

Inositol monophosphatase (E.C.3.1.3.25)

Overview: Inositol monophosphatase (IMPase, *myo*-inositol-1(or 4)-phosphate phosphohydrolase) is a magnesium-dependent homodimer that hydrolyses *myo*-inositol monophosphate to generate *myo*-inositol and phosphate. Glycerol may be a physiological phosphate acceptor. Lithium is a nonselective un-competitive inhibitor more potent at IMPase 1 (pK_i ca 3.5, McAllister *et al.*, 1992; pIC_{50} 3.2, Ohnishi *et al.*, 2007) than IMPase 2 (pIC_{50} 1.8–2.1, Ohnishi *et al.*, 2007). IMPase activity may be inhibited competitively by L690330 (pK_i 5.5, McAllister *et al.*, 1992), although the enzyme selectivity is not yet established.

Nomenclature	IMPase 1	IMPase 2
Other names	IMPA1	IMPA2
Ensembl ID	ENSG00000133731	ENSG00000141401
Rank order of affinity	Inositol 4-phosphate > inositol 3-phosphate > inositol 1-phosphate (McAllister <i>et al.</i> , 1992)	
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Polymorphisms in either of the genes encoding these enzymes have been linked with bipolar disorder (Sjoholt *et al.*, 1997; Yoshikawa *et al.*, 1997; Sjoholt *et al.*, 2000). Disruption of the gene encoding IMPase 1, but not IMPase 2, appears to mimic the effects of lithium in mice (Cryns *et al.*, 2007; 2008).

Abbreviations: L690330, 1-(4-hydroxyphenoxy)ethane-1,1-bisphosphonate

Further Reading

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 Miller DJ, Allemann RK (2007). *myo*-Inositol monophosphatase: a challenging target for mood stabilising drugs. *Mini Rev Med Chem* 7: 107–113.

References

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| Cryns K <i>et al.</i> (2008). <i>Neuropsychopharmacology</i> 33: 674–684. | Sjoholt G <i>et al.</i> (2000). <i>Mol Psychiatry</i> 5: 172–180. |
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| Ohnishi T <i>et al.</i> (2007). <i>J Biol Chem</i> 282: 637–646. | |