Bacterial IMPDH (*Staphylococcus aureus*)
Recombinant, expressed in E.coli
EC 1.1.1.205

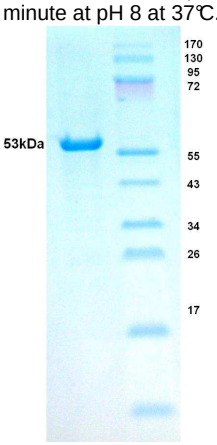
Description
NOVOCIB's bacterial IMPDH is a recombinant protein of *ca. 53*kDa cloned by PCR amplification of *guaB* gene of *Staphylococcus aureus* and expressed in *E.coli*.

Today, antibiotic resistance is one of the world's most important public health problems. There is an urgent need for new antibiotic compounds acting on new targets. One attractive strategy for developing new antibiotics consists in inhibiting bacterial IMPDH, an enzyme involved in the *de novo* synthesis of purine nucleotides, and therefore, necessary for bacterial cell growth and division.

Mammalian and bacterial IMPDHs are known to have significantly different kinetic properties and inhibitor sensitivities (1, 2). The experiments done with previously cloned human IMPDH 2 (ref. # E-Nov 1) and bacterial IMPDH of *Staphylococcus aureus*, are illustrated below. In agreement with published data, mycophenolic acid (MPA) inhibits human IMPDH type II >20-times more efficiently than bacterial IMPDH with IC_{50} values of 100nM and 2.6µM, respectively (A). In contrast, mizoribine monophosphate displays the opposite selectivity (B). It is a more potent inhibitor of bacterial IMPDH with respective IC_{50} values of 12nM and 185nM for bacterial and human enzymes.

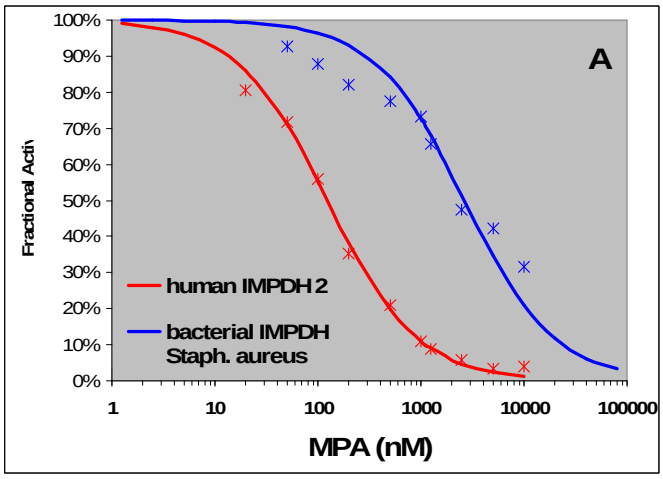
Both bacterial recombinant IMPDH and human recombinant IMPDH are available from **NOVOCIB** providing the tools for selection of species-specific IMPDH inhibitors.

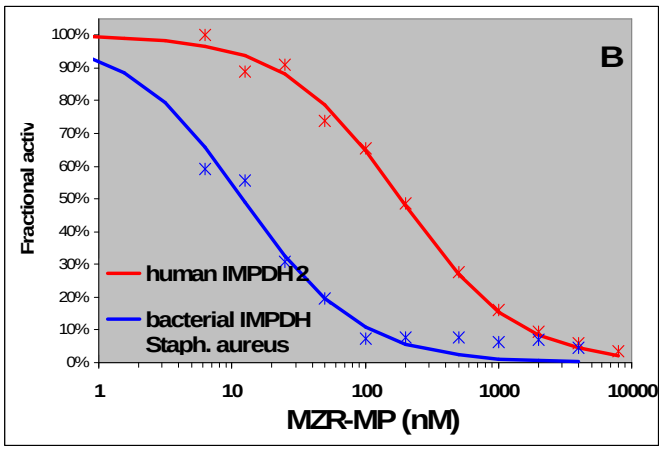
Unit Definition:
One unit of IMPDH converts 1.0 µmole of IMP and NAD to XMP and NADH per minute at pH 8 at 37°C.



Specific Activity:
≥ 0.3 unit/mg protein.

Purity: controlled by 12%AA SDS-PAGE.





IMPDH inhibition:
Effect of MPA (A) and mizoribine monophosphate (B) on human recombinant IMPDH II (red curve) and bacterial recombinant IMPDH of *Staphylococcus aureus*. (blue curve) Enzymatic assays performed in duplicate are carried out at 37°C in 0.1M KH2PO4 buffer pH 8.0 in the presence of 1mM DTT, 200µM NAD, 200µM IMP, 60nM IMPDH II or 95nM IMPDH *S.aureus*. Reaction is followed in an iEMS Reader MF (Labsystems) microtiter plate reader at 340nm

Monophosphorylated mizoribine is produced by enzymatic phosphorylation of mizoribine (MP Biochemicals) by adenosine kinase (Novocib E-Nov5).

References:
[1]. L. Hedstrom and L. Gan (2006): IMP dehydrogenase: structural schizophrenia and an unusual base *Curr. Opin. Chem. Biol.* 10(5), 520-525.
[2]. Zhang R, Evans G, Rotella FJ, Westbrook EM, Beno D, Huberman E, Joachimiak A,Collart FR. Characteristics and crystal structure of bacterial inosine-5'-monophosphate dehydrogenase. *Biochemistry* (1999) 13;38(15):4691-700.

Related products:

- ***Coupled nucleoside kinase – IMPDH assay***
- ***Human recombinant IMPDH II***
- ***IMPDH II inhibition in vitro assay***
- ***Human Adenosine kinase (AK)***