STRENDA Guidelines Level 1A

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as approved on 24th August 2010

The STRENDA Commission (Standards for Reporting Enzymology Data) compiled the following Guidelines, as a service to the community, to define the minimum amount of information that should accompany any published enzyme activity data.

The Commission was founded in 2003 and is supported by the Beilstein-Institut since then. Members of the Commission are: R.N. Armstrong† (*Vanderbilt University, Nashville, TN, USA*), A. Bairoch (*University of Geneva, Switzerland*), Barbara M. Bakker (*University Medical Center Groningen, The Netherlands*), A. Cornish-Bowden (*CNRS-BIP, Marseilles, France*), P. Fitzgerald *(The University of Texas Health Science Center, San Antonio, TX, USA),* P. Halling (*University of Strathclyde, Glasgow, UK*), T.S. Leyh (*The Albert Einstein College of Medicine, Bronx, NY, USA*), C. O'Donovan (*EBI, Cambridge, UK*), F. Raushel (*Texas A&M University, College Station, TX, USA*), J. Rohwer (*University of Stellenbosch, South Africa*), D. Schomburg (*Technical University of Braunschweig, Germany*), N. Swainston (*The University of Manchester, UK*), M.-D. Tsai (*Academia Sinica, Taipeh, Taiwan*), K. Tipton (*Trinity College, Dublin, Ireland*) and C. Kettner (co-ordination, *Beilstein-Institut, Frankfurt, Germany*).

The current checklists (list level 1A and level 1B) were reviewed on a STRENDA meeting in August 2010 in terms of consistency of form and content, as well as of the order and plausibility of the list entries. After slight modifications both lists were approved by the participants and declared as „completed“.

List Level 1A

defines data that are recommended for the methods section for publishing enzyme data.
This information should allow the reproducibility of the results.

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	NCBI Taxonomy ID
Additional information on the enzyme	
Isoenzyme	naturally occurring variant
Tissue	
Organelle	

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Data	Comments
Localization	within cell. Specify what localization is based on
Post-translational modification	add only when determined
Preparation	
Description	*e.g.,* commercial source, procedure used or reference along with modifications
Artificial modification	*e.g.*, truncated, His-tagged, fusion protein, lacking native glycosylation
Enzyme or protein purity	purity defined by which criteria. Specify whether protein or enzyme was purified.
	e.g., apparently homogeneous by PAGE, crude mitochondrial fraction, determined by MS
Metalloenzyme	Mutant, content, cofactors
Assay Conditions	
Substrate purity	Origin of substrate
Measured reaction	as a stoichiometrically balanced equation
	e.g., 2 mol substrate oxidized per mol O_2 consumed
Assay temperature	
Assay pressure	if it is not atmospheric; indicate if not aerobic
Atmosphere if not air	
Assay pH	How was it measured?
Buffer & concentrations	*e.g.*, 100 mM Tris-HCl, 200 mM potassium phosphate, including counter-ion
Metal salt(s) & concentrations	*e.g.*, 10 mM KCl, 1.0 mM $MgSO_4$
Other assay components	*e.g.*, 1.0 mM EDTA, 1.0 mM dithiothreitol
Coupled assay components	if relevant
Substrate & concentration ranges	*e.g.*, 1 - 100 mM glucose, 5 mM ATP
Enzyme/protein concentration	Molar concentration if known, otherwise mass concentration.
	e.g. mg ml^{-1} or better: µM
Varied components	*e.g.* inhibitor concentration
Total assay mixture ionic strength	

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Data	Comments
Activity	
Initial rates of the reaction measured	determine how established. *e.g.* true initial tangent or average over specified time
Proportionality between initial velocity and enzyme concentration	if available
Enzyme activity	Ideally k_{cat} otherwise expressed as amount product formed per amount enzyme protein present - sometimes referred to as enzyme unit or international unit (1 IU = 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 but any modification should be detailed
Type of assay	*e.g.*, continuous or discontinuous, direct or coupled
Reaction stopping procedure	in the case of discontinuous assays
Direction of the assay	with respect to the reaction equation provided *e.g.*, NAD reduction by alcohol dehydrogenase; alcohol + NAD^+ -> aldehyde or ketone + NADH + H^+
Reactant determined	*e.g.*, NADH formation, O_2 utilization
Additional material desirable	
Free metal cation concentrations	*e.g.,* of Mg^{2+} and Ca^{2+}, specify how calculated
Reaction equilibrium constant	define conditions and reaction direction