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Purification of cannabis extracts using Captura™ ‘nanosponge’ adsorbents: from kilo to micro, batch to high throughput, and selective elution

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Abstract: Previously, we described cyclodextrin-derived nanosponges that selectively bind hydrophobic cannabinoids and terpenes permitting facile separation of bioactive ingredients in solution by selectively binding target molecules in preference to unwanted contaminants. Simple filtration of insoluble adsorbent particles is followed by washing to remove waste materials and provides free-flowing powder containing hydrophobic compounds immobilized within the nanosponge core. We now demonstrate the utility of this workflow towards a kilogram scale for the extraction of fresh biomass at room temperature using simple equipment with minimal energy requirements and without the use of distillation or cryogenic extractions. Removal of cannabinoids from the nanosponge can be achieved with a simple ethanol wash or using supercritical CO₂ to provide a solvent free extract. We have shown that the Captura™ nanosponge workflow can be miniaturised to a 96-well plate format. With increasing demand for analysis of products as a requirement of GMP certified workflows, Captura™ 96-well plates allow the rapid, high-throughput cleanup and analysis of large numbers of cannabis samples.