



Introduction

Any standardization efforts will necessitate broad discussions, involving different disciplines. Such activities are best carried out under the auspices of an independent scientific institution, such as the Beilstein-Institut. Hence, it has acted as a catalyst in the formation of the STRENDA (“Standards for Reporting Enzymology Data”) Commission in 2003. The members of the STRENDA commission have recently described these difficulties with the limited use of reported enzyme data to others attempting to apply those data (*CEI*, 2005 1:3-10; *Trends Biochem. Sci.*, 2005: 30:11-12; PMID: 15653320).

In consultation with the wider scientific community, the Commission is addressing them by the creation of checklists in the hope that future publications will more readily yield the sort of information that researchers hope to find.

The current checklists (List level 1A and level 1B) were discussed on the last STRENDA meeting (September 2008) in terms of consistency of form and content, as well as the order and plausibility of the list entries. Some aspects were indicated as requiring minor changes. After introduction of the suggested changes both lists were approved by the participants and these are now regarded as „completed“.

List level 1A contains required data for the methods section for publishing of enzyme activity data. These data are required to allow the reproducibility of the results.

List level 1B is a guideline for the description of the enzyme activity data from the appropriate experiments.

These lists were compiled, as a service to the community, by the STRENDA Commission to define the minimum amount of information that should accompany any published enzyme activity data.

Level 1, List A:

Required data for the methods section for publishing of enzyme activity data.

The data are required to allow the reproducibility of the results.

<http://www.strenda.org/>

Version 1.5

Date: October 9th, 2008

Data	Comments
Identity of the enzyme	
Name of Reaction Catalyst	Name, preferably the accepted name from the IUBMB Enzyme List
EC number	
Sequence accession number	
Organism/species & strain	
Isoenzyme	
Additional information on the enzyme	
Tissue/organelle	
Localization	Within cell or experiment? Specify what localization is based on
Post-translational modification	Add only when determined
Preparation	
Description	<i>e.g., commercial source, procedure used or reference</i>
Artificial modification	<i>e.g. Truncated, His-tagged, fusion protein, lacking native glycosylation</i>
Enzyme or protein purity	purity defined by which criteria. Specify whether protein or enzyme was purified. <i>e.g., apparently homogeneous by PAGE, crude mitochondrial fraction, determined by MS</i>
Substrate purity	Determine origin of substrate
Assay Conditions	
Measured reaction	as a stoichiometrically balanced equation.
Assay temperature	°C
Assay pressure	If it is not atmospheric; indicate if not aerobic
Assay pH	Description of confirmation

Data	Comments
Buffer & concentrations	<i>e.g., 100 mM Tris-HCl, 200 mM potassium phosphate</i>
Metal salt(s) & concentrations	<i>e.g., 10 mM KCl, 1.0 mM MgSO₄</i>
Other assay components	<i>e.g., 1.0 mM EDTA, 1.0 mM dithiothreitol</i>
Coupled assay components	If relevant
Substrate & concentration ranges	<i>e.g., 1 - 100 mM glucose, 5 mM ATP</i>
Enzyme/protein concentration	Molar concentration if number of active sites known, otherwise mass concentration. <i>e.g. nmol ml⁻¹ or mg ml⁻¹ or better: μmol l⁻¹ or g l⁻¹</i>
Variable components	
Total assay mixture ionic strength	
Activity	
Initial rates of the reaction measured	Determine how established
Proportionality between initial velocity and enzyme concentration	If available
Specific activity	Units necessary: Expressed as amount product formed per amount enzyme protein present - sometimes referred to as enzyme unit or international unit (1 U = 1 μmol min ⁻¹). The katal (mol/s) may alternatively be used as a unit of activity (conversion factor 1 unit = 16.67 nkat).
Methodology	
Assay method	a literature reference may suffice for an established procedure that is used without modification
Type of assay	<i>e.g., continuous or discontinuous, direct or coupled</i>
Reaction stopping procedure	in the case of discontinuous assays
Direction of the assay	With respect to the reaction equation provided <i>e.g., NAD reduction by alcohol dehydrogenase; alcohol + NAD⁺ → aldehyde or ketone + NADH + H⁺</i>
Reactant determined	<i>e.g., NADH formation, O₂ utilization</i>
Reaction stoichiometry	<i>e.g., 2 mol substrate oxidized per mol O₂ consumed</i>
Additional material desirable	
Free metal cation concentrations	<i>e.g. of Mg²⁺ and Ca²⁺</i>
Reaction equilibrium constant K	Define conditions and reaction direction