and irregular shape for use in pulmonary toxicity studies which will help answer questions about how physiochemical properties influence toxicity. Polyethylene terephthalate (PET) (Sigma), polyamide 6,6 (PA6,6) (Sigma), and polystyrene (PS) (GoodFellow) were chosen as the test polymers. PET, PA6,6, and PS were dissolved in hexafluoro-2-isopropanol, formic acid, and tetrahydrofuran respectively. Precipitation was performed through the addition of ethanol under probe ultrasonication. Particles were passed through a 5 µm sieve and centrifuged to remove over- and undersized particles. Fibres were fabricated through electrospinning of the same plastic solutions, a process using an electrical gradient to extrude polymer fibres with a diameter of 1-2 µm. Cryotome slicing was then performed to yield fibres with an aspect ratio >3. Both MP types were washed several times to remove residual solvent and other potential contaminants and left to dry. Size distribution was performed through a combination of SEM (Zeiss LEO 1525), and Dynamic Light Scattering (Zetasizer Pro), and fabricated particles were found to all have an aerodynamic diameter of <5 µm. Pyrolysis- Two-Dimensional Gas Chromatography Mass Spectrometry (MS), inductively coupled plasma MS, and Limulus Amebocyte Lysate assays were performed to test for methodological artefacts that may interfere with *in vitro* studies. This simple method for the fabrication of pristine MPs provides a resource to ask fundamental questions about how shape, size, and polymer chemistry influence pulmonary MP toxicity. These techniques can be adopted by the wider MP community to investigate more MP physicochemical properties than those commercially available. Preliminary *in vitro* toxicity studies using fabricated PS particles and fibres caused no significant decrease in cell viability after 24 hours of exposure at doses 3.125-100 µg/mL. This will be supplemented by a comprehensive screen of all fabricated MPs in a macrophage-like cell line.

3.25.P-We287 Controlling Contamination: A Comparison of Control Data Analysis Methods

Amanda Dawson[1]*, Marina Santana*[2]*, Joost LD Nelis*[1] *and Cherie Motti*[3]*, (1)CSIRO, Australia, (2)AIMS@JCU, James Cook University & Australian Institute of Marine Science, Australia, (3)Australian Institute of Marine Science, Australia*

After more than a decade of research, the harmonisation of methods has become an international priority in the field of environmental monitoring for microplastics (MPs). This harmonisation has focused predominantly on extraction and isolation methods, identification of MPs and, more recently reporting. However, there is currently no consensus on how the data generated from controls and blanks are used to correct the sample data. Common approaches used in microplastics studies include a) No correction; b) Subtraction; c) Subtraction of mean; d) Subtraction of LOD/LOQ; e) Spectra similarity; or f) Statistical analysis. This study evaluated 51 different data correction strategies based on variations of the 6 approaches listed above to determine the most suitable for application to MP datasets. These methods were tested on a dummy dataset which comprised of real background contamination collected from in situ laboratory analysis. Of the 51 data methods tested, only 7 managed to remove on average 95% of the contaminant data. Data correction methods based on total subtraction were unable to remove even 50% of the dataset, and hence are not recommended for use to correct MP datasets. All methods based on average subtraction, LOD/LOQ and spectra similarity were successful at removing at least 50% of the data. We recommend using the LOD/LOQ method combined with spectra similarity to remove known contaminants within MP datasets. However, the spectra similarity method relies on all items being analysed spectrally. Therefore, if all items are not spectrally characterised, the LOD/LOQ method without a spectra similarity step was also found to be acceptable.

3.25.P-We288 Interlaboratory Study on the Analysis of Microplastics

Ike van der Veen[1]*, Bert Van Bavel*[2] *and Steven Crum*[3]*, (1)Vrije University Amsterdam, Netherlands, (2)Norwegian Institute for Water Research (NIVA), Norway, (3)WEPAL-QUASIMEME, Netherlands*

Within the European quality Controlled Harmonization Assuring Reproducible Monitoring and assessment of plastic pollution (EUROqCHARM) project an interlaboratory comparison study (ILS) has been organised for the analyses of MP in environmental matrices. The aims of the study were to assess the variance between laboratories performing MP analyses, to assess the different methods used for MP analyses, and to assess the performance on the different type of methods used. With the overall aim of the study to move forward to validate and harmonize various methods.

The ILS focused on the analyses of MP in environmental realistic contaminated test materials. The samples included ‘soda’ tablets simulating water samples with the different polymers in the size region of 50-299 µm, and three sediment and sand samples.

98 laboratories subscribed to the study of which 67 submitted data. Most those laboratories reported on the number of particles (81-87%, depending on the matrix), and only 17-21% reported on the mass of MPs (i.e., mg/tablet or mg/kg). A diversity of methods was used for the extraction and analyses of MP.

Since only a small number of participants report on mass, most of the results on mass were insufficient to be able to perform any statistics on. For the reporting on number of particles, the variation (expressed as relative standard deviation (RSD)) in results was 51-130%, showing that the performance on MP analyses did not improve compared to previous ILS even though the identity of the polymers was known on forehand.

This high variation shows that there is a need for harmonization of methods for MP analyses, and a need for training in order to achieve a better agreement between laboratories performing MP analyses in environmental matrices.

3.25.P-We289 Value for Money: A Cost-effectiveness Analysis of Microplastic Sampling and Analytics

Nelle Siele Meyers[1]*, Gert Everaert*[2]*, Colin Janssen*[3] *and Bavo De Witte*[4]*, (1)Ocean and Human Health, Flanders Marine Institute (VLIZ), Belgium, (2)Ocean & Human health, Flanders Marine Institute (VLIZ), Belgium, (3)Laboratory for Environmental Toxicology (GhEnToxLab), Ghent University, Belgium, (4)Flanders Research Institute for Agriculture, Fisheries and Food (ILVO), Belgium*

The quest for increasingly small microplastic particles, together with their potential impact on ecosystems has expedited the

development of microplastic research in recent years. A wide range of sampling procedures, sample processing steps and sample analysis techniques, both manual and automated, have been established. Despite this progress, this diversification of techniques impedes cross-study comparability and can be confusing for reseachers. Many of the currently applied procedures are also perceived as expensive. Unanswered questions concerning MP abundance, composition, distribution and fate in the marine environment emphasize the need for standardised and reliable monitoring procedures to comply with the Marine Strategy Framework Directive (MSFD).
In our study, which was performed within the JPI Oceans Andromeda project, we performed a cost-effectiveness analysis (CEA) of frequently used methods for microplastic analysis in seawater on a European scale. Data was collected through an online survey consisting of 97 questions related to sample acquisition, sample processing, and sample analysis of preset scenarios. In these scenarios, seawater samples were defined with specific information on microplastic load and composition, microplastic size range, and suspended particulate matter concentration. Total working hours, personnel costs, sector of employment, European marine region of employment, and equipment costs/depreciation/usage were also included in the survey. The survey was performed during autumn 2022 and was spread to experts in the field through personal contacts in various European microplastics expert groups. Following the survey, key outcomes were discussed during two different workshops held with microplastics researchers and with policy makers. Their opinions and perspectives were then used to write up recommendations.
The survey allowed us to compare relative costs and outcomes of different methods based on real experiences of experts in the field. Obtained results allow to gain insight on which workflows provide the greatest value for money for seawater samples, as well as on key elements to which the CEA outcome is sensitive. By providing concrete and useful recommendations of monitoring strategies in terms of cost-effectivity, we want to support reseachers, policy makers and other stakeholders when choosing between different microplastic workflows during future monitoring campaigns in the scope of the MSFD.

3.25.P-We290 Microplastic Analytical Proficiency Testing: Using Immobilised Particles to Improve Experimental Designs
Robin Lenz[1]*, Kristina Enders*[2]*, Julia Muche*[1]*, Elisavet Kanaki*[1]*, Eva C. Vizsolyi*[3]*, Martin G.J. Löder*[3]*, Christian Laforsch*[4]*, Gabriele Eder*[5]*, Matthias Labrenz*[6] *and Dieter Fischer*[1]*, (1)Leibniz Institute of Polymer Research, Germany, (2)IPF, Germany, (3)University of Bayreuth, Germany, (4)University of Bayreuth, Animal Ecology I, Germany, (5)Österreichisches Forschungsinstitut für Chemie und Technik, Austria, (6)Leibniz Institut für Ostseeforschung Warnemünde, Germany*
Interlaboratory calibrations (ILCs), or ring trials, are important procedures to compare and validate the analytical proficiencies of different microplastic (MP) laboratories, techniques or instruments. Conducting an ILC, conventionally involves the preparation of artificial test samples. Every participant will obtain and measure an individual sample and report the result for comparison. There is a variety of published experimental designs for the preparation of the test sample either repetitively, or by splitting a common stock sample. However, especially when the tested material involves particles in the lower micrometer size ranges (here termed small microplastics, sMP, e.g. ~1 to 100 µm), an independent validation of the MP quantities in each replicate is not possible: the only techniques available to quantify them would be those that are supposed to be evaluated by the ILC itself. We introduce the idea of immobilised MP samples and demonstrate their implementation for ILCs. The conceptual difference to suspended ILC designs is that the same sample, in the same constitution, gets measured by every participant instead of individual replica.
The presented implementation is based on cryo-milled and sieved irregular MP particles (nominal sizes of 10 – 70 µm), which are filtered and arrested on silicon and aluminium oxide filters: two kinds microspectroscopic filter materials frequently used for MP quantification. Prior to filtration the particle suspension is mixed with a liquid inorganic binder which leads to an immobilisation of the particles after curing that can withstand flushing with running water or compressed air.
The intended effect of the switch from a design of repeated replica to a to a single immobilised sample is to exclude error terms from an ILC which are a) non-controllable, and b) specific to the ILC itself, thus not informative about the proficiencies in measurements of real world samples.
Preliminary results suggest that in a comparison between a conventional state-of-the-art suspended ILC design and one using a immobilisation, the relative standard deviation of the results reported by the participants was higher in the former by a factor of 6 to 7.
We also discuss other fields of application for the concept of immobilised MP particles: it has already been utilised for sMP purification method evaluations, but also MP sample storability, and correlative microscopy could benefit from the idea.

3.25.P-We291 Platinum Vaporization-deposition Coated Polycarbonate Membranes For Comprehensive, Multimodal, and Correlative Microscopic Analysis of Micro-and Nanoplastics and Other Environmental Particles
Karin Mattsson[1]*, Mats Hagberg*[2] *and Martin Hassellöv*[3]*, (1)Department of Marine Sciences, University of Gothenburg, Sweden, (2)Chalmers University of Technology, Sweden, (3)University of Gothenburg, Sweden*
Anthropogenic particles, including microplastics, are sampled from many matrixes, including the environment such as water, sediment, and air. However, there are no standard methods for sampling particles in the environment; thereby, many different approaches are used for both single particle and ensemble distribution or bulk chemical analyses.
For microplastics, the most commonly used sampling techniques are bulk sampling, i.e., the entire sample volume is collected and not reduced during the sampling, or volume-reduced sampling, i.e., the sample is reduced while collected, such as through filtration. In both cases, the particles of interest will end up on filters. The filters are then analyzed visually and spectroscopically. For particles larger than 300 mm, the quality of the filters is not as crucial as for smaller-sized particles. The size distribution of particles collected in the environment shows a higher abundance of particles within the smaller-sized classes. Because of their small size, high abundance of particles, and a potential biased impact from the operator, automated analysis are required. For automated analysis, the filters' surface has to be unstructured and smooth and have good optical contrast, low Raman, and