

TECHNICAL SHEET

NANOMAG_dyPEG

Descrizione: phosphate buffered aqueous suspension of Fe₃O₄ nanoparticles embedded in PLGA-*b*-PEG-COOH polymeric matrix and functionalized with DyLight® 650

Appearance: dark brown liquid

Chemico-Physical Characteristics:

	Instrument	Range
Fe ₃ O ₄ concentration [% w/w]	ICP-OES	0,10 – 0,30
Average hydrodynamic diameter [nm] Z-average	DLS	40 - 65
PdI	DLS	0,10 – 0,16
ξ _{potential} [mV]	DLS	-40 < ξ < -25
pH	pH-meter	7,4
λ _{excitation} [nm]	Spectrofluorometer	652
λ _{emission} [nm]	Spectrofluorometer	672
Concentrazione Fluoroforo [μM]	Spectrofluorometer	0,15 – 0,30
Magnetic core characteristics¹		
Crystalline diameter [nm]	XRD	9,0 – 14,0
Average inorganic diameter [nm]	TEM	12,0 – 26,0
Blocking Temperature (T _B) [K] ¹	SQUID Magnetometer	> 300
Saturation magnetization (M _s) at 300K [Am ² /kg]	SQUID Magnetometer	66,0 – 72,0
Saturation magnetization (M _s) at 5K [Am ² /kg]	SQUID Magnetometer	75,0 – 82,0
Remnant Magnetization (M _r) at 300K [Am ² /kg]	SQUID Magnetometer	0
Remnant magnetization (M _r) at 5K [Am ² /kg]	SQUID Magnetometer	27,2 – 30,6

¹ Magnetic properties vary with the properties of the matrix in which nanoparticles are dispersed.

Coercive Field (H_c) at 300K [kA/m]	SQUID Magnetometer	0
Coercive Field (H_c) at 10K [kA/m]	SQUID Magnetometer	23,0 – 31,0
Ratio M_r/M_s at 10K	SQUID Magnetometer	0,35 – 0,45
RF mediated Hyperthermia ($H_0= 22$ (kA/m); $f = 356$ (kHz)) [W/g]	RF generator <i>pancake coil</i>	700 - 900

Applications:

The product is used Magnetic Fluid Hyperthermia applications, as MRI contrast agents, for drug loading applications, cell-therapies, cellular internalization studies and Bioimaging *in vivo* applications.

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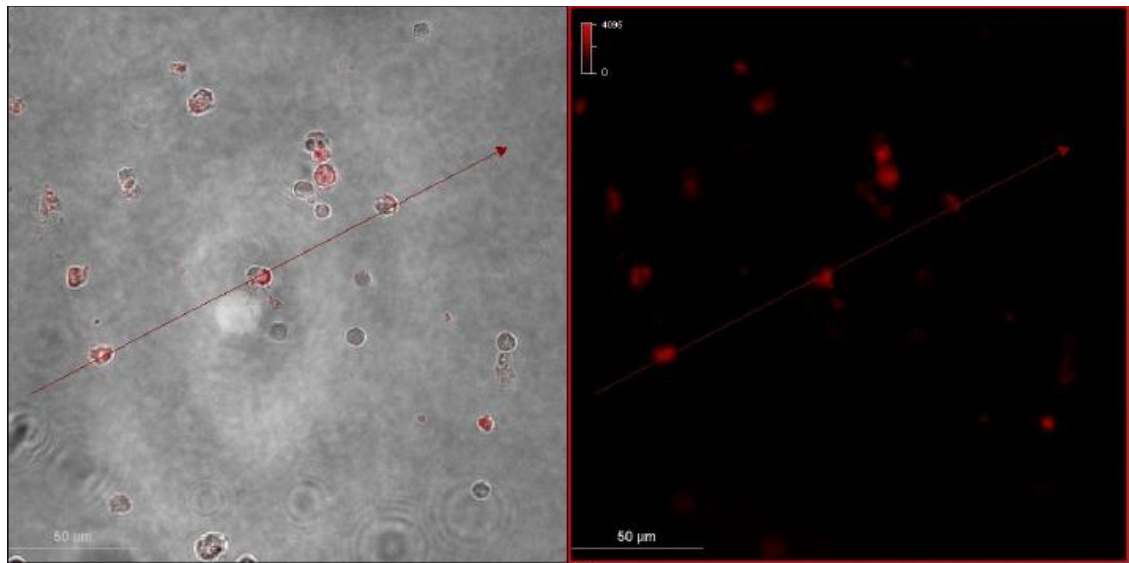
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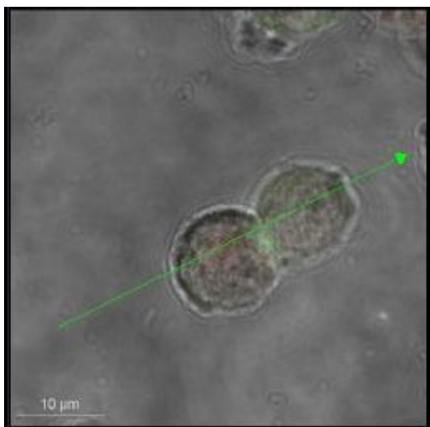
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CELLULAR UPTAKE with T-lymphocytes and PBMC (donor)



The analysis of immunofluorescence images confirms the uptake of NBR both by T-cells (cell line) and PBMC (primary cells, extracted from blood)

EVALUATION OF THE IMMUNOLOGICAL SYNAPSE FORMATION BETWEEN T-LYMPHOCYTES (JURKAT) AND B-LYMPHOCYTES (RAJI) LOADED WITH NANOMAG dyPEG



SINAPSI MARKERS: Phosphotyrosine (pTyr) labeled with fluorophore 488 (green)
Cellular uptake is detected for both the lines and a good formation of the immunological synapse between T lymphocytes (Jurkat) and B lymphocytes (Raji) is recorded

The magnetic and hyperthermic characterization of the magnetic core is provided. Each lot of the product containing the magnetic core indicated above will be analyzed and characterized in terms of the aforementioned quantities at the time of release.

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