Introduction/aims: Matrix metalloproteinases (MMPs) are believed to be involved in the pathological processes behind Alzheimer's disease (AD) / Parkinson's disease (PD). In this study, we aimed to examine the inhibition of MMPs through ancient Swarna Bhasma (SB) / gold nanoparticle (GNP) through in vitro assay after its pharmaceutical preparation and complete characterization.

Methods: SB / GNP was characterized through Transmission electron Microscopy (TEM), Atomic force microscope (AFM), Scanning Electron microscopy (SEM-EDS), X-ray diffraction (XRD), Atomic Absorption spectroscopy (AAS), Fourier transform Infrared spectroscopy (FTIR), etc.

Human Fibrosarcoma cell (HT-1080) is known to secrete MMPs. Overnight grown HT-1080 cells were exposed to SB (GNP). The concentrations used were 50 mg/L, 100 mg/L and 1000 mg/L. Five sets of each concentration along with appropriate controls were maintained. After every 24 h (for 5 days) the supernatants were collected and used in gelatin zymography. Also MMPs activity was detected in terms of gelatin hydrolysis of X-ray film, which served as substrate.

Results: SB particle size was ~ 56 nm. SB found to exert inhibitory action on the activity of these four gelatinases as observed in zymograms. Decrease in the intensity of clear bands of MMPs in zymogram showed inhibitory action of SB in the medium of HT-1080 tumor cells in a concentration-dependent manner.

Conclusion: SB showed significant inhibitory effect on MMPs so can use in other proteinopathies as medicine.