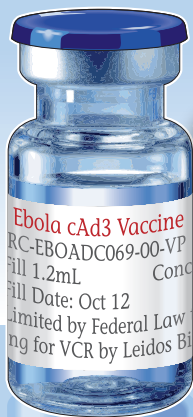
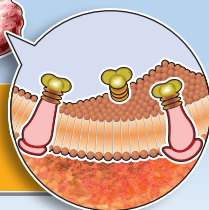


Vaccines show promise in treating Ebola

Two experimental vaccines against the deadly Ebola virus ravaging West Africa could be available as soon as November. Ebola cAd3 and VSV-EBOV would first be given to health care workers most at risk



Ebola virus: Outer membrane is studded with **glycoprotein (GP)** which binds to host cell to enable infection



Ebola cAd3: Developed by U.S. **National Institute of Allergy and Infectious Diseases (NIAID)** and **GlaxoSmithKline**. 10,000 doses available by end of year



Vaccine uses genetically modified chimpanzee “cold” virus – **chimp adenovirus type 3 (cAd3)** – to deliver non-infectious Ebola GP gene to human cells. Gene produces glycoprotein that triggers immune system to fight viral infection



National Microbiology Laboratory

VSV-EBOV: Developed by Canada's **National Microbiology Laboratory**. 800 doses of vaccine donated to World Health Organization



Vaccine based on weakened strains of **vesicular stomatitis virus**, a common animal pathogen. Glycoprotein of VSV is replaced with Ebola GP. Protects both before and after exposure.

Profectus Biosciences is also developing a VSV vaccine

TKM-Ebola:

Tekmira vaccine gave 100% protection in non-human primates to otherwise lethal dose of Zaire Ebola virus



Vaccine uses **RNA interference** – known as **RNAi** – which **silences** disease by causing genes to block Ebola replication within cells of infected person

Johnson & Johnson



Prime-boost vaccine:

Netherlands-based **Crucell** and Denmark-based **Bavarian Nordic**, (J&J's vaccine division) are working with NIAID to produce a two-shot, prime-boost vaccine



First shot uses **adenovirus-based** vaccine to get harmless Ebola gene into cells to prime immune system. Second shot contains **smallpox-based** vaccine which boosts immune response

ZMapp: Vaccine developed by **Mapp Biopharmaceutical**



has successfully treated five of seven Ebola victims – two fatalities



Cocktail of three genetically modified mouse **monoclonal antibodies** – molecules that neutralize GP protein on surface of Ebola virus