

## Standard Abbreviations

### A

A, ampere  
Å, angstrom  
aa, amino acid(s)  
AIDS, acquired immune deficiency syndrome  
ANOVA, analysis of variance  
APC, antigen-presenting cell  
ATP, adenosine triphosphate (also ADP, AMP, CTP, UDP, etc.)  
AU, arbitrary unit

### B

bp, basepair  
Bq, Becquerel  
BrdU, 5-bromo-2'deoxyuridine  
BSA, bovine serum albumin

### C

C, complement  
C region, constant region of Ig  
cAMP, cyclic AMP  
cDNA, complementary DNA  
CFA, complete Freund's adjuvant  
CFSE, carboxyfluorescein diacetate succinimidyl ester  
CFU, colony-forming unit  
Ci, curie  
cM, centimorgan (but morgan)  
CMV, cytomegalovirus  
Con A, concanavalin A  
cpm, counts per minute  
CRISPR, clustered regularly interspaced short palindromic repeats  
CSF, colony-stimulating factor  
CTL, cytotoxic T lymphocyte

### D

d, day  
D region, diversity region of Ig or TCR  
DAPI, 6'-diamidino-2-phenylindole  
DMEM, Dulbecco's modified Eagle's medium  
dpm, disintegrations per minute  
DMSO, dimethylsulfoxide  
DNA, deoxyribonucleic acid  
DNase, deoxyribonuclease  
DNP, dinitrophenyl

## **E**

EBV, Epstein-Barr virus

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

EDTA, ethylenediaminetetraacetic acid

EGTA, ethyleneglycol-bis (β-aminoethyl ether)- *N, N, N', N'*-tetraacetic acid

ELISA, enzyme-linked immunosorbent assay

ELISPOT, enzyme-linked immunospot

ER, endoplasmic reticulum

ERK, extracellular signal-related kinase

E/T ratio, effector-target ratio

## **F**

FACS, BD fluorescence-activated cell sorter

FBS, fetal bovine serum

FCS, fetal calf serum

FITC, fluorescein isothiocyanate

fMLP, formyl-methionyl-leucyl-phenylalanine

## **G**

g, gram

g, unit of gravity

GAPDH, glyceraldehyde 3-phosphate dehydrogenase

GFP, green fluorescent protein

GM-CSF, granulocyte/macrophage colony-stimulating factor

## **H**

h, hour

H chain, heavy chain of Ig

HAT, hypoxanthine, aminopterin, thymidine

HBSS, Hanks' balanced salt solution

H&E, hematoxylin and eosin

Hepes, *N*-2-hydroxyethylpiperazine-*N'*-2-ethane sulfonic acid

HIV, human immunodeficiency virus

HLA, human histocompatibility leukocyte antigens

HPLC, high performance liquid chromatography

HRP, horseradish peroxidase

HSV, herpes simplex virus

HTLV, human T lymphocyte virus

HUVEC, human umbilical vein endothelial cell

## **I**

Id, idiotype

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

IFA, incomplete Freund's adjuvant

IFN, interferon (e.g., IFN- $\gamma$ )  
Ig, immunoglobulin  
IL, interleukin (e.g., IL-2)  
i.m., intramuscular(ly)  
i.n., intranasal(ly)  
IMDM, Iscove's modified Dulbecco's medium  
i.p., intraperitoneal(ly)  
IU, international unit  
i.v., intravenous(ly)

## **J**

J region, joining region of Ig or TCR  
JAK, Janus kinase  
JNK, c-Jun NH<sub>2</sub>-terminal kinase

## **K**

kb, kilobase  
kD, kilodalton  
KLH, keyhole limpet hemocyanin  
KO, knockout

## **L**

L chain, light chain of Ig  
LAK, lymphokine-activated killer  
LD<sub>50</sub>, 50% lethal dose  
LFA, lymphocyte function associated  
LN, lymph node  
LPS, lipopolysaccharide  
LTR, long terminal repeat

## **M**

2-ME, 2-mercaptoethanol  
m, meter  
M, molar  
mAb, monoclonal antibody  
MAPK, mitogen-activated protein kinase  
MEF, mouse embryonic fibroblast  
MEM, minimum essential medium  
MHC, major histocompatibility complex  
min, minute  
ml, milliliter (but liter)  
MLR, mixed leukocyte reaction  
Mls, minor lymphocyte stimulating  
mo, month  
mol, mole

mol wt, molecular weight  
 $M_r$ , relative molecular mass  
mRNA, messenger RNA

## **N**

$n$ , number in study or group  
N, normal (concentration of ionizable groups)  
ND, not determined  
NFAT, nuclear factor of activated T cells  
NF- $\kappa$ B, nuclear factor  $\kappa$ B  
NP-40, Nonidet P-40  
NS/ns, not significant  
nt, nucleotide

## **O**

OD, optical density  
osM, osmolar  
osmol, osmole(s)  
OVA, ovalbumin

## **P**

PAGE, polyacrylamide  
gel electrophoresis  
PBS, phosphate-buffered saline  
PCR, polymerase chain reaction  
PE, phycoerythrin  
PFU, plaque-forming unit  
PHA, phytohemagglutinin  
Pipes, piperazine- $N$ ,  $N'$ -bis(2-ethane sulfonic acid)  
PMA, phorbol myristate acetate  
PMSF, phenylmethylsulfonyl fluoride

## **R**

r, recombinant (e.g., rIFN- $\gamma$ )  
R, receptor (e.g., IL-2R)  
RAG, recombination activating gene  
RBC, red blood cell  
RNA, ribonucleic acid  
RNase, ribonuclease  
ROS, reactive oxygen species  
RT, reverse transcription

## **S**

s, second  
 $s$ , sedimentation coefficient

S, Svedberg unit of sedimentation coefficient  
s.c., subcutaneous(ly)  
SCID, severe combined immunodeficiency  
SD, standard deviation  
SDS, sodium dodecyl sulfate  
SE, standard error  
SEM, standard error of the mean  
shRNA, short hairpin RNA  
siRNA, small interfering RNA  
STAT, signal transducer and activator of transcription

## **T**

$t_{1/2}$ , half-life, half-time  
TCA, trichloroacetic acid  
TCR, T cell receptor for antigen  
TdR, thymidine deoxyribose (also, UdR, AdR, etc.)  
TFA, trifluoroacetic acid  
TGF, transforming growth factor  
TLC, thin layer chromatography  
TLR, toll-like receptor  
TNF, tumor necrosis factor ( $\alpha$ )  
TNP, trinitrophenyl  
Tris, tris (hydroxymethyl) aminomethane

## **U**

U, unit  
UV, ultraviolet

## **V**

V, volt  
V region, variable region of Ig  
vol, volume

## **W**

W, watt  
wk, week  
wt, weight  
WT, wild-type

## **Y**

yr, year