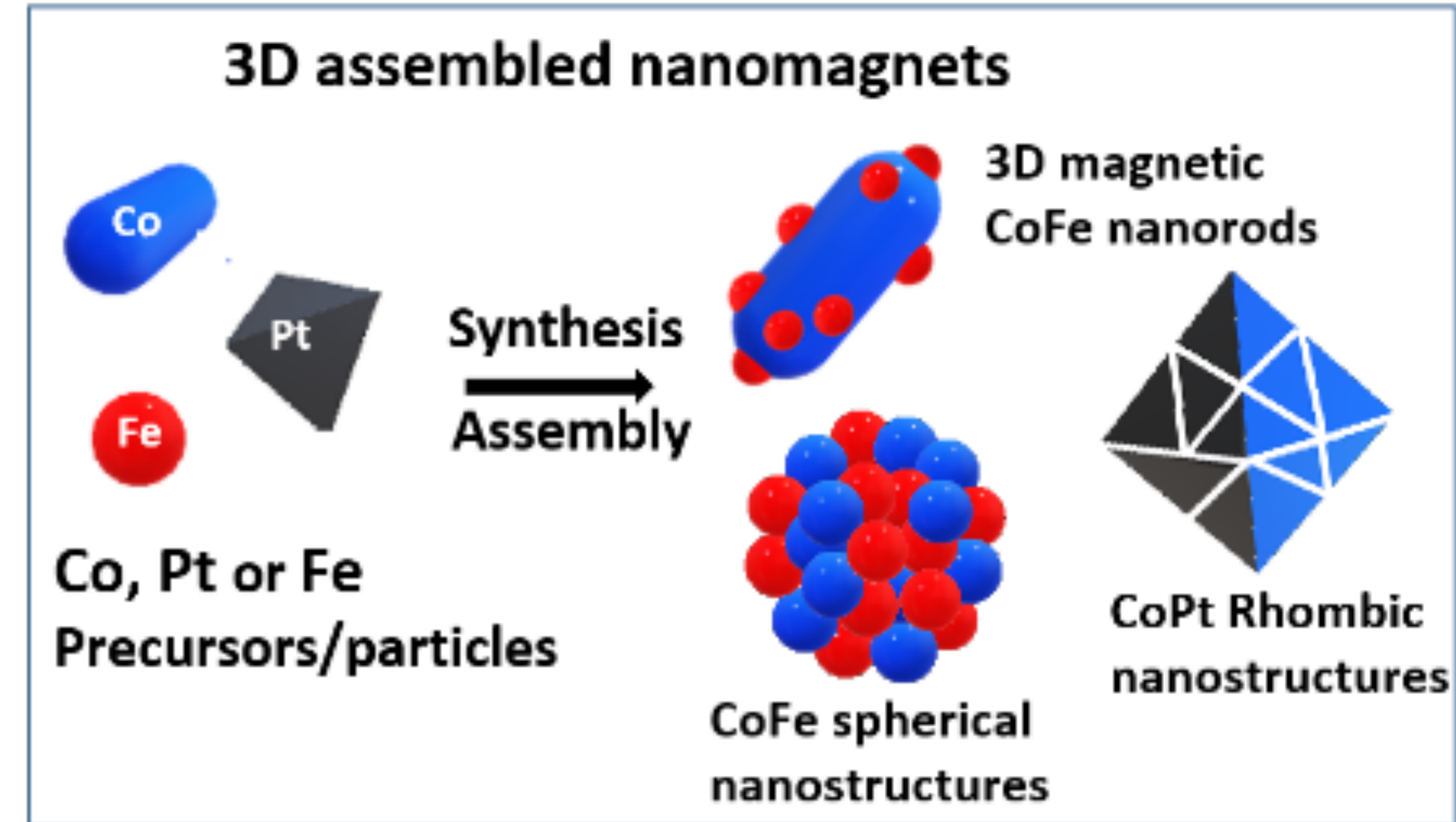
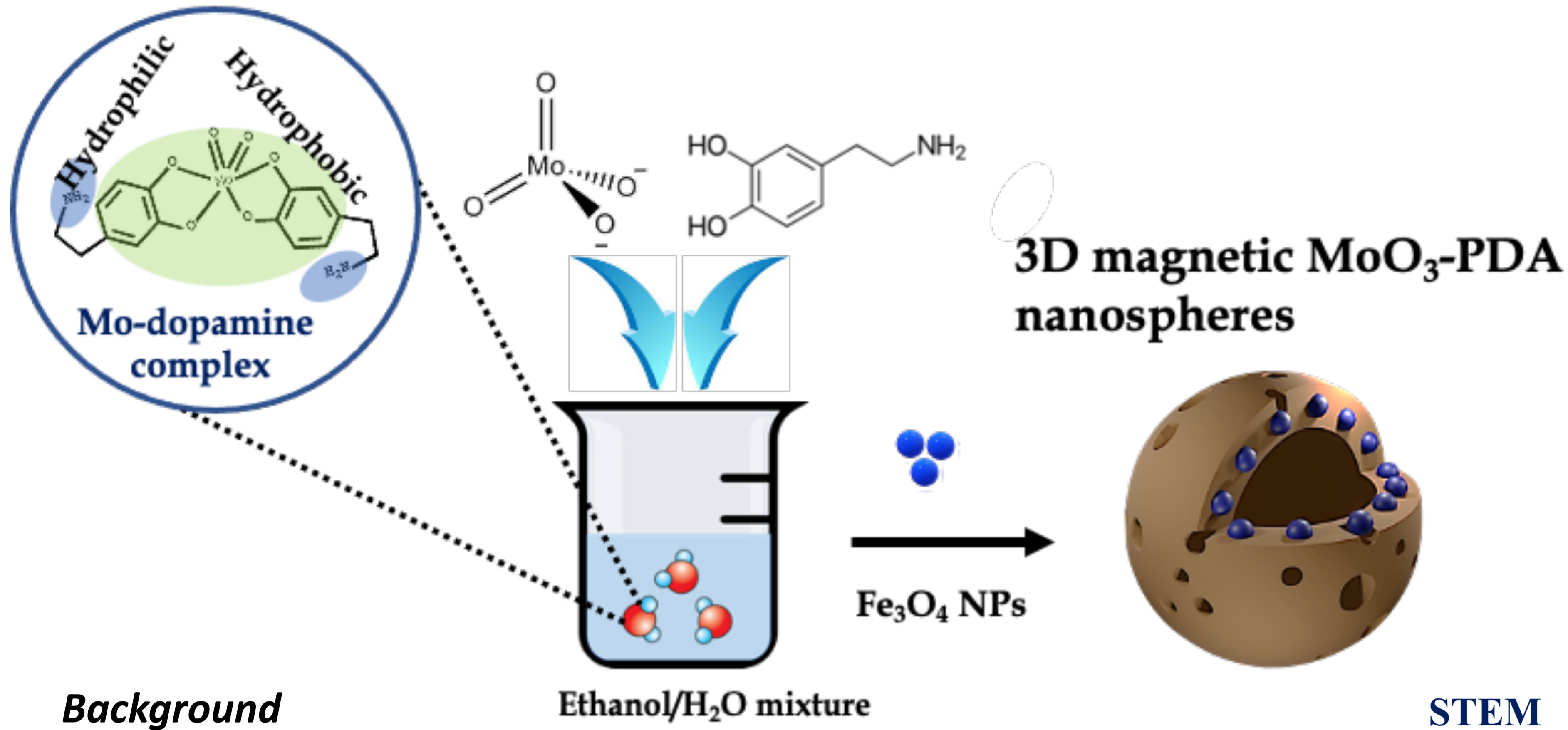


3D magnetic nanostructures for the fabrication of sensors/actuators and energy harvesting device

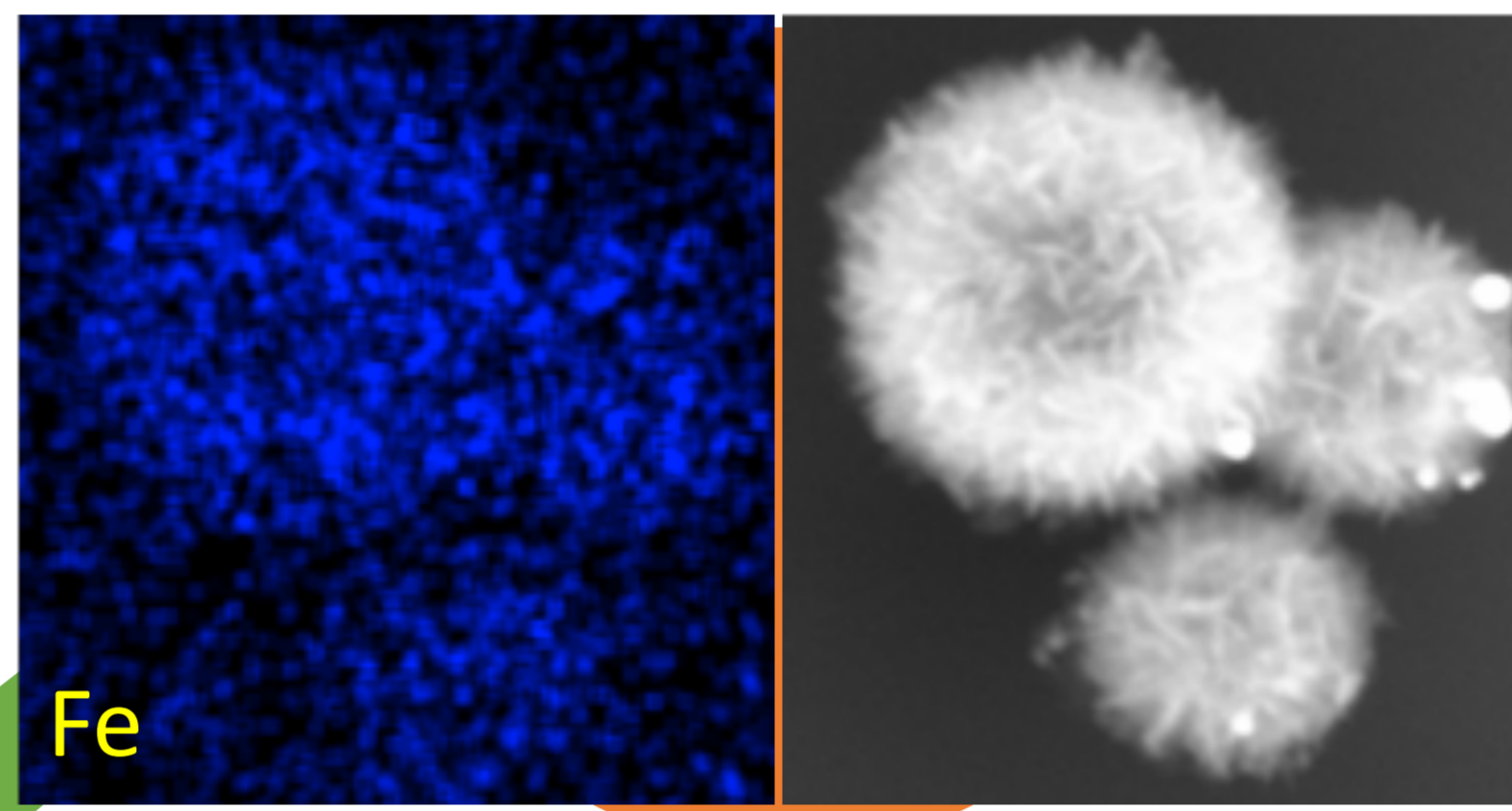
3D nanomagnets: Syntheses and characterization#



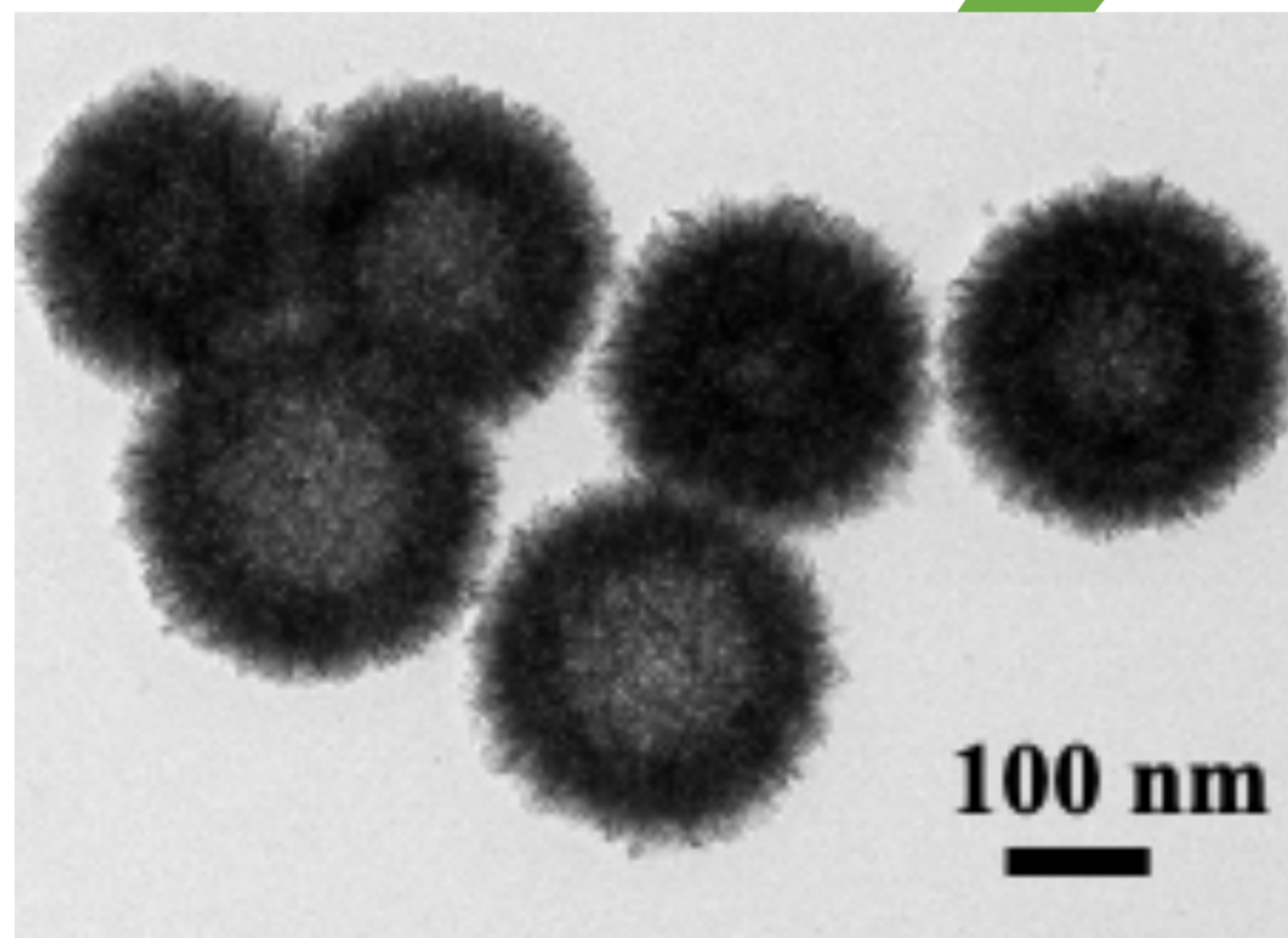
3D geometry has a direct impact on the magnetic configurations and magnetization of magnetic nanoparticles due to spatial coordinates#. Novel nanoassemblies of 3D nanomagnets ranging from nanosphere-, nanorod-, hexagonal-shaped nanostructures are synthesized for application in magnetic nanogenerator device for harvesting ambient stray magnetic noise.

Background

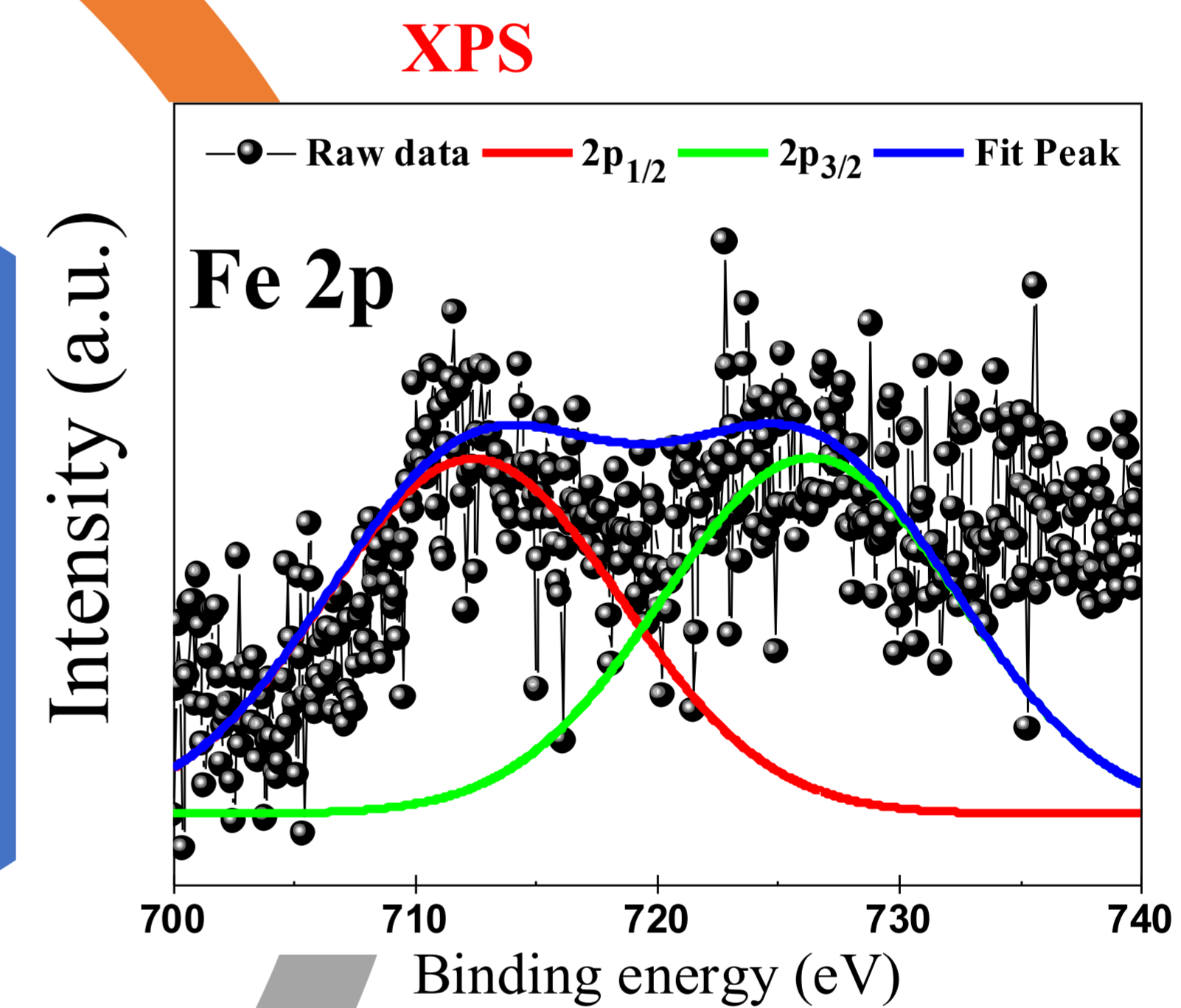
Low-frequency magnetic fields are generated by electrical power lines and consumer electronics. As a by-product, stray magnetic noise are emitted which can be renewably harvested by using electromagnetic nanogenerators and converted to useful electricity.



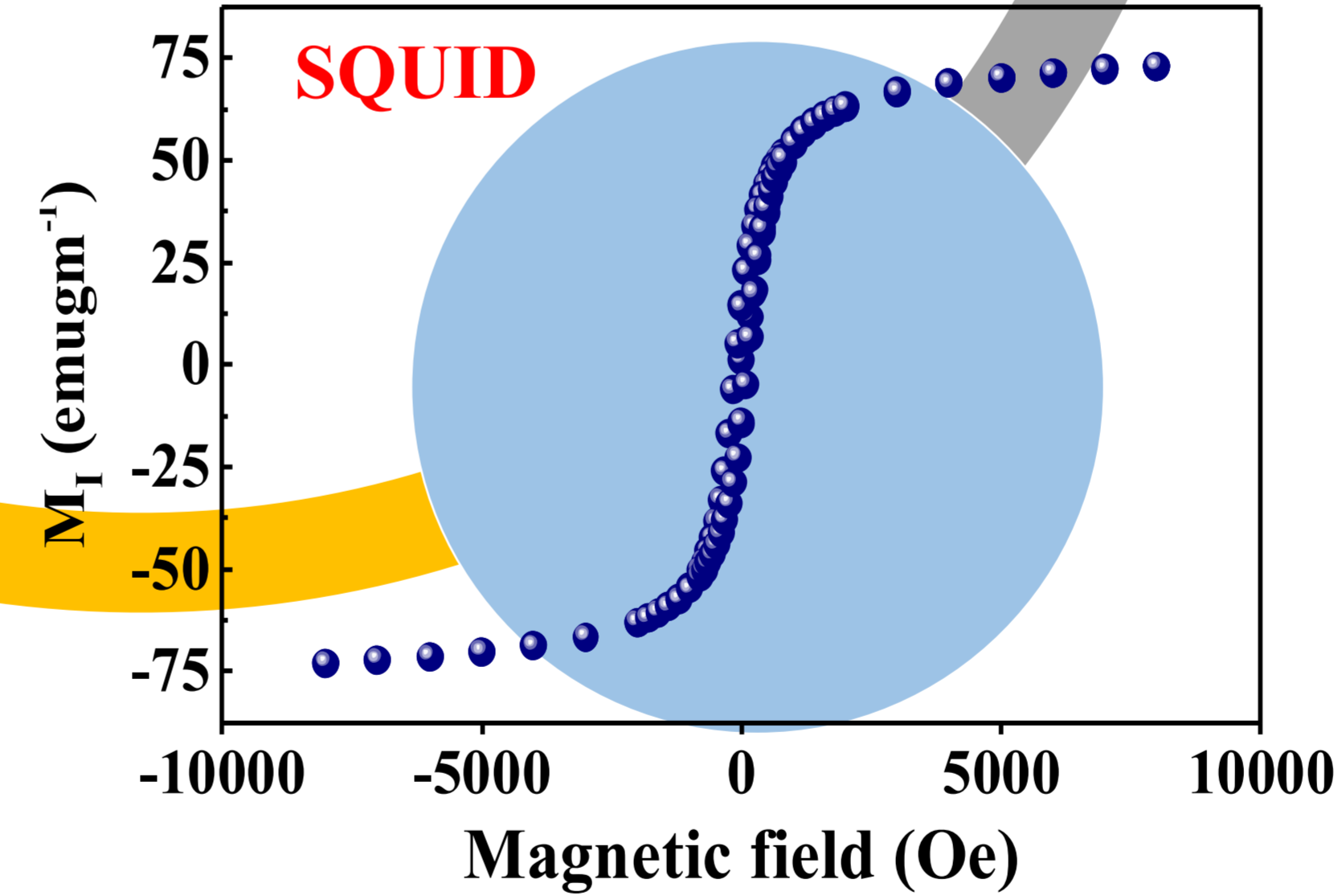
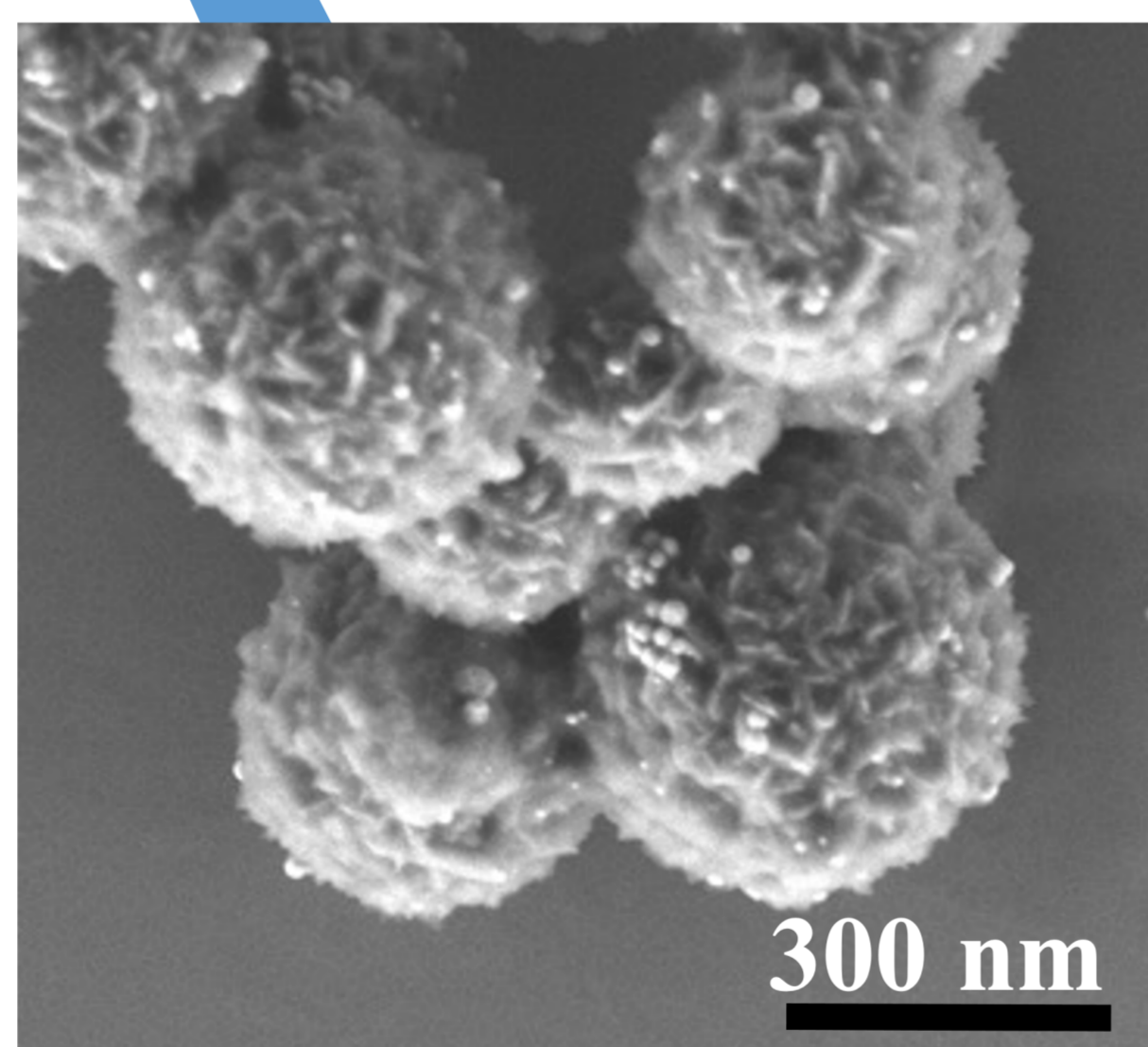
TEM



3D Magnetic Nanospheres

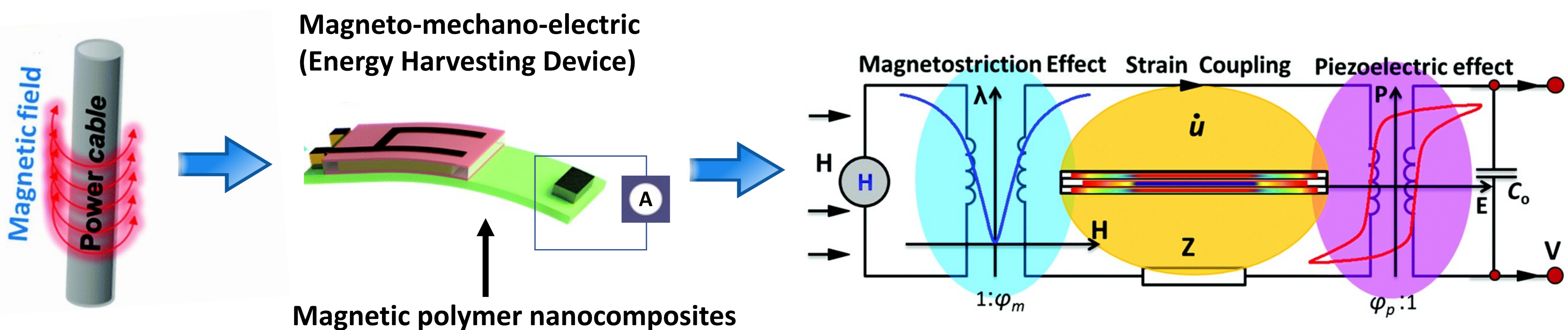


SEM



This work implements 3D magnetic nanostructures and bio-engineered, eco-friendly polymers to fabricate nanogenerators which can induce efficient magneto-mechano-electric coupling effects for magnetic actuation and energy harvesting.

Actuators and energy harvesting



Design of magneto-mechano-electric energy harvesting device via magnetic actuation/ piezoelectric effects

(Sustain. Energ. Fuels, 2017, 1, 2039) #Nat. Comm, 2017, 8, 15756. #Nanoscale Adv. 4, 871, 2022

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