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Biocompatible PEGylated Gold Nanorods Function As Cytokinesis Inhibitors to Suppress Angiogenesis

Hongyuan Song[a,1], Ting Guo[a,1], Zichang Zhao[a], Youheng Wei[b], Haoyang Luo[b], Weizong Weng[c], Rui Zhang[a], Ming Zhong[a], Chunying Chen[d*], Jiacan Su[c*], Wei Shen[a*]

[a]Department of Ophthalmology, Changhai Hospital, Second Military Medical University, Shanghai 200433, China
E-mail: shenwei@smmu.edu.cn

[b]State Key Laboratory of Genetic Engineering, Institute of Genetics, School of Life Sciences, Fudan University, Shanghai 200438, China.

[c]Department of Orthopaedics Trauma, Changhai Hospital, Second Military Medical University, Shanghai 200433, China.
E-mail: drsujiacan@163.com

[d]CAS Key laboratory for Biomedical Effects of Nanomaterials and Nanosafety, National center for Nanoscience and Technology, Beijing, 100190, China.
E-mail: chenchy@nanoctr.cn

[1]These authors contributed equally to this paper.

Corresponding authors: chenchy@nanoctr.cn (Chunying Chen); drsujiacan@163.com (Jiacan Su) and shenwei@smmu.edu.cn (Wei Shen).

Running headline: Gold nanorods function as cytokinesis inhibitor

Abstract: Pathological angiogenesis is driven by uncontrolled growth of endothelial cells (ECs), which could lead to retinopathy, tumor and rheumatoid arthritis, etc. ECs must experience multiple cell division process to grow, and cytokinesis is the final step. The present study shows that PEGylated GNRs (PEG-GNRs) specifically target ECs cytokinesis process which results in high ratio of binucleated cells, and these binucleated ECs lose the ability to proliferate. Further data show that PEG-GNRs do not induce toxicity *in vitro* and *in vivo*. PEG-GNRs could inhibit ECs proliferation, migration, tube formation and inhibit angiogenesis in *ex vivo* model. Oxygen induced retinopathy and tumor angiogenesis model further show that PEG-GNRs can inhibit angiogenesis *in vivo*. Gene expression profiles reveal