Metal Nanoparticles Reduce Intracellular HIV-1 Replication and Stimulate Growth of HIV-1 Infected PBMC

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Abstract:

Noble nanoparticles have the potential to be used as therapeutic agents in HIV-1 infection. Noble nanoparticles have higher electron resonance potential than organic drug molecules to arrest HIV and enhance cell growth. Silver nanoparticles have been shown to exhibit promising cytotoxicity against HIV-infected T-cells and arrest HIV by blocking gp 120-CD4 interaction. Metal nanoparticles are engineered as non-toxic and employed as they have unique signal propagation properties. Combined nanoparticles may arrest HIV replication by functionalize with variety of molecules and produce specific signals and proliferate PBMC by inducing cytokines. The aim is to examine the effect of combined nanoparticles on growth and viral replication in HIV-1 infected human PBMC.

Methodology:

1. The preparation and engineering of Nanoparticles and Nanomedicine were carried out as per Ancient Tamil Medicine (ATM) Protocol.
2. Melted metals (Ag, Sn, Zn) were immersed with plant juices for 180 days
3. Reaction of metals with plant organic molecules
4. Metallo phytochemicals ready for calcinations process for Nanomedicine (NM)
5. Nanomedicine to use HIV infected PBMC cell culture
6. Immuno Peroxidase Test (IPT) - to deduct HIV & Cell Quantification Assay (CQA) - to assess cell growth.

RESULTS:

- **NM + HIV INFECTED PBMC CELLS**
  - HIV free & More PBMC cells
- **HIV INFECTED PBMC WITHOUT NM**
  - Less Number of PBMC with HIV (Golden granules)

Results:

⭐ More cells counts in Nanomedicine treated cultures.
⭐ Absence of HIV (no golden granules) in NM treated cells - NM has arrested the HIV.

Conclusion:

⭐ This study has revealed that the NM arrests the intracellular HIV and proliferates PBMC as well.

Perspectives:

⭐ To develop different types of metallo organic molecules to the treatment of HIV including permanent HIV Cure.
⭐ To develop alternative drug molecules to Antiretroviral therapies.

References:

Ramachandiran SP (1992) Yagobu chunnam 300, chunna gandam 600, loguchenduram 300 vadavaihiyam 300, 1st ed. Thamara Noolagam, Chennai.