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Cancer cell is an excellent scaffold for nanomaterials biosynthesis and theranostics of metastasis**Fawad Ur Rehman, Tianyu Du, Hui Jiang and Xuemei Wang**
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Statement of the Problem: Nanoscale materials and biomedical applications are exponentially increasing each passing day, especially in cancer theranostics and drug delivery system. The nanomaterials synthesis procedure is complex and involves various toxic chemicals. Therefore, the biomedical scientific community has serious health hazard concerns. To overcome the associated complications, a green synthetic approach has been introduced to biosynthesize via plants, bacteria, fungi and algae and most recently redox imbalance mammalian cells i.e., tumor and neurodegenerative maladies.

Methodology & Theoretical Orientation: We have simply introduced the pre-ionic solution of metals viz., HAuCl₄ (Gold), FeCl₂ (Paramagnetic Iron), Na₂SeO₃, etc. to the cancer cell lines (HepG2, HeLa, U87, SGC-7901 etc.) to biosynthesize the nanoprobe for cancer multimode bioimaging via fluorescence, CT and MRI, both *in vitro* and *in vivo*.

Findings: 24 hours post injecting the relevant pre-ionic solutions (40 µl/ml), the cells started fluorescence under confocal microscope. After physical lysis, the relevant nanoclusters were isolated from the cells. The nanoclusters were analyzed via TEM, XPS, Cell Mapping, FTIR and the size was ranged <5 nm. All the cancer cells *in vitro* and tumor xenograft models *in vivo* exhibited fluorescence and performed as contrast agents for CT and MRI by successfully marking tumor. The *in situ* biosynthesized nanoclusters were highly biocompatible and had no adverse effects to vital organs.

Conclusion: The *in situ* biosynthesized nanoclusters by using cancer cells and tumor microenvironment were highly biocompatible and were excellent probes for multimode bioimaging.

Biography

Fawad Ur Rehman is currently a Postdoctoral Fellow in Professor Xuemei Wang's Lab at State Key Laboratory of Bioelectronics, Southeast University, Nanjing, China. He has completed his PhD degree from the same institute, Masters from The University of Agriculture, Peshawar and Doctor of Veterinary Medicine (DVM) degree from the University of Veterinary and Animal Sciences, Lahore, Pakistan. His current research interests include nanoscale materials *in situ* biosynthesis and their biomedical application in synergy to pluripotent stem cells for various diseases theranostics, especially cancer.

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