

Some Standard Abbreviations

(a) Use nonstandard abbreviations only if a term appears two times (the initial appearance of the term and one other time). Spell out the term at first occurrence, and introduce the abbreviation by placing it in parentheses after the term. Units should conform to the International System of Units (SI) (see Handbook of Chemistry and Physics), except for temperatures, which should be expressed in degrees Celsius.

(b) These abbreviations are to be used without definition, always:

ADP	adenosine 5'-diphosphate	GABA	γ -aminobutyric acid
AM	acetoxymethyl ester compound (used as suffix, e.g., fura-2 AM)	GDP	guanosine 5'-diphosphate
A.M., P.M.	Time	GMP	guanosine 5'-monophosphate
AMP	adenosine 5'-monophosphate	GTP	guanosine 5'-triphosphate, also GTP γ S
AMPA	α -amino-3-hydroxy-5-methyl-4-isoxazole propionic acid	HBSS	Hanks' balanced salt solution
ANOVA	analysis of variance	HEPES	4-(2-hydroxyethyl)-1-piperazine-ethanesulfonic acid
ATP	adenosine 5'-triphosphate	HPLC	high-performance (or high-pressure) liquid chromatography
cAMP	cyclic aminomonophosphate	IC ₅₀	median internal or inhibitory concentration
cDNA	complementary DNA	Ig	immunoglobulin; also, IgA, IgD, IgE, IgG, IgM, etc. sometimes with numerical suffixes, e.g., IgG1.
cGMP	cyclic GMP; also, cGDP, cGTP, etc.	IPSC	inhibitory postsynaptic current
cRNA	complementary RNA	IPSP	inhibitory postsynaptic potential
CNS	central nervous system	mRNA	messenger ribonucleic acid
CSF	cerebrospinal fluid	NADPH	[NOT NADP(H)]
DEAE-cellulose	O-(diethylaminoethyl)-cellulose	NMDA	<i>N</i> -methyl-D-aspartate
DMEM	Dulbecco's modified Eagle's medium	PAGE	polyacrylamide gel electrophoresis
DNA	deoxyribonucleic acid	PBS	phosphate-buffered saline
DNase	Deoxyribonuclease	PCR	polymerase chain reaction
EC ₅₀	median effective, external, or excitatory concentration	pH, pC, pO	partial pressure of [element]
ED ₅₀		RNA	ribonucleic acid
EDTA	ethylenediaminetetra-acetate	RNase	Ribonuclease
EGTA	ethylene glycol bis(β -aminoethyl)ether- <i>N,N,N',N'</i> -tetra-acetic acid	SD	standard deviation
ELISA	enzyme-linked immunosorbent assay	SDS	sodium dodecyl sulfate
EPSC	excitatory postsynaptic current	SE	standard error
EPSP	excitatory postsynaptic potential	SEM	standard error of mean
		SSC	sodium--saline citrate
		tRNA	transfer RNA
		Tris	tris(hydroxymethyl)aminomethane

(c) **Supplemental Abbreviations:** These abbreviations are non-standard, but authors are encouraged to use these without definition.

ATCC	American Type Culture Collection	6-OHDA	6-hydroxydopamine
CNRS	Centre National de la Recherche Scientifique	8-OHQ	8-hydroxyquinoline hemisulfate
CREST	Core Research for Evolutional Science and Technology	a.u., A.U.	arbitrary units
HHMI	Howard Hughes Medical Institute	aa	amino acids (e.g., "We used 15-17 aa to determine..." BUT "Several amino acids showed..." OR "When amino acids 15-17 were used...")
NCBI	National Center for Biotechnology Information	Ab	antibody
NIH	National Institutes of Health	ABC	avidin--biotin complex
NCRR	National Center for Research Resources	ACC	anterior cingulate cortex
NIA	National Institute on Aging	ACh	acetylcholine
NIAAA	National Institute on Alcohol Abuse and Alcoholism	AChE	acetylcholinesterase
NICHD	National Institute of Child Health and Human Development	AChR	acetylcholine receptor
NIDA	National Institute on Drug Abuse	ACSF, aCSF	artificial CSF
NIDCD	National Institute on Deafness and Other Communication Disorders	ACTH	adrenocorticotrophic hormone
NIDDK	National Institute of Diabetes and Digestive and Kidney Diseases	AD	Alzheimer's disease
NEI	National Eye Institute	AGRP	agouti-related peptide
NIMH	National Institute of Mental Health	AHP	afterhyperpolarization
NINDS	National Institute of Neurological Disorders and Stroke	ALS	amyotrophic lateral sclerosis
NLM	National Library of Medicine	AM251	<i>N</i> -1-(2,4-dichlorophenyl)-5-(4-iodophenyl)-4-methyl- <i>N</i> -1-piperidiny-1- <i>H</i> -pyrazole-3-carboxamide
RPMI	Roswell Park Memorial Institute	AMPA	AMPA receptor
UMR	Unité Mixte de Recherche	ANCOVA	analysis of covariance
β -gal	β -galactosidase	AP-3	aminophosphonopropionic acid (or -propionate)
2-DG or 2DG	2-deoxyglucose	AP-4	aminophosphonobutyric acid (or -butyrate)
3D, 3-D, 2-D, 2D	three-dimensional, two-dimensional	AP-5	aminophosphonopentanoic acid (or -pentanoate)
4-AP	4-aminopyridine	APB	2-amino-4-phosphonobutyrate
5-HT	5-hydroxytryptamine (serotonin)	APP	amyloid precursor protein
		APV	aminophosphonovalerate
		AraC, Ara C	cytosine arabinoside (or cytosine arabinofuranoside)
		ASA	film speed

b	base	DMSO	dimethyl sulfoxide
BA	Brodmann's area or Brodmann area	DNQX	6,7-dinitroquinoxaline-2,3-dione
BACE	β -site APP cleaving enzyme	DOPAC	dihydroxyphenylacetic acid
BAD	Bcl-2-associated death protein	dpi	dots per inch
BAPTA	bis(2-aminophenoxy)ethane- <i>N,N,N',N'</i> -tetra-acetic acid	DPX	a mixture of distyrene, tricresyl phosphate (or plasticizer), and xylene
BCA	bicinchoninic acid	DRG	dorsal root ganglion
BCIP	5-bromo-4-chloro-indolyl phosphate (most often appears as NBT/BCIP)	dsDNA	double-stranded DNA
BDNF	brain-derived neurotrophic factor	dsRNA	double-stranded RNA
bFGF	basic fibroblast growth factor	DTT	dithiothreitol
bHLH	basic helix-loop-helix	dUTP	deoxy-UTP
BIC	bicuculline	DV	dorsoventral
BK	large conductance	DYN	dynorphin
BLA	basolateral amygdala	E (dig)	embryonic day (dig)
BLAST	basic local alignment search tool	EAA	excitatory amino acids
BMEM	basal minimum essential medium	EBSS	Earle's balanced salt solution
BMP	bone morphogenetic protein	ECL	enhanced chemiluminescence
BOLD	blood oxygenation level-dependent	ECM	extracellular matrix
bp	base pair	EEG	electroencephalogram
BrdU	bromodeoxyuridine	EGF	epidermal growth factor
BRL	Bethesda Research Labs	EGFP	enhanced green fluorescent protein
BSA	bovine serum albumin	EKG	electrocardiogram
BTX	bungarotoxin (or botulinum toxin)	ELISPOT	enzyme-linked immunospot
CaM	calmodulin	EM	electron microscopic
CAM	cell adhesion molecule	EMG	electromyogram
CaMKII	calcium/calmodulin-dependent protein kinase II	EOG	electro-oculogram
CBP	CREB binding protein	EPI	echoplanar imaging
CCD	charge-coupled device (camera type)	ER	endoplasmic reticulum
CCK	cholecystokinin	ERG	electroretinogram
Cdk	cyclin-dependent kinase	ERK	extracellular signal-regulated protein kinase
CeA	central nucleus of the amygdala	ERP	event-related potential
CFP	cyan fluorescent protein	ES	embryonic stem (cell line)
CHAPS	3-[(3-cholamidopropyl)dimethylammonio]-1-propanesulfonate	EST	expressed sequence tag
ChAT	choline acetyltransferase (occasionally, CAT)	EtOH	ethanol
CHO	Chinese hamster ovary (cells)	F_o/F_s	fluorescence relation
CI	confidence interval	FACS	fluorescence-activated cell sorting
CM-cellulose	<i>O</i> -(carboxymethyl)-cellulose	F-actin	filamentous actin
CMV	cytomegalovirus	FAD	familial Alzheimer's disease
CNQX	6-cyano-7-nitroquinoxaline-2,3-dione	FADD	FAS-associated death domain
CNTF	ciliary neurotrophic factor	FBS	fetal bovine serum
CoA	coenzyme A	FCS	fetal calf serum
Con A	concanavalin A	FDG	fluorodeoxyglucose
CRE	cAMP response element	fEPSP	field EPSP
CREB	cAMP response element-binding protein	FFT	fast Fourier transform
CRF	corticotropin-releasing factor	FGF	fibroblast growth factor
CRT	cathode ray tube	FISH	fluorescence <i>in situ</i> hybridization
CTP	cytosine triphosphate; also, CMP, CDP	FITC	fluorescein isothiocyanate
Cy3, Cy5	cyanine 3, cyanine 5	FM 1-43 or FM1-43	<i>N</i> -(3-triethylammoniumpropyl)-4-(4-(dibutylamino)styryl) pyridinium dibromide
DA	dopamine	FM 4-64 or FM4-64	<i>N</i> -(3-triethylammoniumpropyl)-4-(6-(4-(diethylamino)phenyl)hexatrienyl)pyridinium dibromide
DAB	diaminobenzidine	FM	frequency-modulated
DAG	diacylglycerol	fMRI	functional magnetic resonance imaging
DAMGO	D-Ala ² - <i>N</i> -Me-Phe ⁴ -Glycol ⁵ -enkephalin or [D-Ala(2), <i>N</i> -Me-Phe(4),Gly(5)-ol]-enkephalin	FMRP	fragile X mental retardation protein
D-AP	D(-)-2-amino-5-phosphonopentanoic acid	FOV	field of view (MRI term)
D-AP5		FPLC	fast protein liquid chromatography
D-AP-5		FRET	fluorescent resonance energy transfer
DAPI	4',6'-diamidino-2-phenylindole dihydrochloride	FWE	familywise error
DAPT	<i>N</i> -[<i>N</i> -(3,5-difluorophenacetyl)-L-alanyl]-(<i>S</i>)-phenylglycine t-butyl ester	FWHM	full-width at half-maximal (or half-maximum)
db-	dibutyl, as in db-cAMP	GAD	glutamic acid decarboxylase
DEPC	diethylpyrocarbonate	GalC, Gal C	galactocerebroside
df	degrees of freedom	GAP	growth-associated protein
DG	dentate gyrus	GAPDH	glyceraldehyde-3-phosphate dehydrogenase
DHT or 5,7-DHT	dihydroxytryptamine, 5,7-dihydroxytryptamine	GCL	ganglion cell layer
DIDS	4,4-diisothiocyanostilbene-2,2'-disulfonic acid	GDNF	glial cell line-derived neurotrophic factor
DIG	digoxigenin	GFAP	glial fibrillary acidic protein
Dil	1,1'-dioctadecyl-3,3,3',3'-tetramethylindocarbocyanine perchlorate	GFP	green fluorescent protein
DiO	1,1'-dioctadecyl-3,3,3',3'-tetramethyloxycarbocyanine perchlorate	GIRK	G-protein-gated inwardly rectifying K ⁺ channel
DIV	days <i>in vitro</i>	GLM	general linear model
DKO	double knock-out	Glu	glutamate
DL-APV	DL-2-amino-7-phosphonovalerate	GluR	glutamate receptor
dIPFC, DLPFC	dorsolateral prefrontal cortex	GPCR	G-protein-coupled receptor
		GPe	globus pallidus external segment
		GPI	globus pallidus internal segment
		GRIP	glutamate receptor-interacting protein
		GSH	glutathione
		GST	glutathione <i>S</i> -transferase (no hyphen before <i>S</i>)
		H&E	hematoxylin and eosin

HA	hemagglutinin	MS	mass spectrometry
HEK293	human embryonic kidney 293	MS-222	tricaine methane sulfonate
HFS	high-frequency stimulation	MSH	melanocyte-stimulating hormone
HIV	human immunodeficiency virus	MT	middle temporal cortex or visual area
HRF	hemodynamic response function	MTT	3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide [an assay]
HRP	horseradish peroxidase	NA	numerical aperture (lens setting)
HSD	honestly significant difference (not defined if used with Tukey's test)	NAAG	<i>N</i> -acetylaspartylglutamate
Hsp, HSP	heat shock protein	NAc, NAcc	nucleus accumbens
HSV	herpes simplex virus	nAChR	nicotinic ACh receptor
IBMX	1-methyl-3-isobutylxanthine	NBQX	2,3-dihydroxy-6-nitro-7-sulfonyl-benzo[<i>f</i>]quinoxaline
ICER	inducible cAMP early repressor	NBT	nitroblue tetrazolium
IFN	interferon	NCAM	neural cell adhesion molecule
IGF	insulin-like growth factor	ND, n.d.	not determined (tables only)
IL	interleukin	NEN	New England Nuclear (a reagent supplier)
INL	inner nuclear layer	NeuN	neuronal-specific nuclear protein
IP ₃	inositol triphosphate; IP ₁ , inositol monophosphate, etc.	NGF	nerve growth factor
IQ	intelligence quotient	NGS	normal goat serum
-IR	immunoreactivity, immunoreactive, as in GABA-IR (always caps). Use consistently as only one form throughout text (not as both immunoreactivity and immunoreactive in the same paper).	NK	natural killer (cell line)
IRES	internal ribosomal entry site	NMDAR	NMDA receptor
ISH	<i>in situ</i> hybridization	No., no.	number
JNK	c-Jun N-terminal protein kinase	NP-40	Nonidet P-40
KA	kainic acid (or kainate)	NPY	neuropeptide Y
kb	kilobase (always lowercase)	NS, n.s.	not significant
kbp	kilobase pair	NSAIDs	nonsteroidal anti-inflammatory drugs
KLH	keyhole limpet hemocyanin	nt	nucleotide
KO, ko	knock-out	O-2A	oligodendrocytic-type 2 astrocyte progenitor cell
LB	Luria--Bertani	ONL	outer nuclear layer
LCD	liquid crystal display	OPL	outer plexiform layer
LD ₅₀	median lethal dose	ORF	open reading frame (genetics)
LDH	lactate dehydrogenase	P (dig)	postnatal day (dig)
LDL	low-density lipoprotein	PAP	peroxidase-antiperoxidase
L-DOPA	L-3,4-dihydroxyphenylalanine	PB	phosphate buffer
LED	light-emitting diode	PC	personal computer
LGN	(dorsal) lateral geniculate nucleus; dLGN can be used if author also uses LGN	PC-12	pheochromocytoma cell line
LIM	the three gene products Lin-11, Isl-1, and Mec-3	PD	Parkinson's disease
LM	light microscopic	PDBu	phorbol dibutyrate
L-NAME	<i>N</i> -ω-nitro-L-arginine methyl ester	PDGF	platelet-derived growth factor
LPS	lipopolysaccharide	PDZ	postsynaptic density-95/Disks large/zona occludens-1
LTD	long-term depression	PET	positron emission tomography, positron emission tomographic
LTP	long-term potentiation	PFA	paraformaldehyde
mAb	monoclonal antibody	PFC	prefrontal cortex
mAChR	muscarinic AChR	PHA-L	<i>Phaseolus vulgaris</i> leucoagglutinin
MAG	myelin-associated glycoprotein	P _i	inorganic phosphate
MAGUK	membrane-associated guanylate kinase	PIPES	1,4-piperazinediethanesulfonic acid
MAO	monoamine oxidase	PKC	protein kinase C
MAPK	mitogen-activated protein kinase	PLC	phospholipase C
MBP	myelin basic protein	PLSD	protected least significant difference
MEG	magnetoencephalogram, magnetoencephalography, magnetoencephalographic	PMA	phorbol 12-myristate 13-acetate
MEK	mitogen-activated protein kinase kinase	PMSF	phenylmethylsulfonyl fluoride
MEM	Minimum Essential Medium (caps or lowercase)	PNS	peripheral nervous system
mEPSC,	miniature EPSC, EPSP	POMC	proopiomelanocortin
mEPSP		PSC	postsynaptic current
MES	2-[<i>N</i> -morpholino]ethanesulfonic acid	PSD	postsynaptic density
MFC	medial frontal cortex	PSD-95	postsynaptic density-95
mGluR	metabotropic glutamate receptor	PSP	postsynaptic potential
MHC	major histocompatibility complex	PVDF	polyvinylidene difluoride or polyvinylidene fluoride
mIPSC,	miniature IPSC, IPSP	QA	quisqualic acid (or quisqualate)
mIPSP		qRT-PCR	quantitative real-time PCR
miRNA	microRNA	QX-314 (or QX314)	lidocaine <i>N</i> -ethyl bromide 2(triethylamino)- <i>N</i> -(2,6-dimethylphenyl) acetamine 5- <i>N</i> -(2,6-dimethylphenyl)carbamoylmethyl)triethylammonium bromide
MK-801	5 <i>H</i> -dibenzo[<i>a</i> , <i>d</i>]cyclohepten-5,10-imine (dizocilpine maleate)		<i>N</i> -(2,6-dimethylphenyl)carbamoylmethyl)triethylammonium bromide
ML	medialateral	RACE	rapid amplification of cDNA ends
MMLV	Moloney murine leukemia virus	recombinant products	r, rat; h, human; b, bovine, etc.
MNI	Montreal Neurological Institute	RFP	red fluorescent protein
MPEP	2-methyl-6-(phenylethynyl)-pyridine	RGC	retinal ganglion cell
mPFC	medial prefrontal cortex	RIA	radioimmunoassay
MPRAGE (or MP-RAGE)	magnetization-prepared rapid acquisition gradient echo	RIPA	radioimmunoprecipitation assay
MPTP	1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine	RITC	rhodamine isothiocyanate
MR	magnetic resonance	RML	Rocky Mountain Laboratory
MRI	magnetic resonance imaging	rms	root mean square
		RNAi	RNA interference

ROI	region of interest	TCA	trichloroacetic acid
ROS	reactive oxygen species	TdR	thymidine deoxyribose
RP	reverse-phase, as in RP-HPLC	TE	echo time (MRI term)
SC	superior colliculus	TEM	transmission electron microscopy
SCG	superior cervical ganglion		terminal uridine deoxynucleotidyl transferase dUTP
sEPSC, PSP	spontaneous EPSC or EPSP		nick end labeling
SHH, Shh	Sonic hedgehog	TGF	transforming growth factor
shRNA	short hairpin RNA	TH	tyrosine hydroxylase
sIPSC, PSP	spontaneous IPSC or IPSP	TI	inversion time
siRNA	small interfering RNA	TIFF	tagged image file format
SIT	silicon-intensified target (camera type)	TK	thymidine kinase
SITS	4-acetamido-4'-isothiocyanostilbene-2,2'-disulfonic acid	TLC	thin-layer chromatography
SK	small conductance	TMB	tetramethylbenzidine10
SMA	supplementary motor area	TNF	tumor necrosis factor
SNARE	soluble <i>N</i> -ethylmaleimide-sensitive factor (NSF) attachment protein (SNAP) receptor (SNARE)	TPH	tryptophan hydroxylase
SNc	substantia nigra pars compacta	TR	repetition time (no definition needed when used in context of MRI terms)
SNR or SNr	substantia nigra pars reticulata	TRITC	tetramethylrhodamine isothiocyanate
SOD	superoxide dismutase	trkB, TrkB	tyrosine-related kinase B or tyrosine receptor kinase B
SPECT	single photon emission computed tomography	TRP	transient receptor potential
SPL	sound pressure level	TTX	tetrodotoxin
SPM	Statistical Parametric Mapping (software made by Wellcome Department of Cognitive Neurology, London, UK)	TUNEL	terminal deoxynucleotidyl transferase-mediated biotinylated UTP nick end labeling
SPSS	Statistical Program for the Social Sciences (software)	UAS	upstream activator sequence
st.	stratum (e.g., st. oriens, st. moleculare) -- only use as singular (e.g., st. oriens BUT strata oriens and moleculare)	UTR	untranslated region
STN	subthalamic nucleus	UV	ultraviolet
STS	superior temporal sulcus	VACht	vesicular acetylcholine transporter
SV40	simian virus 40	VEGF	vascular endothelial growth factor
SVZ	subventricular zone	VGCC	voltage-gated Ca ²⁺ channel
TBS	Tris-buffered saline	VGLuT	vesicular glutamate transporter
TBS-T or	Tris-buffered saline--Tween 20	VIP	vasoactive intestinal peptide
TBST		VTA	ventral tegmental area
		WT, wt	wild type, wild-type
		X-gal	5-bromo-4-chloro-3-indolyl-β-D-galactopyranoside