



## Publications- the Environmental Pollutant Laboratory UNN

### Peer reviewed publications:

- Strand, T.A., Averina, M., Bakken, K.S., Basnet, S., Böttcher, Y., Huber, S., Hysing, M., Kvestad, I., Lüders, T., McCann, A., Pokhrel, D., Ranjitkar, S., Sharma, A.K., Shrestha, M., Ulak, M., Chandyo, R.K. «*Early life exposures, neurodevelopment, and health outcomes – a study protocol for a birth cohort study in Nepal.*», JMIR Research Protocols 2026, 15:e78593, doi: [10.2196/78593](https://doi.org/10.2196/78593)
- Jakobsen, K., Backmann, H., Nicolaysen, N.G., Zahn, R., Huber, S., Skogen, V., Kildal, A.B., Ytrebø, L-M. «*Renal clearance of endogenous lithium as a marker of proximal tubule function in sepsis and sepsis-associated acute kidney injury*», BMC Nephrology 2026, Vol 27:93, DOI: [10.1186/s12882-026-04743-1](https://doi.org/10.1186/s12882-026-04743-1)
- Teigen, K.A., Höper, A.C., Huber, S., Hegseth, M-N. «*Heavy metal blood concentrations in smelters and chimney sweepers in Norway*», Annals of Work Exposure and Health 2026, Vol 70:1, <https://doi.org/10.1093/annweh/wxaf089>
- Vogt, E., Sørby, S., Huber, S., Averina, A., Øksnes, M., Bjørke-Monsen, A.L. «*Serum concentrations of per- and polyfluoroalkyl substances in women with premature ovarian insufficiency: a cross-sectional case–control study*» Environmental Endocrinology 2025, Vol 1:2, <https://doi.org/10.1093/enendo/wkaf002>
- Oyeyemi, S-O., Averina, A., Huber, S., Charles, D., Furberg, A.S., Yigzaw, K.Y., Wilsgaard, T., Nielsen, C.S., Grimnes, G. «*Per- and polyfluoroalkyl substances and associated proteomic biomarker patterns of immuno-suppression and cell-proliferation in an adolescent population from Northern Norway: The Fit Futures Study*» Environmental Research 2025, Vol 282, 122096, <https://doi.org/10.1016/j.envres.2025.122096>
- Berg, V., Charles, D., Huber, S., Nøst, T.H., Sandanger, T., Averina, M., Bergdahl, I., Nilsen, M., Wilsgaard, T., Rylander, C. «*Multiple repeated pre- and post- diagnostic measurements of perfluoroalkyl substances in type 2 diabetes mellitus cases compared to controls: The Tromsø Study (1986-2016)*», Scientific Reports 2025, 15, 22026, <https://doi.org/10.1038/s41598-025-05422-1>
- Ranjitkar, S., Kvestad, I., Chandyo, R.K., Strand, T.A., Bakken, K.S., Ulak, M., Huber, S., Averina, M., Shrestha M., Hysing, M. «*The association between prenatal maternal Selenium concentration and neurodevelopment in early childhood, results from a mother-child cohort study*», Journal of Nutrition 2025, Vol 155:6, <https://doi.org/10.1016/j.tjn.2025.04.005>
- Coêlho, A.C.M.F., Charles, D., Nøst, T.H., Cioni, L., Huber, S., Herzke, D., Rylander, C., Berg, V., Sandanger, T. «*Temporal and cross-sectional associations of serum per- and polyfluoroalkyl substances (PFAS) and lipids from 1986 to 2016 -The Tromsø Study*», Environment International 2025, Vol 199, 109508, <https://doi.org/10.1016/j.envint.2025.109508>
- Arnemo, J.M., Averina, M., Bjørke-Monsen, A.L., Bolann, B.J., Brox, J., Eggesbø, M., Hokstad, I., Huber, S. «*Lead from ammunition harmful to public health*» Tidsskrift for den norske legeförening 2025, Volum 145, <https://doi.org/10.4045/tidsskr.25.0042>
- Johansen, M., Skeie, G., Braaten, T., Abel, M.H., Huber, S., Kjellevoll, M., Evensen, E., Rayman, M., Hansen, S. «*Inadequate iodine status among women of childbearing age in Northern Norway: a*



cross-sectional study" Food and Nutrition Research 2025, Vol 69

<https://doi.org/10.29219/fnr.v69.10802>

Bjørke-Monsen, A.L., Holstad, K., Huber, S., Averina, M., Bolann, B.J., Brox, J. "PFAS exposure is associated with an unfavourable metabolic profile in infants six months of age" Environment International 2024; Volume 193 <https://doi.org/10.1016/j.envint.2024.109121>

Mwapasa, M., Xu., S., Chakhame, B.M., Maluwa, Rollin, H., A., Choko, A., Huber, S., Odland, J.Ø. "Concentrations of potentially toxic metals and trace elements in pregnant women and association with birth outcomes: A cross-sectional study in Malawi", POLS Global Public Health 2024, Volume 4:11. <https://doi.org/10.1371/journal.pgph.0003521>

Averina M., Huber S., Bjørke-Monsen A.L., Eggesbø, M., Sabaredzovic A., Bolann B.J. «Alarmingly high levels of environmental pollutants in Norwegian children» Tidsskrift for den norske legeforening 2024, Volum 144, Hefte 12 DOI: [10.4045/tidsskr.24.0423](https://doi.org/10.4045/tidsskr.24.0423)

Bolann, B.J., Bjørke-Monsen, A.L., Averina, M., Brox, J., Eggesbø, M., Hokstad, I., Huber, S. «Hazardous substances going astray» Tidsskrift for den norske legeforening 2024, Volum 144, Hefte 11 DOI: <https://doi.org/10.4045/tidsskr.24.0295>

Adlard, B., Bonefeld-Jørgensen, E.C., Dudarev, A.A., Olafsdottir, K., Abass, K., Averina, M., Ayotte, P., Berner, J., Byrne, S., Caron-Beaudoin, E., Drysdale, M., Dumas, P., Garcia-Barrios, J., Gyllenhammar, I., Laird, B., Lemire, M., Aker, A., Lignell, S., Long, M., Norström, K., Packull-McCormick, S., Skaalum Petersen, M., Ratelle, M., Rautio, A., Timmerman, A., Toft, G., Weihe, P., Haugdahl Nøst, T., Wennberg, M. "Levels and trends of persistent organic pollutants in human populations living in the Arctic" International Journal of Circumpolar Health 2024, Volum 83:1, DOI: <https://doi.org/10.1080/22423982.2024.2392405>

Huber, S., Michel, J., Reijnen, M., Averina, M., Bolann, B.J., Odland, J.Ø., Hansen, S., Brox, J. "A Fast-Forward Dilute-and-Shoot Multielement Method for Analysis of 33 Elements in Human Whole Blood, Serum, and Urine by Inductively Coupled Plasma Mass Spectrometry: A Streamlined Approach for Clinical Diagnostic and Biomonitoring" Journal of Analytical Methods in Chemistry 2024, Volum 1, <https://doi.org/10.1155/2024/9944995>

Hansen, S., Xu., S., Huber, S., Álvarez, M.V., Odland, J.Ø. « Profile of per- and polyfluoroalkyl substances, source appointment, and determinants in Argentinean postpartum women" The Science of The Total Environment 915(Pt 3):170096; DOI: [10.1016/j.scitotenv.2024.170096](https://doi.org/10.1016/j.scitotenv.2024.170096)

Averina, M., Huber, S., Almås, B., Brox, J., Jacobsen, B.K., Furberg, A.-S., Grimnes, G. "Early menarche and other endocrine disrupting effects of per- and polyfluoroalkyl substances (PFAS) in adolescents from Northern Norway: the Fit Futures study." Environmental Research 2023; Volume 243, 117703 <https://doi.org/10.1016/j.envres.2023.117703>

Bolann, B, Huber, S., Averina, M., Eggesbø, M., Hokstad, I., Brox, J., Ørebech, P., Monsen, A.-L. "Should we eat more fish – or less?" Tidsskrift for den norske legeforening 2023, Volum 143, Hefte 11, <https://doi.org/10.4045/tidsskr.23.0235>

Charles, D., Berg, V., Nøst, T.H., Wilsgaard, T., Bergdahl, I.A., Huber, S., Ayotte, P., Averina, M., Sandanger, T. M., Rylander, C. "Polybrominated diphenyl ethers in type 2 diabetes mellitus cases and controls: Repeated measurements prior to and after diagnosis" International Journal of Hygiene and Environmental Health 2023; Volume 249, 114148. <https://doi.org/10.1016/j.ijheh.2023.114148>

Götsch, A., Averina, M., Brox, J., Huber, S. "Investigation of background contribution from different



*solvent brands used for sample preparation and analysis of persistent organic pollutants*  
 Organohalogen compounds 2023, 84

- Mwapasa, M., Huber, S., Chakhame, B.M., Maluwa, A., Odland, M.L., Rollin, H., Choko, A., Xu, S., Odland, J.Ø. "Serum Concentrations of Selected Poly- and Perfluoroalkyl Substances (PFASs) in Pregnant Women and Associations with Birth Outcomes. A Cross-Sectional Study from Southern Malawi", International Journal of Environmental Research and Public Health 2023, Volume 20-(3).  
<https://doi.org/10.3390/ijerph20031689>
- Mwapasa, M., Huber, S., Chakhame, B.M., Maluwa, A., Odland, M.L., Ndhlovu, V., Rollin, H., Xu, S., Odland, J.Ø. "Predictors of Maternal Serum Concentrations for Selected Persistent Organic Pollutants (POPs) in Pregnant Women and Associations with Birth Outcomes: A Cross-Sectional Study from Southern Malawi", International Journal of Environmental Research and Public Health 2023, Volume 20-(7). <https://doi.org/10.3390/ijerph20075289>
- Averina, M., Monsen, A.-L. B., Bolann, B.J., Brox, J., Eggesbø, M., Hokstad, I., Huber, S., Ørebech, P. "High level of heavy metals in crab meat." Tidsskrift for Den norske legeförening 2022; Volume 163, 107175 <https://doi.org/10.4045/tidsskr.22.0317>
- Bresson, S. E., Isom, S., Jensen, E.T., Huber, S., Oulhote, Y., Rigdon, J., Lovato, J., Liese, A.D., Pihoker, C., Dabelea, D., Ehrlich, S., Ruzzin, J.N.M. "Associations between persistent organic pollutants and type 1 diabetes in youth." Environment International 2022; Volume 163, 107175  
<https://doi.org/10.1016/j.envint.2022.107175>
- Varsi, K., Huber, S., Averina, M., Brox, J., Monsen, A.-L. B. "Quantitation of linear and branched perfluoroalkane sulfonic acids (PFASs) in women and infants during pregnancy and lactation." Environmental Research 2022; Volume 160, 107065 <https://doi.org/10.1016/j.envres.2021.107065>
- Varsi, K., Torsvik, I. K., Huber, S., Averina, M., Brox, J., Monsen, A.-L. B. "Impaired gross motor development in infants with higher PFAS concentrations." Environmental Research 2021; Volume 204, Part D, 112392 <https://doi.org/10.1016/j.envres.2021.112392>
- Xu, S., Hansen, S., Rautio, A., Riitta-Järvelin, M., Abass, K., Rysä, J., Palaniswamy, S., Huber, S., Grimalt, J.O., Dumas, P., Odland, J.Ø. "Monitoring temporal trends of dioxins, organochlorine pesticides and chlorinated paraffins in pooled serum samples collected from Northern Norwegian women: The MISA cohort study." Environmental Research 2021; Volume 204, Part A 111980  
<https://doi.org/10.1016/j.envres.2021.111980>
- Charles, D., Berg, V., Nøst, T.H., Bergdahl, I.A., Huber, S., Ayotte, P., Wilsgaard, T., Averina, M., Sandanger, T. M., Rylander, C. "Longitudinal changes in concentrations of persistent organic pollutants (1986–2016) and their associations with type 2 diabetes mellitus" Environmental Research 2021; Volume 204, Part B 112129 <https://doi.org/10.1016/j.envres.2021.112129>
- Bjørke-Monsen, A.-L., Huber, S., Averina, M., Brox, J., Bolann, B.J. «Tran inneholder også miljøgifter» Tidsskrift for Den norske legeförening 2021; doi: 10.4045/tidsskr.20.1037
- Berg, V., Charles, D., Bergdahl, I.A., Nøst, T.H., Sandanger, T. M., Tornevi, A., Huber, S., Fuskevåg, O.M., Rylander, C. "Pre- and post-diagnostic blood profiles of chlorinated persistent organic pollutants and metabolic markers in type 2 diabetes mellitus cases and controls" Environmental Research 2021; Volume 195:110846. s. 1-7 <https://doi.org/10.1016/j.envres.2021.110846>
- Dartey E., Ellingsen D.E., Berlinger B., Thomassen Y., Odland J.Ø., Brox J., Nartey V.K., Yeboah F.A., Huber



- S., "Per- and Polyfluoroalkyl Substances in Human Serum Samples of Selected Populations from Ghana"; International Journal of Environmental Research and Public Health (IJERPH) 2021 ;Volume 18.(4) <https://doi.org/10.3390/ijerph18041581>
- Averina, M., Brox, J., Huber, S., Furberg, A.S. "Exposure to perfluoroalkyl substances (PFAS) and dyslipidemia, hypertension and obesity in adolescents. The Fit Futures study" Environmental Research 2021; Volume 195 <https://doi.org/10.1016/j.envres.2021.110740>
- Bjørke-Monsen, A.-L., Varsi, K., Brox, J., Averina, M., Huber, S., "Perfluoroalkyl substances (PFAS) and mercury in never-pregnant women of fertile age: association with fish consumption and unfavorable lipid profile.", BMJ Nutrition, Prevention and Health 2020 <http://dx.doi.org/10.1136/bmjnph-2020-000131>
- Brox, J., Averina, M., Huber, S., "Kan miljøgifter true oss som art?" Tidsskrift for Den norske legeforening 2020; Volum 10. doi: 10.4045/tidsskr.20.0392
- Charles, D., Berg, V., Nøst, T.H., Huber, S., Sandanger, T. M., Rylander, C. "Pre- and post-diagnostic blood profiles of perfluoroalkyl acids in Type 2 Diabetes Mellitus cases and controls", Environmental International 2020, 145. <https://doi.org/10.1016/j.envint.2020.106095>
- Frøhlich, C., Sørum, V., Huber, S., Samuelsen, Ø., Berglund, F., Kristiansson, E., Kotsakis, S., Marathe, N.P., Larsson, D.G.J., Leiros, H.-K.S. "Structural and biochemical characterization of the environmental metallo- $\beta$ -lactamases MYO-1, ECV-1 and SHD-1", Journal of Antimicrobial Chemotherapy 2020, volum 75, 2555-2563; <https://doi.org/10.1093/jac/dkaa175>
- Chiudzu, G.M., Maluwa, A., Tomoko, T., Choko, A., Huber, S., Fuskevåg, O.M., Odland, J.Ø. "Evaluation Of Serum Concentrations Of Copper, Ferritin, Selenium, Zinc And Vitamin D At Birth In Women With Spontaneous Preterm Birth: A Case-Control Study In A Low Resource Country." Journal of Reproductive Medicine Gynaecology & Obstetrics 2020; Volume 5. (055) DOI:[10.24966/RMGO-2574/100055](https://doi.org/10.24966/RMGO-2574/100055)
- Chiudzu, G.M., Choko, A., Maluwa, A., Huber, S., Odland, J.Ø. "Maternal Serum Concentrations of Selenium, Copper and Zinc during Pregnancy are associated with Risk of Spontaneous Preterm Birth: A case-control study from Malawi" Journal of Pregnancy 2020, Volume 2020 <https://doi.org/10.1155/2020/9435972>
- Samuelsen, Ø., Åstrand, O. A. H., Frøhlich, C., Heikal, A., Skagseth, S., Carlsen, T. J. O., Leiros, H.-K.S., Bayer, A., Schnaars, C., Kildahl-Andersen, G., Lauksund, S., Finke, S., Huber, S., Gjøl, T., Andresen, A.M.S., Økstad, O.A., Rongved, P. "ZN148 Is a Modular Synthetic Metallo-beta-Lactamase Inhibitor That Reverses Carbapenem Resistance in Gram-Negative Pathogens In Vivo." Antimicrobial Agents and Chemotherapy 2020 Volume 64. (6), <https://doi.org/10.1128/AAC.02415-19>
- Huber, S., Averina, M., Brox, J. "Automated sample preparation and GC-API-MS/MS as a powerful tool for analysis of legacy POPs in human serum and plasma." Analytical Methods 2020; Volume 7. (12) s. 912-929 <https://doi.org/10.1039/C9AY02400J>
- Averina, M., Hervig, T., Huber, S., Kjær, M., Kristoffersen, E. K., Bolann, B.J. "Environmental pollutants in blood donors: The multicentre Norwegian donor study." Transfusion Medicine 2020, 1-9; <https://doi.org/10.1111/tme.12662>
- Averina, M., Brox, J., Huber, S., Furberg, A.S., Sørensen, M. "Serum perfluoroalkyl substances (PFAS) and risk of various allergies in adolescents. The Tromsø study Fit Futures in Northern Norway."



- Environmental Research 2019; Volume 169. s. 114-121  
<https://doi.org/10.1016/j.envres.2018.11.005>
- Averina, M., Brox, J., Huber, S., Furberg, A.S. "Perfluoroalkyl substances in adolescents in northern Norway: Lifestyle and dietary predictors. The Tromsø study, Fit Futures 1." Environment International 2018; Volume 114. s. 123-130 <https://doi.org/10.1016/j.envint.2018.02.031>
- Bolann, B.J., Huber, S., Ruzzin, J., Brox, J., Huitfeldt, H., Monsen, A.L.B. «Er miljøgifter i norsk kosthold skadelig for barn?» Tidsskrift for Den norske legeforening 2017; Volume 137.(4) s. 295-297 doi:10.4045/tidsskr.16.0978
- Bolann, B.J., Huber, S., Ruzzin, J., Brox, J., Huitfeldt, H., Monsen, A.L.B. «Miljøgifter i kosten handler om mer enn fisk.» Tidsskrift for Den norske legeforening 2017; Volume 137. (14-15) s. 973-974 doi:10.4045/tidsskr.17.0521
- Huber S., Remberger M., Kaj L., Schlabach M., Jörundsdóttir O.H., Vester J., Arnórsson M., Mortensen I., Schwartson R., Dam M. "A first screening and risk assessment of pharmaceuticals and additives in personal care products in waste water, sludge, recipient water and sediment from Faroe Islands, Iceland and Greenland." Science of the Total Environment 562 (2016) 13 – 25.  
<https://doi.org/10.1016/j.scitotenv.2016.03.063>
- Huber S., Brox, J. „An automated high-throughput SPE micro-elution method for perfluoroalkyl substances in human serum.“ Analytical and Bioanalytical Chemistry 2015; Volume 407.(13) s. 3751-3761. <https://doi.org/10.1007/s00216-015-8601-x>
- Berg, V., Nøst, T.H., Huber, S., Rylander, C., Hansen, S., Veyhe, A.S., Fuskevåg, O.M., Odland, J.Ø., Sandanger, T.M. „Maternal serum concentrations of per- and polyfluoroalkyl substances and their predictors in years with reduced production and use.“ Environment International 2014, 69:58 – 66. <https://doi.org/10.1016/j.envint.2014.04.010>
- Ullah, S., Huber, S., Bignert, A., Berger, U. "Temporal trends of perfluoroalkane sulfonic acids and their sulfonamide-based precursors in herring from the Swedish west coast 1991–2011 including isomer-specific considerations", Environment International 2014, 65:63-72  
<https://doi.org/10.1016/j.envint.2014.01.005>

## Reports:

- Mol, H., van Alst, R., Guigues, N., Vorkamp, K., Kukucka, P., Kutka, P., Lalere, B., Lautentie, M., Bichon, E., Schaefers, F., Duca, R., Anagnostopoulos, C., Bandow, N., Cheyins, C., De Cremer, K., Dehaut, A., Lopez, M.E., Fredriksen, H., Ghestem, J-P., Herzke, D., Huber, S., P., Costa, C.T., Costa, S., Huber, S., Karanikolopoulos. G., Kasiotis, K., Sakhi, A.K., Lambert, M., Warth, B., Wellmitz, J., Zardin, Z. «Guidance document QA/QC chemical analysis», Partnership for the Assessment of Risks from Chemicals, Deliverable, D9.4-1 Annex-1, WP 9 – T3, 11.07.2025, [https://www.eu-parc.eu/sites/default/files/2025-11/PARC\\_D9.4-1.zip](https://www.eu-parc.eu/sites/default/files/2025-11/PARC_D9.4-1.zip)
- Vorkamp, K., van Alst, R., Anagnostopoulos, C., Carvalho, P., Costa, C.T., Costa, S., Huber, S., Kasiotis, K., Lopez, M.E., Lepot, B., Zardin, Z. «Inventory Report Sampling: overview existing guidelines and protocols», Partnership for the Assessment of Risks from Chemicals Deliverable, D9.4-1 Annex-1, WP 9 – T3, 11.07.2025, [https://www.eu-parc.eu/sites/default/files/2025-11/PARC\\_D9.4-1.zip](https://www.eu-parc.eu/sites/default/files/2025-11/PARC_D9.4-1.zip)
- Odland, J.Ø., Xu, S., Huber, S., Dumas, P. "Persistent Organic Pollutants (POPs) in Human Samples from The MISA study (Northern Norway)." Norwegian Environment Agency 2021



22s. <https://www.miljodirektoratet.no/publikasjoner/2021/mars-2021/persistent-organic-pollutants-pops-in-human-samples-from-the-misa-study-northern-norway/>

## Master thesis:

Ole Fjose and Håkon Bjørge Nilsen Gårseth «*Mercury exposure in pregnant women in Bhaktapur, Nepal and health outcomes in infants*», Master thesis in Medicine (MED-3950), UiT The Arctic University of Norway 2025; supervisors Maria Averina, Tor A. Strand and Sandra Huber

Kine Pinstrup «*Per- and Polyfluoroalkyl Substances (PFAS) and the Immune System – The link between persistent forever chemicals and altered immune function*», Master thesis in Medicine (MED-3950), UiT The Arctic University of Norway 2025; supervisors Maria Averina and Oyeyemi, S-O.

Tetyana Voloshyna «*A study on the interactions between perfluorosulfonic acids and P-glycoprotein in the Caco-2 cell line model*», Master thesis in Biomedicine (MBI-3911), UiT The Arctic University of Norway 2021; supervisors Erik Dietrichs, Aina Westrheim Ravna, Ole-Martin Fuskevåg and Sandra Huber

Sofie Vibe «*A systematic review of association between organic environmental pollutants and testicular cancer*», Master thesis in Medicine (MED-3950), UiT The Arctic University of Norway 2020; supervisors Maria Averina and Sandra Huber

Jorunn Berntzen «*Er det en kausal sammenheng mellom fedme og diabetes type 2 og miljøgifter?*» Master thesis in Medicine (MED-3950), UiT The Arctic University of Norway 2018; supervisors Maria Averina and Mikhail Sovershæv