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Product Information

N-FORMYL-MET-LEU-PHE
Sigma Prod. No. F3506
Storage temperature: -20° C

CAS NUMBER: 59880-97-6

SYNONYMS: FMLP; N-formyl-L-methionyl-L-leucyl-L-phenylalanine; N-formyl-MLF

PHYSICAL DESCRIPTION:

Appearance: White powder
Molecular formula: $C_{21}H_{31}N_5S$
Molecular weight: 437.6
Optical rotation: $-10^{\circ}C$ (0.5% in acetic acid at $20^{\circ}C$)⁴
Melting point: $215^{\circ}C$ ⁴

STORAGE / STABILITY AS SUPPLIED:

When stored dry at $-20^{\circ}C$, this product is very stable. A sample lost ~1% (HPLC) over six years.¹

SOLUBILITY / STABILITY OF SOLUTIONS:

FMLP is soluble in glacial (100%) acetic acid at a concentration of 20 mg/mL with sonication. Solubility in ethanol was reported as 5 mM (2 mg/mL).^{2,4} It is soluble in DMSO (4 mg/mL; 10 mM); frozen aliquots stored at $-20^{\circ}C$ should be stable at least six months.³

Oxygen-free water should be used in buffers to dilute FMLP, since methionine is subject to oxidation.

HPLC TEST METHOD:

A YMC C-8 column (5 μ m, 25 cm x 4.6 mm i.d.) was used with a gradient of 20% phase A to 40% phase A (or 30% to 50% A) for 15 minutes (solvent phase A = 75% ACN, 0.1% TFA in water; solvent phase B = 0.1% TFA).

Flow rate = 1.3 mL/min.

Sample size: 10 μ L of a 1 mg/mL solution

Detection at 215 nM

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GENERAL REMARKS:

A chemotactic substance is one which affects the orientation or movement of an organism. N-Formyl peptides have been reported to be leukocyte chemoattractants which direct the migration of cells.^{5,6} FMLP was studied along with a number of hydroperoxy (HPETE) and hydroxy (HETE) products, also shown to be chemotactic for human neutrophils. FMLP and 5,12-diHETE (most potent of the series) gave most activity between 0.1 and 1.0 ng/mL.⁷

Studies of the structural requirements indicate that the formyl group is essential,^{5,6} and the side chain in position one (methionine) also confers specificity. The presence of sulfur and greater length in this side chain enhance activity. Phenylalanine in position 3 is a requirement. Eliminating the terminal carboxyl group results in over a 1000-fold reduction in activity.⁶ Studies on structure-activity relations confirmed activity for N-formylmethionyl peptides; the three most potent attractants were found to be N-formyl-MET-LEU-PHE, N-formyl-NLE-LEU-PHE and N-formyl-MET-MET-MET-MET.^{8,9}

Specific membrane receptors are likely to be involved in the mechanism of the chemoattraction.¹⁰

Sigma has not done bioassays on this synthetic peptide.

Additional references are listed below.¹¹⁻¹⁶

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