

Citation Spotlight

Use of Benzonase® Nuclease to Prevent Clumping of Stored Peripheral Blood Mononuclear Cells (PBMCs) During Vaccine Evaluation

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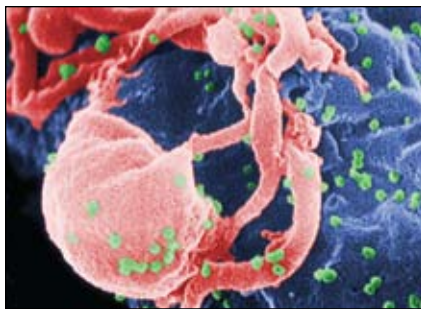
A female *Anopheles albimanus* mosquito feeds on a human host, becoming engorged with blood. *A. albimanus* is a vector of malaria, predominantly in Central America.

Ex vivo cytokine and memory T cell responses to the 42-kDa fragment of *Plasmodium falciparum* merozoite surface protein-1 in vaccinated volunteers

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Scanning electron micrograph of HIV-1 budding from cultured lymphocyte. Multiple round bumps on cell surface represent sites of assembly and budding of virions.

Defining blood processing parameters for optimal detection of cryopreserved antigen-specific responses for HIV vaccine trials

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Images and descriptions courtesy of the Centers for Disease Control

Peripheral blood mononuclear cells (PBMCs) isolated from whole blood have important applications in vaccine research – for example, during quantification of vaccine-induced T cell responses. T cell response assay methods initially required freshly isolated cells for optimal signal detection, posing a serious practical limitation for sample handling during large clinical trials. Frozen PBMCs (particularly PBMCs prepared from stored blood) tend to clump together upon thawing, preventing further analysis. In 2001, Smith et al demonstrated that inclusion of Benzonase® Nuclease in PBMC thawing buffer prevented cell clumping, allowing implementation of PBMC cryopreservation. This method has since been widely adopted in vaccine evaluation studies, including the two profiled here. In the first study (Huaman 2008), Benzonase Nuclease–treated PBMCs were analyzed by ELISPOT and Luminex® xMAP® multiplex assays to determine cytokine levels following stimulation with a 42-amino acid fragment of *Plasmodium falciparum* merozoite surface protein-1 (MSP1). This allowed researchers to assess

potential suitability of the MSP1₄₂ fragment as an anti-malarial vaccine. In the second study (Bull 2007), researchers determined optimal blood processing techniques for use in HIV-1 vaccine evaluation. Defining best practices is critical to prepare for future multicenter, large-scale phase IIB and III trials. Benzonase Nuclease was routinely included in PBMC thawing buffer prior to analysis with ELISPOT assays or intracellular cytokine staining. Taken together, these studies demonstrate an important role of Benzonase Nuclease in developing vaccines against some of the world's most serious infectious diseases. ■

Additional Reference

Smith, J.G., et al. 2001. *Clin. Diagn. Lab. Immunol.* 8, 871.

Product	Size	Cat. No.	Price
Benzonase® Nuclease HC, Purity >90%	25 KU	71205-3	\$140
Benzonase® Nuclease HC, Purity >99%	25 KU	71206-3	\$270
Benzonase® Nuclease, Purity >90%	2.5 KU	70746-3	\$92
	10 KU	70746-4	\$31
Benzonase® Nuclease, Purity >99%	10 KU	70664-3	\$118