Myeloperoxidase (MPO)

Myeloperoxidase (MPO) is a peroxidase enzyme that is abundantly expressed in polymorphonuclear leukocytes (neutrophils) and secreted during their activation.

MPO plays an important role in neutrophil microbicidal action through catalyzing chloride ionoxidation to hypochlorous acid, which is a potent antimicrobial agent. On the other hand, it has been demonstrated that MPO causes oxidative modification of low density lipoprotein (LDL) to a high uptake form that is considered to be a key event in the promotion of atherogenesis (1). For this reason, MPO is believed to participate in the initiation and progression of cardiovascular diseases. MPO possesses potent proinflammatory properties and may directly contribute to tissue injury. In addition, MPO has been suggested to be involved in pathogenesis of lung cancer (2), Alzheimer's disease (3) and multiple sclerosis (4).

Native MPO is a covalently bound tetrameric complex consisting of two glycosylated heavy chains (MW 59 – 64 kDa) and two unglycosylated light chains (MW 14 kDa) with total MW approximately 150 kDa and theoretical pI 9.2 (5).

MPO as a diagnostic marker

MPO is an inflammation marker that can serve as a cardiac marker. It has been shown that an increased MPO level in patient's blood serves as a risk marker for atherosclerosis (6) and coronary artery disease (7). It predicts the early risk of myocardial infarction, as well as the risk of other major adverse cardiac events in patients with chest pain in the ensuing 30-day and 6-month periods (8, 9). The value of MPO as a marker is that MPO predicts these outcomes independently of other known laboratory tested risk factors, including troponins, creatine kinase MB isoform (CK-MB), C-reactive protein (CRP) and lipid profile. Moreover, unlike troponins I and T, CK-MB, and CRP, MPO makes it possible to identify patients at risk for cardiac events in the absence of myocardial necrosis (8). All of these factors make MPO measurements in patients an indispensable procedure to reveal patients with chest pain that are at an increased risk of cardiovascular complications.

There are some autoimmune diseases connected with the development of autoantibodies against MPO. MPO is a main target of anti-neutrophil cytoplasm antibodies (ANCA) -serological markers for certain systemic vasculitides, microscopic polyarteritis and pulmonary eosinophilic granulomatosis (Churg-Strauss syndrome) (10). Low to moderate anti-MPO autoantibody levels are also reported in rheumatoid arthritis.

CLINICAL UTILITY

- **Acute coronary syndrome**
- **Coronary artery disease**
- **Cardiovascular disease risk stratification**
- **Prediction of long term incident major adverse cardiac event**

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Reagents for assay development

At Hytest, we provide several monoclonal antibodies that can be used for the development of quantitative immunoassays enabling the detection of human MPO. We also provide purified native MPO and MPO depleted human serum.

MONOCLONAL ANTIBODIES SPECIFIC TO MPO

We provide seven well-characterized anti-MPO MAbs for the detection of human MPO from clinical samples. All our MAbs have been screened to provide sensitive and specific detection of MPO with good kinetics. The MAbs have been tested with purified antigen in sandwich immunoassay, direct ELISA and Western blotting.

Sandwich assay for quantitative MPO immuno-detection

The presence of autoantibodies in clinical samples can significantly influence the results of a MPO test if the antibodies utilized in assays are sensitive to autoantibodies. We have tested our most sensitive two-site MAb combinations with blood samples containing high titers of MPO autoantibodies and recommend utilizing combinations that are less sensitive to autoantibodies (see Table 1). Calibration curves for two recommended antibody pairs are given in Figure 1.

MPO FREE SERUM

MPO free serum is prepared from pooled normal human serum by immunoaffinity chromatography. The affinity sorbent utilizes several immobilized MAbs with different epitope specificities. MPO free serum can be used as a matrix for standard and calibrator preparation

Table 1.

The most sensitive capture-detection pairs. Data is based on the results using our in-house time-resolved fluorescence immunoassay.

Capture	Detection
16E3	18B7
18B7	16E3
18B7	4B3
19G8	16E3
17G2	18B7

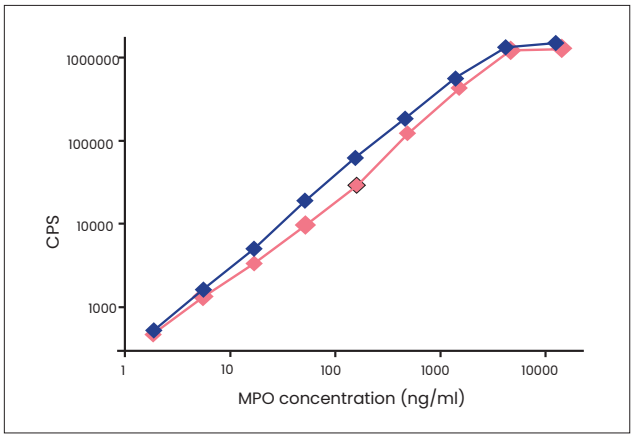

Figure 1.

Calibration curves for two MPO sandwich immunoassays. Pairs 16E3–18B7 (◆) and 18B7–16E3 (◆) were used. Purified native human MPO was used as the antigen.

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ORDERING INFORMATION

MONOCLONAL ANTIBODIES

Product name	Cat. #	MAb	Subclass	Remarks
Myeloperoxidase	4M43	4A4	IgG2b	EIA, WB
		18B7	IgG1	EIA, WB
		4B3	IgG1	EIA
		16E3	IgG1	EIA
		17G2	IgG2b	EIA
		19G8	IgG1	EIA

DEPLETED SERUM

Product name	Cat. #	Source
Myeloperoxidase free serum	8MPFS	Pooled normal human serum

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