Title: **Function of Layered Double Hydroxide Nanoparticles on maintaining mESCs pluripotency**

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Abstract:

The promising applications of MgFe-LDH nanoparticles in directing the stem cell fate was studied, leukemia inhibitory factor (LIF) is vital for mouse embryonic stem cells (mESCs) to sustain its self-renewal and pluripotency, MgFe-LDH nanoparticles could be used as an economical and efficient replacement for LIF. MgFe-LDH was observed to be very effective in maintaining mESCs pluripotency, indicated by clone morphology, ALP activity as well as expression levels of self-renewal related genes and proteins. In addition, MgFe-LDH maintained the potential to differentiate into all three germ layers. Combined transcriptomic and proteomic analysis revealed that MgFe-LDH could activate LIFR regulating signaling pathways, while the extra Fe2+ provided by MgFe-LDH would also enhance TET1/2 abundance related to DNA demethylation. These results suggest that MgFe-LDH nanoparticles can thus be used as an affordable and efficient replacement for LIF in mESC cultivation.