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Futoshi Shibasaki, Ulrika Hallin, and Hiroyuki Uchino

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	Glycobiology and Carbohydrate Biochemistry
	Lipid Biochemistry
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	Biochemistry of Proteolysis
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	Biochemistry in Cell Membranes
	Biochemistry in Diseases and Aging
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	Immunochemistry
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Molecular Biology:	Molecular Biology General
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"Instructions to Authors" are printed in the January and July issues of this JOURNAL every year. Please conform to these instructions when submitting manuscripts. Reprint of "Instructions to Authors" is available.

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(3) By-line. List full names of all authors. A footnote reference(s) to an author(s), indicating a change of address, should be given on the title-page.

(4) From-line. List the institution(s) in which the work was carried out, and the Zip Code, if available.

(5) Running title. Provide a short running title of less than 60 strokes. It should be as informative as possible.

(6) The name, complete mailing address, telephone number, and (if accessible) Fax number and E mail address of the person to whom correspondence should be sent. To expedite the review, much of the journal's correspondence will be by Fax, unless the authors request use of regular mail when submitting the manuscript. The Japanese author(s) must also list in Japanese the name and address of the person who is in charge of proofreading.

(7) Abbreviations. Non-standard abbreviations (see Section IX-6, 7, and 8) should be defined, even if they are known to those familiar with the field. List all non-standard abbreviations used in the paper in alphabetical order in a footnote on the title page.

2. Summary

(1) Every paper should have summary. The summary should be concisely written in less than 200 words. Summaries of Rapid Communications should be limited to 100 words. The summary should briefly present the problem, suggest the scope of the work and the plan of experiments, mention significant data and state major findings and conclusions. Avoid statements such as "The significance of these results is discussed" that do not help the reader. The summary should be intelligible to the nonspecialist as well as the specialist in your field, and hence should avoid specialized terms and abbreviations.

(2) Key words. Provide five key words identifying the nature of the subject matter **alphabetically** in the last part of the summary.

3. Introduction

The text of a **Regular Paper** should begin with a short introduction with no heading. This should state the reasons for performing the work, with brief reference to previous work on the subject. Avoid giving an extensive review of the literature.

4. Methods, Results, and Discussion

The arrangement of the paper after the introduction is not fixed. The author may separate sections with italicized subheadings.

The **Experimental Procedures** or **Materials and Methods** should give sufficient details to enable the reader to repeat your work exactly, if necessary. **The necessity for conciseness should not lead to omission of important experimental details.** Refer to previously published procedures employed by citation of both the original description and pertinent published modifications, and do not include extensive description unless they present substantially new modifications. Combination of the Results and Discussion in a single section sometimes gives a clearer and more compact presentation.

5. References

References cited in the text should be numbered in parentheses with italicized Arabic numerals in order of appearance. References to "unpublished experiments" and "personal communications" should appear parenthetically in the text following the name(s) of the source of information [(Yamada, T., personal communication), (Suzuki, M. and Yoshida, M., unpublished observations) *etc.*]. Be sure to verify the wording of any personal communication with the person who supplied the information and get his approval for the use of his name in connection with the quoted information. All references should be listed in numerical order typed double-spaced on a separate sheet under the heading REFERENCES. Please note the following examples.

(1) For a journal article:

7. Sanger, F., Nicklen, S., and Coulson, A.R. (1977) DNA sequencing with chain-terminating inhibitors. *Proc. Natl. Acad. Sci. USA* **74**, 5463-5467

(2) For a chapter in an edited book:

12. Messing, J. (1983) New M13 vectors for cloning in *Methods in Enzymology* (Wu, R., Grossman, L., and Moldave, K., eds.) Vol. 101, pp. 20-51, Academic Press, New York

(3) For a book by one or more authors:

15. Sambrook, J., Fritsch, E.F., and Maniatis, T. (1989) *Molecular Cloning. A Laboratory Manual* pp. 1339-1341, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY

Text citations to references written by more than two authors should be styled for example as, Smith *et al.* In the reference list, however, the names of all authors (with initials) must be given. If an article has been accepted for publication by a journal but has not yet appeared in print, the reference should be styled as follows:

29. Tanahashi, H. and Ito, T. (1994) Molecular characterization of a novel factor recognizing the interleukin-6 responsive element. *J. Biochem.* (in press)

The use of "in preparation" and "submitted for publication" is not allowed in the reference list.

Citation of the references written in a language which is usually unreadable for general readers and those published in a journal (or book) to which general reader could not easily access should be avoided.

6. Nucleotide Sequence

New nucleotide data must be submitted and deposited in the DDBJ/EMBL/GenBank databases and an accession number obtained before the paper can be accepted for publication. Submission to any one of the three collaborating databanks is sufficient to ensure data entry in all. The accession number should be included in the manuscript e.g., as a footnote on the title page: "Note: Nucleotide sequence data reported are available in the DDBJ/EMBL/GenBank databases under the accession number(s)....". If requested, the database will withhold release of data until publication. The most convenient method for submitting sequence data is by World Wide Web:

DDBJ via SAKURA: http://sakura.ddbj.nig.ac.jp/
EMBL via WEBIN: http://www.ebi.ac.uk/embl/Submission/webin. html
GenBank™ via Banklt: http://www.ncbi.nlm.nih.gov/Banklt/ or stand-alone submission tool
Sequin: http://www.ncbi.nlm.nih.gov/Sequin/

For special types of submissions (e.g., genomes, bulk submissions, etc.) additional submission protocols are available from the above sites.

Database Contact Information

DDBJ: Center for Information Biology and DNA Data Bank of Japan National Institute of Genetics, 1111 Yata, Mishima, Shizuoka 411-8540, JAPAN; telephone: +81 559 81 6853; fax: +81 559 81 6849; e-mail: ddbj@ddbj.nig.ac.jp; web URL: http://www.ddbj.nig.ac.jp/

EMBL: EMBL Nucleotide Sequence Submissions, European Bioinformatics Institute, Wellcome Trust Genome Campus, Hinxton, Cambridge DB10 1SD U.K.; telephone: +44 1223 494499; fax: +44 1223 494472; e-mail: datasubs@ebi.ac.uk; web URL: http://www.ebi.ac.uk

GenBank: National Center for Biotechnology Information, National Library of Medicine, Bldg. 38A, Rm 8N-803, Bethesda, MD 20894, U.S.A.; telephone: +1 301 496 2475; fax: +1 301 480 9241; e-mail: info@ncbi.nlm.nih.gov; web URL: http://www.ncbi.nlm.nih.gov

7. Electronic manuscripts

Electronic manuscripts reduce the possibility of introducing errors and resulted in rapid delivery of proofs. After acceptance, authors are encouraged to send the disk plus one printed manuscript to the Editorial Office of the Journal.

V. PREPARATION OF TABLES

1. Tables should be drawn on separate sheets and numbered consecutively in Roman numerals. For aid in designing tables in acceptable style, refer to current issues of the Journal.
2. Each table should have an explanatory title and sufficient experimental detail, usually in a paragraph immediately following the title, to be intelligible without reference to the text (unless the procedure is given in the Experimental Procedures section, or under another table or figure).
3. Indicate units of measure clearly.
4. Footnotes to tables should be kept to a minimum and should be indicated by superscript lower cases, at the bottom of the table.

VI. PREPARATION OF ILLUSTRATIONS

1. Each figure (Scheme, Diagram) should be given on a separate sheet numbered with an Arabic numeral (Fig. 1, Fig. 2, *etc.*). Figures will be reduced to fit into the type area of the printed page (17.5×23.5 cm).
2. **Identify all figures in the margin or on the back, with the author's name and figure number and indicate TOP.**
3. Each figure should be accompanied by a title and an explanatory legend (Legends to Figures). There should be sufficient experimental detail in the legend to make the figure intelligible without reference to the text (unless the same material has been given with a previous figure, or in the Experimental Procedures section).
4. Legends to Figures should be typed double-spaced, in numerical order, on a separate page.
5. **Photographs should be glossy and as high in contrast as possible. Quadruplicate copies for referees should be of the same quality as the original.**
6. Indicate the magnification of photomicrographs in the legend or include a bar indicating the scale in the figure.
7. Flow diagrams and amino acid or nucleotide sequences should always be presented as direct photographic reproduction.

VII. CHEMICAL AND MATHEMATICAL FORMULAE

1. Refer in the text to simple chemical compounds by their formulae when these can be printed in simple horizontal lines of type. Do not use structural formulae in the running text.
2. Ionic charge should be shown as a superscript following the chemical symbol, *e.g.* Fe^{3+}, SO_4^{2-}.
3. Prepare large structural formulae and long mathematical equations in a form suitable for direct photographic reproduction and include them as a Diagram at the end of the paper.
4. **Isotopically Labeled Compounds**—The symbol for an isotope is shown in square brackets directly before the name (word), as in [^{14}C]urea, [α-^{14}C]leucine, DL-[methyl-^{14}C]methionine. When more than one position in a substance is labeled with the same isotope and the positions are not indicated, the number of labeled atoms should be indicated as a right-hand subscript; as in [$^{14}C_2$]glycolic acid. The symbol *U* indicates uniform, *e.g.* [*U*-^{14}C]glucose (where the ^{14}C is uniformly distributed among all six positions). The isotopic prefix precedes that part of the name to which it refers, as in sodium [^{14}C]formate, thiamine [β-^{32}P]diphosphate. Terms such as ^{131}I-labeled albumin should not be contracted to [^{131}I]albumin. When isotopes of more than one element are introduced, their symbols should be arranged in alphabetical order: *e.g.* L-[3-^{14}C, 2,3-^{2}H, ^{15}N]serine. The symbols ^{2}H and ^{3}H or D and T may be used for deuterium and tritium, respectively.

   For simple molecules, the labeling is indicated by writing the chemical formulae with the prefix superscripts attached to the correct atomic symbols in the formulae: *e.g.* $^{14}CO_2$, $H_2{}^{18}O$, $^{2}H_2O$. Square brackets should not be used for them, or when the isotopic symbol is attached to a word that is not a specific chemical name, abbreviation or symbol: *e.g.* ^{131}I-labeled, ^{14}C-sugar, ^{14}C-steroids, $^{32}PO_4^{3-}$, but [^{32}P]phosphate.
5. **Spectrophotometric Data**—Beer's law may be stated as

$$A = -\log T = \varepsilon lc$$

   Where *A* is the absorbance; *T*, the transmittance ($=I/I_0$); ε, the molar absorption coefficient; *c*, the concentration of the absorbing substances in moles per liter; and *l*, the length of the optical path in centimeters. Under these conditions ε has the dimensions liter·mol^{-1}·cm^{-1} or more briefly M^{-1}·cm^{-1} (not cm^2·mol^{-1}). Do not use "O.D." and "E."

VIII. ETHICS

In scientific investigations involving human subjects, experiments should be performed in accordance with the ethical standards formulated in the Helsinki Declaration of 1964 (revised in 1989, *cf.* http://helix.nih.gov:8001/ohsr/helsinki.phtml). Similarly, animal experiments should follow the ethical standards formulated in the Helsinki Declaration, and measures taken to protect animals from pain or discomfort should be mentioned.

IX. TERMINOLOGY AND ABBREVIATIONS

1. Abbreviations with specific meanings may be used for convenience for complex chemical substances, particularly in equations, tables, or figures. Avoid using abbreviations in titles and summaries except the standard ones listed in Table II of Section IX-8.
2. Use abbreviations and symbols sparingly in the text. In chemical equations, which traditionally depend upon symbols, an abbreviation or symbol may be used for a term that appears in full in the neighboring text. Trivial names are usually sufficiently short not to require abbreviations.
3. An abbreviated name or symbol in a column heading in a table, figure, or photograph must either be taken from the "accepted" list given in Section IX-8 or formulated in accordance with the principles of Section IX-6.
4. For spelling of chemical names consult current issues of the Journal. For chemical terms follow essentially the usages and rules recommended by International Scientific Union, especially Nomenclature Committee of IUBMB (NC-IUBMB, IUBMB: International Union of Biochemistry and Molecular Biology) and IUPAC-IUBMB Joint Commission on Biochemical Nomencla-

ture (JCBN, IUPAC: International Union of Pure and Applied Chemistry): see the recommendations in *Biochemical Nomenclature and Related Documents (1978)*, available from The Biochemical Society, 7 Warwick Court, London WC1R 5DP, U. K. and in *Biochemical Nomenclature and Related Documents. A Compendium,* 2nd edn (Liébecq, C., ed.), Portland Press Ltd, London (1992). (see *Eur. J. Biochem.* **213**, 1-3 (1993)).
Refer also to http://www.chem.qmw.ac.uk/iupac/jcbn/

5. **Enzymes**—Where one or more enzymes figure prominently in a manuscript, authors should use the recommended (trivial) name or systematic name given by Nomenclature Committee of IUBMB and IUPAC-IUBMB Commission on Biochemical Nomenclature: see
Enzyme Nomenclature, Recommendations (1992), Academic Press, Inc.,
see also *Eur. J. Biochem.* **213**, 1-3 (1993).
—Supplement *Eur. J. Biochem.* **223**, 1-5 (1994).
—Supplement 2 *Eur. J. Biochem.* **232**, 1-6 (1995).
—Supplement 3 *Eur. J. Biochem.* **237**, 1-5 (1996).
—Supplement 4 *Eur. J. Biochem.* **250**, 1-6 (1997).
When an enzyme is the main subject of a paper, its source, trivial name, systematic name (or the reaction that it catalyzes) and code number (preceded by "EC") should be included.
6. **Non-Standard Abbreviations**—Use of abbreviations other than the standard ones listed in IX-7 and IX-8 should be kept to a minimum. Such abbreviations should be introduced only when absolutely necessary, as in tables, figures, and other illustrations where space is particularly limited. Abbreviations are usually not needed in the text of a paper where repeated use of long names can be avoided by judicious use of pronouns, or by paraphrasing with words such as "the substrate," "the inhibitor," "the methyl derivative," *etc.* **All non-standard abbreviations used in the text should be defined in alphabetical order in a single footnote on the title page.**
7. **Abbreviations of Units of Measurement and Physical and Chemical Quantities**—These abbreviations listed in Table I may be used without definition.

TABLE I

(1) Prefixes to the names of units					
tera	10^{12}	T	milli	10^{-3}	m
giga	10^{9}	G	micro	10^{-6}	μ
mega	10^{6}	M	nano	10^{-9}	n
kilo	10^{3}	k	pico	10^{-12}	p
deci	10^{-1}	deci (not d)	femto	10^{-15}	f
centi	10^{-2}	c[1)]	atto	10^{-18}	a

(2) Units of Concentration[2)]	
molar (moles/liter)	M
millimolar (millimoles/liter)	mM (not 10^{-3} M)
micromolar (micromoles/liter)	μM (or 10^{-6} M)
nanomolar (nanomoles/liter)	nM (or $\times 10^{-9}$ M)
picomolar (picomoles/liter)	pM (or $\times 10^{-12}$ M)
(3) Units of Length	
meter	m
centimeter	cm
millimeter	mm
micrometer (not micron)	μm (not μ)
nanometer	nm (not mμ)
Ångstrom (0.1 nm)	Å
(4) Units of Area and Volume	
square centimeter	cm^2
cubic centimeter	cm^3
liter	l (in tables only)
milliliter	ml
microliter	μl (not λ)
(5) Units of Mass	
gram	g (kg, mg, μg [not γ], ng, pg)
dalton[3)]	Da

(6) Units of Time			
hour	h	year	yr
minute	min	month	mo
second	s	week	wk
		day	d

(7) Units of Radioactivity	
becquerel	Bq (=1 dps or 60 dpm)
counts per minute	cpm
curie(s)	Ci ($=3.7\times10^{10}$ Bq)
disintegrations per minute	dpm
(8) Other Units	
mole	mol (mmol, μmol, nmol, pmol)
degree Celsius	°C
degree absolute (kelvin)	K
joule	J
kilojoule	kJ
calorie	cal
kilocalorie	kcal
parts per billion	ppb
parts per million	ppm
cycles per second (hertz)	Hz (not cps)
equivalent	eq
ampere	A (mA)
ohm	Ω
volt	V
gauss	G
pascal	Pa
revolutions per minute	rpm
Svedberg unit of sedimentation coefficient (10^{-13} s)	S
(9) Physical and Chemical Quantities	
absorbance	A
equilibrium constant	K
rate constant	k
maximum velocity	V_{max}
Michaelis constant	K_m
equilibrium dissociation constant	K_d
isoelectric point	pI
molecular weight[3)]	M_r
retardation factor	R_f
acceleration of gravity	g
specific rotation	$[\alpha]^t_\lambda$
partial specific volume	$\bar{v}$
diffusion constant	D
sedimentation coefficient	s
density	ρ
sedimentation coefficient in water at 20°C, extraporated to zero concentration	$s^0_{20,w}$
Gibbs energy change	ΔG
entropy change	ΔS
enthalpy change	ΔH
melting temperature	T_m
(10) Other Terms	
logarithm	log
logarithm (natural)	ln
standard deviation of a series	SD
standard error of mean of series	SE

[1)] to be avoided where possible (except for cm).
[2)] Terms such as milligram percent (mg%) should not be used. Weight concentrations should be given as g/ml, g/100 ml, *etc.*
[3)] Molecular weight is dimensionless. Only molecular mass is expressed by daltons.

8. **Accepted Abbreviations and Symbols**—Authors may use, without definition, the abbreviations given in Table II and the symbols and abbreviations for amino acid or nucleotide residues in polymers or sequences. Define other abbreviations in a single footnote on the title page.

TABLE II

(1) General	
Adenosine 3′:5′-cyclic monophosphate	cAMP
Adenosine 5′-mono-, di, and triphosphates[1)]	AMP, ADP, and ATP
Adenosine triphosphatase	ATPase

Base pair(s)	bp
Bovine serum albumin	BSA
O-(Carboxymethyl)	CM-
Circular dichroism	CD
Coenzyme A and its acyl derivatives	CoA (or CoASH) and acyl-CoA
Complementary DNA	cDNA
Cyclic AMP	cAMP
Cyclic GMP	cGMP
Cytidine diphosphate choline, *etc.*	CDP-choline, *etc.*
Cytidine 5′-mono-, di-, and triphosphates	CMP, CDP, and CTP
Deoxyribonuclease	DNase
Deoxyribonucleic acid	DNA
O-(Diethylaminoethyl)	DEAE-
Dithiothreitol	DTT
Electron paramagnetic resonance	EPR
Electron spin resonance	ESR
Ethylenediaminetetraacetic acid	EDTA
[Ethylenebis(oxyethlenenitrilo)]-tetraacetic acid	EGTA
Flavin-adenine dinucleotide and its fully reduced form	FAD and $FADH_2$
Flavin mononucleotide and its fully reduced form	FMN and $FMNH_2$
Fourier transform	FT
Gas chromatography-mass spectrometry	GC-MS
Gas liquid chromatography	GLC
Glutathione and its oxidized form	GSH and GSSG
Guanosine 3′:5′-cyclic monophosphate	cGMP
Guanosine 5′-mono-, di-, and triphosphates	GMP, GDP, and GTP
Guanosine triphosphatase	GTPase
Hemoglobin	Hb
Heterogenous nuclear RNA	hnRNA
High performance (pressure) liquid chromatography	HPLC
4-(2-Hydroxyethyl)-1-piperazineethanesulfonic acid	HEPES
Immunoglobulin	Ig (IgG, IgM, *etc.*)
Infrared	IR
Inorganic orthophosphate	P_i
Inorganic pyrophosphate	PP_i
Inosine 5′-mono-, di-, and triphosphates	IMP, IDP, and ITP
Kilobases	kb
Kilobase pairs	kbp
Lethal dose, 50%	LD_{50}
Messenger RNA	mRNA
Nicotinamide adenine dinucleotide and its reduced form	NAD^+ and NADH[2]
Nicotinamide adenine dinucleotide phosphate and its reduced form	$NADP^+$ and NADPH[2]
Nuclear *magnetic resonance*	NMR
Nuclear RNA	nRNA
Optical rotatory dispersion	ORD
Phosphoric acid residue	P- or -P
Pseudouridine and pseudouridine mononucleotide	ψ and ψMP
Polyacrylamide gel electrophoresis	PAGE
Poly(adenylic acid), polyadenylate[3]	Poly(A)[3]
Polymerase chain reaction	PCR
Restriction fragment length polymorphism	RFLP
Ribonuclease	RNase
Ribonucleic acid	RNA
Ribosomal RNA	rRNA
Ribosylthymine 5′-mono-, di-, and triphosphates	TMP, TDP, and TTP
Sodium dodecyl sulfate	SDS
Thin layer chromatography	TLC
Thymidine (2′-deoxyribosylthymine) 5′-mono-, di-, and triphosphates	dTMP, dTDP, and dTTP[4]
Transfer RNA	tRNA
Tris(hydroxymethyl)aminomethane	Tris
Ultraviolet	UV
Uridine diphosphate glucose, *etc.*	UDP-glucose, *etc.*
Uridine 5′-mono-, di-, and triphosphates	UMP, UDP, and UTP

(2) Amino acids

Alanine	Ala	(A)
Arginine	Arg	(R)
Asparagine	Asn	(N)
Aspartic acid	Asp	(D)
Aspartic acid or asparagine	Asx	(B)
Cysteine	Cys	(C)
Glutamic acid	Glu	(E)
Glutamine	Gln	(Q)
Glutamic acid or glutamine	Glx	(Z)
Glycine	Gly	(G)
Histidine	His	(H)
Isoleucine	Ile	(I)
Leucine	Leu	(L)
Lysine	Lys	(K)
Methionine	Met	(M)
Phenylalanine	Phe	(F)
Proline	Pro	(P)
Serine	Ser	(S)
Threonine	Thr	(T)
Tryptophan	Trp	(W)
Tyrosine	Tyr	(Y)
Valine	Val	(V)

(3) Nucleic acids

Adenosine		A
Bromouridine	BrUrd or	B
Cytidine		C
Dihydrouridine		D or hU
Guanosine		G
Inosine		I
6-Mercaptopurine ribonucleoside (6-thioinosine)		M or sI
'a nucleoside'	Nuc or	N
Pseudouridine		ψ or Q^a
'a purine nucleoside'		R
'a pyrimidine nucleoside'		Y
Thiouridine		S or sU
Thymidine (2′-deoxyribosylthymine)		dT
Uridine		U
Xanthosine		X
Phosphoric residue	-*P* or	p

[1] The various isomers of adenosine monophosphate may be written 2′-AMP, 3′-AMP, or 5′-AMP (in case of possible ambiguity). A similar procedure may be applied to other nucleoside or deoxyribonucleoside monophosphates.
[2] NAD(P)$^+$ and NAD(P)H indicate either NAD^+ or $NADP^+$ and either NADH or NADPH, respectively.
[3] Similarly abbreviate oligo- and polynucleotides composed of repeating sequences or of unknown sequence of given purine or pyrimidine bases, *e.g.* oligothymidylate, oligo(dT); alternating copolymer of A and U, poly(A-U); random copolymer of A and U, poly(A,U).
[4] The d prefix may be used to represent the corresponding deoxyribonucleoside phosphates, *e.g.* dADP.

9. **Names of Animals, Plants, and Microorganisms**—The scientific names are Latin binomials and should be given in full in the title and summary and on first mention in the text (*e.g. Escherichia coli*). Subsequently, the generic name may be contracted (usually to the first letter), *e.g., E. coli.* The strain of laboratory animals and if possible the source should be stated.
10. The cytochromes should be designated by a small italicized letter, *e.g.* cytochrome *a*, b_2, c_1, *etc.*

X. COPYRIGHT

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XI. CHARGES TO AUTHORS

A page charge (currently ¥700 and ¥7,200 per printed page of a Regular Paper and a Rapid Communication, respectively, and subject to change) is levied to help publication costs. Under exceptional circumstances, when no source of grant or other support exists, the authors may apply, at the time of submission, for a grant-in-aid to the Editor-in-Chief.

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