Supplementary Materials

Do's and don'ts of microplastic research: a comprehensive guide

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WEBINAR AND SURVEY

The webinar "Dos and Don'ts of Microplastic Research", organized by the journal Water Emerging Contaminants & Nanoplastics, was held on 17th April 2023 (https://www.oaepublish.com/wecn/journal/webinars_detail/192) to connect researchers with international experts, to facilitate introduction to the field, and encourage constructive dialogue. The webinar consisted of three talks conducted by international microplastics experts (co-authors of this manuscript) followed by a final general discussion prompted by questions from webinar participants and the webinar Chair (Joana C. Prata).

Participants were asked to fill in a short online survey during the webinar to identify their greatest challenges in working with microplastics and fuel discussion, gathering 37 responses (out of a peak of 44 simultaneous viewers, including speakers and staff). The survey consisted of five multiple choice questions and one optional open question so that the speakers could personalize their questions or comments [**Supplementary Material, Supplementary Table 1**]. Two questions addressed the participant's profile: geographic region (following the World Health Organization's categories) and career stage (according to European Union categories). The other three questions addressed their experience in working with microplastics, based on the results from a previous survey[1]. No personal information was collected that could be used to identify participants, maintaining anonymity and not being considered personal data according to European Union's Regulation (EU) 2016/679. At the start of the survey, participants were informed of the terms, namely the use of anonymous data for scientific purposes.

Most participants were researchers working with microplastics located in Europe, America, and Asia [**Table 1**]. Early career researchers (students and PhD candidates) comprised 51.3% of responses, highlighting the need for sharing practical information. The greatest challenges in microplastics sampling and analysis were the lack of standardized methods (78.4%), followed by contamination control (51.4%), lack of specialized equipment in the laboratory (51.4%), and difficulty in identifying microplastics and fibers (35.1%). Many participants commented on the lack of consensus in the definition of microplastics and nanoplastics and the need of techniques to characterize weathering, identify smaller microplastics (e.g., < 20 μm), and to prevent airborne contamination. The greatest challenges in (eco)toxicity studies of microplastics were access to adequate microplastics to be tested (37.8%), quantification of microplastics to prepare solutions or confirm nominal concentrations (37.8%), and use of environmentally relevant concentrations (37.8%). Difficulties in (eco)toxicity studies were more diverse, with 7 out of 11 categories gathering > 20% of responses, compared to 4 out of 10 in sampling and analysis. Participants also highlighted the difficulty in obtaining microplastics for (eco)toxicity assays and the excessive focus of research, so far, on aquatic organisms. While only a limited number of responses was collected (n = 37), the difficulties summarized in survey and mentioned during the webinar's discussion panel likely translate common challenges faced by researchers and thus are worthy of acknowledgement.

Supplementary Table 1. Survey responses (n = 37) regarding the participant characterization and difficulties in working with microplastics.

Question	Answers	Responses [% (n)]
Select your current region (according to WHO divisions):	African Region (AFR)	8.1 (3)
	Region of the Americas (AMR)	32.4 (12)
	South-East Asian Region (SEAR)	21.6 (8)
	European Region (EUR)	32.4 (12)
	Eastern Mediterranean Region (EMR)	2.7 (1)
	Western Pacific Region (WPR)	2.7 (1)
What is your career stage?	Student	24.3 (9)
	First Stage Researcher (R1) (Up to the point of PhD)	27.0 (10)
	Recognised Researcher (R2) (PhD holders or equivalent who are not yet fully independent)	8.1 (3)
	Established Researcher (R3) (Researchers who have developed a level of independence)	18.9 (7)
	Leading Researcher (R4) Researchers leading their research area or field)	13.5 (5)
	Other careers	8.1 (3)
Have you previously worked with microplastics?	Yes	89.2 (33)
	No	10.8 (4)
Select up to three challenges you have faced/considered when sampling microplastics:	Lack of standardized methods;	78.4 (29)
	Lack of equipment in the laboratory (e.g., FTIR);	51.4 (19)
	High costs of sampling;	13.5 (5)
	High effort of sampling (e.g., requiring many hours or person-month);	18.9 (7)
	Difficulty in contamination control;	51.4 (19)
	Difficulty in identifying microplastics and fibers;	35.1 (13)
	Difficulty in publishing results;	10.8 (4)
	Others;	16.2 (6)
	Not working in sampling;	10.8 (4)
	None.	2.7 (1)
Select up to three challenges you have faced/considered when working with (eco)toxicology of microplastics:	Access to adequate microplastics to be tested;	37.8 (14)
	Preparation of microplastics or fibers before the test;	32.4 (12)
	Quantification of microplastics to prepare solutions or confirm nominal concentrations;	37.8 (14)
	Selecting the most relevant endpoints to assess microplastic's toxicity;	29.7 (11)
	Using environmentally relevant concentrations of microplastics in assays;	37.8 (14)
	Confirming the presence of microplastics in internal tissues;	35.1 (13)
	Contamination control;	24.3 (9)
	Difficulty in publishing results;	16.2 (6)
	Others;	8.1 (3)
	Not working with (eco)toxicity;	16.2 (6)
	None.	2.7 (1)

Supplementary Table 2. Survey template used during the webinar "Do's and don'ts of microplastic research".

Informed Consent	If you wish to participate in the roundtable, please fill in the following form. Statistics will be used to fuel discussion. Respondents can also add questions or comments they wish to see addressed. The main topic of discussion will be the challenges that researchers face when working with microplastics. WECN is grateful for your participation and interest in this event. - Joana C. Prata Terms of participation: Participation in this form is voluntary. All data is confidential and anonymous. No personal data will be collected in this questionnaire. Data will be used solely for statistical and scientific ends. No data will be used for commercial ends, spam, or sold to third-parties. Competition and submission of the questionnaire implies acceptance of these terms by the respondent.
Select your current region (according to WHO divisions):	African Region (AFR) Region of the Americas (AMR) South-East Asian Region (SEAR) European Region (EUR) Eastern Mediterranean Region (EMR) Western Pacific Region (WPR)
What is your career stage?	Student First Stage Researcher (R1) (Up to the point of PhD) Recognised Researcher (R2) (PhD holders or equivalent who are not yet fully independent) Established Researcher (R3) (Researchers who have developed a level of independence) Leading Researcher (R4) Researchers leading their research area or field) Other careers
Have you previously worked with microplastics?	Yes No
Select up to THREE challenges you have faced/considered when SAMPLING microplastics:	Lack of standardized methods; Lack of equipment in the laboratory (e.g., FTIR); High costs of sampling; High effort of sampling (e.g., requiring many hours or person-month); Difficulty in contamination control; Difficulty in identifying microplastics and fibers; Difficulty in publishing results; Others; Not working in sampling; None.
Select up to THREE challenges you have faced/considered when working with (ECO)TOXICOLOGY of microplastics:	Access to adequate microplastics to be tested; Preparation of microplastics or fibers before the test; Quantification of microplastics to prepare solutions or confirm nominal concentrations; Selecting the most relevant endpoints to assess microplastic's toxicity; Using environmentally relevant concentrations of microplastics in assays; Confirming the presence of microplastics in internal tissues; Contamination control;

	Difficulty in publishing results; Others; Not working with (eco)toxicity; None.
Regarding the challenges in working with microplastics, do you have any comment or question you would like to ask the panel?	Open answer

References

1. Plastics - the facts 2022. Plastics Europe. Available from: https://plasticseurope.org/knowledge-hub/plastics-the-facts-2022/. [Last accessed on 26 Feb 2024]