



Fusion Peptide for Early Stage Detection of HIV

AzTE Case # M13-232L

Inventors

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Invention Description

Early stage detection of Human Immunodeficiency Virus (HIV) combined with the usage of antiretrovirals is a vital component in the effort to prevent further HIV transmission and reduce the number of new infections. HIV infections are commonly diagnosed by detecting the appearance of specific antibodies in blood. However, in the early stages of the disease, HIV affects the immune system such that those antibodies aren't present until the virus has infected the host for 2-8 weeks. This makes early stage detection nearly impossible. Moreover, during this time the virus can replicate in the body very quickly.

Researchers at Arizona State University have designed and prepared a fusion peptide for early stage detection of HIV. The fusion peptide has three parts: the first part is used for purification and solid medium binding; the second part is used to increase proteolytic stability during expression; and the third part is used to bind with gp120 protein for early stage HIV detection. Moreover, the sensitivity of the fusion peptide to detect the HIV-1 gp120 protein is about 20-200 times higher than previously published methods. Because of the unique construction of the fusion peptide, it can be prepared in an *in vivo* expression system which translates into substantial cost savings.

This technology demonstrates for the first time a method to prepare short peptides (≤ 50 amino acids) in an *in vivo* expression system, while still being low in cost and easy to handle. It also represents a highly sensitive new method for early detection of HIV.

Potential Applications

- Early stage detection of HIV

Intellectual Property

Status:

Patent Pending

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Benefits and Advantages

- Detects 10pg/mL concentrations of gp120 in human blood – a sensitivity of 20-200 times higher than current detection methods
- Low-cost and greater efficiency than *in vitro* expression and chemical synthesis methods
- Easy to use method