

John White Symposium



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Exploring the biological identity of nanoplastics

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Despite recent attention to nanoplastics, there is still much to learn about their surface coatings that give them their “bioidentity”, which is critical to their behaviour in biological contexts. These coatings, corona, form on the particle as a complex mixtures of proteins and other surface-active chemicals – some strongly bound, and others weakly attached and exceptionally hard to study– which depend on both the particle and its environment.

We show that the nature of the protein corona in simple systems depends on the surface charge and particle size of the nanoplastics, and that nanoparticles with corona can aggregate to form higher order structures, which may trigger biological stress responses. We also show that model nanoplastics strongly associate with human alveolar epithelial cells, in a manner dependent on their protein corona.

However, there is much still to be learnt about the impact of complex environmental systems on these coatings, which is critical to the development of mitigation strategies for nanoplastic contamination.

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