamins, PCBs, PBDEs, Hair Dyes
  - WIKILIST: Additives in Cigarettes, Extremely Hazardous Substances
  - EPA: PALs, HPV list, Chemical Contaminants, PPRTV Reports etc, Pesticides Chemical Search
- Helps cluster in the batch search and as a query on the lists page (see figure)
- invitroDbv3 assays added to assay list



#### Lists of Chemicals

📩 Download 🔻 🛛

Columns ~

- Download the "list of lists" as Excel or TSV
- Subset of lists from query "what are all Norman Network lists?"

http://comptox-prod.epa.gov/dashboard/chemical\_lists/isearch=NORMAN

Select List

NORMAN

Copy Filtered Lists URL

List Acronym	List Name 🗘	Last Updated 🗘	Number of Chemicals 🕈	List Description \$
EUBIOCIDES	NORMAN: Biocides from the NORMAN Priority List	2018-07-26	160	List of compounds currently used in the EU as biocides or compounds recently banned as biocides from the 2015 NORMAN priority list, prioritized and assessed for exposure by NORMAN using data from ECHA and other sources.
EUCOSMETICS	NORMAN: Combined 2000/2006 EU Cosmetic Ingredients Inventory	2017-07-14	2878	EUCOSMETICS contains the Combined Inventory of Ingredients Employed in Cosmetic Products (2000, SCCNFP/0389/00 Final) and Revised Inventory (2006, Decision 2006/257/EC), prepared for NORMAN by P. von der Ohe (UBA) and R. Aalizadeh (Uni. Athens).
FRENCHLIST	NORMAN WATER: French Monitoring List	2017-07-14	1171	FRENCHLIST contains substances for prospective monitoring activities in France, developed in cooperation with the NORMAN Network Working Group 1 on Prioritization. Provided by Valeria Dulio, INERIS, France. Further details on the website.
KEMIMARKET	NORMAN: KEMI List of Substances on the Market	2017-07-13	30418	The KEMI Market List contains chemicals expected to be on the market. Complied by Stellan Fischer, KEMI (Swedish Chemicals Agency) from various regulatory databases, including hazard and exposure scores to support the identification of unknowns.
NORMANCT1	NORMAN: Collaborative Trial 20215 Target and Suspects	2017-07-14	732	NORMANCT15 is a compilation of all target and suspect substances reported by participants in the NORMAN Collaborative Trial on Non- target Screening, run by the NORMAN Network and described in Schymanski et al 2015, DOI: 10.1007/s00216-015-8681-7

## List of Assays

- Download list of all assays (Excel or TSV)
- Filter by Vendor or Multiple Vendors
- Subset of lists from query based on substring search e.g. <u>http://comptox.epa.gov/dashboard/assay\_endpoints/?search=ESR1</u>

	APR X NVS X CEETO:	K X NHEERL_PADILLA X NHEERL_HUNTER X Y Search query	🖪 Copy page URI
(	ACEA Biosciences		
	Apredica		Gene Symbols
assay con ellCycleAr	Attagene Bioseek	cleArrest_1hr was analyzed into 2 assay endpoints. This assay endpoint, the negative fitting direction relative to DMSO as the negative control	
f activity.	Novascreen	reporter, measures of all nuclear dna for loss-of-signal activity can be	
tand the primary neralize t	Odyssey Thera Tox21/NCGC	el as they relate to the gene . Furthermore, this assay endpoint can be has produced multiple assay endpoints where this one serves a signaling relatable targets, this assay endpoint is annotated to the "cell cycle"	
t family, v	Ceetox/OpAns	feration".	
assay con	CellzDirect	cleArrest_1hr was analyzed into 2 assay endpoints. This assay endpoint,	
llCycleAr	NHEERL Padilla Lab	the positive fitting direction relative to DMSO as the negative control and	
vity. Usin the signa	NCCT's Lab	orter, measures of all nuclear dna for gain-of-signal activity can be used they relate to the gene . Furthermore, this assay endpoint can be referred	
readout,	Tanguay Lab	uced multiple assay endpoints where this one serves a signaling function.	
he intend /here the	NHEERL's Hunter Lab	targets, this assay endpoint is annotated to the "cell cycle" intended	
assay con ellLoss_1h	NHEERL Stoker & Laws Lab NHEERL_MED	ss_1hr was analyzed into 2 assay endpoints. This assay endpoint, gative fitting direction relative to DMSO as the negative control and	

#### For a Specific Assay List

• All the advantages of the new "Multiple Results Page" plus...

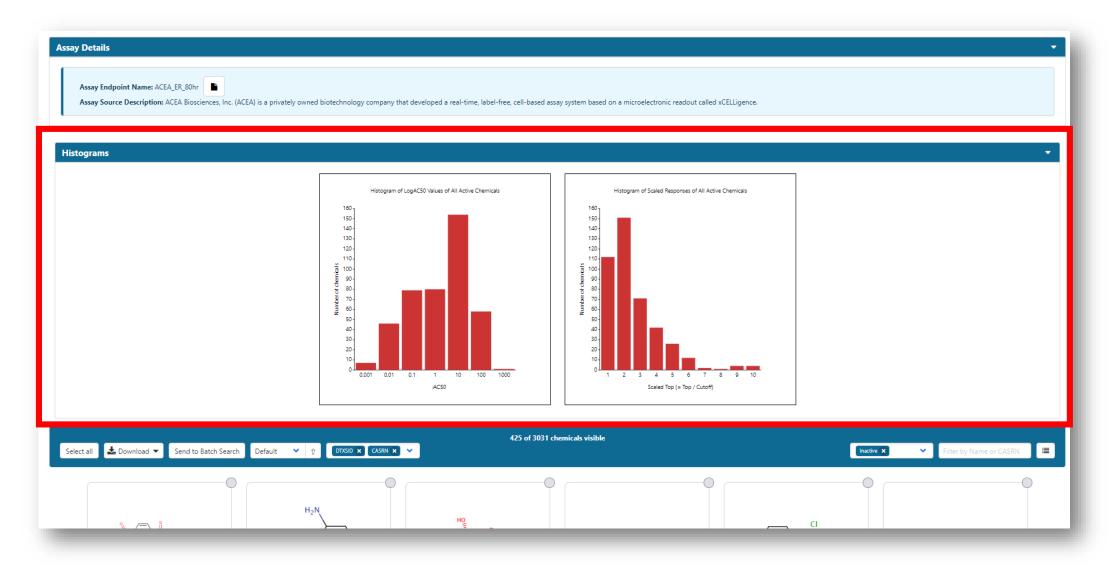
Assay Endpoint Name: ACEA_ER_80hr										
Assay Details		•								
Assay Endpoint Name: ACEA_ER_80hr Sasay Source Description: ACEA Biosciences, Inc. (ACEA) is a privately owned biotechnology company that developed a real-time, label-free, cell-based assay system based on a microelectronic readout called xCELLigence.										
Histograms       425 of 3031 chemicals visible										
Select all 📩 Download 🔻 Send to Batch Search Default 💙 🕆 DTXSID 🗙 CASRN X 💙	Inactive 🗙	✓ Filter by Name or CASRN III								
$H_{2N}$ $H_{2N}$ $H_{2N}$ $H_{2}$ $H$										

#### Specific Assay List

• Reworked assay table – more details available including AOP Wiki link

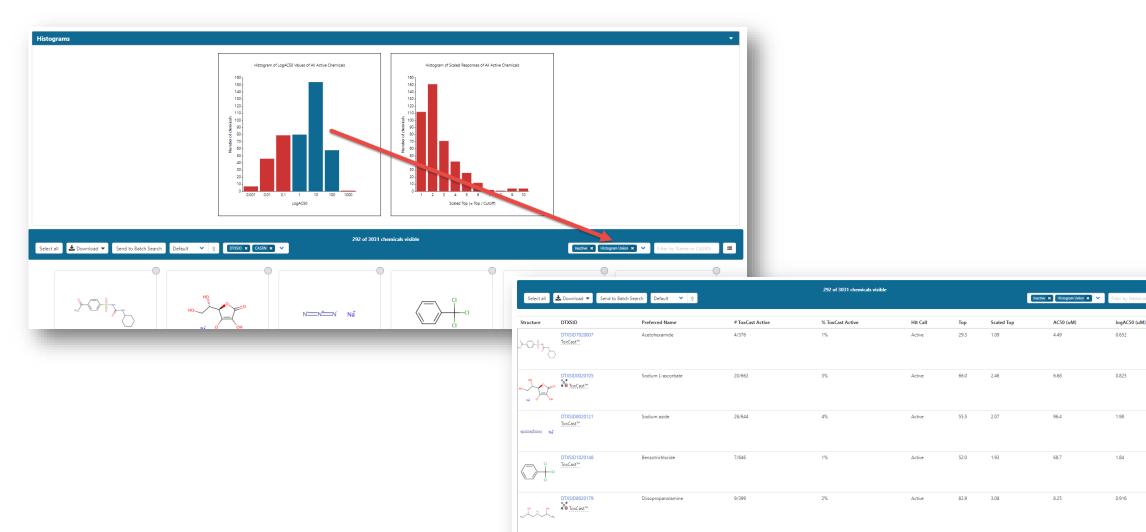
а			All Chemicals in	Assay Endpoint: ACEA_ER_80hr				
				<b>≵</b> Excel				
Annotat	ons Citations	tcpl Processing	Reagents AOPs					
				<b>D</b>				
	Assay Run Type	Level Applied	Method Name	Description				
1	MULTI	2	none	apply no level 2 method				
2	MULTI	3	pval.apid.medpcbyconc.max	plate-wise median response of positive control (max)		All Chem	icals in Assay Endpoint: ACEA_ER_80hr	
3	MULTI	3	resp.pc	response percent activity			<b>±</b> Excel	
4	MULTI	3	bval.apid.nwllslowconc.med	Take the median cval of the n wells and the first two concentrations, by apid	Annotations Citat	tions tcpl Processing Reagents AO	Ps	
5	MULTI	3	resp.shiftneg.3bmad	Make values below baseline zero.				
6	MULTI	4	bmad.aeid.lowconc.twells	bmad based on two lowest concentration of treatment wells	100.00	100.70		l D
7	MULTI	5	bmad3	Add a cutoff value of 3*bmad.	AOP ID	AOP Title		
8	MULTI	5	pc20	Add a cutoff value of 20.	200 AOP ID: 200	Estrogen receptor activation leading	) to breast cancer	
9	MULTI	б	singlept.hit.high	Look for single point hits with activity only at the highest conc tested		n receptor activation leading to breast	cancer	
10	MULTI	б	singlept.hit.mid	Look for single point hits with activity not at highest conc tested	AUTHOR STATUS: U SAAOP STATUS: Ur	Under development: Not open for comr oder Development	ment. Do not cite	
11	MULTI	б	multipoint.neg	Look for inactives with multiple medians above baseline	34401 314103.01			
12	MULTI	б	noise	Look for noisy curves, relative to the assay				
13	MULTI	б	border.hit	Look for actives with borderline activity				
14	MULTI	б	border.miss	Look for inactives with borderline activity				
15	MULTI	б	modlga.lowconc	AC50 less than lowest concentration tested				
16	MULTI	б	gnls.lowconc	Look for low concentration gnls winners				
17	MULTI	б	overfit.hit	Flag hit-calls that would get changed after doing the small N correction to the aic values.				
18	MULTI	б	efficacy.50	Flag hit-calls with efficacy values less than 50% intended for biochemical assays.				

#### Specific Assay List – Histogram summary view



#### Specific Assay List – Histogram summary view

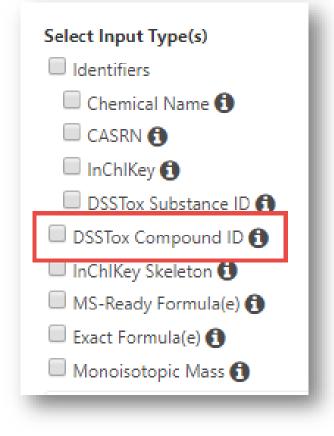
• Display specific subset of data from histogram – switch to Table Mode



....

#### Batch Search

#### • New Search input - DTXCID



#### New Search Outputs

Metadata Curation Level Details NHANES/Predicted Exposure fi Data Sources 👩 Include ToxVal Data Availability 1 Assay Hit Count 🕄 Number of PubMed Articles (1) PubChem Data Sources 6 CPDat Product Occurrence Count 🚯 🔲 IRIS 🚯 PPRTV 1 Clicking on QC Notes will include manual annotation notes added to a record during the OC Notes 🙃 Include links to recompose action process. Enhanced Data Sheets MetFrag Input File (Beta) 1 ToxPrint single fingerprints ① Abstract Sifter Input File (Beta) Synonyms and Identifiers 🚯 Related Substance relationships f ToxPrint fingerprints (ChemoTyper format - CSV/TSV only) 1 Associated ToxCast Assays 🕄

#### What are QC Notes?

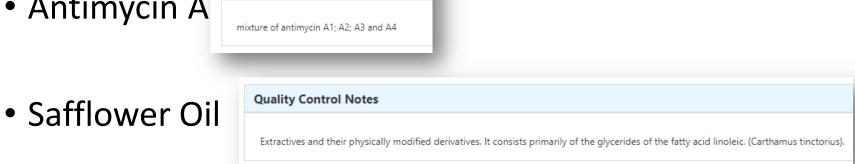
#### Examples

Toxaphene

#### **Quality Control Notes**

Complex, but reproducible mixture of at least 175 distinct C10-chloro compounds, having an approximate overall empirical formula of C10 H10 Cl8; the 2 most active components are a C10H10Cl8 compound and a C10H11Cl7 compound which had been elucidated as 2,2,5-endo,6exo,8,9,10-heptachlorobornane. Produced by the chlorination of camphene to 67-69% chlorine by weight and made up of compds. of C10 H8 CI10, C10 H18-n CI n (mostly poychloroboranes) and C10 H16-n CI n (oychloroboranes and/or polychlorotricyclenes) with n = 6 to 9 See Merck Index

**Quality Control Notes** • Antimycin A



#### Associated ToxCast assays for chemicals

Abstract Sitter input File (Beta) M Synonyms and Identifiers f ToxPrint fingerprints (ChemoTy Associated ToxCast Assays

Selecting this checkbox provides a separate Excel worksheet with input chemicals listed (as Related Substance relationship columns) and all assays that those chemicals have been examined in. The cells are color-coded as red for ACTIVE and blue as INACTIVE. For a thorough understanding of all parameters reported in the Excel spreadsheet the user is referenced to various documentation including 1) an article entitled "tcpl: the ToxCast pipeline for high-throughput screening data" and 2) documentation regarding tcpl on the Comprehensive R Archive Network (cran). Attention is specifically directed to the Introduction vignette providing vignette an overview of the tcpl package.

51 APR HEPG2 MITOMEMBPOT 72H UP -		KOGEN: Integr	ň	ň	ň	
52 APR_HEPG2_MITOTICARREST_72H_DN	0		5	ň	0 70	
53 APR HEPG2 MITOTICARREST 72H UP -	70	- 0	ň	ň	ň	
54 APR HEPG2 NUCLEARSIZE 72H DN -	0	- 0	ň	ทั้	ň	
55 APR_HEPG2_NUCLEARSIZE_72H_UP	- 0	- 0	ň	ň	Å	
56 APR HEPG2 OXIDATIVESTRESS 72H DN -	-	- 0	Ď	ŏ	0	
57 APR HEPG2 OXIDATIVESTRESS 72H UP -	0	- 0	Ď	1	ŏ	
58 APR HEPG2 P53ACT 72H DN -	0	- 0	0	0	Ő	
59 APR_HEPG2_P53ACT_72H_UP -	0	- 0	0	1	0	
60 APR HEPG2 STRESSKINASE 72H DN -	0	- 0	0	0	Ő	
61 APR HEPG2 STRESSKINASE 72H UP	0	- 70	0	0	0	
62 ATG AHR CIS UP -	0 0	- 0	0	0	1	
63 ATG AP 1 CIS UP	0 0	- 0	1	0	0	
64 ATG AP 2 CIS UP -	<b>0</b> 0	- 70	0	ō	0	
65 ATG BRE CIS UP -	<b>0</b>	- 70	1	0	0	
66 ATG C EBP CIS UP -	1 0	- 0	1	Ő	0	
67 ATG CMV CIS UP -	0 Ö	- 1	0	Ő	0	
68 ATG CRE CIS UP -	<b>0</b> 0	- 0	1	0	0	
69 ATG DR4 LXR CIS UP -	1 0	- "0	0	Ó	0	
70 ATG DR5 CIS UP -	0 0	- 0	0	1	0	
71 ATG_E_BOX_CIS_UP -	0 0	- 0	0	0	0	
72 ATG_E2F_CIS_UP -	0 0	- 0	0	0	0	
73 ATG_EGR_CIS_UP -	0 0	- 0	1	Ŭ.	0	
74 ATG_ERE_CIS_UP -	0 1	- 0	0	1	Ó	
75 ATG_ETS_CIS_UP -	0 0	- 0	0	0	0	
76 ATG_FOXA2_CIS_UP -	́О О	- 70	0	Ō	0	
77 ATG_FOXO_CIS_UP -	ю °0	- 70	0	б	0	
78 ATG_GATA_CIS_UP -	<b>1</b> 0 <b>1</b> 0	- 0	0	0	0	
79 ATG_GLI_CIS_UP -	0 0	- 0	0	б	0	
80 ATG_GRE_CIS_UP -	<u>o</u>	- '0	0	б	0	
81 ATG_HIF1A_CIS_UP -	1 0	- 0	0	0	0	

DTX SID3020122 DTX SID2020137 DTX SID6020141 DTX SID902

#### **Related Substance Relationships**

Enhanced Data Sheets	- EPA: National-Scale Air				
MetFrag Input File (Beta)	EPA: PPRTV Chemical R				
	EPA: Provisional Adviso				
ToxPrint single fingerprints	EPA: Safer Choice Chem				
Abstract Sifter Input File (Beta)	Selecting this checkbox provides a separate Excel worksheet containing the relationship				
Synonyms and Identifiers 🕄	between two chemicals. The output file includes the DTVSIDs and names/CASPNs between the				
Related Substance relationships 🚺					
ToxPrint fingerprints (ChemoTyper f	salt form, transformation product and other relationships.				
Associated ToxCast Assays 1					

	А	В	С	D	E	F	G	Н
1	INPUT	DTXSID	PREFERRED_NAME	HAS_RELATIONSHIP_WITH	RELATED_DTX SID	RELATED_PREFERRED_NAME	RELATED	CASRN
2	xylenes	DTXSID2021446	Xylenes	Transformation Product	DTXSID40176394	N-Benzoylalanine	2198-64-3	
3	xylenes	DTXSID2021446	Xylenes	Component	DTXSID6026298	m-Xylene	108-38-3	
4	xylenes	DTXSID2021446	Xylenes	Component	DTXSID3021807	o-Xylene	95-47-6	
5	xylenes	DTXSID2021446	Xylenes	Component	DTXSID2021868	p-Xylene	106-42-3	
6	xylenes	DTXSID2021446	Xylenes	Predecessor: Component	DTXSID9021421	Xylenes; defined mixture 1	NOCAS_21	421
7	xylenes	DTXSID2021446	Xylenes	Predecessor: Component	DTXSID7021447	Xylenes; defined mixture 2	NOCAS_21	447
8	xylenes	DTXSID2021446	Xylenes	Predecessor: Component	DTXSID30891529	Total Petroleum Hydrocarbons (TPH)	NOCAS_89	1529
9	xylenes	DTXSID2021446	Xylenes	Markush Child	DTXSID3021807	o-Xylene	95-47-6	
10	xylenes	DTXSID2021446	Xylenes	Markush Child	DTXSID6026298	m-Xylene	108-38-3	
11	xylenes	DTXSID2021446	Xylenes	Markush Child	DTXSID2021868	p-Xylene	106-42-3	

#### Work in Progress

- New manual in development
- Training "videos" will be posted to YouTube in the future
- New lists are in preparation to add to the lists page

# Feedback welcome williams.antony@epa.gov