J Nanomed Nanotechnol 2013, 4:6
http://dx.doi.org/10.4172/2157-7439.S1.015

OMICS Group Conferences
Accelerating Scientific Discovery

3rd International Conference on
Nanotek & Expo

December 02-04, 2013 Hampton Inn Tropicana, Las Vegas, NV, USA

Effect of zinc oxide nanoparticles on the carcass traits and gut morphological of broiler chicks during starter phase

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In the current study, a total of 300 male broiler chickens (Ross 308) were obtained from a commercial hatchery and fed diets with different levels of zinc oxide nanoparticles (ZO-NPs) during the starter phase (from 1 to 21 d). Experiential diets were including: T1 (control; basal diet), T2, T3, T4 and T5, were supplementation basal diet with 30, 60, 90 or 120 mg of ZO-NPs/kg diet respectively. On d 21, four birds (one bird per replicate) as randomly selected, slaughtered and then carcass yield, breast and thigh composition were evaluated. The results indicated that breast and thigh muscle weight were higher in birds fed ZO-NPs compared to other treatment ($P<0.05$). As well as, dry matter, crude protein, calcium and phosphorous of breast and thigh muscles in T3 and T4 birds treatment were higher than control groups ($P<0.05$). As well, height and width of villi, crypts depth and VH/CD ratio broiler jejunum had significantly increased ($P<0.05$) in birds that fed diet supplemented with 60 and/or 90 mg of ZO-NPs.kg in comparison with control treatment. In conclusion, results of current study indicated that ZO-NPs improved carcass traits and quality of edible carcass of broilers, i.e., breast and thigh muscles, the mention improvement observed in broilers that fed basal diet inclusion of 60 to 90 mg of ZO-NPs/kg.

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Vaginal gel formulated with silver nanoparticles block the transmission of HIV-1 in human cervical culture

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Previously we demonstrated that silver nanoparticles (AgNPs) have antiviral activity against HIV-1 at non-cytotoxic concentrations; acting as a broad spectrum virucidal by preventing the interaction of the envelope of HIV-1 and cellular CD4+ receptor, thereby inhibiting fusion or entry of the virus into the host cell.

In this study, we evaluated the antiviral activity the gel/AgNPs as a potential topical vaginal microbicide to prevent transmission of HIV-1 infection using explants of human cervical culture, in an "*in vitro*" model that simulates "*in vivo*" conditions. When formulated into a non-spermicidal gel/AgNPs (Replens), besides preventing the transmission of cell-associated HIV-1 and cell-free HIV-1 isolates; they were also not toxic to the cervical explants, even when the human tissues were exposed continuously to 0.15 mg/mL for 48 h. Only 1 min of pretreatment to the explants was required to prevent transmission of HIV-1 (fast acting), and when left for 20 min, even followed by extensive washing, it prevented the transmission of HIV-1 in this model for 48 h (long lasting effect).

Based on this data, the vaginal gel/AgNPs is a promising microbicidal candidate for use in topical agents to prevent HIV-1 transmission, and further research is warranted.

Biography

Humberto H. Lara, M.D., Ph.D. obtained "summa cum laude" for his doctoral work in Nanobiotechnology. His group is pioneer in HIV-1 treated with silver nanoparticles and has been cited in more than 1,000 publications.

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