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New insight into selective binding properties of infectious HIV

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Free infectious HIV-1 is widely thought to be the major form of the virus in the blood of infected persons. U.S. Military HIV Research Program (MHRP) researchers, however, have demonstrated that essentially all of the infectious virus particles can bind to the surface of red blood cells isolated from each of 30 normal (non-infected) human donors. The results were published today in *PLoS ONE*, and can be accessed here.

The lead investigators, Dr. Zoltan Beck and Dr. Carl Alving, researchers with MHRP in the Division of Retrovirology, Walter Reed Army Institute of Research (WRAIR), explain that the data show that although infectious HIV-1 virus particles that bind to red blood cells comprise only a small amount, perhaps as little as a mean of 2.3% of a typical HIV-1 preparation, erythrocyte-bound HIV-1 is then approximately 100-fold more infectious than free (non-cell-bound) HIV-1 for infection of target cells.

The study concludes that infectious virions constitute only a small fraction of a typical HIV-1 preparation and that, in a laboratory setting, all of the infectious virions can bind to red blood cells and other non-permissive cells (i.e., cells that cannot be infected). If this is true in HIV-infected humans it could mean that red blood cell-bound HIV-1 might be more important than free virus for transmission of infectious HIV-1 to target cells that can be infected.

Dr. Alving says, "If the same behavior of binding of infectious HIV-1 to

red blood cells occurs in humans, it might be possible that red blood cell-bound infectious virions are protected from degradation or immune attack."

Dr. Beck adds, "This study suggests that erythrocytes might serve as an important, and perhaps hidden, reservoir for infectious HIV-1 virions."

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