

INDEX

A

Acceptor..... 55–57, 62–72
 Adoptive cell therapy 178
 Adoptive transfer 127, 130–133, 154, 165, 167, 177
 Ampicillin 17, 20, 59
 Antibody..... 52, 57, 118, 134, 135, 155, 167, 169, 176, 203
 Apoptosis v, 6, 7, 14, 54, 138, 181–194

B

Bioluminescence imaging (BLI) 4, 8, 20,
 23–26, 30, 32, 41–49, 56, 57, 61, 65–67, 92, 97,
 99–109, 113, 120, 123, 124
 Bioluminescence resonance energy transfer
 (BRET) 52, 55–57, 63–72
 Biosensor 6, 68, 71
 Bone marrow 100, 101, 103, 105, 108, 127–135

C

Caspase-3 182–184
 Cerenkov v, 197–206
 Charge-coupled-device (CCD) 32, 56,
 67, 78, 81, 198
 Chimeric antigen receptors (CARs)..... 165
 Cis-acting elements 3, 15
 Cloning 6, 17, 19, 21, 54, 56–58, 66,
 89–92, 107, 113, 115
 Coelenterazine 18, 22, 24–26, 32, 35, 42,
 53, 57, 69, 71
 Cre-Lox 8

D

Data analysis 37, 64, 80, 83, 84, 148
 Deoxycytidine kinase (dCK)..... 154, 167, 176
 D-luciferin 18, 23–26, 43, 45, 46, 53, 57,
 66, 114, 115, 121, 122, 124, 129, 132
 Donor 55–57, 62–64, 66–72, 108, 133, 177
 Dopamine 2 receptor (D2R)..... 53, 167, 176
 3D tumor models 209–217
 Dual modality v, 1–10, 13–26

E

EnduRen™ 57, 69

F

Fetal bovine serum (FBS)..... 17, 57, 59, 101,
 108, 114, 117, 119, 128, 129, 133, 144, 211
 [¹⁸F]-FDG v, 138, 182, 184
 [¹⁸F]-FHBG 139–142, 145, 146, 148
 9-(4-[¹⁸F]-fluoro-3 hydroxymethylbutyl)
 guanine..... 139
 Fluorescence/living imaging 18, 24, 25,
 30, 47, 57, 75–84, 102, 129
 Fluorescence resonance energy transfer
 (FRET)..... 55, 69, 70
 Fluorescent proteins
 CFP 2
 Dronpa 2
 DsRed 2
 eGFP 2, 26
 green fluorescent protein (GFP) 2, 26,
 53, 55, 99, 113, 154, 168
 IrisFP 2
 KFP 2
 mCherry 2
 mOrange 56, 57, 65, 66
 TagRFP 2
 tdTomato 76
 TurboFP 66
 YFP 2, 53, 70
 Foot-and-mouth disease virus (FMDV)..... 14

G

Galleria mellonella (*G. mellonella*)..... 90, 92, 94, 96
 Gene expression v, 1–10, 13, 15–17, 19,
 21, 22, 29, 54, 61, 63, 87, 96, 100, 113, 117, 118,
 167, 198, 204

H

Herpes simplex virus (HSV)..... 4, 53, 138, 141, 154
 Herpes simplex virus thymidine kinase
 (HSV-TK) 138–141, 143, 144,
 148, 154, 155
 Hexadimethrine bromide 101
 Human embryonic kidney (HEK) 293 43,
 101–103, 105, 108, 109, 119, 177
 Human prostate cancer xenograft model
 (PC3) 115–117, 119–122

Hypoxia 113–124
 Hypoxia response elements (HREs) 114, 119, 122

I

Image acquisition 33, 35, 49, 62, 132, 148, 192
 Imaging
 indirect 1, 3, 53
 magnetic resonance (MRI) 1, 53, 153, 181, 197
 optical 1, 3, 9, 30, 32, 37–39, 61, 64, 121, 197–199, 201, 202
 surrogate 1–10, 52, 182
 Immunotherapy 165, 166
 Inducible reporter systems 7, 16, 168
 Internal ribosomal entry site (IRES) 14
 In vivo imaging systems (IVIS) 18, 23–25, 43–46, 48, 49, 57, 61, 62, 66, 77–79, 81, 83, 84, 95, 102, 119–121, 129, 132, 133, 161, 204, 205

L

L929 101, 108
Lactuca romana (*L. romana*) 89, 90, 94
 Lentiviral production 100–104, 122, 143
 Lentivirus 43, 100, 102, 105, 130, 143, 148
 Luciferases
 bacterial v, 2, 53, 87, 88, 92, 94
 click beetle 54, 56
 firefly 2, 4, 5, 7, 8, 20, 22, 23, 25, 26, 29, 41–49, 53, 56, 57, 60, 100, 113, 119, 120, 128
 Gaussia, gluc 2, 26, 42, 53
 NanoLuc 41–49, 53, 67
 Oplophorus 2
 Oplophorus gracilirostris 42, 53
 Photinus pyralis 53, 54
 renilla 2, 4, 6, 17, 20, 25, 26, 42, 53, 54, 56, 61, 113
 vargulin 53
luxCDABE 87

M

Macrophage v, 99–109, 153
 MicroPET 137, 140, 142, 143, 146, 154, 156, 158, 169, 174, 187, 192
 Mouse 3, 4, 8, 9, 16, 20, 25, 30, 32, 34, 41, 43, 44, 48, 49, 61, 62, 64, 76–79, 81–83, 89, 95, 97, 100, 101, 103, 107–110, 115, 121, 123, 129, 132
 Multimodality reporter 4, 8, 16
 Mycobacteria
 M. bovis 75–77, 82
 M. tuberculosis 75

N

Nanomaterials 209, 210
 Nanoparticle v, 4, 153, 183, 198, 203, 205, 209–217
 Neomycin 17–19, 23, 114, 142, 173
 NF- κ B 6
 Noninvasive imaging v, 3, 41, 54, 55, 128, 132, 166
 Norepinephrine transporter (NET) 154, 167, 176
 Nuclear localization signal (NLS) 66, 119–121
 Nuclear reporter gene 153–162, 165–179
 Nucleoside kinases 138

O

Oncology 29

P

PC3, *see* Human prostate cancer xenograft model (PC3)
 Peptide 8, 14, 15, 52, 66, 71, 167, 183, 189
Photobacterium luminescens 53, 87
 Polybrene 101, 103, 115, 120, 128, 130, 142, 143, 171
 Positron emission tomography (PET) v, 4, 137, 153, 166, 181–194, 197
 Promoters
 CMV 4, 7, 15–17, 19, 21, 115
 SV40 4, 15, 16
 ubiquitin C 4, 15
 Prostate cancer 4, 116, 140
 Protein-protein interactions (PPIs) 41, 52, 55, 56, 62–68

R

Radiolabeling 138, 140, 142, 153–162, 167, 183, 189, 203
 Radiotherapy 182, 198, 204
 Region of interest (ROIs) 24, 45, 46, 64, 79, 80, 83, 89, 91, 147, 201, 206
 Relative light units (RLU) 22, 24, 26, 60, 61, 107
 Reporter system 4–7, 15, 16, 54, 61, 64, 87, 89–92, 95, 166, 168, 174, 175

S

Sequential resonance energy transfer (SRET) 69
 Silver v, 209–217
 Silver nanoparticles (AgNPs) v, 209–217
 Sodium iodide symporter (NIS) 53, 54, 167, 176
 Stable cell line 23–24, 44, 60, 61, 116–118, 139, 140
 Suicide gene 138, 177

T

T cell 43, 119, 128, 132, 134, 153–162, 165–179
 Tetracycline.....7, 16, 17, 24
 TGFβ..... 54
 Thymidine kinase (TK).....v, 4, 8, 53,
 137–149, 154, 155, 167, 176
 Transcription factors (TF) 2, 3, 5, 6,
 15, 16, 21, 54, 61, 114, 119
 Transduction 2, 44, 48, 52, 53, 72,
 100, 102, 103, 105, 106, 109, 116, 120, 127,
 129–134, 139, 140, 143, 144, 155, 158, 168,
 169, 171–174, 177

Transgenic mice

knockin 8
 knockout..... 8
 Tumor imaging3, 4, 6, 8, 20, 24–26,
 29, 30, 35, 36, 38, 46, 47, 121–123, 139–141,
 145, 146, 156, 166, 181–194, 199, 209–217
 Two-step-transcriptional activation (TSTA)..... 3, 15, 16

W

Western blot 18, 20, 21, 23, 44, 45,
 57, 59, 72, 117