

Background

MIF (or macrophage migration inhibitory factor) was the first lymphokine/cytokine to be recognized in the pregenomics era (1, 2). Regardless, it is one of the least understood of all inflammatory mediators (1, 3). Mouse MIF is a 12.5 kDa, 115 amino acid (aa) nonglycosylated polypeptide that is synthesized without a signal sequence (4 - 7). Secretion occurs nonclassically via an ABCA1 transporter (6). The initiating Met is removed, leaving Pro as the first amino acid. The molecule consists of two α -helices and six β -strands, four of which form a β -sheet. The two remaining β -strands interact with other MIF molecules, creating a trimer (2, 8). Structure-function studies suggests MIF is bifunctional with segregated topology. The N- and C-termini mediate enzyme activity (in theory). Phenylpyruvate tautomerase activity (enol- to-keto) has been demonstrated and is dependent upon Pro at position #1 (9). Amino acids 3 - 23 have also been shown to be reminiscent of a GST glutathione-binding domain (10). MIF has proinflammatory cytokine activity centered on aa's 49 - 65. On fibroblasts, MIF induces, IL-1, IL-8 and MMP expression; on macrophages, MIF stimulates, NO production and TNF- α release following IFN- γ activation (11, 12). Mouse MIF apparently acts through CD74 and CD44, likely in some form of trimeric interaction (13, 14). Mouse MIF is active on human cells, while human MIF is active on mouse cells (12). Mouse MIF is 99%, 84%, 90%, and 90% aa identical to rat, porcine, bovine and human MIF, respectively.

References:

1. Norand, E.F. and M. Leech (2005) *Front. Biosci.* **10**:12.
2. Donn, R.P., and D.W. Ray (2004) *J. Endocrinol.* **182**:1.
3. Calandra, T. and T. Roger (2003) *Nat. Rev. Immunol.* **3**:791.
4. Bozza, M. *et al.* (1995) *Genomics* **27**:412.
5. Mitchell, R. *et al.* (1995) *J. Immunol.* **154**:3863.
6. Flieger, O. *et al.* (2003) *FEBS Lett.* **551**:78.
7. Lanahan, A. *et al.* (1992) *Mol. Cell. Biol.* **12**:3919.
8. Philo, J.S. *et al.* (2004) *Biophys. Chem.* **108**:77.
9. Stamps, S.L. *et al.* (2000) *Biochemistry* **39**:9671.
10. Blocki, F.A. *et al.* (1993) *Protein Sci.* **2**:2095.
11. Sato, A. *et al.* (2003) *Dev. Comp. Immunol.* **27**:401.
12. Bernhagen, J. *et al.* (1994) *Biochemistry* **33**:14144.
13. Leng, L. *et al.* (2003) *J. Exp. Med.* **197**:1467.
14. Meyer-Siegler, K.L. and P.L. Vera (2005) *J. Urology* **173**:615.

Description

Source	<i>E. coli</i> -derived Pro2 - Ala115 Accession # NP_034928
Predicted Molecular Mass	12.4 kDa

Specifications

Activity	Bioassay data are not available.
Endotoxin Level	<1.0 EU per 1 μ g of the protein by the LAL method.
Purity	>97%, by SDS-PAGE under reducing conditions and visualized by silver stain.
Formulation	Lyophilized from a 0.2 μ m filtered solution in PBS with BSA as a carrier protein. See Certificate of Analysis for details.

Preparation and Storage

Reconstitution	Reconstitute at 10 μ g/mL in sterile PBS containing at least 0.1% human or bovine serum albumin.
Shipping	The product is shipped at ambient temperature. Upon receipt, store it immediately at the temperature recommended below.
Stability & Storage	<p>Use a manual defrost freezer and avoid repeated freeze-thaw cycles.</p> <ul style="list-style-type: none"> ● 12 months from date of receipt, -20 to -70 °C as supplied. ● 1 month, 2 to 8 °C under sterile conditions after reconstitution. ● 3 months, -20 to -70 °C under sterile conditions after reconstitution.

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NOT FOR USE IN HUMANS