

Table 1: Examples of Pickering emulsions for biomedical applications, including therapeutic delivery, biosensing and bioseparation.

| | Stabilising Particle | Stabilising particle size & shape | | Emulsion Type | Cargo | Ref |
|----------------------------|------------------------------------|--|----------------|----------------------|---------------------------|-------------|
| Topical application | Chitosan | 300 nm | Sphere | O/W | Rutin | 16 |
| | Cyclodextrin | 2 nm | Truncated cone | W/W | Bupivacaine Base | 18 |
| | Silica | 15-20 nm | Sphere | O/W | <i>all-trans</i> Retinol | 11 |
| | | 20 nm | Sphere | O/W | VX | 12 |
| | | 20 nm | Sphere | W/O | Caffeine | 10 |
| Oral application | Silybin | 300 nm | Flat sphere | O/W | Self-stabilising | 29 |
| | Starch | 100 nm | Irregular | O/W | Thymol | 17 |
| | | | | | Amphotericin B | |
| Magnesium hydroxide | 21 and 45 nm | n/a* | O/W | Ibuprofen | 28 | |
| Parenteral application | Glycerol monostearate | n/a* | n/a* | W/O | Oseltamivir Phosphate | 33 |
| | Polylactic-co-glycolic acid (PLGA) | n/a* | n/a* | W/O | Oxaliplatin | 30 |
| | | 100-120 nm | n/a* | O/W | Antigen | 34 |
| Biosensing & Bioseparation | N-Acylchitosan | n/a* | n/a* | O/W | <i>Escherichia coli</i> | 41 |
| | | | | | <i>Micrococcus luteus</i> | |
| | Silica | 10 nm | Sphere | O/W | S-Naproxen | 40 |
| | | 10 nm | Sphere | | 17- <i>b</i> -estradiol | 42 |
| | | 5-15 nm | Sphere | | Haemoglobin | 24 |
| | | 12 nm | Sphere | | Bisphenols | 44 |
| | | n/a* | n/a* | | W/O | Haemoglobin |
| | Magnetite | n/a* | n/a* | O/W | λ - Cyhalothrin | 42 |

*Information not applicable or not provided.

Table 2 Examples of stimuli-responsive Pickering emulsions for biomedical applications.

| | Stabilising Particle | Stabilising particle size & shape | | Emulsion Type | Stimulus Response | Ref |
|-----------------------------|--|--|--------------------------------|---------------------------|--|------------|
| pH | Graphene oxide@polylactic acid@hydroxyapatite | 1.2 $\mu\text{m}^{\#}$ | Sphere $^{\#}$ | Microcapsule (from W/O/W) | Induced cargo release | 51 |
| | Hairy silica | 20-30 nm | Hairy spheres | O/W or W/O or O/W/O | Phase inversion | 64 |
| Light | Silica@lanthanide-doped upconversion nanoparticles (UCNPs) | 150 nm | Sphere | W/O | Reversible phase inversion | 79 |
| | Silica | 250–350 nm | Sphere | O/W | Reversible phase inversion | 80 |
| | Titania | 30 nm | Hairy spheres | W/O | Reversible phase inversion | 52 |
| Temperature | Carbon dots/Poly(<i>N</i> -isopropylacrylamide) | 100 nm | Sphere | O/W | Controlled fluorescence | 9 |
| | Poly(<i>N</i> -isopropylacrylamide) | 820 nm (Fe ₃ O ₄) | Hairy irregular sphere | O/W | Demulsification | 85 |
| | Silica | 20 nm | Sphere | O/W | Demulsification | 89 |
| Magnetic | Magnetite | 200 nm to 40 μm | Sphere | O/W | Reversible demulsification | 97 |
| | Magnetite- <i>grafted</i> -octyltriethoxysilane | 15 to 35 nm | Sphere | O/W | Increased stability | 96 |
| | Magnetite- <i>grafted</i> -polystyrene | 12 nm | Hairy sphere | O/W | Demulsification | 95 |
| pH & Light | Poly(methacrylic acid- <i>co</i> -methyl methacrylate- <i>co</i> -7-(4-vinylbenzyloxy)-4-methylcoumarin) | 80 to 110 nm | Micelle | O/W | Shape change | 100 |
| pH & Temperature | Poly[2-(dimethylamino)ethyl methacrylate]- <i>grafted</i> -cellulose nanocrystals | 350 nm | Nanotubes | O/W | Reversible demulsification | 105 |
| | Poly(methyl methacrylate)- <i>block</i> -poly(((4-adamantaneimino)methyl) phenyl methacrylate)- <i>grafted</i> -poly(<i>N</i> -isopropylacrylamide) | 135 nm | Sphere | O/W | Demulsification | 104 |
| Protease & Light | Gold- <i>grafted</i> - α -synuclein | 10 nm (Au); 35 $\mu\text{m}^{\#}$ | Sphere; β -sheet $^{\#}$ | Microcapsule (from O/W) | Induced cargo release, and photothermal activity | 53 |

$^{\#}$ Size and/or shape of final microcapsule.