

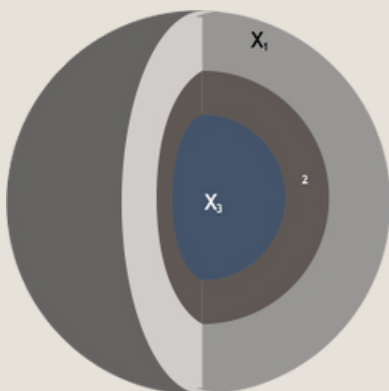


Functional Nanomaterials

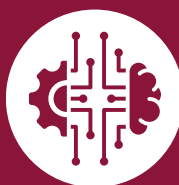
**Empowering
Innovations
with Functional
Nanomaterials**

Accelerated output of products & services

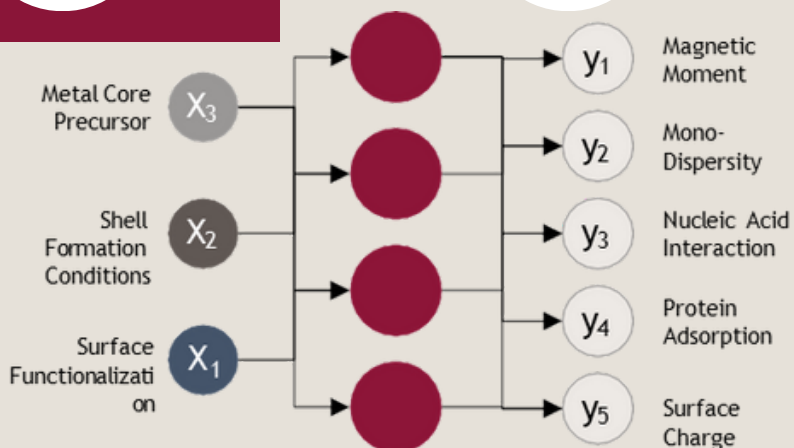
**Precision control
of core, shell, and
surface**



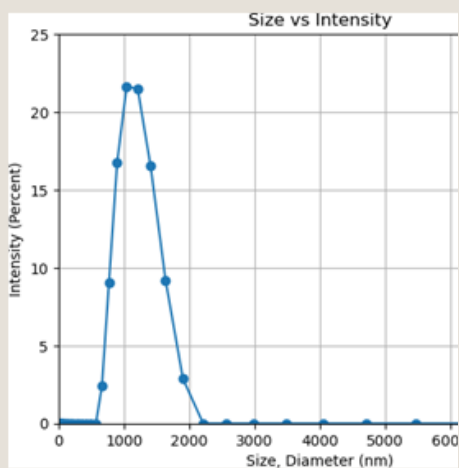
**Leverage
proprietary
predictive
models**



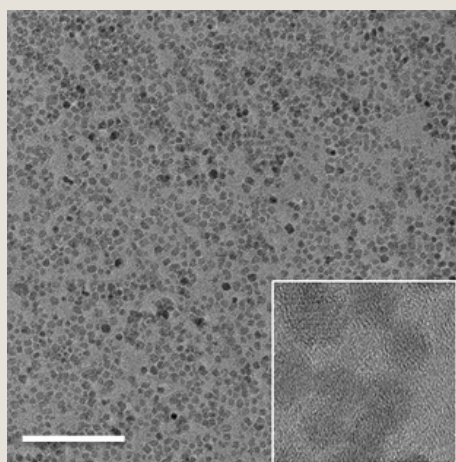
**Rapid
optimization &
acceleration from
bench to scale-up**



MAGNETIC NANOPARTICLES WITH HIGH MONO-DISPERSITY



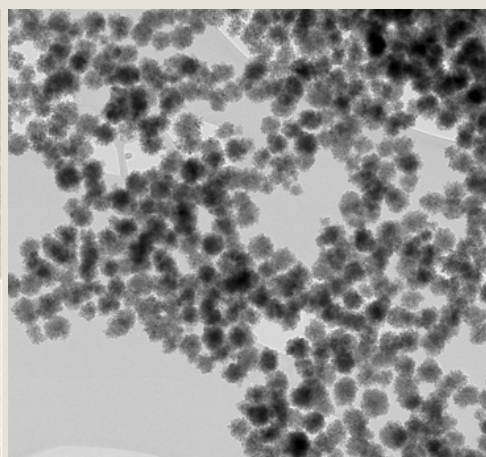
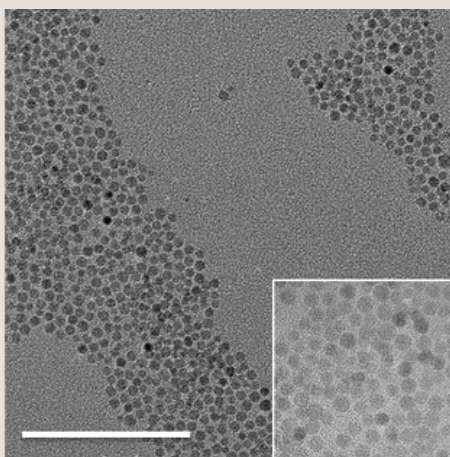
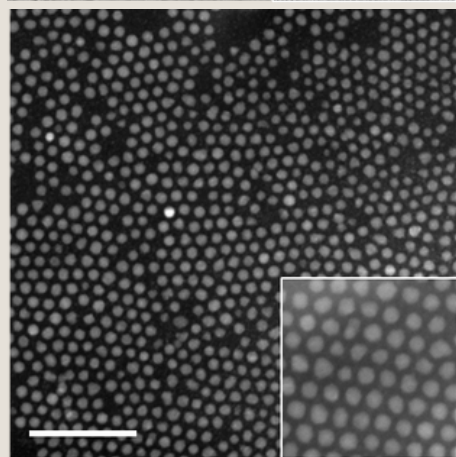
With a uniform size and shape, these magnetic nanoparticles have high mono-dispersity allowing for consistent and predictable interactions with biological molecules



Magnetic separation: They can be used for efficient separation and purification of biomolecules, such as proteins, nucleic acids, and cells

Drug delivery: By attaching therapeutic agents or drugs to the nanoparticles

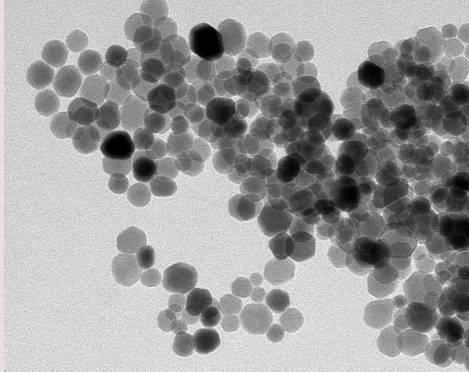
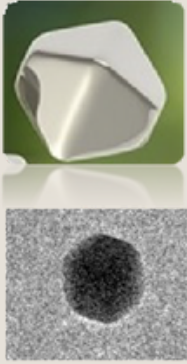
Magnetic resonance imaging (MRI): These nanoparticles can enhance the contrast in MRI scans, providing better imaging of tissues and organs.



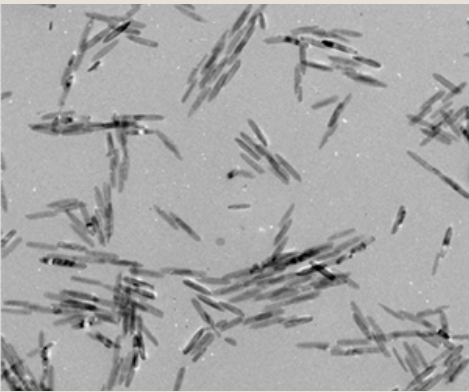
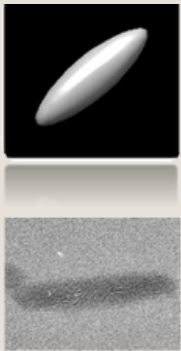
Scale bar = 100nm

Scale bar = 500nm

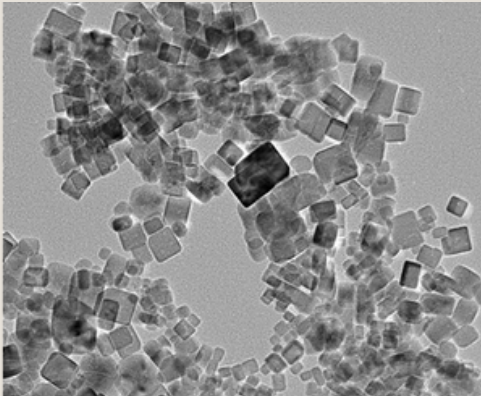
MAGNETIC NANOPARTICLES WITH TUNABLE SIZES & SHAPES



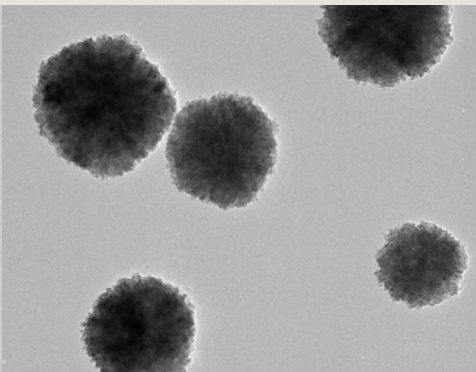
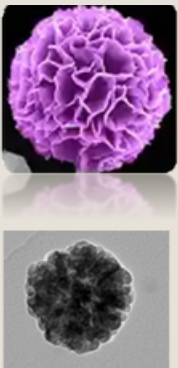
These magnetic nanoparticles offer flexibility in their size and shape, allowing customization for specific applications. Their tunability enables tailored interactions with biological systems.



Biosensors: By functionalizing the nanoparticles with specific biomolecules (e.g., antibodies, aptamers), they can be used in biosensors for the detection of biomarkers or pathogens.



Hyperthermia therapy: Magnetic nanoparticles can generate heat when exposed to an alternating magnetic field.



Tissue engineering: The nanoparticles can be incorporated into scaffolds or hydrogels to provide magnetic guidance for cell growth and tissue regeneration.

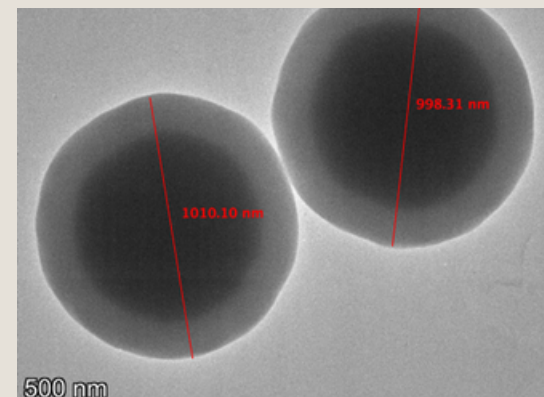
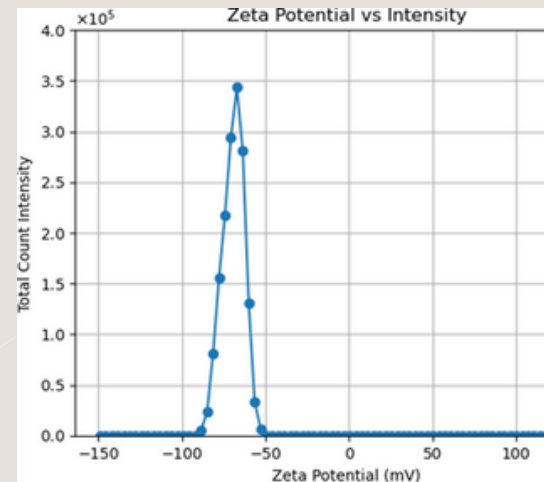
MAGNETIC NANOPARTICLES – CONTROLLABLE POLYMER SHELL

These magnetic nanoparticles have a controllable polymer shell that can be tailored to enhance stability, functionality, and compatibility with biological systems

Magnetic bioseparation: preventing nonspecific binding and enhancing the stability of the nanoparticles in biological fluids, improving their performance in magnetic separation processes.

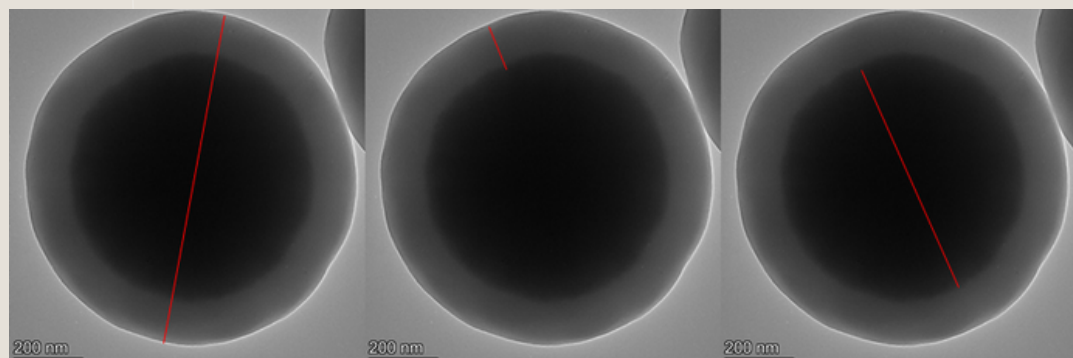
Targeted drug delivery: The polymer shell can be functionalized with targeting ligands or responsive moieties, allowing specific delivery of drugs to desired locations.

Magnetic resonance imaging (MRI) contrast agents: The polymer shell can enhance the biocompatibility of the nanoparticles and improve their circulation time in the body.

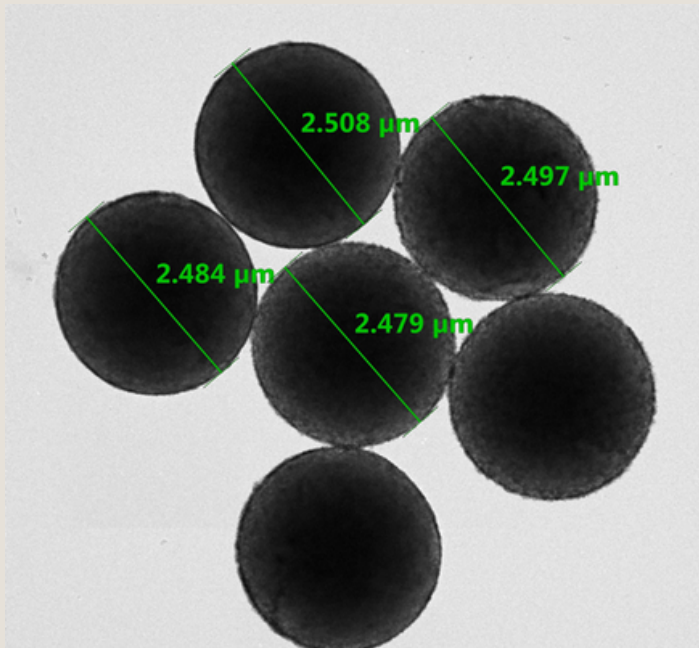


Example:

- 1 micron mono-disperse magnetic beads
- 700nm core of aggregated superparamagnetic iron oxide
- 150nm silica shell



MAGNETIC MICROBEADS – CONTROLLABLE/ TUNEABLE FOR ASSAYS

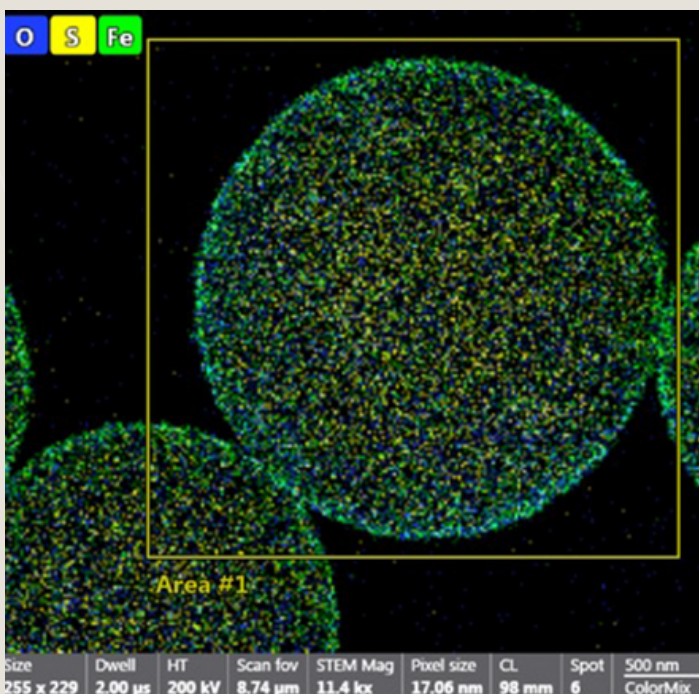


These larger magnetic microbeads are designed specifically for use in assays and diagnostic applications. They offer controllability and tunability for optimized performance.

Immunoassays: The microbeads can be functionalized with antibodies or antigens to capture and detect specific analytes in biological samples. Targeted drug

Nucleic acid analysis: The microbeads can be used for nucleic acid purification, amplification, and sequencing.

Cell sorting and isolation: By functionalizing the microbeads with cell-specific ligands, they can be used for magnetic-activated cell sorting (MACS) or isolation of specific cell populations.



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