Chemo-phototherapy of cancer cells using gold nanocage -cored pH-sensitive thiol-ended triblock copolymer

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Light-based therapies including photothermal therapy have been validated clinically for curative and palliative treatment of solid tumors. However, these monotherapies can suffer from incomplete tumor killing [1-2]. According to these facts, gold nanocage-cored biodegradable micelles were prepared by coating gold nanocage (GNC) with synthesized pH -sensitive thiol-ended triblock copolymer [poly (acrylic acid) -b-poly (N,N dimethyl amino ethylmetacrylate) -b-poly (ε-caprolactone)-SH; PAA-b-PDMAEMA-b-PCL-SH]. Furthermore, the anti-cancer drug methotrexate (MTX) was conjugated onto the gold nanocage-cored micelles (GNC@ polymer) by the electrostatic force and the nanocomposites formed were named GNC@ polymer-MTX. The in vitro therapy effect was comprehensively evaluated among free MTX, GNC@polymer, and GNC@ polymer–MTX, with or without near- IR light irradiation to improve curative effect of GNC@ polymer–MTX led by the combination of chemo -photothermal therapy

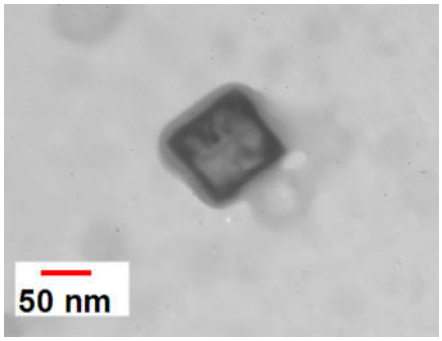

Fig. 1 TEM image of gold nanocage -cored pH-sensitive thiol-ended triblock copolymer

References

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