WHO Technical Consultation: Heterologous Prime-Boost Immunization in Ebola vaccine development and testing, licensure and use

Geneva, 21 November 2014

Introduction

Heterologous prime-boost immunization is administration of two different vectors or delivery systems expressing the same or overlapping antigenic inserts. This has been known to greatly increase both antibody and T cell immunogenicity when performed using certain vector combinations, above repeated dosing with the same vaccine candidate, for several years now. Prime-boost has been shown to increase both initial efficacy and duration of protection in several animal models including a non-human primate model of ebola virus disease, but more extensively in malaria, HIV and tuberculosis.

WHO convened a meeting jointly with NIAID on heterologous prime-boost immunization in 2012\(^1\), and this topic was highlighted during a 2013 WHO consultation on recombinant viral vectors. At the 2013 consultation, it was raised that heterologous prime-boost immunization combinations are likely to be submitted for marketing authorization/licensure in coming years, and that regulatory authorities were therefore encouraged to consider how they would approach such submissions. It has also been highlighted that some data on the reverse order vaccination would be helpful for safety purposes.

There are at least four recombinant viral vectors under advanced discussion for use in ebola vaccine trials: Chimpanzee adenovirus 3 (ChAd3), human adenovirus 26 (Ad26), vesicular stomatitis virus (VSV) and modified vaccinia virus Ankara (MVA). The two already in the clinic for ebola are ChAd3 and VSV.

The expected outcomes of this meeting are

1) A list of key questions on heterologous prime-boost immunisation related to ebola vaccine development, testing, licensure and use
2) Mapping of priority Phase 1 clinical trial designs for ebola vaccine heterologous prime-boost evaluation

\(^1\)http://apps.who.int/vaccine_research/diseases/malaria/niaid_workshop_hiv_malaria_tb_2012/en/index.html
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<td>0900 - 0915</td>
<td>Introductions, Review of Declarations of Interest</td>
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<td>0915 - 0930</td>
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| 0930 - 1000 | Overview of preclinical results on heterologous prime-boost immunisation in ebola, HIV, TB, malaria, hepatitis C and other pathogens.  
To include review of data on interval **Robert Seder and Nancy Sullivan** |
| 1000 - 1030 | **Coffee**                                                              |
| 1030 - 1100 | Overview of clinical results on heterologous prime-boost immunisation in ebola, HIV, TB, malaria, hepatitis C and other pathogens.  
To include review of data on interval **Adrian Hill** |
| 1100 - 1200 | Review of key questions to be addressed related to heterologous prime-boost for ebola  
- Development  
- Testing  
- Licensure  
- Practicalities of immunization: two different vaccines given in sequence in Sierra Leona, Liberia and Guinea? |
| 1200 - 1300 | **Lunch**                                                               |
| 1300 - 1530 | Possible Phase 1 clinical trial designs to address these questions  
- Laboratory capacity required for clinical trial sites  
- Ways to generate prime-boost data in short timelines  
- Data likely to be necessary for licensure |
| 1530 - 1600 | **Coffee**                                                              |
| 1600 - 1630 | Decision-making following clinical trials: how to ensure comparability of data from different centres and vaccines |