NISLabs.com In-Vitro Study of Immune Modulation in Alomac® versus high-end aloe vera
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Results to be published in 2026.

This document addresses the top 7 cytokines/chemokines/ proteins which Alomac activated/deactivated, what they do and what each means in an in-vitro study by NIS Labs comparing Alomac powder to a high-end aloe vera.

Definitions:

- *Cytokine* - a signaling protein. It makes things happen in the body.
- *Chemokines* - a family of small cytokines, or signaling proteins, secreted by cells.
- *Monocytes* are versatile immune cells that serve as precursors to macrophages and dendritic cells, playing essential roles in recognizing and eliminating pathogens, clearing cellular debris, and initiating and regulating both innate and adaptive immune responses.
- *NK cells*, or Natural Killer cells, are a type of lymphocyte (a white blood cell) and a crucial component of the innate immune system.

IL-8 – Alomac triggered robust production of IL-8 (aqueous)
Interleukin-8 (IL-8) is one of the most important and well-studied chemokines in the human body. While it was originally discovered and named **IL-8**, its modern, systematic name is **CXCL8**. You will see both names used, but CXCL8 is the current standard. "CXC" refers to the structure of the protein, and "L" stands for Ligand.

IL-8/CXCL8 is the emergency flare gun specifically for neutrophils.
Its primary and most powerful biological activity is the **recruitment and activation of neutrophils**, which are the body's most abundant white blood cell and the first responders to acute bacterial infections and tissue injury.

IL-1β – Alomac induced a greater increase of Interleukin-1 beta (IL-1β) compared to BiAloe
Interleukin-1 beta (IL-1β) is one of the most important and powerful cytokines in the human body. Think of it as a "master alarm" for the immune system.
It belongs to the Interleukin-1 (IL-1) family of cytokines and is a quintessential **pro-inflammatory cytokine**, meaning its primary role is to initiate and amplify inflammation. Its activity is so potent that its production and release are very tightly controlled.

IFN-γ – Alomac robustly increased (Interferon) IFN-γ. Both aqueous and digested.
Antiviral peptide and activator of NK (natural killer). While IL-1β is a "master alarm" for innate immunity, **Interferon-gamma (IFN-γ)** can be thought of as the **"conductor of the cellular immune orchestra."** It is the sole member of the Type II interferon family and is a cornerstone of adaptive, cell-mediated immunity.
Its primary role is not just to sound an alarm, but to **activate, direct, and arm** professional immune cells to seek out and destroy intracellular pathogens (like viruses and certain bacteria) and cancerous cells.

IP-10 and MCP-1 – Alomac triggered robust suppression for selective antiviral response (these two recruit specific monocytes). (Monocytes are a type of white blood cell (leukocyte) that play a vital role in the immune system.)
MCP-1 is critically important molecule in inflammation.

MCP-1 stands for **Monocyte Chemoattractant Protein-1**. Its modern, systematic name is **CCL2** (Chemokine [C-C motif] Ligand 2). You will see both names used frequently in scientific literature. Unlike broad-acting cytokines like IL-1β or IFN-γ, MCP-1 has a much more specialized job. Think of it not as an "alarm" or a "conductor," but as a specific **"recruitment officer"** or a set of **"GPS coordinates"** for the immune system.
Its primary biological activity is to be a **potent chemoattractant**, a chemical signal that lures specific immune cells—most notably monocytes—to a site of inflammation, infection, or injury.

IP-10 acts as a key operational arm for the adaptive immune system. **IP-10** stands for **I**nterferon-gamma-**p**roducible protein **10**. Its modern, systematic name is **CXCL10**. As with other cytokines, you will see both names used, but CXCL10 is the current standard.

IP-10/CXCL10 is the rallying cry that summons the elite soldiers—the T-cells and NK cells—to the battlefield. Its primary biological activity is to be a powerful **chemoattractant for lymphocytes that drive a Th1-type immune response**, which is the response specialized for fighting intracellular pathogens (like viruses) and cancer.

CD69 and CD25 proteins – Alomac induces expression on the surface of NK cells
(This gets to the heart of how immunologists measure and understand the dynamic state of an immune cell.)
The expression of **CD69** and **CD25** on the surface of an NK cell are classic **activation markers**. They are like status flags that the cell raises to indicate what it's doing. Crucially, they appear at different times and signify different stages and types of activation.

CD stands for **Cluster of Differentiation**. It is a standardized naming system that scientists use to identify and categorize the thousands of different proteins found on the surface of cells.

- Each protein is given a number (e.g., CD3, CD4, CD8, CD25, CD69).
- By using lab techniques to see which "CD" proteins a cell has on its surface, a scientist can identify the cell type (e.g., "This cell has CD4, so it's a helper T-cell") and its status (e.g., "This helper T-cell also has CD69, so it has just been activated").

CD69 and **CD25** are both **activation markers**, meaning their appearance signals that a cell has been activated.

- **CD69:** This is an **"early" activation marker**. It's one of the first badges a cell puts on its uniform (within hours) to show it has just encountered a threat and is now "on duty." Its main job is to keep the cell in the tissue where the fight is happening.
- **CD25:** This is a **"later" activation marker**. It's a badge that appears after about 24 hours. It's the alpha-chain of the high-affinity Interleukin-2 receptor. By expressing CD25, the cell is essentially putting up a big antenna to receive the "multiply and sustain the attack" signal (IL-2).