

有機フッ素化合物（PFAS）ワーキンググループ （第2回） 議事次第

1. 日時及び場所

令和5年5月26日（金） 14:00～16:30
食品安全委員会 中会議室

2. 議 事

- （1）令和5年度食品安全委員会運営計画について
- （2）有機フッ素化合物（PFAS）の健康影響評価について
- （3）その他

< 配布資料一覧 >

議事次第、専門委員名簿

資料1 令和5年度食品安全委員会運営計画
資料2-1 選定された文献（実験動物）
資料2-2 選定された文献（疫学）
資料2-3 選定された文献（体内動態）
資料3 PFOS、PFOA等のリスク評価について

参考資料1 令和4年度食品安全確保総合調査 調査報告の概要
参考資料2 令和4年度食品安全確保総合調査 パーフルオロ化合物に係る国際機関等の評価及び科学的知見の情報収集並びに整理成果報告書

選定された文献（実験動物）

通し No.	エンド ポイント	評価値算出 機関	区分	タイトル	年	著者	雑誌
1	生殖・ 発生	ATSDR 2021	POD	Effects of developmental exposure to perfluorooctanoic acid (PFOA) on long bone morphology and bone cell differentiation	2016	Koskela et al.	Toxicol Appl Pharmacol
2	生殖・ 発生	EPA 2016 (PFOA) FSANZ 2017	POD	Effects of perfluorooctanoic acid exposure during pregnancy in the mouse	2006	Lau et al.	Toxicol Sci
3	生殖・ 発生	EPA 2016 (PFOS) ATSDR 2021 FSANZ 2017	POD	Two-generation reproduction and cross-foster studies of perfluorooctanesulfonate (PFOS) in rats	2005a	Luebker et al.	Toxicology
4	生殖・ 発生	EPA 2023 (PFOS)	POD候補	Neonatal mortality from in utero exposure to perfluorooctanesulfonate (PFOS) in Sprague-Dawley rats: dose-response, and biochemical and pharmacokinetic parameters	2005b	Luebker et al.	Toxicology
5	生殖・ 発生	EPA 2023 (PFOA)	POD候補	Effects of perfluorooctanoic acid exposure during pregnancy on the reproduction and development of male offspring mice	2018	Song et al.	Andrologia
6	生殖・ 発生	EPA 2023 (PFOA)	POD候補	Perfluorooctanoic acid exposure during pregnancy alters the apoptosis of uterine cells in pregnant mice.	2018	Li et al.	Int J Clin Exp Pathol
7	生殖・ 発生	EPA 2023 (PFOS)	POD候補	Effects of perfluorooctane sulfuric acid on placental PRL-family hormone production and fetal growth retardation in mice.	2015	Lee et al.	Mol Cell Endocrinol
8	生殖・ 発生	EFSA 2020	POD候補	Prenatal perfluorooctanoic acid exposure in CD-1 mice: low-dose developmental effects and internal dosimetry.	2011	Macon et al.	Toxicol Sci
9	生殖・ 発生	EFSA 2020	POD候補	The mammary gland is a sensitive pubertal target in CD-1 and C57Bl/6 mice following perinatal perfluorooctanoic acid (PFOA) exposure.	2015	Tucker et al.	Reprod Toxicol
10	生殖・ 発生	EFSA 2020	POD候補	Gestational and chronic low-dose PFOA exposures and mammary gland growth and differentiation in three generations of CD-1 mice.	2011	White et al.	Environ Health Perspect
11	生殖・ 発生			Perfluorooctanoic acid induced developmental toxicity in the mouse is dependent on expression of peroxisome proliferator activated receptor-alpha	2007	Abbott et al.	Toxicol Sci
12	生殖・ 発生			Maternal exposure causes mitochondrial dysfunction in brain, liver, and heart of mouse fetus: An explanation for perfluorooctanoic acid induced abortion and developmental toxicity	2019	Salimi et al.	Environ Toxicol

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13	生殖・ 発生			Developmental toxicity of perfluorooctanoic acid in the CD-1 mouse after cross-foster and restricted gestational exposures	2007	Wolf et al.	Toxicol Sci
14	生殖・ 発生			Effects of perfluorooctanoic acid (PFOA) exposure to pregnant mice on reproduction	2010	Yahia et al.	J Toxicol Sci
15	生殖・ 発生			Neonatal death of mice treated with perfluorooctane sulfonate	2008	Yahia et al.	J Toxicol Sci
16	生殖・ 発生			Combined effects of perfluorooctane sulfonate (PFOS) and maternal restraint stress on hypothalamus adrenal axis (HPA) function in the offspring of mice	2010	Ribes et al.	Toxicol Appl Pharmacol
17	生殖・ 発生			Gestational and lactational exposure to potassium perfluorooctanesulfonate (K+PFOS) in rats: developmental neurotoxicity	2009	Butenhoff et al.	Reprod Toxicol
18	生殖・ 発生			Effects of prenatal perfluorooctane sulfonate (PFOS) exposure on lung maturation in the perinatal rat	2003	Grasty et al.	Birth Defects Res B Dev Reprod Toxicol
19	生殖・ 発生			Prenatal window of susceptibility to perfluorooctane sulfonate-induced neonatal mortality in the Sprague-Dawley rat	2003	Grasty et al.	Birth Defects Res B Dev Reprod Toxicol
20	生殖・ 発生			Exposure to perfluorooctane sulfonate during pregnancy in rat and mouse. II: Postnatal Evaluation	2003	Lau et al.	Toxicol Sci
21	生殖・ 発生			Exposure to perfluorooctane sulfonate during pregnancy in rat and mouse. I: Maternal and Prenatal Evaluations	2003	Thibodeaux et al.	Toxicol Sci
22	生殖・ 発生			Effects of developmental perfluorooctane sulfonate exposure on spatial learning and memory ability of rats and mechanism associated with synaptic plasticity	2015	Wang et al.	Food Chem Toxicol
23	生殖・ 発生			Window of susceptibility to perfluorooctane sulfonate (PFOS)-induced neonatal mortality in the rat	2003	Grasty et al.	Res B Dev Reprod Toxicol
24	生殖・ 発生			Glucose and lipid homeostasis in adult rat is impaired by early-life exposure to perfluorooctane sulfonate	2014	Lv et al.	Environ Toxicol
25	生殖・ 発生			Gestational and lactational exposure to potassium perfluorooctanesulfonate (K+PFOS) in rats: toxicokinetics, thyroid hormone status, and related gene expression	2009	Chang et al.	Reprod Toxicol
26	生殖・ 発生			Prenatal and postnatal impact of perfluorooctane sulfonate (PFOS) on rat development: a cross-foster study on chemical burden and thyroid hormone system	2009	Yu et al.	Environ Sci Technol

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27	生殖・ 発生			Perfluorooctane sulfonate induces apoptosis of hippocampal neurons in rat offspring associated with calcium overload	2015	Wang et al.	Toxicology Research
28	生殖・ 発生			Inflammation-like glial response in rat brain induced by prenatal PFOS exposure	2011	Zeng et al.	Neurotoxicology
29	生殖・ 発生			Developmental perfluorooctane sulfonate exposure inhibits long-term potentiation by affecting AMPA receptor trafficking	2019	Zhang et al.	Toxicology

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30	代謝	Health Canada 2018 (PFOA)	POD	13-week dietary toxicity study of ammonium perfluorooctanoate (APFO) in male rats	2004	Perkins et al.	Drug Chem Toxicol
31	代謝	ATSDR 2021 ANSES 2017	POD	Evaluation of potential reproductive and developmental toxicity of potassium perfluorohexanesulfonate in Sprague Dawley rats	2009	Butenhoff et al.	Reprod Toxicol
32	代謝		専門委員 ／専門参 考人選択	Involvement of oxidative stress and inflammation in liver injury caused by perfluorooctanoic acid exposure in mice	2014	Yang et al.	Biomed Res Int
33	代謝		専門委員 ／専門参 考人選択	Subchronic toxicity studies on perfluorooctanesulfonate potassium salt in cynomolgus monkeys	2002	Seacat et al.	Toxicol Sci
34	代謝		専門委員 ／専門参 考人選択	Perfluorooctanoic acid-induced hepatic toxicity following 21-day oral exposure in mice	2008	Son et al.	Arch Toxicol
35	代謝			The effects of perfluorooctanoate on high fat diet induced non-alcoholic fatty liver disease in mice	2019	Li et al.	Toxicology
36	代謝			Adverse bioeffect of perfluorooctanoic acid on liver metabolic function in mice	2018	Wu et al.	Environ Sci Pollut Res Int
37	代謝			Comparative hepatic effects of perfluorooctanoic acid and WY 14,643 in PPAR-alpha knockout and wild-type mice	2008	Wolf et al.	Toxicol Pathol
38	代謝			Gene expression profiling in wild-type and PPAR α - null mice exposed to perfluorooctane sulfonate reveals PPAR α -independent effects	2010	Rosen et al.	PPAR Research
39	代謝			Effects of perfluoro fatty acids on peroxisome proliferation and mitochondrial size in mouse liver: Dose and time factors and effect of chain length	1993	Permadi et al.	Xenobiotica
40	代謝			Animal toxicity studies with ammonium perfluorooctanoate	1980	Griffith and Long	Am Ind Hyg Assoc J
41	代謝			Studies on the toxicological effects of PFOA and PFOS on rats using histological observation and chemical analysis	2009	Cui et al.	Arch Environ Contam Toxicol
42	代謝			Inhalation toxicity of ammonium perfluorooctanoate	1986	Kennedy et al.	Food Chem Toxicol

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43	代謝			Characterization of hepatic responses of rat to administration of perfluorooctanoic and perfluorodecanoic acids at low levels	1995	Kawashima et al.	Toxicology
44	代謝			Mechanisms of extrahepatic tumor induction by peroxisome proliferators in male CD rats	2001	Biegel et al.	Toxicol Sci
45	代謝			Induction of apoptosis and CYP4A1 expression in Sprague-Dawley rats exposed to low doses of perfluorooctane sulfonate	2011	Kim et al.	J Toxicol Sci
46	代謝			Gene expression profiles in rat liver treated with perfluorooctanoic acid (PFOA)	2006	Guruge et al.	Toxicol Sci
47	代謝			Toxicity of ammonium perfluorooctanoate in male cynomolgus monkeys after oral dosing for 6 months	2002	Butenhoff et al.	Toxicol Sci
48	免疫	EPA 2023 (PFOS)	POD候補	NTP technical report on the toxicity studies of perfluoroalkyl sulfonates (perfluorobutane sulfonic acid, perfluorohexane sulfonate potassium salt, and perfluorooctane sulfonic acid) administered by gavage to Sprague Dawley (Hsd:Sprague Dawley SD) rats	2019	NTP	-
49	免疫	EPA 2023 (PFOA)	POD候補	Perfluorooctanoic acid-induced immunomodulation in adult C57BL/6J or C57BL/6N female mice	2008	Dewitt et al.	Environ Health Perspect
50	免疫	EPA 2023 (PFOS)	POD候補	Testosterone-Mediated Endocrine Function and TH1/TH2 Cytokine Balance after Prenatal Exposure to Perfluorooctane Sulfonate: By Sex Status.	2016	Zhong et al.	Int J Mol Sci
51	免疫	EPA 2023 (PFOA)	POD候補	Evaluation of the immune system in rats and mice administered linear ammonium perfluorooctanoate.	2008	Loveless et al.	Toxicol Sci
52	免疫		専門委員 ／専門参 考人選択	Chronic effects of perfluorooctanesulfonate exposure on immunotoxicity in adult male C57BL/6 mice	2009	Dong et al.	Arch Toxicol
53	免疫		専門委員 ／専門参 考人選択	Suppression of humoral immunity in mice following exposure to perfluorooctane sulfonate	2008	Peden-Adams et al.	Toxicol Sci
54	免疫		専門委員 ／専門参 考人選択	Perfluorooctanoic acid alters T lymphocyte phenotypes and cytokine expression in mice	2009	Son et al.	Environ Toxicol
55	免疫		専門委員 ／専門参 考人選択	Exposure to the immunosuppressant, perfluorooctanoic acid, enhances the murine IgE and airway hyperreactivity response to ovalbumin	2007	Fairley et al.	Toxicol Sci

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56	免疫		専門委員 ／専門参 考人選択	Subchronic effects of perfluorooctanesulfonate exposure on inflammation in adult male C57BL/6 mice	2012	Dong et al.	Environ Toxicol
57	免疫			Perfluorooctanoic acid induces mast cell-mediated allergic inflammation by the release of histamine and inflammatory mediators	2012	Singh et al.	Toxicol Lett
58	免疫			Immunotoxic changes associated with a 7-day oral exposure to perfluorooctanesulfonate (PFOS) in adult male C57BL/6 mice	2009	Zheng et al.	Arch Toxicol
59	免疫			Effects of environmentally-relevant levels of perfluorooctane sulfonate on clinical parameters and immunological functions in B 6C 3F 1 mice	2011	Fair et al.	J Immunotoxicol
60	免疫			Effect of perfluorooctane sulfonate (PFOS) on influenza A virus-induced mortality in female B6C3F1 mice	2009	Guruge et al.	J Toxicol Sci
61	免疫			Effects of perfluorooctane sulfonate (PFOS) exposure on markers of inflammation in female B6C3F1 mice	2011	Mollenhauer et al.	J Environ Sci Health A Tox Hazard Subst Environ Eng

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62	神経	EPA 2021 (PFOS)	POD候補	Neurotoxic effects of lactational exposure to perfluorooctane sulfonate on learning and memory in adult male mouse	2020	Mshaty et al.	Food Chem Toxicol
63	神経		専門委員 ／専門参 考人選択	Neurotoxicity of perfluorooctane sulfonate to hippocampal cells in adult mice	2013	Long et al.	PLoS ONE
64	神経			The ubiquitous environmental pollutant perfluorooctanoic acid inhibits feeding behavior via peroxisome proliferator-activated receptor- α	2008	Asakawa et al.	Int J Mol Med
65	神経			Behavioral effects in adult mice exposed to perfluorooctane sulfonate (PFOS)	2007	Fuentes et al.	Toxicology
66	神経			Perfluorooctane sulfonate disrupts the blood brain barrier through the crosstalk between endothelial cells and astrocytes in mice	2019	Yu et al.	Environ Pollut
67	神経			Perfluorooctane sulfonate (PFOS) exposure could modify the dopaminergic system in several limbic brain regions	2008	Salgado et al.	Toxicol Lett
68	神経			Ultrasonic-induced tonic convulsion in rats after subchronic exposure to perfluorooctane sulfonate (PFOS)	2011	Kawamoto et al.	J Toxicol Sci
69	神経			Effects of subchronic perfluorooctane sulfonate exposure of rats on calcium-dependent signaling molecules in the brain tissue	2010	Liu et al.	Arch Toxicol
70	内分泌			Effects of perfluorooctane sulfonate on rat thyroid hormone biosynthesis and metabolism	2009	Yu et al.	Environ Toxicol Chem
71	内分泌			Regulation of corticosterone secretion is modified by PFOS exposure at different levels of the hypothalamic-pituitary-adrenal axis in adult male rats	2014	Pereiro et al.	Toxicol Lett
72	内分泌			Initial study on the possible mechanisms involved in the effects of high doses of perfluorooctane sulfonate (PFOS) on prolactin secretion	2015	Salgado et al.	Food Chem Toxicol
73	内分泌			Perfluorooctane sulfonate (PFOS) can alter the hypothalamic-pituitary-adrenal (HPA) axis activity by modifying CRF1 and glucocorticoid receptors	2018	Salgado-Freiria et al.	Toxicol Lett
74	内分泌			Perfluorooctane sulfonate effects on the reproductive axis in adult male rats	2014	López-Doval et al.	Environ Res

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75	内分泌			Estrogen-like activity of perfluoroalkyl acids in vivo and interaction with human and rainbow trout estrogen receptors in vitro	2011	Benninghoff et al.	Toxicol Sci
76	内分泌			Estrogen-like properties of perfluorooctanoic acid as revealed by expressing hepatic estrogen-responsive genes in rare minnows (<i>Gobiocypris rarus</i>)	2007	Wei et al.	Environ Toxicol Chem
77	心血管			The roles of bone morphogenetic protein 2 in perfluorooctanoic acid induced developmental cardiotoxicity and l-carnitine mediated protection	2018	Lv et al.	Toxicol Appl Pharmacol
78	腎臓			Elimination and toxicity of perfluorooctanoic acid during subchronic administration in the Wistar rat	1987	Hanhijärvi et al.	Pharmacol Toxicol
79	腎臓			Oxidative stress and Cx43-mediated apoptosis are involved in PFOS-induced nephrotoxicity	2022	Tang et al.	Toxicology
80	その他			Perfluorooctane sulfonic acid disrupts protective tight junction proteins via protein kinase D in airway epithelial cells	2022	Lucas et al.	Toxicol Sci

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81	発がん 性	EPA 2023 (PFOS) Health Canada 2018 (PFOS)	POD	Chronic dietary toxicity and carcinogenicity study with potassium perfluorooctanesulfonate in Sprague Dawley rats	2012	Butenhoff et al.	Toxicology
82	発がん 性	EPA 2023 (PFOS)	POD	104-Week Dietary Chronic Toxicity and Carcinogenicity Study with Perfluorooctane Sulfonic Acid Potassium Salt (PFOS; T-6295) in Rats (pp. 1-216).	2002	Thomford	3M
83	発がん 性	EPA 2023 (PFOA)	POD候補	NTP technical report on the toxicology and carcinogenesis studies of perfluorooctanoic acid (CASRN 335-67-1) administered in feed to Sprague Dawley (Hsd:Sprague Dawley SD) rats [NTP]	2020	NTP	-
84	発がん 性		専門委員 ／専門参 考人選択	Evaluation of the chronic toxicity and carcinogenicity of perfluorohexanoic acid (PFHxA) in Sprague-Dawley rats	2015	Klaunig et al.	Toxicol Pathol
85	発がん 性			Induction of Leydig cell adenomas by ammonium perfluorooctanoate: a possible endocrine-related mechanism	1992	Cook et al.	Toxicol Appl Pharmacol
86	発がん 性			Exposure to perfluorooctanoic acid leads to promotion of pancreatic cancer	2022	Kamendulis et al.	Carcinogenesis
87	発がん 性			Chronic dietary toxicity and carcinogenicity study with ammonium perfluorooctanoate in Sprague-Dawley rats	2012	Butenhoff et al.	Toxicology
88	遺伝毒 性			Mutagenic Effects of Perfluorooctanesulfonic Acid in gpt Delta Transgenic System Are Mediated by Hydrogen Peroxide.	2015	Wang et al.	Environ Sci Technol
89	遺伝毒 性			Can sustained exposure to PFAS trigger a genotoxic response? A comprehensive genotoxicity assessment in mice after subacute oral administration of PFOA and PFBA	2019	Crebelli et al.	Regul Toxicol Pharmacol
90	遺伝毒 性			Evaluation of perfluorooctanoate for potential genotoxicity	2014	Butenhoff et al.	Toxicol Rep
91	遺伝毒 性			The protective role of curcumin on perfluorooctane sulfonate-induced genotoxicity: Single cell gel electrophoresis and micronucleus test	2013	Çelik et al.	Food Chem Toxicol
92	遺伝毒 性			Curcumin prevents perfluorooctane sulfonate-induced genotoxicity and oxidative DNA damage in rat peripheral blood	2016	Eke et al.	Drug Chem Toxicol

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93	遺伝毒性			In vitro assessment of the cytotoxic and mutagenic potential of perfluorooctanoic acid	2008	Fernández et al.	Toxicol In Vitro
94	遺伝毒性			Peroxisome proliferator activated receptor-mediated genotoxicity of perfluoroalkyl acids using human lymphoblastoid cells	2016	Nakamura et al.	Fundamental Toxicol Sci
95	遺伝毒性			Perfluoroalkylated substances (PFAS) affect oxidative stress biomarkers in vitro	2015	Wielsøe et al.	Chemosphere

選定された文献（疫学）

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1	免疫	EFSA 2020	POD	Internal exposure to perfluoroalkyl substances (PFASs) and biological markers in 101 healthy 1-year-old children: associations between levels of perfluorooctanoic acid (PFOA) and vaccine response	2020	Abraham et al.	Arch Toxicol
2	免疫	EPA 2021 (PFOS, PFOA) EPA 2023 (PFOS, PFOA)	POD	Application of benchmark analysis for mixed contaminant exposures: Mutual adjustment of perfluoroalkylate substances associated with immunotoxicity	2018	Budtz-Jørgensen and Grandjean	PLoS One
3	免疫	EPA 2023 (PFOS, PFOA)	POD候補	Concentrations of tetanus and diphtheria antibodies in vaccinated Greenlandic children aged 7-12 years exposed to marine pollutants, a cross sectional study.	2021	Timmerman et al.	Environ Res
4	免疫	EPA 2021 (PFOS, PFOA)	過去の POD	Estimated exposures to perfluorinated compounds in infancy predict attenuated vaccine antibody concentrations at age 5-years	2017a	Grandjean et al.	J Immunotoxicol
5	免疫	EPA 2021 (PFOS, PFOA)	過去の POD	Serum vaccine antibody concentrations in adolescents exposed to perfluorinated compounds	2017b	Grandjean et al.	Environ Health Perspect
6	免疫	EPA 2021 (PFOS, PFOA) EFSA 2018	過去の POD	Serum vaccine antibody concentrations in children exposed to perfluorinated compounds	2012	Grandjean et al.	JAMA
7	免疫		専門委員／専門参考人選択	Prenatal exposure to perfluoroalkyl and polyfluoroalkyl substances and childhood atopic dermatitis: a prospective birth cohort study	2018	Chen et al.	Environ Health
8	免疫			Effect of prenatal exposure to per- and polyfluoroalkyl substances on childhood allergies and common infectious diseases in children up to age 7 years: The Hokkaido study on environment and children's health	2020	Ait Bamai et al.	Environ Int
9	免疫			Serum polyfluoroalkyl concentrations, asthma outcomes, and immunological markers in a case-control study of Taiwanese children	2013	Dong et al.	Environ Health Perspect
10	免疫			PFAS (per- and polyfluoroalkyl substances) and asthma in young children: NHANES 2013-2014	2020	Jackson-Browne et al.	Int J Hyg Environ Health
11	免疫			Exposure to perfluoroalkyl substances and allergic outcomes in children: A systematic review and meta-analysis	2020	Luo et al.	Environ Res
12	免疫			Exposure to perfluoroalkyl substances and neonatal immunoglobulin profiles in the upstate KIDS study (2008-2010)	2022	Jones et al.	Environ Pollut
13	免疫			Effects of exposure to per- and polyfluoroalkyl substances on vaccine antibodies: A systematic review and meta-analysis based on epidemiological studies	2022	Zhang et al.	Environ Pollut

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14	免疫			Prenatal exposure to perfluorinated chemicals and relationship with allergies and infectious diseases in infants	2012	Okada et al.	Environ Res
15	免疫			Prenatal exposure to perfluoroalkyl acids and prevalence of infectious diseases up to 4 years of age	2017	Goudarzi et al.	Environ Int
16	免疫			Maternal levels of perfluoroalkyl substances (PFASs) during pregnancy and childhood allergy and asthma related outcomes and infections in the Norwegian Mother and Child (MoBa) cohort	2019	Impinen et al.	Environ Int
17	免疫			Prenatal exposure to perfluoroalkyl substances (PFASs) associated with respiratory tract infections but not allergy- and asthma-related health outcomes in childhood	2018	Impinen et al.	Environ Res
18	免疫			Prenatal exposure to perfluoroalkyl substances, immune-related outcomes, and lung function in children from a Spanish birth cohort study	2019	Manzano-Salgado et al.	Int J Hyg Environ Health
19	免疫			Prenatal perfluorooctanoic acid exposure is associated with early onset atopic dermatitis in 5-year-old children	2019	Wen et al.	Chemosphere
20	免疫			Exposure to perfluoroalkyl substances during fetal life and hospitalization for infectious disease in childhood: A study among 1,503 children from the Odense Child Cohort.	2021	Dalsager et al.	Environ Int
21	免疫			Cord blood gene expression supports that prenatal exposure to perfluoroalkyl substances causes depressed immune functionality in early childhood	2016	Pennings et al.	J Immunotoxicol

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22	生殖・発生	EPA 2023 (PFOS, PFOA)	POD	Maternal serum levels of perfluoroalkyl substances in early pregnancy and offspring birth weight.	2020	Wikström et al.	Pediatr Res
23	生殖・発生	EPA 2023 (PFOS, PFOA)	POD候補	Early-Pregnancy Plasma Concentrations of Perfluoroalkyl Substances and Birth Outcomes in Project Viva: Confounded by Pregnancy Hemodynamics?	2018	Sagiv et al.	Am J Epidemiol
24	生殖・発生	EPA 2023 (PFOS, PFOA)	POD候補	Perfluoroalkyl substances during pregnancy and offspring weight and adiposity at birth: Examining mediation by maternal fasting glucose in the healthy start study	2017	Starling et al.	Environ Health Perspect
25	生殖・発生	EPA 2023 (PFOS, PFOA)	POD候補	Are perfluorooctane sulfonate alternatives safer? New insights from a birth cohort study.	2020	Chu et al.	Environ Int
26	生殖・発生	EPA 2023 (PFOS)	POD候補	Serum perfluorooctanoic acid and perfluorooctane sulfonate concentrations in relation to birth outcomes in the Mid-Ohio Valley, 2005-2010.	2013	Darrow et al.	Environ Health Perspect
27	生殖・発生	EPA 2023 (PFOS)	POD候補	Associations of paternal and maternal per- and polyfluoroalkyl substances exposure with cord serum reproductive hormones, placental steroidogenic enzyme and birth weight.	2021	Yao et al.	Chemosphere
28	生殖・発生	EPA 2023 (PFOA)	POD候補	Combined Effects of Prenatal Exposures to Environmental Chemicals on Birth Weight.	2016	Govarts et al.	Int J Environ Res Public Health
29	生殖・発生		専門委員／専門参考人選択	Prenatal exposure to perfluorooctanoate and risk of overweight at 20 years of age: a prospective cohort study	2012	Halldorsson et al.	Environ Health Perspect
30	生殖・発生			Cumulative exposure to environmental pollutants during early pregnancy and reduced fetal growth: the Project Viva cohort	2018	Rokoff et al.	Environ Health
31	生殖・発生			Prenatal exposure to per- and polyfluoroalkyl substances and infant growth and adiposity: The healthy start study	2019	Starling et al.	Environ Int
32	生殖・発生			Associations of Perfluoroalkyl Substances (PFAS) with lower birth weight: an evaluation of potential confounding by glomerular filtration rate using a physiologically based pharmacokinetic model (PBPK)	2015	Verner et al.	Environ Health Perspect
33	生殖・発生			Gestational perfluoroalkyl substance exposure and body mass index trajectories over the first 12 years of life	2021	Braun et al.	Int J Obes (Lond)
34	生殖・発生			Attention deficit/hyperactivity disorder and childhood autism in association with prenatal exposure to perfluoroalkyl substances: A nested case-control study in the Danish National Birth Cohort	2015	Liew et al.	Environ Health Perspect

通し No.	エンドポイント	評価値算出 機関	区分	タイトル	年	著者	雑誌
35	生殖・発生			Early prenatal exposure to suspected endocrine disruptor mixtures is associated with lower IQ at age seven	2020	Tanner et al.	Environ Int
36	生殖・発生			Concentrations of perfluoroalkyl substances and bisphenol A in newborn dried blood spots and the association with child behavior	2018	Ghassabian et al.	Environ Pollut
37	生殖・発生			Prenatal and childhood exposure to per- and polyfluoroalkyl substances (PFASs) and child cognition	2018	Harris et al.	Environ Int
38	生殖・発生			The association between prenatal exposure to perfluoroalkyl substances and childhood neurodevelopment	2020	Spratlen et al.	Environ Pollut
39	生殖・発生			Prenatal and childhood exposure to poly- and perfluoroalkyl substances (PFAS) and cognitive development in children at age 8 years	2019	Vuong et al.	Environ Res
40	生殖・発生			The association between prenatal endocrine-disrupting chemical exposure and altered resting-state brain fMRI in teenagers	2020	Weng et al.	Brain Struct Funct
41	生殖・発生			The association between maternal perfluoroalkyl substances exposure and early attention deficit hyperactivity disorder in children: a systematic review and meta-analysis	2021	Qu et al.	Environ Sci Pollut Res Int
42	生殖・発生			Early life multiple exposures and child cognitive function: A multi-centric birth cohort study in six European countries	2021	Julvez et al.	Environ Pollut
43	生殖・発生			The association between prenatal perfluoroalkyl substance exposure and symptoms of attention-deficit/hyperactivity disorder in 8-year-old children and the mediating role of thyroid hormones in the Hokkaido study	2022	Itoh et al.	Environ Int
44	生殖・発生			Prenatal exposure to perfluoroalkyl substances and cardiometabolic risk in children from the Spanish INMA birth cohort study	2017	Manzano-Salgado et al.	Environ Health Perspect
45	生殖・発生			Gestational exposure to perfluoroalkyl substances and congenital heart defects: A nested case-control pilot study	2021	Ou et al.	Environ Int
46	生殖・発生			Prenatal exposure to per- and polyfluoroalkyl substances and childhood adiposity at 7 years of age	2022	Zhang et al.	Chemosphere
47	生殖・発生			Prenatal Exposure to Perfluoroalkyl Substances Associated With Increased Susceptibility to Liver Injury in Children	2020	Stratakis et al.	Hepatology
48	生殖・発生			Association of Prenatal Exposure to Endocrine-Disrupting Chemicals With Liver Injury in Children	2022	Midya et al.	JAMA Netw Open

通し No.	エンドポイント	評価値算出 機関	区分	タイトル	年	著者	雑誌
49	生殖・発生			Exposure to perfluoroalkyl substances during fetal life and pubertal development in boys and girls from the danish national birth cohort	2019	Ernst et al.	Environ Health Perspect
50	生殖・発生			Cord blood per- and polyfluoroalkyl substances, placental steroidogenic enzyme, and cord blood reproductive hormone	2019	Yao et al.	Environ Int
51	生殖・発生			Early life exposures to perfluoroalkyl substances in relation to adipokine hormone levels at birth and during childhood	2019	Shelly et al.	J Clin Endocrinol Metab
52	生殖・発生			Associations of perfluoroalkyl substances with adipocytokines in umbilical cord serum: A mixtures approach	2022	Ding et al.	Environ Res
53	生殖・発生			Exposure to Perfluoroalkyl acids and foetal and maternal thyroid status: a review	2020	Boesen et al.	Environ Health
54	生殖・発生			Association of exposure to prenatal perfluoroalkyl substances and estrogen receptor 1 polymorphisms with the second to fourth digit ratio in school-aged children: The Hokkaido study	2022	Nishimura et al.	Reprod Toxicol
55	生殖・発生			Associations of per- and polyfluoroalkyl substances (PFAS) and their mixture with oxidative stress biomarkers during pregnancy	2022	Taibl et al.	Environ Int
56	生殖・発生			Prenatal exposure to mixtures of persistent endocrine disrupting chemicals and early menarche in a population-based cohort of British girls	2021	Marks et al.	Environ Pollut
57	生殖・発生			Endocrine disruptors and neonatal anthropometry, NICHD Fetal Growth Studies - Singletons	2018	Buck Louis et al.	Environ Int
58	生殖・発生			Prenatal Exposure to Per- and Polyfluoroalkyl Substances (PFASs) and Association between the Placental Transfer Efficiencies and Dissociation Constant of Serum Proteins-PFAS Complexes	2019	Gao et al.	Environ Sci Technol
59	生殖・発生			Exposure to perfluorinated compounds and human semen quality in arctic and European populations	2012	Toft et al.	Hum Reprod
60	生殖・発生			Association of perfluoroalkyl and polyfluoroalkyl substances with premature ovarian insufficiency in Chinese women	2018	Zhang et al.	J Clin Endocrinol Metab
61	生殖・発生			The effects of perfluoroalkyl and polyfluoroalkyl substances on female fertility: A systematic review and meta-analysis	2022	Wang et al.	Environ Res
62	生殖・発生			Global Exposure to Per- and Polyfluoroalkyl Substances and Associated Burden of Low Birthweight	2022	Fan et al.	Environ Sci Technol

通し No.	エンドポイント	評価値算出 機関	区分	タイトル	年	著者	雑誌
63	生殖・発生			Per- and polyfluoroalkyl substances exposure during pregnancy and adverse pregnancy and birth outcomes: A systematic review and meta-analysis	2021	Gao et al.	Environ Res
64	生殖・発生			Association between per- and polyfluoroalkyl substances and semen quality	2022	Wang et al.	Environ Sci Pollut Res Int
65	生殖・発生			Associations between exposure to perfluoroalkyl substances and birth outcomes: A meta-analysis	2022	Yang et al.	Chemosphere

通し No.	エンドポイント	評価値算出 機関	区分	タイトル	年	著者	雑誌
66	代謝	EPA 2023 (PFOS, PFOA)	POD	Using 2003-2014 U.S. NHANES data to determine the associations between per- and polyfluoroalkyl substances and cholesterol: Trend and implications.	2019	Dong et al.	Ecotoxicol Environ Saf
67	代謝	EPA 2023 (PFOS, PFOA) EFSA 2018	POD候補	Association of perfluorooctanoic acid and perfluorooctane sulfonate with serum lipids among adults living near a chemical plant	2009	Steenland et al.	Am J Epidemiol
68	代謝	EPA 2023 (PFOS, PFOA)	POD候補	Per- and polyfluoroalkyl substances and blood lipid levels in pre-diabetic adults-longitudinal analysis of the diabetes prevention program outcomes study.	2019	Lin et al.	Environ Int
69	代謝	EFSA 2018	過去の POD	Association between plasma PFOA and PFOS levels and total cholesterol in a middle-aged Danish population	2013	Eriksen et al.	PLoS One
70	代謝	EFSA 2018	過去の POD	Exposure to Polyfluoroalkyl Chemicals and Cholesterol, Body Weight, and Insulin Resistance in the General US Population	2010	Nelson et al.	Environ Health Perspect
71	代謝		専門委員/専門参考人選択	Stochastic pharmacokinetic-pharmacodynamic modeling for assessing the systemic health risk of perfluorooctanoate (pfoa)	2018	Convertino et al.	Toxicol Sci
72	代謝			The association between PFOA, PFOS and serum lipid levels in adolescents	2021	Geiger et al.	Chemosphere
73	代謝			The association between perfluoroalkyl chemicals and serum lipid levels in children	2015	Zeng et al.	Sci Total Environ
74	代謝			Serum albumin mediates the effect of multiple per- and polyfluoroalkyl substances on serum lipid levels	2020	Fan et al.	Environ Pollut
75	代謝			Associations between lipid/lipoprotein levels and perfluoroalkyl substances among US children aged 6-11 years	2018	Jain et al.	Environ Pollut
76	代謝			The association between total serum isomers of per- and polyfluoroalkyl substances, lipid profiles, and the DNA oxidative/nitrative stress biomarkers in middle-aged Taiwanese adults	2020	Lin et al.	Environ Res
77	代謝			Association among total serum isomers of perfluorinated chemicals, glucose homeostasis, lipid profiles, serum protein and metabolic syndrome in adults: NHANES, 2013-2014	2018	Liu et al.	Environ Pollut
78	代謝			Exposure to Perfluoroalkyl Substances and Metabolic Outcomes in Pregnant Women: Evidence from the Spanish INMA Birth Cohorts	2017	Matilla-Santander et al.	Environ Health Perspect
79	代謝			Examining confounding by diet in the association between perfluoroalkyl acids and serum cholesterol in pregnancy	2015	Skuladottir et al.	Environ Res

通し No.	エンドポイント	評価値算出 機関	区分	タイトル	年	著者	雑誌
80	代謝			Perfluoroalkyl substance mixtures and cardio-metabolic outcomes in highly exposed male workers in the Veneto Region: A mixture-based approach	2022	Batzella et al.	Environ Res
81	代謝			PFAS Concentrations and Cardiometabolic Traits in Highly Exposed Children and Adolescents	2021	Canova et al.	Int J Environ Res Public Health
82	代謝			The PFAS Health Study: Systematic Literature Review	2018	Kirk et al.	-
83	代謝			Adiposity and glycemic control in children exposed to perfluorinated compounds	2014	Timmermann et al.	J Clin Endocrinol Metab
84	代謝			Perfluoroalkyl substances, metabolomic profiling, and alterations in glucose homeostasis among overweight and obese Hispanic children: A proof-of-concept analysis	2019	Alderete et al.	Environ Int
85	代謝			Longitudinal associations of exposure to perfluoroalkylated substances in childhood and adolescence and indicators of adiposity and glucose metabolism 6 and 12 years later: The European Youth Heart Study	2016	Domazet et al.	Diabetes Care
86	代謝			The association between perfluoroalkyl substances and lipids in cord blood	2020	Spratlen et al.	J Clin Endocrinol Metab
87	代謝			Environmental exposure to perfluoroalkyl substances in early pregnancy, maternal glucose homeostasis and the risk of gestational diabetes: A prospective cohort study	2021	Yu et al.	Environ Int
88	代謝			Early-life exposure to perfluoroalkyl substances in relation to serum adipokines in a longitudinal birth cohort	2022	Shih et al.	Environ Res
89	代謝			Association of perfluoroalkyl substances exposure with cardiometabolic traits in an island population of the eastern Adriatic coast of Croatia	2019	Chen et al.	Sci Total Environ
90	代謝			Perfluoroalkyl substances and metabolic syndrome	2019	Christensen et al.	Int J Hyg Environ Health
91	代謝			Association of serum levels of perfluoroalkyl substances (PFASs) with the metabolic syndrome (MetS) in Chinese male adults: A cross-sectional study	2018	Yang et al.	Sci Total Environ
92	内分泌・ 代謝			Positive association between perfluoroalkyl chemicals and hyperuricemia in children	2013	Geiger et al.	Am J Epidemiol
93	肝臓	EPA 2023 (PFOS, PFOA)	POD候 補	Liver function biomarkers disorder is associated with exposure to perfluoroalkyl acids in adults: Isomers of C8 Health Project in China	2019	Nian et al.	Environ Res

通し No.	エンドポイント	評価値算出 機関	区分	タイトル	年	著者	雑誌
94	肝臓	EPA 2023 (PFOS, PFOA)	POD候補	Serum perfluorooctanoate (PFOA) and perfluorooctane sulfonate (PFOS) concentrations and liver function biomarkers in a population with elevated PFOA exposure.	2012	Gallo et al.	Environ Health Perspect
95	肝臓	EPA 2023 (PFOA)	POD候補	Modeled perfluorooctanoic acid (PFOA) exposure and liver function in a mid-Ohio valley community	2016	Darrow et al.	Environ Health Perspect
96	肝臓			Sex differences in the association between perfluoroalkyl acids and liver function in US adolescents: Analyses of NHANES 2013-2016	2019	Attanasio	Environ Pollut
97	肝臓			Investigation of the Associations Between Low-Dose Serum Perfluorinated Chemicals and Liver Enzymes in US Adults	2010	Lin et al.	Am J Gastroenterol
98	肝臓			Environmental perfluoroalkyl acid exposures are associated with liver disease characterized by apoptosis and altered serum adipocytokines	2019	Bassler et al.	Environ Pollut
99	肝臓			Associations of perfluorinated chemical serum concentrations and biomarkers of liver function and uric acid in the US population (NHANES), 2007-2010	2015	Gleason et al.	Environ Res
100	肝臓			Per- and perfluoroalkyl substances alternatives, mixtures and liver function in adults: A community-based population study in China	2022	Liu et al.	Environ Int
101	肝臓			Individual and mixture associations of perfluoroalkyl substances on liver function biomarkers in the Canadian Health Measures Survey	2022	Borghese et al.	Environ Health
102	神経			Early-life exposure to persistent organic pollutants (OCPs, PBDEs, PCBs, PFASs) and attention-deficit/hyperactivity disorder: A multi-pollutant analysis of a Norwegian birth cohort	2019	Lenters et al.	Environ Int
103	神経			Childhood exposure to per- and polyfluoroalkyl substances and neurodevelopment in the CHARGE case-control study	2022	Oh et al.	Environ Res
104	心血管			Association of perfluoroalkyl substances with gestational hypertension and preeclampsia in the MIREC study	2020	Borghese et al.	Environ Int
105	心血管			Serum polyfluoroalkyl chemicals are associated with risk of cardiovascular diseases in national US population	2018	Huang et al.	Environ Int
106	心血管			Association between perfluoroalkyl acids and the prevalence of hypertension among US adults	2020	Liao et al.	Ecotoxicol Environ Saf
107	心血管			Perfluorooctanoic acid and cardiovascular disease in US adults	2012	Shankar et al.	Arch Intern Med

通し No.	エンドポイント	評価値算出 機関	区分	タイトル	年	著者	雑誌
108	腎臓			Perfluoroalkyl substances and kidney function in chronic kidney disease, anemia, and diabetes	2018	Conway et al.	Diabetes Metab Syndr Obes
109	腎臓			Renal function and isomers of perfluorooctanoate (PFOA) and perfluorooctanesulfonate (PFOS): Isomers of C8 Health Project in China	2019	Wang et al.	Chemosphere
110	腎臓			Isomers of per- and polyfluoroalkyl substances and uric acid in adults: Isomers of C8 Health Project in China	2019	Zeng et al.	Environ Int
111	腎臓			Perfluoroalkyl substances (PFASs) exposure and kidney damage: Causal interpretation using the US 2003-2018 National Health and Nutrition Examination Survey (NHANES) datasets	2021	Moon et al.	Environ Pollut
112	レビュー			Cumulative risk assessment of 17 perfluoroalkylated and polyfluoroalkylated substances (PFASs) in the Swedish population	2013	Borg et al.	Environ Int
113	方法論			Hazard quotient profiles used as a risk assessment tool for PFOS and PFOA serum levels in three distinctive European populations	2015	Ludwicki et al.	Environ Int
114	方法論			Derivation of a Human In Vivo Benchmark Dose for Perfluorooctanoic Acid From ToxCast In Vitro Concentration-Response Data Using a Computational Workflow for Probabilistic Quantitative In Vitro to In Vivo Extrapolation	2021	Loizou et al.	Front Pharmacol
115	分類			Commentary: cumulative risk assessment of perfluoroalkyl carboxylic acids and perfluoroalkyl sulfonic acids: what is the scientific support for deriving tolerable exposures by assembling 27 PFAS into 1 common assessment group?	2022	Colnot et al.	Arch Toxicol

通し No.	エンドポイント	評価値算出 機関	区分	タイトル	年	著者	雑誌
116	発がん性	EPA 2023 (PFOA)	POD	Serum concentrations of per- and polyfluoroalkyl substances and risk of renal cell carcinoma	2020	Shearer et al.	J Natl Cancer Inst
117	発がん性	EPA 2023 (PFOA)	POD候補	Perfluorooctanoic acid exposure and cancer outcomes in a contaminated community: a geographic analysis.	2013	Vieira et al.	Environ Health Perspect
118	発がん性		専門委員／専門参考人選択	Perfluorinated alkylated substances serum concentration and breast cancer risk: Evidence from a nested case-control study in the French E3N cohort	2019	Mancini et al.	Int J Cancer
119	発がん性		専門委員／専門参考人選択	Associations between Polyfluoroalkyl Substances Exposure and Breast Cancer: A Meta-Analysis	2022	Jiang et al.	Toxics
120	発がん性		専門委員／専門参考人選択	Plasma perfluoroalkyl substance exposure and incidence risk of breast cancer: A case-cohort study in the Dongfeng-Tongji cohort	2022	Feng et al.	Environ Pollut
121	発がん性			Exposure to perfluoroalkyl substances and risk of hepatocellular carcinoma in a multiethnic cohort	2022	Goodrich et al.	JHEP Rep
122	発がん性			Perfluorooctanoic acid (PFOA) exposures and incident cancers among adults living near a chemical plant	2019	Barry et al.	Environ Health Perspect
123	発がん性			Critical Review on PFOA, Kidney Cancer, and Testicular Cancer	2020	Bartell and Vieira	J Air Waste Manag Assoc
124	発がん性			A critical review of perfluorooctanoate and perfluorooctanesulfonate exposure and cancer risk in humans	2014	Chang et al.	Crit Rev Toxicol
125	発がん性			Perfluorooctanoate and perfluorooctanesulfonate plasma levels and risk of cancer in the general Danish population	2009	Eriksen et al.	J Natl Cancer Inst
126	発がん性			Glioma is associated with exposure to legacy and alternative per- and polyfluoroalkyl substances	2023	Xie et al.	J Hazard Mater
127	発がん性			Risk assessment for PFOA and kidney cancer based on a pooled analysis of two studies	2022	Steenland et al.	Environ Int
128	内分泌			Serum Biomarkers of Exposure to Perfluoroalkyl Substances in Relation to Serum Testosterone and Measures of Thyroid Function among Adults and Adolescents from NHANES 2011-2012	2015	Lewis et al.	Int J Environ Res Public Health
129	内分泌			Perfluoroalkyl and polyfluoroalkyl substances and maternal thyroid hormones in early pregnancy	2020	Aimuzi et al.	Environ Pollut

通し No.	エンドポイント	評価値算出 機関	区分	タイトル	年	著者	雑誌
130	内分泌			Association between organohalogenated pollutants in cord blood and thyroid function in newborns and mothers from Belgian population	2018	Dufour et al.	Environ Pollut
131	内分泌			Pharmacokinetic bias analysis of an association between clinical thyroid disease and two perfluoroalkyl substances	2019	Dzierlenga et al.	Environ Int
132	内分泌			Quantitative bias analysis of the association between subclinical thyroid disease and two perfluoroalkyl substances in a single study	2020	Dzierlenga et al.	Environ Res
133	内分泌			Association between perfluoroalkyl substance exposure and thyroid hormone/thyroid antibody levels in maternal and cord blood: The Hokkaido Study	2019	Itoh et al.	Environ Int
134	内分泌			Association of perfluorinated chemical exposure in utero with maternal and infant thyroid hormone levels in the Sapporo cohort of Hokkaido Study on the Environment and Children's Health	2016	Kato et al.	Environ Health Prev Med
135	内分泌			Thyroid function and perfluoroalkyl acids in children living near a chemical plant	2012	Lopez-Espinosa et al.	Environ Health Perspect
136	内分泌			Association between serum perfluorooctanoic acid (PFOA) and thyroid disease in the U.S. National Health and Nutrition Examination Survey	2010	Melzer et al.	Environ Health Perspect
137	内分泌			Perfluoroalkyl substances and thyroid stimulating hormone levels in a highly exposed population in the Veneto Region	2022	Gallo et al.	Environ Res
138	内分泌			Maternal Perfluoroalkyl Substances, Thyroid Hormones, and DIO Genes: A Spanish Cross-sectional Study	2021	Sarzo et al.	Environ Sci Technol
139	内分泌			Plasma concentrations of per- and polyfluoroalkyl substances at baseline and associations with glycemic indicators and diabetes incidence among high-risk adults in the Diabetes Prevention Program trial	2017	Cardenas et al.	Environ Health Perspect
140	内分泌			Perfluoroalkyl substances in older male anglers in Wisconsin	2016	Christensen et al.	Environ Int
141	内分泌			PFOA is associated with diabetes and metabolic alteration in US men: National Health and Nutrition Examination Survey 2003-2012	2018	He et al.	Sci Total Environ
142	内分泌			Nonlinear associations between dietary exposures to perfluorooctanoic acid (PFOA) or perfluorooctane sulfonate (PFOS) and type 2 diabetes risk in women: Findings from the E3N cohort study	2018	Mancini et al.	Int J Hyg Environ Health
143	内分泌			Plasma concentrations of perfluoroalkyl substances and risk of Type 2 diabetes: A prospective investigation among U.S. Women	2018	Sun et al.	Environ Health Perspect

通し No.	エンドポイント	評価値算出 機関	区分	タイトル	年	著者	雑誌
144	内分泌			Association between per- and polyfluoroalkyl substances and risk of gestational diabetes mellitus	2022	Wang et al.	Int J Hyg Environ Health
145	内分泌			Endocrine-disrupting chemicals and the risk of gestational diabetes mellitus: a systematic review and meta-analysis	2022	Yan et al.	Environ Health
146	内分泌			Prenatal exposure to perfluorodecanoic acid is associated with lower circulating concentration of adrenal steroid metabolites during mini puberty in human female infants. The Odense Child Cohort	2020	Jensen et al.	Environ Res
147	内分泌			Perfluoroalkyl substances and ovarian hormone concentrations in naturally cycling women	2015	Barrett et al.	Fertil Steril
148	その他			Associations of serum perfluoroalkyl substance and vitamin D biomarker concentrations in NHANES, 2003-2010	2019	Etzel et al.	Int J Hyg Environ Health
149	その他			Perfluoroalkyl substances and changes in bone mineral density: A prospective analysis in the POUNDS-LOST study	2019	Hu et al.	Environ Res

選定された文献（体内動態）

通し No.	モデル 採用	タイトル	年	著者	雑誌
1	EPA 2023	Dosimetric anchoring of in vivo and in vitro studies for perfluorooctanoate and perfluorooctanesulfonate.	2013	Wambaugh et al.	Toxicol Sci
2	EPA 2023	A simple pharmacokinetic model of prenatal and postnatal exposure to perfluoroalkyl substances (PFASs)	2016	Verner et al.	Environ Sci Technol
3	EPA 2023	A Generic Pharmacokinetic Model for Quantifying Mother-to-Offspring Transfer of Lipophilic Persistent Environmental Chemicals.	2022	Kapraun et al.	Toxicol Sci
4	EFSA 2020	Development of pbpk models for pfoa and pfos for human pregnancy and lactation life stages	2013	Loccisano et al.	J Toxicol Environ Health A
5	EFSA 2020	Evaluation and prediction of pharmacokinetics of PFOA and PFOS in the monkey and human using a PBPK model	2011	Loccisano et al.	Regul Toxicol Pharmacol
6		Isomer-Specific Binding Affinity of Perfluorooctanesulfonate (PFOS) and Perfluorooctanoate (PFOA) to Serum Proteins	2015	Beesoon and Martin	Environ Sci Technol
7		The Dilemma of perfluorooctanoate (PFOA) human half-life	2021	Dourson and Gadagbui	Regul Toxicol Pharmacol
8		Half-lives of PFOS, PFHxS and PFOA after end of exposure to contaminated drinking water	2018	Li et al.	Occup Environ Med
9		Concentrations of perfluoroalkyl substances (PFASs) in human embryonic and fetal organs from first, second, and third trimester pregnancies	2019	Mamsen et al.	Environ Int
10		Human donor liver and serum concentrations of perfluorooctanesulfonate and other perfluorochemicals	2003	Olsen et al.	Environ Sci Technol
11		Relationships of perfluorooctanoate and perfluorooctane sulfonate serum concentrations between mother-child pairs in a population with perfluorooctanoate exposure from drinking water	2012	Mondal et al.	Environ Health Perspect
12		Occurrence, temporal trends, and half-lives of perfluoroalkyl acids (PFAAs) in occupational workers in China	2016	Fu et al.	Sci Rep

通し No.	モデル 採用	タイトル	年	著者	雑誌
13		Renal clearance of perfluorooctane sulfonate and perfluorooctanoate in humans and their species-specific excretion	2005	Harada et al.	Environ Res
14		Biliary excretion and cerebrospinal fluid partition of perfluorooctanoate and perfluorooctane sulfonate in humans	2007	Harada et al.	Environ Toxicol Pharmacol
15		Isomer-Specific Distribution of Perfluoroalkyl Substances in Blood	2016	Jin et al.	Environ Sci Technol
16		Use of simple pharmacokinetic modeling to characterize exposure of Australians to perfluorooctanoic acid and perfluorooctane sulfonic acid	2010	Thompson et al.	Environ Int
17		Changes in concentrations of perfluorinated compounds, polybrominated diphenyl ethers, and polychlorinated biphenyls in Norwegian breast-milk during twelve months of lactation	2000	Thomsen et al.	Environ Sci Technol
18		Distribution of poly- and perfluoroalkyl substances in matched samples from pregnant women and carbon chain length related maternal transfer	2013	Zhang et al.	Environ Sci Technol
19		Trans-placental transfer of thirteen perfluorinated compounds and relations with fetal thyroid hormones	2011	Kim et al.	Environ Sci Technol
20		The transplacental transfer efficiency of per- and polyfluoroalkyl substances (PFAS): a first meta-analysis	2022	Appel et al.	J Toxicol Environ Health B Crit Rev
21		Apparent Half-Lives of Chlorinated-Perfluorooctane Sulfonate and Perfluorooctane Sulfonate Isomers in Aviation Firefighters	2022	Nilsson et al.	Environ Sci Technol
22		Physiologically based pharmacokinetic (PBPK) modeling of perfluorohexane sulfonate (PFHxS) in humans	2022	Sweeney and Lisa	Regul Toxicol Pharmacol
23		Risk Assessment of Perfluorooctane Sulfonate (PFOS) using Dynamic Age Dependent Physiologically based Pharmacokinetic Model (PBPK) across Human Lifetime	2021	Deepika et al.	Environ Res