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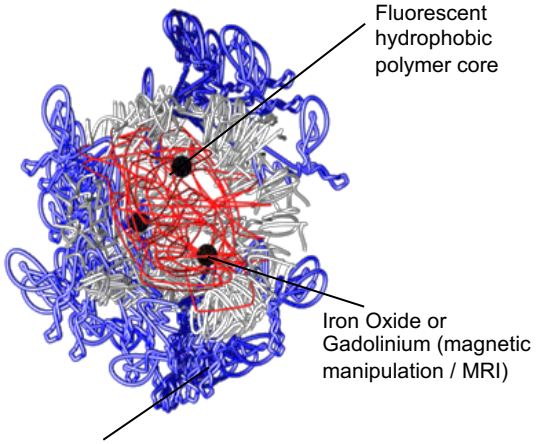
CPN™ – CONJUGATED POLYMER NANOPARTICLES

With immensely bright emission properties and highly specific targeting capabilities, our non-toxic CPN™ molecular probes have many advantages over traditional dyes in a variety of R&D applications, including in vitro imaging and labelling.

CPN™ 900 IR-I

(COOH, Maleimide, Alkyne, Streptavidin)



Conjugated Polymer Nanoparticles (CPN)

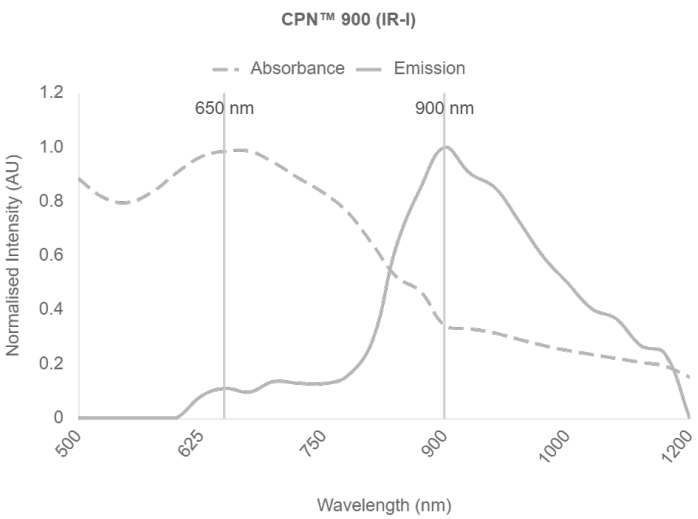
CPN™ 900 (IR-I) has ex/em maxima of $^{650}/_{900}$ which means it is compatible with instruments with 640 or 808 nm laser excitation. CPN™ 900 (IR-I) can be readily combined with additional CPNs™ to label multiple cellular proteins or biological sample components within the same mixture with minimal spectral overlap.

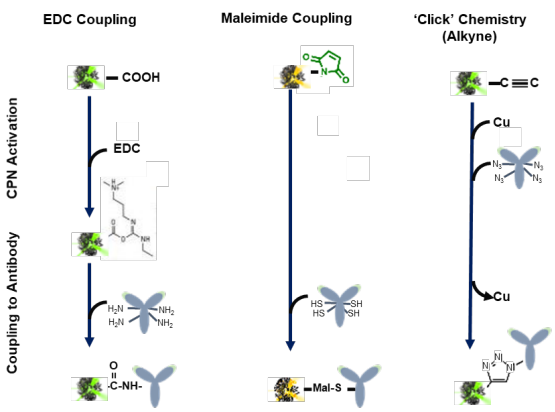
All CPNs™ come PEGylated as standard. CPNs™ are available with a number of surface chemistries including a carboxyl surface, maleimide, and alkyne (click chemistry), to fit desired linkage preferences. The CPNs™ are also available linked to streptavidin to bind biotinylated molecules.

Biological Properties:

CPNs™ readily conjugate to biomolecules such as antibodies or streptavidin. The intense brightness of CPNs™ dramatically increases sensitivity with single nanoparticles detectable in flow cytometry and immunocytochemistry. CPN™ conjugates can be used in 'end user' assays at concentrations matching those of other conjugated fluorophores. Due to differences in assay systems working dilutions should be determined by titration assay. CPNs™ are both thermal and photostable, however once conjugated to biological materials, they should be stored at 2-6° C.

Ex / Em	650 / 900 nm
Storage	CPN Carboxyl, Maleimide, Alkyne = Ambient temp CPN + Streptavidin / Antibody = 4 ºC
Conc'	0.1mg/ml (1x10^9 CPN / ml)





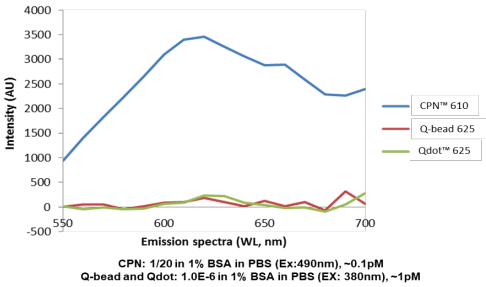
Applications

- Flow cytometry
- Cell imaging / tracking
- Lateral Flow & Vertical Flow Assays
- Immunohistochemistry
- Fluorescent ELISA
- Fluorescent In Situ Hybridisation
- Western blotting, etc

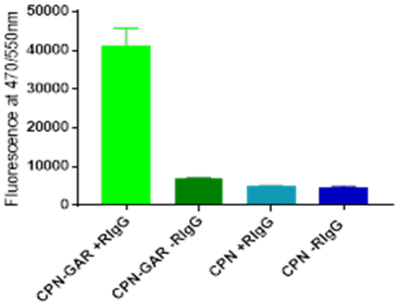
Structural Properties:

CPNs™ are water-soluble micelles compromising of a Light Emitting Polymer and are around 70-80 nm in size encapsulated within a biocompatible surfactant, increasing the hydrophilicity and allowing them to form micelles. This 'core-shell' structure, consisting of the polymer forming the core and the surfactant the surrounding shell, provides a ready base on which to covalently bond functionalising molecules, such as streptavidin, antibodies, targeting proteins or nucleic acids. CPNs™ also incorporate iron oxide into their core. This allows CPNs™, and the molecules or cells to which they are attached, to be manipulated using magnets to direct movement and facilitate purification. The iron oxide can be also be visualised using Magnetic Resonance Imaging (MRI), acting as a contrast reagent.

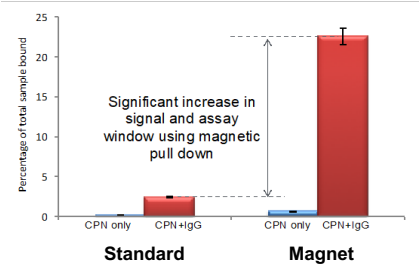
(A) Comparison of CPN™ 610 & Qdot / Q-bead 625



(B) ELISA: Improved Performance



(C) Magnetic Attraction, Localisation During Conjugation



(A) CPNs™ have been shown to be between 100-1000x brighter than their market equivalents in a comparative study between CPN™ 610, Q-bead 625 and Qdot 625, which was carried out by UCLA researchers. **(B)** The combination of this superior brightness with long-lasting stability allows for low level analyte detection and extended read out times for automated systems. **(C)** Utilising the magnetic properties during conjugation for localisation of the CPNs™ yields a further 10-fold increase in signal, offering even greater sensitivity and the earlier detection of biomarkers.

CPN™ Spectral Range