

2-ME 2-mercaptoethanol (use instead of  $\beta$ -ME or  $\beta$ -mercaptoethanol)

Å angstrom

aa amino acid (only with numbers)

Ab antibody

ABTS 2,2'-azinobis(3-ethylbenzthiazoline-6-sulfonic acid)

ADP adenosine 5'-diphosphate

Ag antigen

AIDS acquired immunodeficiency syndrome

AMP adenosine 5'-monophosphate

ANOVA analysis of variance

AP-1 activator protein 1

APC Ag-presenting cell

ATP adenosine triphosphate

BAFF B cell-activating factor of the TNF family

BALB/c a mouse strain

BALT bronchus-associated lymphoid tissue

BAPTA-AM 1,2-bis(2-aminophenoxy)ethane-*N,N,N',N'*-tetraacetic acid acetoxymethyl ester

BCR B cell receptor

bp base pair (only with numbers)

BrdU 5-bromo-2'-deoxyuridine

BSA bovine serum albumin

C complement

C region constant region of Ig

cAMP cyclic AMP

C terminus carboxyl or COOH terminus

C-terminal carboxyl-terminal or COOH-terminal

CCL CC chemokine ligand  
CCR CC chemokine receptor  
CD40LCD40 ligand  
cDNA complementary DNA  
CDP cytidine 5'-diphosphate  
CDR complementarity determining region  
C/EBP CCAAT/enhancer-binding protein  
CFA complete Freund's adjuvant  
CFSE 5- (and 6-)carboxyfluorescein diacetate succinimidyl ester  
CFU colony-forming unit  
cGMP guanosine 3',5'-cyclic monophosphate  
CHAPS 3-[(3-cholamidopropyl)dimethylammonio]-1-propane sulfonate  
Ci curie  
CIITA class II transactivator  
CLIP class II-associated invariant-chain peptide  
cM centiMorgan(s)  
CMP cytidine 5'-monophosphate  
CMV cytomegalovirus  
CNS central nervous system  
CoA coenzyme A  
Con A concanavalin A  
CpG cytosine guanine dinucleotide  
cpm counts per minute  
CREB cAMP response element binding protein  
cRNA complementary RNA  
CSF colony-stimulating factor  
CTL cytotoxic T lymphocyte

CTLA cytolytic T lymphocyte-associated Ag

CTP cytidine 5'-triphosphate

CXCL CXC chemokine ligand

CXCR CXC chemokine receptor

D region diversity region of Ig or T cell receptor for Ag

d day(s); deoxy; distilled (as in dH<sub>2</sub>O)

Da dalton (only with numbers)

DAP12 has no expansion; do **not** define as DNAX activating protein 12

DAPI 4',6'-diamidino-2-phenylindole

DEAE diethylaminoethyl

df degrees of freedom

DMEM Dulbecco's modified Eagle's medium

DMSO dimethylsulfoxide

DNA deoxyribonucleic acid

DNase deoxyribonuclease

DNP dinitrophenyl

dpm disintegrations per minute

ds double-stranded (as dsDNA)

DTT dithiothreitol

E erythrocyte

E:T ratio effector to target ratio

EBV Epstein-Barr virus

EC<sub>50</sub> 50% effective concentration

ECL enhanced chemiluminescence

ED<sub>50</sub> 50% effective dose

EDTA ethylenediaminetetraacetic acid

EGTA ethylene glycol-bis(b-aminoethyl ester)-*N,N,N',N'*-tetraacetic acid

ELISA enzyme-linked immunosorbent assay

ELISPOT enzyme-linked immunospot

EMSA electrophoretic mobility shift assay

ERK extracellular signal-regulated kinase

E:T ratio effector to target ratio

Fab Ag-binding fragment

F(ab')<sub>2</sub> fragment affinity-purified secondary antibodies

FACS fluorescence-activated cell sorting

F-actin filamentous actin

FAM 6-carboxyfluorescein

FBS fetal bovine serum

FcR Fc receptors (e.g., FcγRI), Examples: FcεRI (high-affinity IgE receptor), FcγRIIIA (low-affinity type 3 receptor for Fc portion of IgG), FcεRI (high-affinity receptor for Fc portion of IgE), and so forth; **but** spell out “Fc receptor” if used as a general noun (e.g., “... the following Fc receptors: FcR, FcRI...”); do **not** use FcR

FCS fetal calf serum

FITC fluorescein isothiocyanate

FLICE Fas-associated death domain-like IL-1B-converting enzyme

FLIP FLICE inhibitory protein

FLT3 or Flt3 *fms*-related tyrosine kinase 3

fMLF formyl-methionyl-leucyl-phenylalanine

FOXP3 (human) or Foxp3 (murine) forkhead box protein 3

fura 2-AM fura 2-acetoxymethyl ester

g gram (only with numbers)

GALT gut-associated lymphoid tissue

GAPDH or G3PDH glyceraldehyde-3-phosphate dehydrogenase

G-CSF granulocyte CSF

GDP guanosine 5'-diphosphate

GFP green fluorescent protein

GM-CSF granulocyte-macrophage CSF

GMP guanosine 5'-monophosphate

gp glycoprotein (e.g., gp100)

GPI glycosylphosphatidylinositol

GST glutathione S-transferase

GTP guanosine 5'-triphosphate

h hour (only with numbers)

H chain heavy chain

H&E hematoxylin and eosin

HBSS Hanks' balanced salt solution

HEPES *N*-2-hydroxyethylpiperazine-*N*'-2-ethanesulfonic acid

HIV human immunodeficiency virus

HLA human histocompatibility leukocyte Ag

HPLC high performance liquid chromatography

HRP horseradish peroxidase

HSV herpes simplex virus

HUVEC human umbilical vein endothelial cell

IC<sub>50</sub> 50% inhibition/inhibitory concentration

ICAM intercellular adhesion molecule

ICOS inducible costimulator

Id idotype; idiotypic determinant

ID<sub>50</sub> 50% infective dose or 50% inhibiting dose

IDO indoleamine 2,3-dioxygenase

IFA incomplete Freund's adjuvant

IFN interferon (e.g., IFN-γ)

Ig immunoglobulin (also IgA, IgD, IgE, IgG, IgM)

IgH    Ig heavy chain  
 IL     interleukin (e.g., IL-2)  
 i.m.   intramuscular  
 IMDM   Iscove's modified Dulbecco's medium  
 IMEM   Iscove's minimal essential medium  
 i.p.    intraperitoneal  
 ITAM   immunoreceptor tyrosine-based activation motif  
 ITIM   immunoreceptor tyrosine-based inhibitory motif  
 IU     international unit  
 i.v.    intravenous  
 I $\kappa$ B or I- $\kappa$ B    inhibitory NF- $\kappa$ B  
 J region        joining region of Ig or T cell receptor for Ag  
 JAK or Jak     Janus kinase  
 JNK    c-Jun N-terminal kinase  
 K<sub>a</sub>    association constant  
 K<sub>D</sub>    affinity constant  
 K<sub>d</sub>    distribution coefficient; dissociation constant  
 kb     kilobase (only with numbers)  
 kbp    kilobase pair (only with numbers)  
 kDa    kilodalton (only with numbers)  
 L chain        light chain  
 LD<sub>50</sub>   50% lethal dose  
 LFA    leukocyte (lymphocyte) function-associated Ag  
 LIF    leukemia inhibitory factor  
 LPS    lipopolysaccharide  
 LU     lytic unit  
 M-CSF   macrophage CSF

m.w. molecular weight

mAb monoclonal Ab

MACS magnetic-activated cell sorting

MALDI-TOF matrix-assisted laser desorption ionization-time of flight

MALDI matrix-assisted laser desorption ionization

MALT mucosa-associated lymphoid tissue

MAPK mitogen-activated protein kinase

MCP monocyte chemoattractant protein

MEK mitogen-activated protein kinase kinase

MEM minimum essential medium

MES 2-(*N*-morpholino)ethanesulfonic acid

mg milligram (only with numbers)

MHC major histocompatibility complex

min minute (only with numbers)

MIP macrophage-inflammatory protein

ml milliliter (only with numbers)

MLC mixed lymphocyte culture

MLR mixed leukocyte reaction

mo month(s) (only with numbers)

MOPS 4-morpholinepropanesulfonic acid

$M_r$  relative molecular mass

mRNA messenger RNA

MTT 3-(4,5-dimethylthiazol-2-yl)-2,5-dimethyltetrazolium bromide or 3-[4,5-dimethylthiazol-2-yl]-2,5-diphenyltetrazolium bromide

MyD88 myeloid differentiating factor 88

N terminus amino terminus or NH<sub>2</sub>-terminus

N-terminal amino-terminal or NH<sub>2</sub>-terminal

*n* number in study or group

NAD nicotinamide adenine dinucleotide

NADH reduced NAD

NaDodSO<sub>4</sub> sodium dodecyl sulfate

NADP NAD phosphate

NADPH NAD phosphate (reduced)

NBT nitroblue tetrazolium

ND not determined

NDP nucleoside 5'-diphosphate

NF-κB nuclear factor κB

NF nuclear factor

NFAT or NF-AT nuclear factor of activated T cells

Ni-NTA nickel-nitrilotriacetic acid

NK natural killer (cell)

NKT natural killer T (cell)

NMP nucleoside 5'-monophosphate

NO nitric oxide

NOD nonobese diabetic

NS not significant

nt nucleotide (only with numbers)

NTP nucleoside 5'-triphosphate

OCT octamer-binding factor

OD optical density

OVA ovalbumin

*p* probability

p- phosphorylated (**only** as a hyphenated prefix); see also phospho-

PAGE polyacrylamide gel electrophoresis

PBL peripheral blood lymphocyte

PBMC peripheral blood mononuclear cell

PBS phosphate-buffered saline

PCR polymerase chain reaction

PE phycoerythrin

PECAM-1 platelet endothelial cell adhesion molecule-1

PerCP peridinin chlorophyll protein

PFU plaque-forming unit

PG prostaglandin

PGE2 prostaglandin E2

PHA phytohemagglutinin

phospho- phosphorylated (**only** as a hyphenated prefix); see also p-

PI3K phosphatidylinositol 3-kinase

PIPES piperazine-*N N'*-bis(2-ethane sulfonic acid)

PMA phorbol myristate acetate

PMSF phenylmethylsulfonyl fluoride

PWM pokeweed mitogen

R receptor Standard **only** in combination with another standard abbreviation (e.g., IL-1R). If it's part of a nonstandard gene or protein name, R may be defined or not; follow copy. Always spell out "receptor" when used alone, and spell it out at first appearance when used as part of a nonstandard abbreviation.

r recombinant, (recombinant (e.g., rIFN- $\alpha$ ; never by itself); if added to another standard abbreviation, consider the resultant combined abbreviation standard as well

RACE rapid amplification of cDNA end

RAG recombination-activating gene

RANTES regulated upon activation, normal T cell expressed and secreted

RBC red blood cell

RFLP restriction fragment length polymorphism

RIA radioimmunoassay

RNA ribonucleic acid

RNase ribonuclease

rpm revolutions per minute

RPMI (usually RPMI 1640)

rRNA ribosomal RNA

RT-PCR reverse transcriptase polymerase chain reaction

s second (use only with numbers)

s.c. subcutaneous

SCID severe combined immunodeficiency

SD standard deviation

SDS sodium dodecyl sulfate

SDS-PAGE sodium dodecyl sulfate-polyacrylamide gel electrophoresis

SE standard error

SEM standard error of the mean

SHIP src homology 2-containing inositol 5' phosphatase

SIV simian immunodeficiency virus

sp. act. specific activity

SRBC sheep red blood cell

ss single-stranded (e.g., ssDNA)

SSC standard saline citrate

STAT or stat signal transducer and activator of transcription

SV40 simian virus 40

$t_{1/2}$  half-life, half-time

TAMRA 5-(and 6)-carboxytetramethylrhodamine

TAP transporter associated with Ag processing

TBS Tris-buffered saline

TBST TBS with Tween 20

TCA trichloroacetic acid

TCR T cell receptor for Ag

TDP thymidine 5'-diphosphate

TdT terminal deoxynucleotidyltransferase

TGF transforming growth factor

Th cell T helper cell

TLC thin layer chromatography

TLR Toll-like receptor

TMP thymidine 5'-monophosphate

TNF tumor necrosis factor

TNM tumor-node-metastasis (allowed only in a phrase [e.g., “TNM staging” “TNM classification,” “TNM grade”], not as a stand-alone abbreviation)

TNP trinitrophenyl

TRAIL TNF-related apoptosis-inducing ligand

Tris tris(hydroxymethyl)aminomethane

tRNA transfer RNA

TTP thymidine 5'-triphosphate

TUNEL TdT-mediated dUTP nick end labeling

U unit (only with numbers)

UDP uridine 5'-diphosphate

UMP uridine 5'-monophosphate

UTP uridine 5'-triphosphate

UV ultraviolet

V region variable region of Ig

V(D)J or VDJ variable diversity joining

v/v volume to volume ratio (%)

v/w volume to weight ratio (%)

VCAM vascular cell adhesion molecule

VLA very late activation Ag

W watt (only with numbers)

w/v weight to volume ratio (%)

w/w weight to weight ratio (%)

WBC white blood cell

WEHI medium

wk week (only with numbers)

xid X-linked immunodeficiency

ZAP70  $\zeta$ -associated protein 70 (or  $\zeta$ -chain-associated protein 70)

$\mu\text{g}$  microgram (only with numbers)

$\mu\text{l}$  microliter (only with numbers)