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ABBREVIATIONS AND SYMBOLS

%	Percentage
%C	Crosslinker, acrylamide monomer ratio of the monomer solution
%T	Acrylamide monomer concentration
α	Alpha
β	Beta
κ	Kappa
°C	Degree Celsius
2D-PAGE	Two-dimensional polyacrylamide gel electrophoresis
µA	Microampere
µg	Microgram
µl	Microlitre
µm	Micrometre
aa	Amino acid
ADP	Adenosine 5'-diphosphate
ANR	Anaerobe
APF	Aggregation-promoting factor
AR	Analytical
Arg	Arginine
Asn	Asparagine
ATCC	American Type Culture Collection
ATP	Adenosine 5'-triphosphate
BCA	Bicinchroninic acid
B_f	Final number bacteria
B_i	Initial number bacteria
BSA	Bovine serum albumin
BU	Bacteriocin unit
C	Cytosine
CFU	Colony forming unit

CHAPS	3-[(3-cholamidopropyl)-dimethyl-ammonia]-1-propane sulfonate
cm	Centimetre
CO_2	Carbon dioxide
Cys	Cysteine
Da	Dalton
DMSO	Dimethyl sulfoxide
DNA	Deoxyribonucleic acid
ESI-MS	Electrospray ionization mass spectrometry
et al.	et alii (and colleagues)
$[Fe^{3+}PPIX]_2O$	Iron (III) porphyrin
*fim*A	Fimbrillin A
FPLC	Fast-Protein Liquid Chromatography
g	Gram
G	Guanine
Gly	Glycine
GM-CSF	Granulocyte macrophage colony-stimulating factor
GRAS	Generally regarded as safe
hag	Hemagglutinin gene
Hag	Hemagglutinin protein
hem	Hemin-regulated gene
HCl	Hydrochloric acid
HmuR	Hemoglobin-hemin receptor
HPLC	High-Performance Liquid Chromatography
hrs.	Hours
i.e.	id est (that is)
IEC	Ion exchange chromatography
IgA	Immunoglobulin A
IgE	Immunoglobulin E
IL.	Illinois state
IL	Interleukin

IPG	Immobilized pH Gradients
K	Potassium
KC	Kuffer cells cytokine
kDa	Kilodalton
kgp	Lysine-specific cysteine proteinase gene
kVh	Kilovolt
l	Litre
LAB	Lactic acid bacteria
LPS	Lipopolysaccharide
Lys	Lysine
M	Molar
MCP	Macrophage chemoattractant protein
MD	Maryland
mg	Milligram
MIC	Minimal inhibitory concentration
MIRCEN	Microbiological Resources Centre
ml	Millilitre
MMP	Matrix metalloprotease
mMRS	Modified De Mann-Rogosa-Sharpe broth
mRNA	Messenger ribonucleic Acid
MW	Molecular weight
N	Normality
NaCl	Sodium Chloride
NAD	Nicotinamide Adenine Dinucleotide
NADP	Nicotinamide Adenine Dinucleotide Phosphate
NaOH	Sodium hydroxide
NC.	North Carolina state
NF-κB	Nuclear factor kappa beta
NK	Natural killer
mAu	Milliabsorbance unit
nm	Nanometre

No.	Number
NY.	New York state
ON.	Ontario state
OH.	Ohio state
p	Probability
P	Phosphate
PAGE	Polyacrylamide gel electrophoresis
PBS	Phosphate buffer saline
PEP-PTS	Phosphoenolpyruvate phosphotransferase system
PG	Packing group
pH	power of Hydronium
pI	Isoelectric point
PMF	Proton motive force
PMN	Polymorphonuclear leukocytes
*prt*C	Protease collagenase gene
PS	Polysaccharide
rgp	Arginine-specific cysteine proteinase gene
Rgp	Arginine-specific cysteine proteinase
RP	Reverse phase
rpm	Revolution per minute
rRNA	Ribosomal ribonucleic acid
sec	Second
SDS	Sodium dodecyl sulfate
SOD	Superoxide dismutase
spp.	Species
TEMED	N,N,N',N'-tetra-methyl-ethylenediamine
Th	T-helper cell
TISTR	Thailand Institute of Scientific and Technological Research
tla	TonB-linked adhesion gene
TNF	Tumor necrosis factor

Tyr	Tyrosine
USA	The United States of America
UV	Ultraviolet
Val	Valine
w/v	Weight by volume
Xaa	Unspecified amino acid