

INDEX

A

Antibiotic resistance 103
Antibodies 172, 200,
205, 209–220, 225
Antibody delivery 210
Arc 48, 256
Automated image analysis 262
Automated microscopy 6, 256, 257, 259–261

B

β-actin 48, 58, 110, 111, 126, 127
Budding yeast 131–148

C

Chromosome painting 167–178, 181
Chromosome territories 168, 181–193
Clustered regularly interspaced short palindromic
repeats (CRISPR) 11, 18, 37,
39, 63, 64, 226, 233, 240

D

Diffusion 30, 32, 118, 152,
225, 230, 241–243, 247–249
DNA probes 47, 91, 188
Drosophila 63, 68, 70, 168, 172
Dynamics 12, 22, 28,
30, 36, 38, 42, 47, 64, 71, 75, 77, 79, 99, 132,
139, 145, 152, 224, 242, 243, 268

E

Embryo 63, 68, 70
Endogenous mRNA 11, 18, 125, 126
Endogenous protein 209, 210,
226, 227, 233, 240, 248
Epitranscriptomic modification 89
Extracellular vesicles (EVs) 110, 118, 127

F

Factor distribution 215
Fluorescence imaging 31, 57, 90
Fluorescence in situ hybridization (FISH) 14,
24, 27, 36, 47, 92, 95, 97, 110, 112, 113, 115,
121–124, 126, 127, 167, 168, 177, 191, 207

Fluorescence microscopy 12, 18, 24,
39, 42, 58, 90, 91, 94, 99, 138, 153, 155, 224,
226–228, 252, 254, 256

G

Gene expression 3, 21, 36,
47, 63, 132, 151, 182
Gene locus 37, 44, 181–193, 196
GFP-binding nanobody 200
Glutaraldehyde (GA) 115, 123–126, 183, 186
Green fluorescent protein (GFP) 4–6,
11, 13, 17, 37, 39, 42, 48, 51, 68, 77, 81, 110,
145, 152, 199–204, 206, 210

I

Image analysis 9, 13, 24,
94, 95, 99–102, 122, 124, 153, 215, 217, 261
Image processing and analysis 9, 77, 142, 153
Image quantification 217, 252, 254, 261
Imaging 4, 21, 36,
47, 63, 77, 90, 110, 132, 152, 182, 204, 209,
224, 239, 251
In situ hybridization 63, 92–94, 98, 103

L

Live-cell imaging 5, 9, 12,
15, 18, 21–32, 51, 77–79, 81, 131–148, 205,
206, 219, 229, 239–249
Live-cell microscopy 203
Live imaging 11–14,
18, 35–44, 68, 70, 73, 154
Long non-coding RNAs (LncRNAs) 21–32

M

Membrane nanotubes 109, 124
Messenger ribonucleic acids (mRNAs) 3,
44, 48, 63, 75, 109, 131, 151–161
Microscopy 6, 8, 12, 18,
42, 43, 51, 58, 63, 68, 72, 94, 132, 134, 148, 152,
176, 203, 204, 209, 210, 212, 214, 216, 217,
226, 251–268
Mitotic chromosomes 239–249
Molecular beacons (MBs) 21–32,
90, 91, 95–98, 100, 132

Mouse embryonic stem cells (mESCs)37–41,
 206, 239–242, 244–249
 mRNA turnover75, 76
 mRNP export 132, 133, 138, 141, 143
 MS2 3, 36, 48,
 63, 77, 111, 132, 152, 251
 MS2-GFP 47
 MS2/MCP system 3–19
 MS2/PP7 stem-loops36, 67
 MS2 system9, 11, 17, 18, 58
 MS2V64, 12, 17, 18
 MS2V74–6, 8, 13–18

N

Neurons 11, 47–59
 Nuclear pore complex (NPC) 131–148,
 151–154, 157, 159
 Nucleus 4, 6, 13,
 16, 19, 27, 29, 30, 43, 66, 71, 76, 77, 82, 112,
 122, 127, 131, 142, 146, 151, 153, 155–159,
 167, 168, 181, 182, 188, 190, 191, 202, 210,
 215–217, 219, 220, 223, 225, 230–232, 236,
 261, 264, 265, 267
 Numbers and brightness (N&B) 223–236

O

Oligomerization 223–236
 Oligonucleotide 22, 26,
 44, 91, 97, 109, 112–113
 Oligopaints 167–178
 Optogenetic 252, 266

P

Polyacrylamide matrices182–188, 191
 PP736, 48, 64,
 65, 67, 72, 76, 77, 132–134, 137, 138, 146, 251
 PP7-GFP 47
 Protein–protein interactions 199

R

Residence time 243, 248

Ribosomal RNA (rRNA)89–106
 RNA methylation89–106
 RNA modification90, 95
 RNA polymerase II 210

S

Saccharomyces cerevisiae4, 132, 133
 Single cell methods 226
 Single cells 17, 18,
 35, 36, 40, 41, 47, 90, 91, 104, 109, 125, 167,
 206, 207, 209–220, 242, 252, 256, 262, 268
 Single-molecule 4, 8, 9,
 13–15, 17–19, 22, 24, 26, 27, 29, 72, 80,
 109–127, 132, 148, 239–249
 Single-molecule fluorescent in situ hybridization
 (smFISH)5, 6,
 9, 14–19, 26, 27, 29, 31, 72, 109–127, 147
 Single-molecule imaging240–242, 246, 248
 Single-molecule live-cell imaging 239–249
 Single particle tracking (SPT) 12,
 28–30, 77, 80–82, 84–86, 152, 160
 Stiffness182, 183, 188, 191
 Superregistration 17, 142–144, 148

T

Tandem repeats22, 23, 29
 Targeted manipulation 199–207
 Targeted repositioning 199–207
 Three-dimensional fluorescence in situ
 hybridization (3D-FISH) 182–196
 3D structured illumination microscopy
 (3D-SIM) 210, 214,
 216, 217, 219
 Three (3′)-RNA End Accumulation during
 Turnover (TREAT)75, 76
 Transcription 3, 21, 35,
 47, 63, 89, 112, 152, 167, 181, 203, 210, 223,
 239, 251
 Transcriptional dynamics64, 71
 Transcription factor (TF) 72, 203,
 209–220, 223–236, 239–249, 252