

**August 2018**

## **Translocases (EC 7): A new EC Class**

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Six enzyme classes have been recognized since the first Enzyme classification and nomenclature list was first approved by the International Union of Biochemistry in 1961. These were based on the type of reaction catalysed: Oxidoreductases (EC 1), Transferases (EC 2), Hydrolases (EC 3), Lyases (EC 4), Isomerases (EC 5) and Ligases (EC 6). However, it has become apparent that none of these could describe the important group of enzymes that catalyse the movement of ions or molecules across membranes or their separation within membranes. Several of these involve the hydrolysis of ATP and had been previously classified as ATPases (EC 3.6.3.-), although the hydrolytic reaction is not their primary function.

These enzymes have now been classified under a new EC class of translocases (EC 7). The reactions catalysed are designated as transfers from 'side 1' to 'side 2' because the designations 'in' and 'out' (or 'cis' and 'trans'), which had been used previously, lack clarity and can be ambiguous. The comments associated with each entry then describe the specific translocations catalysed.

The subclasses designate the types of ion or molecule translocated:

**EC 7.1** contains enzymes catalysing the translocation of hydrons (hydron being the general name for H<sup>+</sup> in its natural abundance),

**EC 7.2** contains those catalysing the translocation of inorganic cations and their chelates,

**EC 7.3** contains those catalysing the translocation of inorganic anions,

**EC 7.4** contains those catalysing the translocation of amino acids and peptides,

**EC 7.5** contains those catalysing the translocation of carbohydrates and their derivatives

**EC 7.6** contains those catalysing the translocation of other compounds.

The sub-subclasses concern the reaction that provided the driving force for the translocation, where these are relevant:

EC 7.x.1 translocations linked to oxidoreductase reactions

EC 7.x.2 translocations linked to the hydrolysis of a nucleoside triphosphate

EC 7.x.3 translocations linked to the hydrolysis of a diphosphate

EC 7.x.4 translocations linked to a decarboxylation reaction

Exchange transporters that are not dependent on enzyme-catalysed reactions, such as the exchange of ions across membranes, are not included and pores that change conformation between open and closed states in response to phosphorylation or some other catalysed reaction are classified under EC 5.6 (Macromolecular conformational isomerases).

*(We are grateful to Dr Amanda Mackie (Macquarie University) for her advice on the content of this EC class)*