

Common Scientific Abbreviations

°C	degree Celsius
μA	microampere
μCi	microcurie
μg	microgram
μl	microliter
μm	micrometer
2D	two-dimensional
3D	three-dimensional
A	ampere
a	year
Å	angstrom (10 ⁻¹⁰ m)
A. dest.	Aqua destillata
aa	amino acid(s)
Ab	antibody
Ac	acetyl
ACE	angiotensin-converting enzyme
ACh	acetylcholine
AChE	acetylcholine esterase
ACTH	Adrenocorticotropin
Ade	adenine
ADH	alcohol dehydrogenase
ADH	antidiuretic hormone
Ado, A	adenosine
ADP	adenosine diphosphate
AIDS	acquired immune deficiency syndrome
α-KGA	α-ketoglutarate
ALA	aminolevulinic acid
Ala, A	alanine
ALAT	alanine aminotransferase
alk.	alkaline
AMP	adenosine monophosphate
Amp	ampicillin
AP	alkaline phosphatase
APC	antigen presenting cell
APS	Ammonium peroxosulfate
aq.	aqueous
Ara	arabinose

Arg, R	argenine
ASAT	aspartate aminotransferase
Asn, N	asparagine
Asp, D	aspartate
ATP	adenosine triphosphate
ATPase	adenosine triphosphatase
av.	average
BFP	blue fluorescent protein
BHK	baby hamster kidney
BOD	biochemical oxygen demand
bp	base pair
BrdU	bromodeoxyuridine
BSA	bovine serum albumin
BTN	biotine
But	butyl
ca.	circa
CaM	Calmodulin
cAMP	cyclic AMP
Car	carnitine
CAT	chloramphenicol acetyltransferase
CCD	charge-coupled device
CD	cluster of differentiation
cd	candela
Cdk	Cyclin-dependent kinase
cDNA	complementary DNA
CDP	cytidine diphosphate
Cer	ceramide
cf.	confer (see, compare)
CFP	cyan fluorescent protein
cfu	colony forming unit
cGMP	cyclic GMP
CHAPS	3-(3-cholamidopropyl)diethylammonio 1 propanesulfonate
CHO	Chinese hamster ovary
Cho	choline
Chol	cholesterol
Chym	Chylomicron
Ci	Curie
Cir	cituline

Cit	citrate
CL	cardiolipine
Cm	Chloramphenicol
CMP	cytidine monophosphate
CMV	cytomegalivirus
CNS	central nervous system
CoA	coenzima A
CoB ₁₂	cobalamine
COD	chemical oxygen demand
CoF = FH ₄	tetrahydrofolate
Con A	concanavalin A
conc.	concentration, concentrated
const.	constant
CoQ	ubichinone
cpm	counts per minute
cps	counts per second
Cr	creatine
Csh	cystine
CTAB	cetyltrimethylammoniumbromide
CTP	cytidine triphosphate
Cyd, C	cytidine
Cyo	cytosine
Cys, C	cysteine
Cyt	cytochrome
<i>d</i>	density
d	day
Da	dalton
DAB	3,3-diaminobenzidine
DAG	diacylglycerol
DAPI	6'-diamidino-2-phenylindole
dATP	2'-deoxyadenine triphosphate
dCTP	2'-deoxycytidine triphosphate
DEAE	diethylaminiethyl
deg.	degrees
DEPC	diethylpyrocarbonate
dev.	deviation
dGTP	2'-deoxyguanosine triphosphate
diam.	diameter

dil.	dilute(d), dilution
DME	Dulbecco's modified Eagle's medium
DMF	dimethylformamide
DMSO	dimethyl sulfoxide
DNA	deoxyribonucleic acid
DNase	deoxyribonuclease
dNDP	mixture of dADP, dCDP, dGDP, dTDP
dNMP	mixture of dAMP, dCMP, dGMP, dTMP
DNP	dinitrophenyl
dNTP	mixture of dATP, dCTP, dGTP, dTTP
DOC	dissolved organic carbon
dpm	disintegrations per minute
dps	disintegrations per second
dRib	2-deoxyribose
dTDP	2'-deoxythymidine diphosphate
dTMP	2'-deoxythymidine monophosphate
DTT	dithiothreitol
dTTP	2'-deoxythymidine triphosphate
e.g.	exempli gratia (for example)
EC ₅₀	median effective concentration
ECL	enhanced chemiluminescence
ECM	extracellular matrix
EDTA	ethylenediaminetetraacetic acid
EGF	epidermal growth factor
EGFP	enhanced GFP
EGTA	ethyleneglycol-bis(β-aminoethyl ether)-N,N'-tetraacetic acid
ELISA	enzyme-linked immunosorbent assay
EM	electron microscopy
ER	endoplasmic reticulum
EST	expressed sequence tag
est.	estimate, estimated
Et	ethyl
et al.	at alii (and others)
etc.	et cetera (and so forth)
EtN	ethanolamine
EtOH	ethanol
evapn.	evaporation
F ₀	parental generation

F ₁	first filial generation
F ₂	second filial generation
FACS	fluorescence-activated cell sorter
F-actin	filamentous actin
FAD	flavine adenine dinucleotide
FADH ₂	reduced FAD
FAK	focal adhesion kinase
FBS	fetal bovine serum
FCS	fetal calf serum
Fd	ferredoxine
Fe/S	iron-sulphur cluster
FFA	free fatty acid
FGF	fibroblast growth factor
FID	flame ionization detector
Fig.	figure
FISH	fluorescent in situ hybridization
FITC	fluorescein isothiocyanate
fl.	fluid
FMN	flavine mononucleotide
FMNH ₂	reduced FMN
FPLC	fast protein liquid chromatography
FRAP	fluorescence recovery after photobleaching
Fru	fructose
Fum	fumarate
g	unit of gravity
g	gram
G418	geneticin
GABA	γ-aminobutyric acid
Gal	galactose
GC	gas chromatography
GDP	guanosine diphosphate
Gent	gentamycin
GFP	green fluorescent protein
Glc	glucose
Gln, Q	glutamine
GLP	good laboratory practice
Glu, E	glutamate
Gly, G	glycine

GMP	guanosine monophosphate
Gra	glyceraldehyde
Gri	glycerate
Gro	glycerol
GSH	reduced glutathione
GSSG	oxidised glutathione
GST	glutathione S-transferase
GTP	guanosine triphosphate
GTPase	guanosine triphosphatase
Gua	guanine
Guo, G	guanosine
h	hour
HA	hemagglutinin
HAT	hypoxanthine, aminopterin, thymidine
Hb	haemoglobin
HBS	HEPES buffered saline
HBSS	Hanks' balanced salt solution
HBV	hepatitis B virus
Hcy	homoserine
HDL	high density lipoprotein
HEK293	human embryonal kidney cells
HeLa	Henrietta Lacks cells (cervical cancer)
HEPES	N-2-hydroxyethylpiperazine-N'-2-ethane sulfonic acid
His, H	histidine
HIV	human immunodeficiency virus
HLA	human leucocyte antigen
HMG	β-hydroxy-β-methyl-glutarate
hnRNA	heterogeneous nuclear RNA
hPa	hectopascal
HPLC	high performance liquid chromatography
HRP	horseradish peroxidase
HUVEC	human umbilical vein endothelial cells
Hyp	hypoxanthine
i.e.	id est (that is)
i.l.	intraluminal(ly)
i.m.	intramuscular(ly)
i.p.	intraperitoneal(ly)
i.v.	intravenous(ly)

IC ₅₀	median inhibitory concentration
ICAM	intercellular adhesion molecule
Ict	isocitrate
IDL	intermediate density lipoprotein
IEF	isoelectric focusing
IFN	interferon
Ig	immunoglobulin
IL	interleukin
Ile, I	isoleucine
Ino, I	inosine
Ins	inositol
insol.	insoluble
InsP ₃ , IP ₃	inositol-1,4,5-trisphosphate
IPTG	isopropyl-β-d-thiogalactoside
IR	infrared
IU	international unit
J	joule
JNK	c-Jun NH ₂ -terminal kinase
K	Kelvin
Kan	kanamycin
kb	kilobase
kbp	kilobase pair
kDa	kilodalton
kg	kilogram
kJ	kilojoule
l	liter
LA	lipoamide
Lac	lactate
LB	Luria broth (medium)
LC ₅₀	median lethal concentration
LD ₅₀	median lethal dose
LDH	lactate dehydrogenase
LDL	low density lipoprotein
Leu, L	leucine
liq.	liquid
LPS	lipopolysaccharide
LT ₅₀	median lethal time
Lys, K	lysine

m	meter
M	molar (mol/l)
mA	milliamperere
mAb	monoclonal antibody
MAG	monoacyl glycerol
MAPK	mitogen-activated protein kinase
max.	maximum
mCi	millicurie
MD	missing data
MDCK	Madin–Darby canine kidney
MDR	multi drug resistance
Me	methyl
MEM	Eagle’s minimum essential medium
MeOH	methanol
MES	2-(N-morpholino)ethane sulfonic acid
Met, M	methionine
mg	milligram
MHC	major histocompatibility complex
MIC	minimal inhibitory concentration
min	minute
min.	minimum
mixt.	mixture(s)
ml	milliliter
Mlt	malate
mm	millimeter
MNC	mononuclear cells
mo	month
MOI	multiplicity of infection
mol	mole
mol wt	molecular weight
MOPS	3-(N-morpholino)propansulfonic acid
M _r	relative molecular mass
mRNA	messenger RNA
MS	mass spectrometry
ms	millisecond
Mse	selenomethionine
MTT	3(4,5-dimehtylthiazol-2-yl)-2,5-diphenyl-tetrazoliumsalt
N	normal (concentration of ionizable groups)

n	number in a study or group
NA	numerical aperture
NAD(P) ⁺	nicotinamide adenine dinucleotide (phosphate)
NAD(P)H	reduced NAD(P)
NBD	nitrobenzoxadiazole
NBT	nitro(blue)tetrazolium chloride
NC	nitrocellulose
ND	not determined
NDP	mixture of ADP, CDP, GDP, UDP
Neo	neomycin
NEPHGE	nonequilibrium pH gradient electrophoresis
NGF	nerve growth factor
NK	natural killer
NLS	nuclear localization signal
nm	nanometer
NMP	mixture of AMP, CMP, GMP, UMP
NMR	nuclear magnetic resonance
No.	number
NP-40	Nonidet P-40
NS	not significant
NSF	N-ethyl-maleimide sensitive fusion protein
nt	nucleotide
NTP	mixture of ATP, CTP, GTP, UTP
Nuc, N	nucleoside
OAA	oxalacetate
OD	optical density
OMP	orotidine monophosphate
ONC	overnight culture
ONPG	o-nitrophenyl-β-D-galactopyranoside
Ord, O	orotidine
ORF	open reading frame
Orn	ornithine
Oro	orotate
osM	osmolar
oxid.	oxidation, oxidising, oxidised
PAGE	polyacrylamide gel electrophoresis
PAH	polycyclic aromatic hydrocarbon
PAPS	3'-phosphoadenosyl-5'-phosphosulfate

PBS	phosphate-buffered saline
PC	phosphatidyl choline
PCA	perchloric acid
PCB	polychlorinated biphenyl
PCR	polymerase chain reaction
PDGF	platelet-derived growth factor
PE	phosphatidyl ethanolamine
PEG	polyethyleneglycol
PEP	phosphoenolpyruvate
PFA	paraformaldehyde
PFGE	pulsfield gel electrophoresis
pfu	plaque forming unit
PGX	prostaglandin X
PG	phosphatidyl glycerol
pH	negative logarithm of the hydrogen ion concentration
Ph	phenyl
Phe, P	phenylalanine
P _i	inorganic orthophosphate
pI	isoelectric point
PI	phosphatidyl inositol
PID	photo-ionization detection
PIPES	Piperazine-N,N'-bis(2-ethansulfonic acid)
PKA	protein kinase A
pK _a	negative logarithm of the dissociation constant
PKB	protein kinase B
PKC	protein kinase C
PKG	protein kinase G
PLC	phospholipase C
PLP	pyridoxal phosphate
PMA	phorbol myristate acetate
PMN	polymorphonuclear leukocyte
PMP	pyridoxamine phosphate
PMSF	phenylmethylsulfonyl fluoride
PP _i	pyrophosphate
ppm.	parts per million
Pro, P	proline
Prop	propyl
PS	phosphatidyl serine

Ptd	phosphatidyl
Puo, R	purine nucleoside
Pur	purine
PVDF	polyvinylidenfluoride
Pyd, Y	pyrimidine nucleoside
Pyl	pyrrollysine
Pym	pyrimidine
Pyr	pyruvate
<i>r</i>	correlation coefficient
RBC	red blood cell
red.	reduction, reducing, reduced
rER	rough endoplasmic reticulum
RFLP	restriction fragment length polymorphism
RIA	radioimmunoassay
Rib	ribose
RNA	ribonucleic acid
RNAi	RNA interference
RNase	ribonuclease
RNP	ribonucleoprotein
rpm	revolutions per minute
rRNA	ribosomal RNA
RT	room temperature
RT-PCR	reverse transcription PCR
<i>s</i>	sedimentation coefficient
S	Svedberg unit of sedimentation coefficient
s	second
s.c.	subcutaneous
Sac = Suc	saccharose = sucrose
SAH = AdoHcy	S-adenosyl-L-homocysteine
SAM = AdoMet	S-adenosyl-methionine
sat.	saturated
SD	standard deviation
SDS	sodium dodecyl sulfate
SE	standard error
Sec	selenocysteine
SEM	standard error of the mean
sER	smooth endoplasmic reticulum
Ser, S	serine

sic.	thus, so (used in citations to indicate that the preceding is not a copying error)
siRNA	small interfering RNA
SNAP	soluble NSF attachment protein
SNARE	SNAP receptor
soln.	solution
sp. act.	specific activity
Sph	sphingosine
Spm	spermidine
SSC	sodium salt citrate
SSCP	single strand conformation polymorphism
ssDNA	single strand DNA
STR	short tandem repeat
SU	subunit
Succ	succinate
SV40	simian virus 40
$t_{1/2}$	half-life, half-time
Tab.	table
TAE	tris-acetate-EDTA buffer
TAG	triacyl glyceride
Tau	taurine
TB	terrific broth (medium)
TBE	tris-borate-EDTA buffer
TBS	Tris-buffered saline
TCA	trichloroacetic acid
TCA	tricarboxylic acid cycle
TE	tris-EDTA
TEMED	N,N,N',N'-tetramethyl-ethylendiamine
temp.	temperature
Tet	tetracyclin
TFA	trifluoroacetic acid
TGF	transforming growth factor
TGN	trans-Golgi network
Thd, T	thymidine
Thr, T	threonine
Thy	thymine
TLC	thin layer chromatography
TMB	3,3',5,5'-trimethylbenzidine
TNF	tumor necrosis factor (α)

TOC	total organic carbon
TPP	thiamine pyrophosphate
Tris	tris(hydroxymethyl)aminomethane
TRITC	tetramethylrhodamine isothiocyanate
tRNA	transfer RNA
Trp, W	tryptophane
t-SNARE	target membrane SNARE
<i>t</i> -test	Student's <i>t</i> -test
TUNEL	Tdt-mediated dUTP-biotin nick end labeling
Tyr, Y	tyrosine
U	unit
UDP	uridine diphosphate
UMP	uridine monophosphate
Ura	uracil
Urd, U	uridine
USE	unique site elimination
UTP	uridine triphosphate
UTR	untranslated region
UV	ultraviolet
Val, V	valine
VLDL	very low density lipoprotein
vol.	volume
vs.	versus (against)
W	watt
w/v	weight per volume
WGA	wheat germ agglutinin
wk	week
wt	weight
Xan	xanthine
Xao, X	xantosine
XGal	5-bromo-4-chloro-3-indoyl- β -D-galactopyranoside
YAC	yeast artificial chromosome
YFP	yellow fluorescent protein
YNB	yeast nitrogen base
YPD	yeast peptone dextrose
YT	yeast tryptone
Zeo	Zeocin