
Nanoparticles

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With the increasing number of treatment options for the human immunodeficiency virus (HIV) infection, we find ourselves more and more preoccupied with the route of administration of antiretrovirals and apparently, the future may yet hold some surprises.

With countless available publications on nanotechnology and nanoparticles in cancer treatment, when it comes to HIV we still use the classic approach and we keep searching for new molecules, with different targets.

At the AIDS 2012 XIX International AIDS Conference in Washington DC, USA, Dr. Jerome Zack (University of California, Los Angeles) presented a new approach and a new option for treatment administration: using nanoparticles as carriers.

But are these particles something new for the organism? Apparently not, as researchers have described naturally-occurring, self-assembling ribonucleoprotein particles, present in almost all cells of the human body, and named them “vault” particles.

HIV latency is a topic of intense research, since the elimination of viral reservoirs may hold the key to providing a cure for this life-long infection.

Bioengineered “vaults” can be used to deliver drugs in difficult to penetrate places and Dr Jerome Zack described a very interesting approach, that of activating latent HIV reservoirs in order to eliminate them. Using nanoparticle-based delivery, he managed to selectively activate CD4-positive T cells to increase HIV transcription and therefore expose the virus to the action of antiretrovirals.

With the ongoing research, these nanoparticles can prove to be a considerable tool for controlling drug delivery at the infection site; they could allow the use of smaller doses of antiretroviral drugs, with potentially lower associated toxicity and fewer side effects. Still, further research is needed to achieve the transition of this knowledge from bench to bedside and to better describe the role of nanoparticles in the care of HIV-infected patients.

In the context of these recent scientific advances, we have to be prepared to define ways to monitor the use, the efficacy, the safety and the tolerability of these new drug delivery instruments, since nanoparticles may very well represent a piece of the near future.

Take nanoparticles and combine them with the recent advances in pharmacogenomics and it becomes apparent that we are getting closer and closer to truly individualized care in HIV infection.

For further details on the conference, visit the official website at <http://www.aids2012.org/>

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