Escherichia coli (cont.)
distinguishing media, 78
mobile genetic elements, 50–51
nonpathogenic, 56
O157:H7, 8, 10, 12, 23, 24, 56,
102–104, 107
transposons and integrons, 50–51
β-glucuronidase, 78

F
Ferric uptake regulator (fur), 51
Five B subunits, 2, 22, 23, 26, 28, 29, 34, 35
Foodborne Disease Outbreak Surveillance
System (FDOSS), 10
Foodborne illness, 1, 7–11, 55, 64, 65, 88
Foodborne Outbreak Online Database
(FOOD Tool), 7, 10, 11

G
Gangliosides, 66–67
cell membrane milieu, 30
Gb3, 28–30
Gb4, 28, 29
holotoxins, 28, 30
Gastroenterological, 67
Genetic sequence, 108
Genetic toxoids, 86
Globotetraosylceramide (Gb4) gangliosides,
28, 29, 34, 66, 83, 101, 104, 108
Globotriaosylceramide (Gb3) gangliosides,
28–30, 34, 66, 68, 83, 101,
104, 108
β-glucuronidase, 78
Golgi complex, 31
Good Agricultural Practices (GAP), 109
Good Handling Practices (GHP), 109
Gram-positive bacteria, 78
Guanidinium chloride (GuCl), 94
Gut bacteria, 56

H
Hazard Analysis and Critical Control Points
(HACCP) principles, 107
HeLa cell, 82, 88
Helix-turn-helix (HTH), 48
Hemolytic uremic syndrome (HUS), 66–70,
81, 85, 104, 105
Hemorrhagic colitis (HC), 67
Holotoxin, 2, 26–28, 30, 32, 35, 92, 108
Host cell, 2, 3, 47–49, 57, 66–67, 70
Human kidney cells, 31, 69
Human serum amyloid protein P (HuSAP), 33,
34, 94
Hybrid toxins, 26, 28

I
IgG molecule, 84, 88
IgY antibodies, 86
Imunoaffinity chromatography, 88
Immunoassay systems, 84
Insertion sequence (IS), 50
Integrons genes, 51, 55
Internal standard (ISt), 92
Intimin, 65

K
Kidney cells, 102, 108
Kidney damage, 67

L
Lactobacillus casei, 104
Lambdoid phages, 2, 47–50, 52–54
Lateral flow assays (LFAs), 90
Lateral flow device (LFD), 81, 90
Latex agglutination assay, 87
LexA, 50
Lipopolysaccharides, 2
Loop-mediated isothermal amplification
(LAMP), 80
Lysosome, 31, 34
Lytic replication, 48

M
MacConkey (MAC), 78
Magnesium pyrophosphate, 80
Mass spectrometry, 91–94
Median lethal dose (LD₅₀), 8, 34, 69, 70, 81, 82
Messenger RNA (mRNA), 70
Metronidazole antibiotic, 69
Microbead-based immunoassay, 90, 91
Microbiological survey, 13, 55
Minimum lethal dose (MLD), 81
Mobile genetic elements, 3
E. coli, 50–51
effect on pathogenicity, 55–57
Mobile health (mHealth) technology, 90
Monoclonal antibody (mAb), 81, 83, 86–89
Stx
detection, inactivation, and protection,
86–87
for differentiating subtypes, 87–88
Morbidity and Mortality Weekly Report (MMWR), 9
Mosaic phages, 54–55
Mouse models, 56, 81
Multiple Reaction Monitoring method (MRM), 92, 94

N
National Outbreak Reporting System (NORS), 10
N-glycolylneuraminic acid, 37
N-glycosidase, 2, 3, 25, 32
Nucleic acid amplification techniques, 80
Nucleic acid detection methods, 80

O
O104:H4, 66, 68
O157:H7, 2, 7, 8, 10, 12, 13, 23, 24, 26, 56, 65, 66, 69, 70, 78, 79, 86, 103, 104, 107
O26 serogroup, 9
O157 serogroup, 54

P
P38a protein, 31
Pk blood group antigen, 28
Person-to-person contact, 12, 64
Pertussis toxin, 37
Phage λ, 47–50, 53
PKCδ proteins, 31
Planar array system, 90
Polyclonal antibodies (pAbs), 83–86
Polyketide azithromycin, 104
Polymerase Chain Reaction (PCR) technology, 56, 57, 70–72, 79, 80, 89
Polymyxin antibiotic, 69
Portable assays, 89
Pк promoter, 54
Premier EHEC, 87
Prospect STEC assay, 87

Q
Quantitative PCR (qPCR), 80, 84, 86, 87
Quick service restaurant (QSR), 1

R
Rainbow® Agar O157, 79
RecA*, 50
Receptor binding assays, 83
Recombination protein (RecA), 54

Research Collaboratory for Structural Bioinformatics (RCSB), 23, 24, 26–28, 33, 36, 38
Ribosomes, 32

S
Salmonella, 7
causes severe disease, 8
clinical manifestations, 7
common sources of, 12–13
development of serious sequelae, 67–68
economic cost, 5–7
evolution, 8–12
humans, 5, 7
microbiological survey, 13
symptoms, 7
waterborne, 10
Shiga toxins (Stx), 5, 54–57, 77
AB5 protein toxins, 35–37
antibiotic treatment, 68–69
beneficial uses, 101–102
binding sites, 66–67
bioassay, 81–83
cells and intracellular trafficking, 30–32
gangliosides, 28–30
general considerations and ELISAs, 83–86
intestinal damage, 67
phage control, 51–55
prevent or treat, 102–107
production, activity, and gene structure, 24–28
STEC (see Shiga toxin-producing Escherichia coli (STEC))
structure, 21–25
Stx1, 57, 68, 108
Stx2, 57, 68, 86, 108
threat to human health, 63–65
threat to worldwide health, 3
types and subtypes, 33–34, 69–70
type 1 (Stx1), 23–27, 29, 30
type 2 (Stx2), 23–27, 29, 30, 34
Shigella, 64, 65, 82
S. boydii, 64
S. dysenteriae, 23, 24, 64, 88, 103
type 1, 8, 21, 27, 37, 56, 57, 63, 64, 67, 68, 70, 72
type 4, 64
S. flexneri, 25, 64
S. sonnei, 10, 25, 64
Shigellosis, 64
Sorbitol-MacConkey agar (SMAC), 78
SOS response, 48, 69, 103, 108
Starfish ligand, 104–106
Subtilase cytotoxin (SubAB), 35

T
Target cell, 2, 23, 26–28, 30, 31, 33–35, 66, 92, 102, 104, 105
Three-dimensional (3D) ribbon structure, 22
Translational medicine, 108
Transposable elements, 50
Transposon genes, 3, 51, 54, 55, 72
Trypsin, 27
Tryptone bile X-glucuronide (TBX), 78

U
US Department of Agriculture’s Food Safety and Inspection Service (USDA-FSIS), 79
US Food Safety Modernization Act (FSMA), 109

V
Vero cells, 33, 69, 82, 83, 89, 90, 93
Verocytotoxin-producing E. coli (VTEC).
See Shiga toxin-producing E. coli (STEC)
Verocytotoxins (VCT), 21
Verotoxins (VT), 21

W
Waterborne, 64
Waterborne Disease & Outbreak Surveillance & Reporting (WDOSR), 10
Whole genome sequencing (WGS) technique, 80
World Health Organization (WHO), 109

X
Xenoproteomic, 102