Uncertainties surrounding novel supplement formulations

In this guide

59. There is a large degree of uncertainty regarding the identity and physicochemical properties of supplements claiming to have enhanced bioavailability that are available on the market. Many of these supplements make generic claims about improved bioavailability but do not indicate the supposed mechanisms underlying this effect and it is not clear what the point of comparison

is. Some of these products make precise quantitative claims about their relative absorption, but these statements are generally unreferenced and/or have a lack of associated evidence.

60. Many supplements on the market are advertised as ‘liposomal’, but the physicochemical identities of the supplements in question are not rigorously characterised. For instance, one company (Lipolife) claims that many liposomal supplements available on the market are of a low quality, and that some products advertised as ‘liposomal’ do not contain any liposomes. Their website also argues that the terms ‘liposomal’ and ‘liposome’ do not mean the same thing; whereas ‘liposomes’ refers to spherical phospholipid bilayer structures, ‘liposomal’ may refer to products that contain (phospho)lipids, but which do not necessarily contain liposomes (i.e., they are emulsions) (Lipolife, 2023).

61. Lipolife’s website displays analysis of several commercially available ‘liposomal’ vitamin C products in terms of particle size, polydispersity index (PDI), and nutrient content. Based on the conclusions of their analysis, one product did not contain any liposomes, whilst the particle size and PDI were highly variable between others. Moreover, one product contained approximately 4% of the claimed levels of vitamin C. It should be noted, however, the methods used in this analysis were not reported and the analysed products were from rival companies.

62. Lipolife also offer a service to which consumers can submit liposomal formulations purchased from other companies for analysis of key physicochemical properties. As of 16/02/2023, two supplements have been analysed. One returned generally acceptable results with a low PDI and expected particle size, whereas the other contained particles larger than the expected size for liposomes, a high PDI, and no detectable levels of the advertised supplement (nicotinamide mononucleotide).

63. Although these results need to be interpreted with caution, as the analytical methods were not reported, it indicates consumer uncertainty in the liposomal supplement market with potential significant heterogeneity in the formulation of products advertised as ‘liposomal’, and/or intentional mislabelling.

64. Altrient are another company arguing that many so-called ‘liposomal’ products contain no actual liposomes (Altrient, 2023). Abundance and Health, the distributor and retailer for Altrient, have also performed independent analysis of liposomal products. Their director has stated that analyses conducted in September 2020 demonstrated very low levels of liposomes in two products, and the absence of liposomes in another (Abundanceandhealth, 2021).

65. Although the analysis performed by Abundance and Health has not been published, it prompted an investigation by the Advertising Standards Authority (ASA) in November 2019 into one of the products that was being marketed as ‘liposomal vitamin C’. The company in question explained that the product was an ‘emulsion’ of phospholipids that wrapped around the vitamin C. However, following consultation with the Laboratory of the Government Chemist and scrutiny of the evidence and associated analytical data (particle tracking analysis), the ASA ruled that there was insufficient evidence to convincingly demonstrate the presence of liposomes in the product. A ruling was made against the advert appearing in that form again (Advertising Standards Authority, 2021).

66. As these considerations make clear, there is likely to be significant heterogeneity in the properties of supplements that are advertised as ‘liposomal’ and many of the products available lack testing and characterisation. There are therefore important limitations in our understanding of the identity of the formulations in question.