

ENDONAUT TECHNOLOGY

EndoNaut consists of biocompatible and biodegradable di-block copolymers which self-assemble into vesicles in water. These nanoscopic carriers enable the encapsulation of either hydrophilic or hydrophobic compounds, including large biological macromolecules fig 1A. The particle size is controlled by (a) the chemical composition of the polymer, (b) surface chemistry, and (c) through the preparation methodology. The intrinsic pH sensitivity of endoNaut allows the cargo to be released within the cell once internalisation has occurred (link to video). The polymer composition can be tailored for targeting specific cell groups through variations in the surface chemistry of the endoNaut vesicle , and for targeting specific cell populations via entropy-driven multiplexing. EndoNaut's unique set of features place this technology at the top of the market .

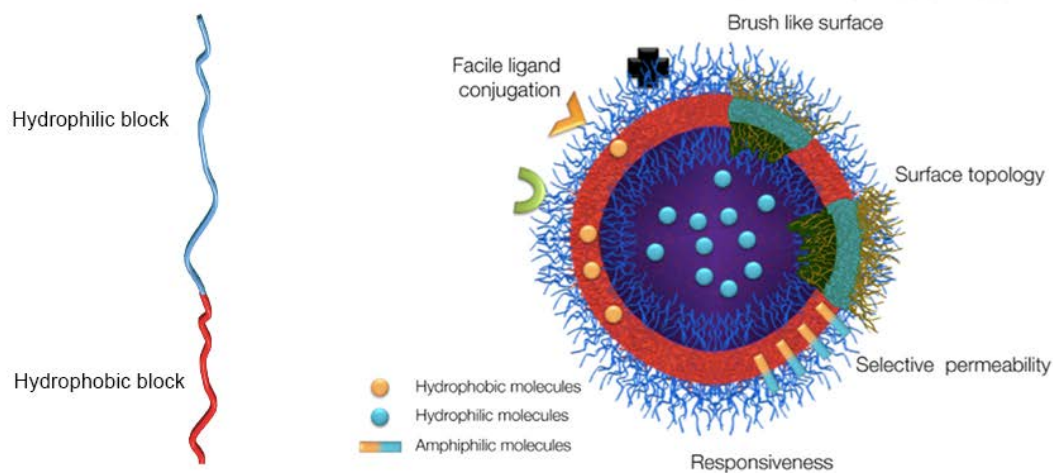


Fig.1. (a) Schematic of EndoNaut.

ONCOLOGY APPLICATION

EndoNaut technology has shown great advantages when used in oncology applications.

EndoNaut has a unique combination of properties, which are capable of revolutionising cancer therapy.

1) EndoNaut for the first time allows intracellular release, with more bioactive molecules provided to each targeted cell;

This translates to:

- Improved bioactive molecules efficacy lowering IC50s;
- Improved selectivity for cancer cells and less toxicity on healthy cells;
- Minimised emergence of drug resistance;

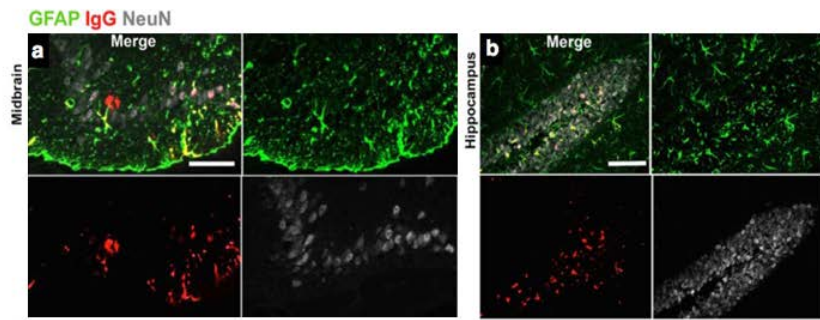
2) EndoNaut has mechanical flexibility allowing deep penetration into tumour;

3) EndoNaut has tuneable surface properties allowing highly specific tumour targeting;

4) EndoNaut showed more effectiveness in reducing tumour size when compared with other currently used cancer treatments;

Example:

The unique capabilities of EndoNaut have been exploited to transport bioactive molecules into the brain. This is achieved by targeting the Low Density Lipoprotein Receptor-Related Protein 1 (LRP-1) receptor. This has been shown using a fluorescent bioactive molecule, demonstrating EndoNaut enables the efficient delivery of macromolecules into the brain cells.



(a) and (b). Confocal micrographs of midbrain and hippocampus sections, after i.v. injection of fluorescent bioactive molecule-loaded EndoNaut (red). The sections were double labeled to show astrocytes (green) and neurons (grey).