DOI: 10.1289/EHP13423

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Supplemental Material

Expanded Systematic Evidence Map for Hundreds of Per- and Polyfluoroalkyl Substances (PFAS) and Comprehensive PFAS Human Health Dashboard

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Additional File- Excel Document

DeDuper

DeDuper is a tool developed by ICF, freely available to clients by request, that incorporates machine learning to identify and reconcile duplicate references in multiple database search results. The DeDuper tool uses a two-phase approach to identify duplicates: 1) locates duplicates using automated logic, and 2) employs machine learning to predict likely duplicates which are then verified manually.

ICF automated the deduplication process by applying a novel pipeline of deduplication algorithms. Deduplication is performed in two phases and can be evaluated for <u>precision</u> (proportion of true positives within all records predicted to be duplicates) and <u>recall</u> (i.e., sensitivity, the proportion of true positives within all records that were actual duplicates). Phase 1 prioritizes precision, by defining a set of exact match rules that operate on a limited set of fields in standard bibliographic citation files (lower-case title, publication year, first author, and starting page). The second phase of the pipeline uses machine learning to flag predicted matches as duplicates for removal and entity resolution on <u>Research Information Systems</u> (RIS) files; this phase is designed to maximize recall by applying algorithms to more comprehensively detect the remaining duplicates. The algorithms (i) intelligently limit the number of record comparisons to ensure speedy performances, and (ii) apply machine learning and fuzzy comparisons to learn and apply user tolerance for differences in select fields that are not exact matches (e.g., title, author names, and publication year).

This tool utilizes the Python Dedupe package to compare references field by field to identify pairs that have the highest likelihood of being a duplicate record. During training, the program:

- Groups records based on editing distance across specific fields (i.e., affine gap distance).
- Proposes grouped records as duplicates to the user for verification and changes the relative weights of various features of each entry based on the user's response.
- Identifies the probability of duplication based on the distance between each record cluster after sufficient testing and allows for a more conservative or a more aggressive deduplication process based on threshold probabilities.

For rapid processing, ICF created a large training dataset from deduplication efforts on previous projects that save the user the need for training the model for each new run.

The algorithms underlying DeDuper - and its application in a case study involving a literature search related to diisononyl phthalate (DINP) - were presented at the 2019 Society of Toxicology (SOT) meeting. In this case study, ICF applied DeDuper to a set of 30,000 references in which duplicates had been previously identified manually. Phase 1 achieved a precision of 100%, although recall was limited at 76%. Phase 2 achieved a recall of 99% with a 48% precision. After accounting for manual review to remove false positives from the machine-identified duplicates pile, the combined pipeline realized an 82% efficiency gain. ICF normalized these results based on maximum possible efficiency gains (which depends on the proportion of duplicate groups in the original dataset) to estimate a specificity of 85%.

Distiller Literature Inventory SOP for Expanded PFAS Evidence Map (abbreviated)

Part 1: Data Extraction

<u>Step 1: View list of studies.</u> To view the list of studies, go to Review -> Level 3 -> Health Literature Inventory Extraction form. Alternatively, you can access the list from the assessment home page. Under Level 3, click on "Unreviewed" to access the list of studies that have not been extracted yet.



Step 2: Select a study for extraction. Select a study by clicking on it, and a new tab will open.

RefID: 1277446, Subacute exposure to N-ethyl perfluorooctanesulfonamidoethanol results in the formation of perfluorooctanesulfonate and alters superoxide dismutase activity in female rats W. Xie, Q. Wu, I. Kania-Korwel, J. C. Tharappel, S. Telu, M. C. Coleman, H. P. Glauert, K. Kannan, S. V. Mariappan, D. R. Spitz, J. Weydert, H. J. Lehmler Level: 3, State: Included Perfluorooctanesulfonamides, such as N-ethyl perfluorooctanesulfonamidoethanol (N-EtFOSE), are large scale industrial chemicals but their disposition and...

RefID: 1303734, Induction of triglyceride accumulation in the liver of rats by perfluorinated fatty acids with different carbon chain lengths: Comparison with induction of peroxisomal beta-oxidation N. Kudo, Y. Kawashima Level: 3, State: Included

The potency to accumulate triglyceride (TG) was compared between perfluorinated fatty acids (PFCAs) with different carbon chain lengths in the liver of male...

RefID: 1332452, Effects of perfluoro fatty acids on peroxisome proliferation and mitochondrial size in mouse liver: dose and time factors and effect of chain length H. Permadi, B. Lundgren, K. Andersson, C. Sundberg, J. W. Depierre Level: 3, State: Included

Once the new tab opens, search the RefID

at https://heronet.epa.gov/heronet/index.cfm/search and download the PDF.

Step 3: Data extraction - Part 1

Step 3a: Enter Author information. Use the format specified in the Distiller form.

Reference (short format), e.g., Smith, 1978, Smith and Jones, 1978 or Smith et al., 1978 (for more than 3 authors).



Step 3b: Select all supplemental tags that apply

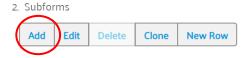
Step 3c: Select other PFAS chemicals that were evaluated but not included in our screening Step 3d: Select "No" for the QC question if you are doing the primary extraction

Select "No" to indicate that you are doing the initial data extraction. If you find during your review that the study does not meet PECO criteria, it should not be extracted. Select "study is not PECO-relevant: update full-text screening tags" to indicate that the study needs to be retagged at the full text review level.

Step 4: Data extraction – Part 2

Step 4a: Add a subform

To begin extracting data, click on 'Add' and a subform will appear. You are now ready to enter information into the form.



Step 4b: Enter evidence type. This is a dropdown menu – human, animal, or PBPK

Evidence Type

*human for epidemiological data; animal for studies conducted in animals



Note: For this project, select "human (abbreviated extraction)" for human.

<u>Step 4c: Select chemical form.</u> This is a dropdown menu of the preferred names of each chemical.

Refer to the Master List in Teams for their synonyms.

Chemical form

Select the preferred name of the chemical. Please refer to the **chemical list** in Teams for the list of synonyms.



Permanently add an answer to this question

The next questions about study design will differ depending on whether the study is in humans or animals.

Human studies (abbreviated form):

<u>Step 4d (Human): Enter sex, population, and study design</u>. Select sex, population, and study design from dropdown menus. Please refer to Table S3 for guidance in selecting the study design.

Sex
In most case studies that include males and females can be marked as "both" and sex-specific differences in response described in the "Doses or exposure levels associated with findings" question below.
Select an Answer ▼
Population Select an Answer
Study design (human) Select an Answer

<u>Step 4e (Human): Exposure measurement.</u> Enter information on the exposure measurement as prompted in the Distiller form.

Exposure measurement | biomonitoring | air | food | drinking water | occupational (use in cases where exposure is based on factors such as job function, place in building where people worked)

<u>Step 4f (Human): Select health outcome.</u> See Table S2 for what kind of endpoints are grouped under which health outcomes. Please create a separate form for each outcome. See Step 6 on how to clone a form.

Health outcomes (Abbreviated Human Health Extraction - no endpoints)

Form should be completed for one health outcome; form can be cloned for studies that assess more than one health outcome.



direct administration - oral

Animal studies (abbreviated):

Step 4d (Animal): Enter study design. This is a drop-down menu.

Note: If a study presents multiple experiments with different exposure durations, e.g. subchronic and chronic, these experiments need to be entered in separate forms. Please indicate which experiment you are referring to in the comment box. Also, see instructions below to clone the form.

Study design (animal) Form should be completed for each study design presented in a study; form can be cloned for studies that assess more than one study design acute (<24 hours) •

"Developmental" includes F0 and F1 data from one generation repro/developmental study designs.

"Multigenerational" includes repro/developmental studies that span two generations and beyond.

Both developmental and multigenerational study designs will have a free text box where you will indicate the generation (F0, F1, etc).

Step 4e: Enter the route, species, sex, and health outcomes Route Select an Answer Species Select an Answer Sex In most case studies that include males and females can be marked as "both" and sex-specific differences in response described in the "Doses or exposure levels associated with findings" question below. Select an Answer Health outcomes (Abbreviated Animal Extraction - no endpoints) Form should be completed for one health outcome; form can be cloned for studies that assess more than one health outcome. Select an Answer Tomments For most studies this field will be blank. However, if there are multiple experiments, please indicate which one you are referring to in this form. ...

Note: See **Table S2** for what kind of endpoints are grouped under which health outcomes. <u>Step 5: Click 'Submit'</u> when you have completed the form. This will save the subform. Note: If you are done with all your subforms, you must also click 'Submit' at the top of the page (see Step 8).

<u>Step 6: Cloning the form.</u> If you have more than one study design or health outcome, you can 'clone' the form to avoid having to reenter the study design information (although all outcome information will need to be deleted and reentered in the cloned form). To do this, select the form you

want to clone and click "Clone" near the top of the page. Alternatively, you can start a new blank form by clicking "Add".



<u>Step 7:</u> Editing the form: If you need to change information or edit a form you have completed, you can click on the arrow within a form to edit.



<u>Step 8: At the top of the page, click 'Submit'.</u> Note: If you don't do this, the study will remain as 'reviewed, but unsubmitted', which means it is still incomplete.



Table S1. PFAS under assessment by U.S. EPA that are not included in this systematic evidence map.

PFAS	CAS RN	DTSXID	U.S. EPA Assessment activity
Perfluorobutanoic acid (PFBA)	375-22-4	DTXSID4059916	IRIS Assessment ^a U.S. EPA (2022) ²
Ammonium perfluorobutanoate	10495-86-0	DTXSID10893420	
Perfluorohexanoic acid (PFHxA)	307-24-4	DTXSID3031862	IRIS Assessment ^a U.S. EPA $(2022)^{\frac{3}{2}}$
Ammonium perfluorohexanoate	21615-47-4	DTXSID90880232	
Sodium perfluorohexanoate	2923-26-4	DTXSID3052856	
Perfluorooctanoic acid (PFOA)	335-67-1	DTXSID8031865	Development of SDWA National Primary Drinking Water Regulation U.S. EPA (2023) ⁴
Ammonium perfluorooctanoate	3825-26-1	DTXSID8037708	
Perfluorononanoic acid (PFNA)	375-95-1	DTXSID8031863	IRIS Assessment ^a U.S. EPA (2021) ^{<u>5</u>}
Ammonium perfluorononanoate	4149-60-4	DTXSID20880205	
Sodium heptadecafluorononanoate	21049-39-8	DTXSID50896632	
Perfluorodecanoic acid (PFDA)	335-76-2	DTXSID3031860	IRIS Assessment ^a U.S. EPA (2023) ^{<u>6</u>}
Ammonium perfluorodecanoate	3108-42-7	DTXSID60880027	
Sodium perfluorodecanoate	3830-45-3	DTXSID20880028	
Perfluorobutanesulfonic acid (PFBS)	375-73-5	DTXSID5030030	ORD Assessment U.S. EPA (2021) ^Z
Perfluorobutanesulfonate	45187-15-3	DTXSID60873015	
Ammonium perfluorobutanesulfonate	68259-10-9	DTXSID3071355	
Potassium perfluorobutanesulfonate	29420-49-3	DTXSID3037707	
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	DTXSID7040150	IRIS Assessment ^a U.S. EPA (2023) ^{<u>8</u>}
Potassium perfluorohexanesulfonate	3871-99-6	DTXSID3037709	
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	DTXSID3031864	Development of SDWA National Primary Drinking Water Regulation U.S. EPA (2023) ²
Perfluorooctanesulfonate	45298-90-6	DTXSID80108992	
Ammonium perfluorooctanesulfonate	29081-56-9	DTXSID9067435	

Lithium perfluorooctanesulfonate	29457-72-5	DTXSID2032421	
Potassium perfluorooctanesulfonate	2795-39-3	DTXSID8037706	
Sodium perfluorooctanesulfonate	4021-47-0	DTXSID50635462	
Perfluoro-2-methyl-3-oxahexanoic acid ("GenX Chemicals")	13252-13-6	DTXSID70880215	OW Assessment U.S. EPA (2021) ¹⁰
Ammonium perfluoro-2-methyl- 3-oxahexanoate	62037-80-3	DTXSID40108559	
Lithium bis [(trifluoromethyl)sulfonyl] azanide (HQ-115)	90076-65-6	DTXSID8044468	ORD Assessment U.S. EPA (2023) ¹¹
1,1,1-Trifluoro-N- [(trifluoromethyl)sulfonyl] methanesulfonamide (TFSI)	82113-65-3	DTXSID2045026	

Note: These PFAS were deprioritized from the evidence map due to scoping considerations as described in the Methods section. These PFAS chemicals are undergoing more in-depth analyses as part of specific U.S.EPA chemical assessments. Interested readers can access assessments or draft materials at the identified citations. ^aThe URLs provided in the citation records provide links to the chemical assessment page for PFAS under assessment by the U.S. EPA Office of Research and Development's (ORD) Integrated Risk Information System (IRIS) Program. Information on timelines for development of the assessments can be found in the IRIS Program Outlook, ¹² which is updated 3 times a year.

Table S2: Categorization for grouping endpoints under health outcomes

Health Effect Category	Examples of Relevant Endpoints	Notes
Systemic Effects	 body weight (not reproductive/developmental) mortality, survival, or LD50s growth curve clinical observations (e.g., lethargy; oral discharge) 	 clinical chemistry endpoints are under Hepatic or Hematologic maternal body weights are under Reproductive pup body weight endpoints are under Developmental pathology (including gross lesions) is organ-specific
Carcinogenicity	tumorsprecancerous lesions (e.g., dysplasia)	
Cardiovascular Effects	 heart weight heart, artery, and vein histopathology blood pressure serum cholesterols and lipids 	other blood measures are under Hepatic, Immune, or Hematologic
Dermal Effects	skin sensitivityskin histopathology	-

Health Effect	Examples of Relevant Endpoints	Notes
Category	Examples of Relevant Lilupoints	
Developmental Effects	 pup viability/survival, or other birth parameters pup weight or growth (into adulthood if developmental exposure) developmental landmarks (e.g., eye opening) not including markers for other organ/system-specific toxicities skeletal, visceral, or gross abnormalities in fetuses/pups 	 histopathology and markers of development specific to other systems are organ/system- specific (e.g., vaginal opening is under Female Reproductive; tests of sensory maturation are under Nervous System)
Endocrine Effects	 thyroid/adrenal weight thyroid/adrenal histopathology hormonal measures in any tissue or blood (non-reproductive) stress-related factors in blood (e.g., glucocorticoids or other adrenal markers) 	reproductive hormones are under Reproductive
Gastrointestinal Effects	stomach and intestine weightstomach and intestine histopathology	-
Hematologic Effects	 corpuscular volume red blood cells serum hematocrit or hemoglobin serum platelets or reticulocytes serum biochemical measures (sodium, calcium, phosphorus) blood coagulation markers 	 white blood cell counts and globulin are under Immune serum lipids are under Cardiovascular serum liver markers are under Hepatic
Hepatic Effects	 liver weight liver histopathology liver tissue enzyme activity (e.g., catalase) or protein/DNA content liver enzymes (ALT; AST) liver biochemical markers (albumin; glycogen) liver tissue lipids (triglycerides, cholesterol) 	 serum lipids are under Cardiovascular biochemical markers such as albumin or glucose are under Hematological liver tissue cytokines are under immune serum glucose is under Metabolic
Immune Effects	 host resistance allergic, autoimmune, or infectious disease hypersensitivity lymphocyte phenotyping or proliferation lymphoid tissue weight, histopathology, cell counts 	 red blood cells are under Hematological non-immune measures of pulmonary function are under Respiratory

Health Effect		Notes
Category	Examples of Relevant Endpoints	
	 immune functional assays (e.g., antibody production, natural killer cell function, delayed-type hypersensitivity [DTH], mixed leukocyte reaction [MLR], cytotoxic T lymphocyte [CTL], phagocytosis or bacterial killing by monocytes) immune responses in the respiratory system (includes asthma) white blood cell counts serum immunological factors or cytokines immune cell counts or immune-specific cytokines in non-lymphoid tissues bone marrow histopathology and cell counts 	
Metabolic Effects	 pancreatic effects relevant to diabetes induced-obesity or body mass index free fatty acids serum glucose or insulin, or other measures related to diabetes 	
Musculoskeletal/	bone weight and histopathology	
Connective Tissue	muscular histopathology	
Neurological	brain weight	
Effects	brain histopathology	
	 nervous system histopathology 	
	 behavioral measures (including 	
	functional observation battery and	
	cage-side observations)	
Ocular Effects	eye histopathology	
	vison changes	
	eye irritation	
Renal Effects	kidney weight	
	kidney histopathology	
	Urinary tract histopathology	
	bladder weight and histopathology	
	• urinary measures (e.g., protein; volume;	
Daniel III	pH; specific gravity)	1.11
Reproductive	dam health, body weight, food	birth parameters (e.g., litter
Effects	consumption	size; resorptions;
	reproductive organ weight	

Health Effect Category	Examples of Relevant Endpoints	Notes
	 reproductive organ histopathology markers of sexual differentiation or maturation (e.g., preputial separation in males; vaginal opening or estrous cycling in females) mating parameters (e.g., success; mount latency) sperm parameters (e.g., counts; motility) reproductive hormones 	implantations; viability) are under Developmental [NOTE: if data indicate altered birth parameters are likely attributable to female fertility, these data may be discussed under Female Reproductive]
Respiratory Effects	lung weight and histopathologynasal cavity histopathology	

Table S3: Types of study designs (human)

Study Design	Description
Cross-sectional	Exposure and outcome are examined at the same point in time in a defined study population. Cannot determine if exposure came before or after outcome.
Cohort	A group of people is examined over time to observe a health outcome. Everyone belongs to the same population (e.g., general U.S. population; an occupational group; cancer survivors). All cohort studies (prospective or retrospective) consider exposure data from before the occurrence of the health outcome.
Case-control	Cases (people with the health outcome) and controls (people without the health outcome) are selected at the start of a study. Exposure is determined and compared between the two groups. A case-control study can be nested within a cohort.
Ecological	The unit of observation is at the group level (e.g., zip code; census tract), rather than the individual level. Ecological studies are often used to measure prevalence and incidence of disease. Cannot make inferences about an individual's risk based on an ecological study.
Controlled Trial	Exposure is assigned to subject and then outcome is measured.

Table S4. HAWC Visual Inventory Table by Chemical

Inventory of HAWC data pivot visuals by chemical in this SEM.

PFAS	lata pivot visuals by chemical in the (Exposure Route)	HAWC URL
DTXSID	Health Category	
(E)-Perfluoro(4-methyl-	(Oral)	https://hawc.epa.gov/summary/data-
2-pentene)	Cardiovascular, Dermal,	pivot/assessment/100500256/Figure-
DTXSID70880159	Endocrine, Gastrointestinal,	1-E-Perfluoro4-methyl-2-pentene-
	Hematologic, Hepatic, Immune,	alloral/
	Metabolic, Musculoskeletal,	
	Nervous, Ocular, Reproductive,	
	Respiratory, Urinary, and	
	Whole Body	
	(Inhalation)	https://hawc.epa.gov/summary/data-
	Cardiovascular, Dermal,	pivot/assessment/100500256/Figure-
	Endocrine, Hematologic,	31a-E-Perfluoro4-methyl-2-
	Hepatic, Immune, Metabolic,	pentene_Inh/
	Nervous, Reproductive, Respiratory, Urinary, Whole	
	Body	
	(Inhalation)	https://hawc.epa.gov/summary/data-
	Developmental, Hepatic,	pivot/assessment/100500256/Figure-
	Immune, Reproductive,	31b-E-Perfluoro4-methyl-2-
	Respiratory, Urinary, and	pentene Inh/
	Whole Body	
	Literature Tagtree	https://hawc.epa.gov/summary/visual
		/assessment/100500256/E-
		Perfluoro4-methyl-2-pentene/
1-	(Oral)	https://hawc.epa.gov/summary/data-
(Perfluorohexyl)ethane	Cardiovascular, Dermal,	pivot/assessment/100500256/Figure-
DTXSID30379857	Endocrine, Gastrointestinal,	2-1-Perfluorohexylethane_Oral-All/
	Hematologic, Hepatic, Immune,	
	Musculoskeletal, Nervous,	
	Ocular, Renal, Reproductive,	
	Respiratory, Urinary, and Whole Body	
	Literature Tagtree	https://hawc.epa.gov/summary/visual
	Literature ragiree	/assessment/100500256/PFAS-
		430XAgency-1-Perfluorohexylethane-
		DTXSID-94b1/
<u> </u>	<u> </u>	'

Diiodoperfluorohexane DTXSID90190949 Cardiovascular, Dermal, Endocrine, Gastrointestinal, Hematologic, Hepatic, Immune, Nervous, Renal, Reproductive, Respiratory, Urinary, and Whole Body (Inhalation) Cardiovascular, Endocrine, Hematologic, Hepatic, Immune, Metabolic, Nervous, Reproductive, Respiratory, Urinary, and Whole Body (Inhalation) Cardiovascular, Dermal, Endocrine, Gastrointestinal, Hematologic, Hepatic, Immune, Metabolic, Nervous, Reproductive, Respiratory, Urinary, and Whole Body (Inhalation) Cardiovascular, Endocrine, Hematologic, Hepatic, Immune, Metabolic, Musculoskeletal, Nervous, Ocular, Reproductive, Respiratory, Urinary, and Whole Body Literature Tagtree 1,6- Divinylperfluorohexane DTXSID20170895 1,6- Divinylperfluorohexane-DTX-829a/ https://hawc.epa.gov/summary/visua/ /assessment/100500256/PFAS- 430XAgency-16- Divinylperfluorohexane-DTX-5c0c/ https://hawc.epa.gov/summary/visua/ /assessment/100500256/PFAS- 430XAgency-10- Divinylperfluorohexane-DTX-5c0c/ https://hawc.epa.gov/summary/visua/ /assessment/100500256/PFAS- 430XAgency-10- Divinylperfluorohexane-DTX-5c0c/ https://hawc.epa.gov/summary/visua/ /assessment/100500256/PFAS- 430XAgency-10- Divinylperfluorohexane-DTX-5c0c/ https://hawc.epa.gov/summary/visua/ /assessment/1005	4.0	(O1)	https://havya.ong.gov/gummawy/data
DTXSID90190949 Endocrine, Gastrointestinal, Hematologic, Hepatic, Immune, Nervous, Renal, Reproductive, Respiratory, Urinary, and Whole Body (Inhalation)	1,6-	(Oral)	https://hawc.epa.gov/summary/data-
Hematologic, Hepatic, Immune, Nervous, Renal, Reproductive, Respiratory, Urinary, and Whole Body (Inhalation) Cardiovascular, Endocrine, Hematologic, Hepatic, Immune, Metabolic, Nervous, Reproductive, Respiratory, Urinary, and Whole Body (Inhalation) Cardiovascular, Dermal, Endocrine, Gastrointestinal, Hematologic, Hepatic, Immune, Metabolic, Musculoskeletal, Nervous, Ocular, Dermal, Endocrine, Gastrointestinal, Hematologic, Hepatic, Immune, Metabolic, Musculoskeletal, Nervous, Ocular, Reproductive, Respiratory, Urinary, and Whole Body Literature Tagtree https://hawc.epa.gov/summary/oisus/assessment/100500256/Figure-35-16-Diiodoperfluorohexane_Inhalatio-e0b2/ Divinylperfluorohexane_DTXSID20170895 Literature Tagtree https://hawc.epa.gov/summary/visus/assessment/100500256/PFAS-430XAgency-16-Divinylperfluorohexane-DTXS-829a/ https://hawc.epa.gov/summary/visus/assessment/100500256/PFAS-430XAgency-16-Divinylperfluorohexane-DTX-5c0c/ https://hawc.epa.gov/summary/visus/assessment/100500256/PFAS-430XAgency-11-H-Perfluoropentyl-methacrylate-Betyl-met	•		, , , , , , , , , , , , , , , , , , , ,
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Whole Body		•	
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DTXSID5061954 Literature Tagtree https://hawc.epa.gov/summary/visua/assessment/100500256/PFAS-430XAgency-Not-Specified-in-TitleAbstrac-05b3/ 1H,1H,5H- Perfluoropentyl methacrylate DTXSID90880131 Perfluoroundecanoic-acid-a4bf/ https://hawc.epa.gov/summary/visua/assessment/100500256/PFAS-430XAgency-Not-Specified-in-TitleAbstrac-05b3/ https://hawc.epa.gov/summary/data-pivot/assessment/100500256/Figure-4-1H1H5H-Perfluoropentyl-methacrylate8ebe/	Perfluoroundecanoic		/assessment/100500256/PFAS-
Literature Tagtree https://hawc.epa.gov/summary/visua/assessment/100500256/PFAS-430XAgency-Not-Specified-in-TitleAbstrac-05b3/ 1H,1H,5H- Perfluoropentyl methacrylate DTXSID90880131 Literature Tagtree https://hawc.epa.gov/summary/visua/assessment/100500256/PFAS-430XAgency-Not-Specified-in-TitleAbstrac-05b3/ https://hawc.epa.gov/summary/data-pivot/assessment/100500256/Figure-4-1H1H5H-Perfluoropentyl-methacrylate8ebe/	acid		430XAgency-11-H-
/assessment/100500256/PFAS- 430XAgency-Not-Specified-in- TitleAbstrac-05b3/ 1H,1H,5H- Perfluoropentyl Methacrylate DTXSID90880131 /assessment/100500256/PFAS- 430XAgency-Not-Specified-in- TitleAbstrac-05b3/ https://hawc.epa.gov/summary/data- pivot/assessment/100500256/Figure- 4-1H1H5H-Perfluoropentyl- methacrylate8ebe/	DTXSID5061954		Perfluoroundecanoic-acid-a4bf/
430XAgency-Not-Specified-in- TitleAbstrac-05b3/ 1H,1H,5H- Perfluoropentyl Methacrylate DTXSID90880131 430XAgency-Not-Specified-in- TitleAbstrac-05b3/ https://hawc.epa.gov/summary/data- pivot/assessment/100500256/Figure- 4-1H1H5H-Perfluoropentyl- methacrylate8ebe/		Literature Tagtree	https://hawc.epa.gov/summary/visual
TitleAbstrac-05b3/ 1H,1H,5H- Perfluoropentyl methacrylate DTXSID90880131 TitleAbstrac-05b3/ https://hawc.epa.gov/summary/data-pivot/assessment/100500256/Figure-4-1H1H5H-Perfluoropentyl-methacrylate8ebe/			/assessment/100500256/PFAS-
1H,1H,5H- Perfluoropentyl Methacrylate DTXSID90880131 (Oral) Whole Body Whole Body Whole Body Whole Body Whole Body 4-1H1H5H-Perfluoropentyl- methacrylate8ebe/			430XAgency-Not-Specified-in-
Perfluoropentyl methacrylateWhole Bodypivot/assessment/100500256/Figure- 4-1H1H5H-Perfluoropentyl- methacrylate8ebe/			TitleAbstrac-05b3/
Perfluoropentyl methacrylateWhole Bodypivot/assessment/100500256/Figure- 4-1H1H5H-Perfluoropentyl- methacrylate8ebe/	1H,1H,5H-	(Oral)	
DTXSID90880131 methacrylate8ebe/	Perfluoropentyl	Whole Body	pivot/assessment/100500256/Figure-
D1X2ID90880131	methacrylate		
(Inhalation) https://hawc.epa.gov/summary/data			methacrylate8ebe/
		(Inhalation)	https://hawc.epa.gov/summary/data-
Hepatic, Respiratory, Urinary, pivot/assessment/100500256/Figure-			pivot/assessment/100500256/Figure-
and Whole Body 22-16-			1
•		,	Diiodoperfluorohexane_Inhalation_All

	Т	
	Literature Tagtree	https://hawc.epa.gov/summary/visual
		/assessment/100500256/PFAS-
		430XAgency-1H1H5H-
		Perfluoropentyl-methac-7712/
1H-Perfluorohexane	(Oral)	https://hawc.epa.gov/summary/data-
DTXSID20188995	Cardiovascular, Endocrine,	pivot/assessment/100500256/Figure-
	Gastrointestinal, Hematologic,	5-1H-Perfluorohexane Oral-All/
	Hepatic, Immune, Multi-	3 III Terridoronexarie_ordi / III/
	System, Nervous, Reproductive,	
	Urinary, and Whole Body	hill and the second second second
	Literature Tagtree	https://hawc.epa.gov/summary/visual
		/assessment/100500256/PFAS-
		430XAgency-1H-Perfluorohexane-
		DTXSID20188995/
2-	Literature Tagtree	https://hawc.epa.gov/summary/visual
(Perfluorohexyl)ethanet		/assessment/100500256/PFAS-
hiol		430XAgency-2-
DTXSID20379947		Perfluorohexylethanethiol-D-ec01/
2,2,2-Trifluoroethyl	Literature Tagtree	https://hawc.epa.gov/summary/visual
triflate	_	/assessment/100500256/PFAS-
DTXSID1073365		430XAgency-222-Trifluoroethyl-
		triflate-D-aed1/
2,2,3,3,3-	(Inhalation)	https://hawc.epa.gov/summary/data-
pentafluoropropanol	Cardiovascular, Dermal,	pivot/assessment/100500256/Figure-
DTXSID4059966	Endocrine, Gastrointestinal,	23-22333-
D1X31D4039300	Hematologic, Hepatic, Immune,	
		pentafluoropropanol_Inhalation_All/
	Multi-System,	
	Musckuloskeletal, Nervous,	
	Ocular, Reproductive,	
	Ocular, Reproductive, Respiratory, Urinary, and	
	Ocular, Reproductive,	
2,3-	Ocular, Reproductive, Respiratory, Urinary, and	https://hawc.epa.gov/summary/visual
2,3- Dichlorooctafluorobutan	Ocular, Reproductive, Respiratory, Urinary, and Whole Body	/assessment/100500256/PFAS-
Dichlorooctafluorobutan e	Ocular, Reproductive, Respiratory, Urinary, and Whole Body	/assessment/100500256/PFAS- 430XAgency-23-
Dichlorooctafluorobutan e DTXSID90870512	Ocular, Reproductive, Respiratory, Urinary, and Whole Body Literature Tagtree	/assessment/100500256/PFAS- 430XAgency-23- Dichlorooctafluorobutane-D-31bf/
Dichlorooctafluorobutan e DTXSID90870512 2:1 Fluorotelomer	Ocular, Reproductive, Respiratory, Urinary, and Whole Body Literature Tagtree (Oral)	/assessment/100500256/PFAS- 430XAgency-23- Dichlorooctafluorobutane-D-31bf/ https://hawc.epa.gov/summary/data-
Dichlorooctafluorobutan e DTXSID90870512	Ocular, Reproductive, Respiratory, Urinary, and Whole Body Literature Tagtree	/assessment/100500256/PFAS- 430XAgency-23- Dichlorooctafluorobutane-D-31bf/ https://hawc.epa.gov/summary/data- pivot/assessment/100500256/Figure-
Dichlorooctafluorobutan e DTXSID90870512 2:1 Fluorotelomer	Ocular, Reproductive, Respiratory, Urinary, and Whole Body Literature Tagtree (Oral)	/assessment/100500256/PFAS- 430XAgency-23- Dichlorooctafluorobutane-D-31bf/ https://hawc.epa.gov/summary/data-
Dichlorooctafluorobutan e DTXSID90870512 2:1 Fluorotelomer alcohol	Ocular, Reproductive, Respiratory, Urinary, and Whole Body Literature Tagtree (Oral) Developmental,	/assessment/100500256/PFAS- 430XAgency-23- Dichlorooctafluorobutane-D-31bf/ https://hawc.epa.gov/summary/data- pivot/assessment/100500256/Figure-
Dichlorooctafluorobutan e DTXSID90870512 2:1 Fluorotelomer alcohol	Ocular, Reproductive, Respiratory, Urinary, and Whole Body Literature Tagtree (Oral) Developmental, Gastrointestinal, Ocular,	/assessment/100500256/PFAS- 430XAgency-23- Dichlorooctafluorobutane-D-31bf/ https://hawc.epa.gov/summary/data- pivot/assessment/100500256/Figure-
Dichlorooctafluorobutan e DTXSID90870512 2:1 Fluorotelomer alcohol	Ocular, Reproductive, Respiratory, Urinary, and Whole Body Literature Tagtree (Oral) Developmental, Gastrointestinal, Ocular, Reproductive, Respiratory, and Whole Body ^a	/assessment/100500256/PFAS- 430XAgency-23- Dichlorooctafluorobutane-D-31bf/ https://hawc.epa.gov/summary/data- pivot/assessment/100500256/Figure- 6-21-Fluorotelomer-alcohol_Oral-All/
Dichlorooctafluorobutan e DTXSID90870512 2:1 Fluorotelomer alcohol	Ocular, Reproductive, Respiratory, Urinary, and Whole Body Literature Tagtree (Oral) Developmental, Gastrointestinal, Ocular, Reproductive, Respiratory, and Whole Body ^a (Inhalation)	/assessment/100500256/PFAS- 430XAgency-23- Dichlorooctafluorobutane-D-31bf/ https://hawc.epa.gov/summary/data- pivot/assessment/100500256/Figure- 6-21-Fluorotelomer-alcohol_Oral-All/ https://hawc.epa.gov/summary/data-
Dichlorooctafluorobutan e DTXSID90870512 2:1 Fluorotelomer alcohol	Ocular, Reproductive, Respiratory, Urinary, and Whole Body Literature Tagtree (Oral) Developmental, Gastrointestinal, Ocular, Reproductive, Respiratory, and Whole Body ^a (Inhalation) Hematologic, Hepatic, Immune,	/assessment/100500256/PFAS- 430XAgency-23- Dichlorooctafluorobutane-D-31bf/ https://hawc.epa.gov/summary/data- pivot/assessment/100500256/Figure- 6-21-Fluorotelomer-alcohol_Oral-All/ https://hawc.epa.gov/summary/data- pivot/assessment/100500256/Figure-
Dichlorooctafluorobutan e DTXSID90870512 2:1 Fluorotelomer alcohol	Ocular, Reproductive, Respiratory, Urinary, and Whole Body Literature Tagtree (Oral) Developmental, Gastrointestinal, Ocular, Reproductive, Respiratory, and Whole Body ^a (Inhalation)	/assessment/100500256/PFAS- 430XAgency-23- Dichlorooctafluorobutane-D-31bf/ https://hawc.epa.gov/summary/data- pivot/assessment/100500256/Figure- 6-21-Fluorotelomer-alcohol_Oral-All/ https://hawc.epa.gov/summary/data-

2H,3H- Decafluoropentane	Literature Tagtree (Inhalation) Dermal, Developmental,	https://hawc.epa.gov/summary/visual /assessment/100500256/PFAS- 430XAgency-21-Fluorotelomer- alcohol-DTXS-db5c/ https://hawc.epa.gov/summary/data- pivot/assessment/100500256/Figure-
DTXSID30869884	Endocrine, Hematologic, Hepatic, Multi-System, Musculoskeletal, Nervous, Ocular, Reproductive, Respiratory, Urinary, and Whole Body	25-2H3H- Decafluoropentane_Inhalation_All/
	Literature Tagtree	https://hawc.epa.gov/summary/visual/assessment/100500256/PFAS-430XAgency-2H3H-Decafluoropentane-DTXSID-3812/
2H-Perfluoro-2-propanol DTXSID1022134	(Oral) Cardiovascular, Developmental, Endocrine, Gastrointestinal, Hematologic, Hepatic, Immune, Metabolic, Musculoskeletal, Nervous, Reproductive, Respiratory, Urinary, and Whole Body	https://hawc.epa.gov/summary/data- pivot/assessment/100500256/Figure- 7-2H-Perfluoro-2-propanol_Oral-All/
	(Inhalation) Cardiovascular, Endocrine, Gastrointestinal, Hepatic, Immune, Musculoskeletal, Nervous, Ocular, Reproductive, Respiratory, Urinary, and Whole Body	https://hawc.epa.gov/summary/data- pivot/assessment/100500256/Figure- 26-2H-Perfluoro-2- propanol_Inhalation_All/
	Literature Tagtree	https://hawc.epa.gov/summary/visual /assessment/100500256/PFAS- 430XAgency-2H-Perfluoro-2- propanol-DTXSI-9696/
2-Methoxy-2H- perfluoropropane DTXSID80157187	Literature Tagtree	https://hawc.epa.gov/summary/visual /assessment/100500256/PFAS- 430XAgency-2-Methoxy-2H- perfluoropropane-e0b2/
2-Vinyl(1- bromoperfluoroethane) DTXSID4066389	(Inhalation) Cardiovascular, Hematologic, Hepatic, Immune, Metabolic, Reproductive, Respiratory, Urinary, and Whole Body	https://hawc.epa.gov/summary/data- pivot/assessment/100500256/Figure- 27-2-Vinyl1- bromoperfluoroethane_Inhal-12cf/

3-ethoxy- 1,1,1,2,3,4,4,5,5,6,6,6- dodecafluoro-2- (trifluoromethyl)- hexane DTXSID90870315	(Oral) Developmental, Endocrine, Hematologic, Hepatic, Immune, Nervous, Reproductive, Urinary, and Whole Body	https://hawc.epa.gov/summary/visual/assessment/100500256/PFAS-430XAgency-2-Vinyl1-bromoperfluoroethane-64e8/https://hawc.epa.gov/summary/data-pivot/assessment/100500256/Figure-9-3-Ethoxyperfluoro2-methylhexane_Oral-All/
	(Inhalation) Hepatic, Immune, Metabolic, Nervous, Reproductive, Urinary, and Whole Body	https://hawc.epa.gov/summary/data- pivot/assessment/100500256/Figure- 28-3-Ethoxyperfluoro2- methylhexane_Inh-0921/
	Literature Tagtree	https://hawc.epa.gov/summary/visual/assessment/100500256/PFAS-430XAgency-3-Ethoxyperfluoro2-methylhexa-fc0c/
6:2 Fluorotelomer phosphate monoester (DTXSID90558000)	Literature Tagtree	https://hawc.epa.gov/summary/visual /assessment/100500256/PFAS- 430XAgency-62-Fluorotelomer- phosphate-monoest/
6:2 FTCA DTXSID50472556	(Oral) Hepatic, Metabolic, and Whole Body Literature Tagtree	https://hawc.epa.gov/summary/data- pivot/assessment/100500256/Figure- 10-62-FTCA_Oral-All/ https://hawc.epa.gov/summary/visual /assessment/100500256/PFAS- 430XAgency-2-Perfluorohexyl- ethanoic-aci-5b45/
7-H- Perfluoroheptanoate (DTXSID20892929)	Literature Tagtree	https://hawc.epa.gov/summary/visual/assessment/100500256/PFAS-430XAgency-7-H-Perfluoroheptanoate/
8:2 Fluorotelomer thioether amido sulfonate (DTXSID90892335)	Literature Tagtree	https://hawc.epa.gov/summary/visual/assessment/100500256/82-Fluorotelomer-thioether-amido-sulfonate-DT-8e81/
ADONA DTXSID00874026	(Oral) Cardiovascular, Endocrine, Hematologic, Hepatic, Immune, Metabolic, Nervous, Ocular, Reproductive, and Urinary	https://hawc.epa.gov/summary/data- pivot/assessment/100500256/Figure- 11a-ADONA_Oral-All/

	T	
	(Oral) Whole Body	https://hawc.epa.gov/summary/data- pivot/assessment/100500256/Figure- 11a-ADONA_Oral-male-90d-whole-
	(5.1)	body-and-4e06/
	(Oral)	https://hawc.epa.gov/summary/data-
	Cardiovascular, Endocrine,	pivot/assessment/100500256/Figure-
	Hematologic, Hepatic, Immune,	11c-ADONA_Oral-male-28d-all-
	Metabolic, Nervous,	except-who-115f/
	Reproductive, and Urinary	
	(Oral)	https://hawc.epa.gov/summary/data-
	Developmental, Reproductive,	pivot/assessment/100500256/Figure-
	and Whole Body ^a	11-ADONA_Oral-devtoxscreen/
	(Oral)	https://hawc.epa.gov/summary/data-
	Cardiovascular, Endocrine,	pivot/assessment/100500256/Figure-
	Hematologic, Hepatic, Immune,	14-ADONA_Oral-female-28d-all-
	Metabolic, Nervous,	except-wholebo/
	Reproductive, and Urinary	
	(Oral)	https://hawc.epa.gov/summary/data-
	Cardiovascular, Endocrine,	pivot/assessment/100500256/Figure-
	Hematologic, Hepatic, Immune,	16-ADONA_Oral-female-90d-all-
	Metabolic, Nervous, Ocular,	except-whole/
	Reproductive, and Urinary	
	Literature Tagtree	https://hawc.epa.gov/summary/visual
		/assessment/100500256/PFAS-
		430XAgency-Ammonium-48-dioxa-
		3H-perfluor-4ba6/
Dichloromethyl((perfluo	Literature Tagtree	https://hawc.epa.gov/summary/visual
rohexyl)ethyl)silane		/assessment/100500256/PFAS-
DTXSID00223797		430XAgency-
		Dichloromethylperfluorohexyle-311c/
Heptafluoropropyl	(Inhalation)	https://hawc.epa.gov/summary/data-
iodide	Developmental, Reproductive,	pivot/assessment/100500256/Figure-
DTXSID1061073	and Whole Body	30-
		Hexafluoroisopropanol_Inhalation_All
		/
Octafluoro-1,4-	(Oral)	https://hawc.epa.gov/summary/data-
diiodobutane	Multi-system, Endocrine,	pivot/assessment/100500256/Figure-
DTXSID5030030	Hepatic, Reproductive, and	17a-Octafluoro-14-
	Whole Body	diiodobutane_Oral-All/
	(Oral)	https://hawc.epa.gov/summary/data-
	Hepatic and	pivot/assessment/100500256/Figure-
	Reproductive	17b-Octafluoro-14-
		diiodobutane_Abnorma-9359/

T	I	
Perfluoro-1,4-	(Inhalation)	https://hawc.epa.gov/summary/data-
diiodobutane	Cardiovascular, Dermal,	pivot/assessment/100500256/Figure-
DTXSID30190948	Endocrine, Gastrointestinal,	36-Perfluoro-14-
	Hematologic, Hepatic, Immune,	diiodobutane_Inhalation_All/
	Musculoskeletal, Nervous,	
	Ocular, Reproductive,	
	Respiratory, Urinary, and	
	Whole Body	
	(Inhalation)	https://hawc.epa.gov/summary/data-
	Endocrine, Gastrointestinal,	pivot/assessment/100500256/Figure-
	Hepatic, Immune, Nervous,	36a-Perfluoro-14-
	Ocular, Reproductive,	diiodobutane_Inhalatiion/
	Respiratory, and Urinary	
	(Inhalation)	https://hawc.epa.gov/summary/data-
	Cardiovascular, Dermal,	pivot/assessment/100500256/Figure-
	Hematologic, Metabolic,	36b-Perfluoro-14-
	Musculoskeletal, and Whole	diiodobutane_Inhalation/
	Body	
	(Inhalation)	https://hawc.epa.gov/summary/data-
	Cardiovascular, Endocrine,	pivot/assessment/100500256/Figure-
	Hepatic, Immune, Nervous,	37-Perfluoro-14-
	Reproductive, Respiratory,	diiodobutane_Inhalati-9db3/
	Urinary, and Whole Body	_
	(Inhalation)	https://hawc.epa.gov/summary/data-
	Endocrine, Hematologic,	pivot/assessment/100500256/Figure-
	Hepatic, Immune, Metabolic,	38-Perfluoro-14-
	Reproductive, Respiratory,	diiodobutane Inhalati-5875/
	Urinary, and Whole Body	
	Literature Tagtree	https://hawc.epa.gov/summary/visual
		/assessment/100500256/PFAS-
		430XAgency-Perfluoro-14-
		diiodobutane-DTX-9102/
Perfluoro-2-methyl-3-	(Inhalation)	https://hawc.epa.gov/summary/data-
pentanone	Endocrine, Hematologic,	pivot/assessment/100500256/Figure-
DTXSID4074932	Hepatic, Immune, Multi-	39-Perfluoro-2-methyl-3-
	System, Nervous, Ocular,	pentanone_Inha-8215/
	Reproductive, Urinary, and	·
	Whole Body	
	(Inhalation)	https://hawc.epa.gov/summary/data-
	Cardiovascular, Endocrine,	pivot/assessment/100500256/Figure-
	Gastrointestinal, Hematologic,	39-Perfluoro-2-methyl-3-
	Hepatic, Immune, Multi-	pentanone Inh-c016/
	System, Nervous, Ocular,	
	Reproductive, Respiratory,	
	Urinary, and Whole Body	
	ormary, and windle body	

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	(Inhalation) Hematologic, Hepatic, Immune, Metabolic, Multi-System, Respiratory, Urinary, and Whole Body	https://hawc.epa.gov/summary/data- pivot/assessment/100500256/Figure- 39c-Perfluoro-2-methyl-3- pentanone_Inh-a817/
	(Inhalation) Developmental, Reproductive, and Whole Body	https://hawc.epa.gov/summary/data- pivot/assessment/100500256/Figure- 39d-Perfluoro-2-methyl-3- pentanone_Inh-89d3/
	Literature Tagtree	https://hawc.epa.gov/summary/visual/assessment/100500256/PFAS-430XAgency-Perfluoro-2-methyl-3-pentanon-364e/
Perfluorododecanoic acid DTXSID8031861	(Oral) Endocrine, Hepatic, Reproductive, Urinary, and Whole Body ^a	https://hawc.epa.gov/summary/data- pivot/assessment/100500256/Figure- 21-Perfluorododecanoic- acid_OralChronic/
	(Oral) Endocrine, Hepatic, Metabolic, Nervous, Reproductive, and Whole Body	https://hawc.epa.gov/summary/data- pivot/assessment/100500256/Figure- 22-Perfluorododecanoic-acid_Oral- Shortterm/
	(Oral) Cardiovascular, Endocrine, Gastrointestinal, Hematologic, Hepatic, Immune, Metabolic, Musculoskeletal, Nervous, Reproductive, Urinary, and Whole Body	https://hawc.epa.gov/summary/data- pivot/assessment/100500256/Figure- 23a-Perfluorododecanoic- acid_Kato2014/
	(Oral) Developmental	https://hawc.epa.gov/summary/data- pivot/assessment/100500256/Figure- 23b-Perfluorododecanoic-acid_Oral- Kato-fa2c/
	(Oral) Developmental, Endocrine, Multi-System, Reproductive, and Whole Body	https://hawc.epa.gov/summary/data- pivot/assessment/100500256/Figure- 18-PFDoA_Oral-All/
	Literature Tagtree	https://hawc.epa.gov/summary/visual/assessment/100500256/PFAS-430XAgency-Perfluorododecanoic-acid-DTXS-db5d/
Perfluoromethylcyclohe xane DTXSID5059874	Literature Tagtree	https://hawc.epa.gov/summary/visual/assessment/100500256/PFAS-430XAgency-Perfluoromethylcyclohexane-DT-705b/

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TFA (sodium	(Oral)	https://hawc.epa.gov/summary/data-
trifluoroacetate)	Hepatic and Whole Body	pivot/assessment/100500256/Figure-
DTXSID0062715		19-TFA-sodium-trifluoroacetate_Oral-
		All/
Trideca-	(Oral)	https://hawc.epa.gov/summary/data-
1,1,1,2,2,3,3,4,4,5,5,6,6-	Cardiovascular, Developmental,	pivot/assessment/100500256/Figure-
fluorohexane	Endocrine, Nervous, Renal,	20-Trideca-1112233445566-
DTXSID20188995	Reproductive, Respiratory,	fluorohexane -459a/
	Urinary, and Whole Body	,
Trimethoxy((perfluoroh	Literature Tagtree	https://hawc.epa.gov/summary/visual
exyl)ethyl)silane		/assessment/100500256/PFAS-
DTXSID80235136		430XAgency-
D1//31D00233130		Trimethoxyperfluorohexylethyl-8933/
1-	Literature Tagtree	https://hawc.epa.gov/summary/visual
_	Literature Tagtree	
(Perfluorohexyl)octane		/assessment/100500256/PFAS-
(DTXSID20440585)		430XAgency-1-Perfluorohexyloctane-
4.0		DTXSID-8512/
1,8-	Literature Tagtree	https://hawc.epa.gov/summary/visual
Diiodoperfluorooctane		/assessment/100500256/PFAS-
(DTXSID50335975)		430XAgency-18-
		Diiodoperfluorooctane-DTXS-468b/
11-Chloroeicoafluoro-3-	Literature Tagtree	https://hawc.epa.gov/summary/visual
oxaundecane-1-		/assessment/100500256/PFAS-
sulfonate		430XAgency-11-chloroeicoafluoro-3-
(DTXSID40892507)		oxaund-6840/
2-(N-Ethyl-	Literature Tagtree	https://hawc.epa.gov/summary/visual
perfluorooctanesulfona		/assessment/100500256/PFAS-
mido)acetate		430XAgency-2-N-Ethyl-
(DTXSID60892504)		perfluorooctanesulf-47a9/
2-(N-	Literature Tagtree	https://hawc.epa.gov/summary/visual
Ethylperfluorooctanesulf	_	/assessment/100500256/PFAS-
onamido)acetic acid		430XAgency-2-N-
(DTXSID5062760)		Ethylperfluorooctanesulfo-2427/
2-(N-	Literature Tagtree	https://hawc.epa.gov/summary/visual
Methylperfluorooctanes	3	/assessment/100500256/PFAS-
ulfonamido)acetate		430XAgency-2-N-
(DTXSID00892503)		Methylperfluorooctanesulf-9adb/
2-(N-	Literature Tagtree	https://hawc.epa.gov/summary/visual
Methylperfluorooctanes		/assessment/100500256/PFAS-
ulfonamido)acetic acid		430XAgency-2-N-
(DTXSID10624392)		Methylperfluorooctanesulf-dee4/
2,2,3,3,4,4,5-	Literature Tagtree	https://hawc.epa.gov/summary/visual
Heptafluorotetrahydro-	Literature ragiree	/assessment/100500256/PFAS-
5-		1 .
		430XAgency-2233445-
(nonafluorobutyl)furan		Heptafluorotetrahydro-1891/
(DTXSID60871632)		

2H-Perfluoro-2-decenoic acid (DTXSID60825615)	Literature Tagtree	https://hawc.epa.gov/summary/visual/assessment/100500256/PFAS-430XAgency-2H-Perfluoro-2-decenoic-acid65bc/
2H-Perfluoro-2-octenoic acid (DTXSID00892326)	Literature Tagtree	https://hawc.epa.gov/summary/visual/assessment/100500256/PFAS-430XAgency-2H-Perfluoro-2-octenoic-acid74b5/
2- Perfluorodecylethanoic acid (DTXSID40892325)	Literature Tagtree	https://hawc.epa.gov/summary/visual/assessment/100500256/PFAS-430XAgency-2-Perfluorodecylethanoic-aci-1a6f/
2- Perfluorooctylethanoic acid (DTXSID50451109)	Literature Tagtree	https://hawc.epa.gov/summary/visual/assessment/100500256/PFAS-430XAgency-2-Perfluorooctylethanoic-aci-3c1f/
3- (Perfluoroethyl)propano I (DTXSID70869964)	Literature Tagtree	https://hawc.epa.gov/summary/visual/assessment/100500256/PFAS-430XAgency-3-Perfluoroethylpropanol-DTXS-1069/
3- (Perfluorohexyl)propano I (DTXSID70379871)	Literature Tagtree	https://hawc.epa.gov/summary/visual/assessment/100500256/PFAS-430XAgency-3-Perfluorohexylpropanol-DTXS-3b01/
4,8-Dioxa-3H- perfluorononanoic acid (DTXSID40881350)	Literature Tagtree	https://hawc.epa.gov/summary/visual/assessment/100500256/PFAS-430XAgency-48-Dioxa-3H-perfluorononanoic-892a/
6:2/8:2Fluorotelomerph osphatediester (DTXSID20873415)	Literature Tagtree	https://hawc.epa.gov/summary/visual/assessment/100500256/PFAS-430XAgency-6282-Fluorotelomer-phosphate1f70/
6:2Fluorotelomerphosp hatediester (DTXSID50561590)	Literature Tagtree	https://hawc.epa.gov/summary/visual/assessment/100500256/PFAS-430XAgency-62-Fluorotelomer-phosphate-di-fc99/
6:2Fluorotelomerthioeth eramidosulfonate (DTXSID70892333)	Literature Tagtree	https://hawc.epa.gov/summary/visual/assessment/100500256/PFAS-430XAgency-62-Fluorotelomer-thioether-am-34da/
6:2Fluorotelomerthioeth eramidosulfonic acid (DTXSID90892330)	Literature Tagtree	https://hawc.epa.gov/summary/visual/assessment/100500256/PFAS-430XAgency-62-Fluorotelomer-thioether-am-568d/
7:1Fluorotelomeralcohol (DTXSID5059793)	Literature Tagtree	https://hawc.epa.gov/summary/visual/assessment/100500256/PFAS-

		430XAgency-71-Fluorotelomer-
		alcohol-DTXS-7571/
8:2Fluorotelomerphosp	Literature Tagtree	https://hawc.epa.gov/summary/visual
hatediester		/assessment/100500256/PFAS-
(DTXSID90218051)		430XAgency-82-Fluorotelomer-
		phosphate-di-5b5a/
8:2Fluorotelomerphosp	Literature Tagtree	https://hawc.epa.gov/summary/visual
hatemonoester		/assessment/100500256/PFAS-
(DTXSID60874027)		430XAgency-82-Fluorotelomer-
		phosphate-mo-b64e/
8:2Fluorotelomerthioeth	Literature Tagtree	https://hawc.epa.gov/summary/visual
eramidosulfonic acid	J	/assessment/100500256/PFAS-
(DTXSID30892334)		430XAgency-82-Fluorotelomer-
(=,		thioether-am-e3be/
9:1Fluorotelomeralcohol	Literature Tagtree	https://hawc.epa.gov/summary/visual
(DTXSID00369826)		/assessment/100500256/PFAS-
(= 111011 2000010,		430XAgency-91-Fluorotelomer-
		alcohol-DTXS-ff20/
9-Chlorohexadecafluoro-	Literature Tagtree	https://hawc.epa.gov/summary/visual
3-oxanonane-1-sulfonic		/assessment/100500256/PFAS-
acid		430XAgency-9-chlorohexadecafluoro-
(DTXSID80892506)		3-oxan-7aea/
Heptafluoro-2-	Literature Tagtree	https://hawc.epa.gov/summary/visual
iodopropane	inclutare raginee	/assessment/100500256/PFAS-
(DTXSID5060982)		430XAgency-Heptafluoro-2-
(DIMOIDGGGGG,		iodopropane-DTX-7090/
Heptafluoropropyliodide	Literature Tagtree	https://hawc.epa.gov/summary/visual
(DTXSID1061073)	inclutare raginee	/assessment/100500256/PFAS-
(21/10/22020/07)		430XAgency-Heptafluoropropyl-
		iodide-DTXS-106b/
Hexaflumuron	Literature Tagtree	https://hawc.epa.gov/summary/visual
(DTXSID3032620)		/assessment/100500256/PFAS-
(= 17.0.2002020,		430XAgency-Hexaflumuron-
		DTXSID3032620/
Perfluoro-1,2-	Literature Tagtree	https://hawc.epa.gov/summary/visual
dimethylcyclobutane	inclutare raginee	/assessment/100500256/PFAS-
(DTXSID20880189)		430XAgency-Perfluoro-12-
(5176152666263)		dimethylcyclobut-4af5/
Perfluoro-1,3,5-	Literature Tagtree	https://hawc.epa.gov/summary/visual
trimethylcyclohexane		/assessment/100500256/PFAS-
(DTXSID80380039)		430XAgency-Perfluoro-135-
(=		trimethylcycloh-649c/
Perfluoro-4-	Literature Tagtree	https://hawc.epa.gov/summary/visual
(perfluoroethyl)cyclohex	included lugities	/assessment/100500256/Perfluoro-4-
ylsulfonate		perfluoroethylcyclohexylsulfonate-
(DTXSID20892328)		c7f0/
(51731520032320)		0/10/

Perfluorobutylmethylet	Literature Tagtree	https://hawc.epa.gov/summary/visual
her		/assessment/100500256/PFAS-
(DTXSID4073120)		430XAgency-Perfluorobutyl-methyl-
		ether-D-3d37/
Perfluorodecanesulfonat	Literature Tagtree	https://hawc.epa.gov/summary/visual
е		/assessment/100500256/PFAS-
(DTXSID00873014)		430XAgency-
,		Perfluorodecanesulfonate-DTXS-
		9de1/
Perfluorodecanesulfonic	Literature Tagtree	https://hawc.epa.gov/summary/visual
acid	Ü	/assessment/100500256/PFAS-
(DTXSID3040148)		430XAgency-Perfluorodecanesulfonic-
(2 11.0.200 102 10)		acid1033/
Perfluoroisohexane	Literature Tagtree	https://hawc.epa.gov/summary/visual
(DTXSID40188992)	Literature rugiree	/assessment/100500256/PFAS-
(517,51540150332)		430XAgency-Perfluoroisohexane-
		DTXSID40188992/
Perfluoromethyldecalin	Literature Tagtree	https://hawc.epa.gov/summary/visual
(DTXSID00871631)	Literature rugiree	/assessment/100500256/PFAS-
(517,51500071031)		430XAgency-Perfluoromethyldecalin-
		DTXSID-782f/
Perfluorononanesulfona	Literature Tagtree	https://hawc.epa.gov/summary/visual
	Literature Tagtree	
te (DTYSIDCO073010)		/assessment/100500256/PFAS-
(DTXSID60873010)		430XAgency-
		Perfluorononanesulfonate-DTXS-
5 (1		5155/
Perfluorononanesulfonic	Literature Tagtree	https://hawc.epa.gov/summary/visual
acid		/assessment/100500256/PFAS-
(DTXSID8071356)		430XAgency-
		Perfluorononanesulfonic-acida770/
Perfluorooctane	Literature Tagtree	https://hawc.epa.gov/summary/visual
(DTXSID0059794)		/assessment/100500256/PFAS-
		430XAgency-Perfluorooctane-
		DTXSID0059794/
Perfluorooctanesulfona	Literature Tagtree	https://hawc.epa.gov/summary/visual
midoethanol		/assessment/100500256/PFAS-
(DTXSID80892329)		430XAgency-
		Perfluorooctanesulfonamido-et-5a57/
Perfluoropentanesulfon	Literature Tagtree	https://hawc.epa.gov/summary/visual
ate		/assessment/100500256/PFAS-
(DTXSID70892479)		430XAgency-
		Perfluoropentanesulfonate-DTX-
		1875/
Perfluoropentanesulfoni	Literature Tagtree	https://hawc.epa.gov/summary/visual
c acid		/assessment/100500256/PFAS-
(DTXSID8062600)		,,,
(= ::::::::::::::::::::::::::::::::::::		1

		430XAgency-
		Perfluoropentanesulfonic-acid-23fa/
Perfluoropropanoate	Literature Tagtree	https://hawc.epa.gov/summary/visual
(DTXSID10892478)		/assessment/100500256/Perfluoropr
		opanoate-DTXSID10892478/
Perfluorosebacic acid	Literature Tagtree	https://hawc.epa.gov/summary/visual
(DTXSID50184728)		/assessment/100500256/PFAS-
		430XAgency-Perfluorosebacic-acid/
Trifluoroacetate	Literature Tagtree	https://hawc.epa.gov/summary/visual
(DTXSID60162799)		/assessment/100500256/PFAS-
		430XAgency-Trifluoroacetate-
		DTXSID60162799/
Trifluoroaceticanhydride	Literature Tagtree	https://hawc.epa.gov/summary/visual
(DTXSID90861920)		/assessment/100500256/PFAS-
		430XAgency-Trifluoroacetic-
		anhydride-DTX-cd2d/
Animal SQE Heatmap	Heatmap ^a	https://hawc.epa.gov/summary/visual
		/assessment/100500256/Animal-SQE-
		Heatmap/
Animal SQE	Heatmap ^a	https://hawc.epa.gov/summary/visual
Heatmap_nonECHA		/assessment/100500256/Animal-SQE-
		Heatmap_nonECHA/
PFAS 430	Literature Tagtree ^a	https://hawc.epa.gov/summary/visual
		/assessment/100500256/PFAS-430-
		HAWC-Literature-Inventory-Tree/
Additional PFAS of	Literature Tagtree ^a	https://hawc.epa.gov/summary/visual
Interest		/assessment/100500256/PFAS-
		XAgency-HAWC-Literature-Inventory-
		Tree/
PFAS 430/Additional	Embedded Exterrnal Website ^a	https://hawc.epa.gov/summary/visual
PFAS of Interest		/assessment/100500256/PFAS-430-
Evidence Map		XAgency-Evidence-Map-Dashboard/
Dashboard		
Comprehensive PFAS	Embedded External Website ^a	https://hawc.epa.gov/summary/visual
Dashboard		/assessment/100500256/Comprehens
		ive-PFAS-Dashboard/

 $^{^{\}it a}$ These visuals are also included as figures in the manuscript

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