

INDEX

A

- Animal models 155–164, 170–171, 173, 174, 201–206
- Annexin V staining..... 149
- Anti-tumor efficacy..... 168, 170–171, 176, 177
- Aphidicolin..... 86, 88, 89, 92
- Apoptosis..... 86, 95–107, 111, 112, 115, 123, 124, 162, 168, 179–183, 185, 188–193, 195, 197, 199, 202, 205–207
- ATP content..... 97, 99–100
- Autocatalytic activity..... 23, 25

B

- Bacterial expression 34
- Baculovirus
 - AcNPV baculovirus DNA..... 25
 - amplification..... 17–18
 - Bac-N-Blue system 17, 25
 - Bac-to-Bac system..... 17, 25, 26, 41
 - BacVector-3000 system 17, 25
 - expression 14, 25
 - infection..... 17
 - pBAC4..... 17
 - pBlueBac plasmid..... 17, 25
 - pFastBacHTa..... 17
- BAL model. *See* Bronchoalveolar lavage (BAL) model
- Binding constant 68–69, 75
- Bleomycin-sulphate induced lung inflammation model..... 200
- BrdU incorporation 163, 168, 169, 172, 176
- Bronchoalveolar lavage (BAL) model..... 201

C

- Caspase-3 111, 113–116, 119, 168–170, 172, 173, 176, 183, 195
- Caspase 3/7 activity assay 113, 115–116, 119, 170, 173
- CDK2 activity 3–6, 10, 36, 158, 159, 163
- CDK-inhibitor 2, 10, 34, 39, 54, 59, 60, 68, 85–93, 95–107, 111–120, 123–137, 141–153, 156, 158, 167–177, 180, 181, 185, 188–193, 195, 196, 199–201, 211–222
- CDK knockout mice
 - CDK1 KO..... 162–164
 - CDK2 KO..... 162
 - CDK4 KO..... 159–161
 - CDK6 KO..... 159–161

- Cell cycle analysis..... 149–150
- Cell death assay..... 170, 173
- Cell lysis 5, 6, 15, 18, 100
- Cell synchronization..... 85–93
- Cell viability 88, 91, 119, 149, 173, 186, 220
- Competition titration 68, 69, 75–77
- Confocal imaging 149, 194–195
- Coomassie Blue staining..... 3, 5–8, 11
- Crystallography 34–37, 39–41, 47, 49, 52, 54, 61, 159
- Culture of monocyte-derived macrophages..... 187
- Cyclin
 - cyclin A (CycA)..... 3–5, 9, 29, 34, 35, 60–62, 67–81, 156, 167
 - cyclin B (CycB) 1, 9, 14, 17, 20, 22, 24, 26, 27, 41, 42, 156, 158, 159, 167
 - cyclin C (CycC)..... 1, 14, 17, 20, 22, 24, 26, 27, 30, 41, 42
 - cyclin D1 (CycD1) 36, 37, 40
 - cyclin D3 (CycD3) 40
 - cyclin H (CycH)..... 13, 14, 158, 167
 - cyclin T1 (CycT1) 14, 17, 20, 22–24, 26, 27, 42
- Cyclin A binders..... 67–81
- Cyclin dependent kinases (CDKs)
 - CDK1..... 1–5, 7, 9, 10, 12, 59, 155–164, 168
 - CDK2..... 2–8, 10, 12, 29–36, 39–42, 48, 49, 51–53, 55, 59–65, 76, 144, 155, 156, 158–164
 - CDK4..... 1–4, 6–10, 12, 30, 35–37, 48, 53–55, 60, 155, 156, 158–162, 164, 177
 - CDK5..... 1, 2, 30, 32, 38–40, 59, 113, 116–120, 167, 168
 - CDK6..... 3, 4, 6–9, 12, 30, 33, 36, 37, 40, 55, 155, 156, 158–162, 164, 177
 - CDK7..... 1, 13–27, 30, 33, 40–41, 59, 158, 162, 177, 180, 194
 - CDK8..... 1, 13–27, 30, 33, 41–42
 - CDK9.. 1, 13–27, 30, 33, 42, 59, 162, 177, 180, 183, 194

D

- DAPI (4',6-diamidino-2-phenylindole) staining 193, 194
- DNA damage 123–125, 127–130, 132, 135
- DNA digestion with DNase I 131, 133
- DNA repair 123–137
- Docking..... 47, 49, 53, 54, 61, 63
- Drug delivery strategies..... 141–153

E

E. coli
 BL21 (DE3) 24, 40
 BL21(DE3)lysS..... 16, 20
 DH10Bac cells..... 26
 Econo-Pac Mono S cartridges..... 16, 19
 Electrophoresis 6, 7, 12, 17, 20, 113, 125
 Eosinophil isolation..... 186–187
 Extraction of detergent-soluble p21 132–133, 136

F

Flavopiridol 42, 59, 112
 Flow cytometry..... 86, 88, 89, 91–93,
 98–99, 106, 142, 149, 150, 153, 168, 173, 180, 183,
 188–190, 192, 193, 196–199
 Fluorescence spectroscopy..... 69, 71, 75, 76
 Fluorescent peptide sensor 67–81
 Fragment-based de novo design 47–55

G

Gene silencing..... 113–114, 117
 Genetic algorithm 51, 52
 Genetic algorithm-based de novo design of inhibitors
 (GANDI) 48, 50–53, 55
 Glutathione-agarose beads 16, 21, 24, 25
 Glutathione-sepharose-4B resin..... 11
 Glutathione *S*-transferase (GST) 4, 7, 11, 12,
 16, 20–22, 24, 25, 34, 35, 39–42
 GST-CTD substrate 16, 22

H

HAT buffer 3–5, 7
 HeLa-DsRED cell line 101–102, 104
 HeLa-GFP cell line 103–104
 High-performance liquid chromatography
 (HPLC)..... 68, 70, 71, 73, 74, 147, 152
 Hypodiploid nuclei staining 181–182
 Hypoxia..... 112, 115–116, 119

I

Immunofluorescence 125, 129–132, 194
 Immunohistochemistry (IHC) assay 169, 172, 177
 Immunoprecipitation..... 1–8, 10, 14, 114,
 117–120, 125, 127, 131, 133–137, 171
 Inflammation..... 95, 111, 112, 179–207
 In situ extraction of chromatin-bound p21..... 130–131
 Ischemia reperfusion..... 111–120
 Isolation of lymphocytes..... 169, 170, 172, 173

K

Kinase activity 1–8, 10, 13, 14, 22, 23, 27, 159
 Kinase assay..... 3–8, 10–12, 16, 20–23, 27

L

LEGEND de novo design program 49, 53–54
 Library..... 48, 49, 53, 61, 63–64, 218
 Light microscopy..... 96, 181, 189
 Lipopolysaccharide (LPS) or lipoteichoic acid (LTA)/
 peptidoglycan (PepG)-induced lung inflammation
 model..... 201
 LLC-PK1 cell line..... 112, 114, 116–119
 Lysosomal extract preparation 146

M

Macrophage..... 179, 180, 185, 187, 196–199, 201–204, 207
 MAT1 14, 17, 20, 22, 23, 26, 158
 MBP. *See* Myelin basic protein (MBP)
 Metabolites..... 59, 99, 100, 112, 153, 212–222
 Metabolomics 211–222
 Microinjection 184, 202, 204–207
 Mitochondria 95–107, 182, 189–192
 Mitochondrial membrane potential ($\Delta\psi_m$) 96, 189–192
 Mitotic index..... 88, 92
 MOI. *See* Multiplicity of infection (MOI)
 Mono S chromatography..... 16, 18–20
 Morpholinos..... 184, 203–206
 Multiplicity of infection (MOI) 17, 18, 26
 Myelin basic protein (MBP)..... 16, 21–23, 42

N

Nanoparticle
 cellular uptake study 147–148
 elemental analysis 152
 Glucidex®47 molecular gate 145, 146, 148, 149
 internalization and cargo release..... 147–149
 loading and surface functionalization 144, 146
 MCM-41 142, 144, 146, 148–151
 mesoporous material..... 144
 molecular gate aperture mechanism..... 146
 N₂ adsorption-desorption isotherm 151
 powder X-ray diffraction 150
 silica mesoporous support..... 147–149
 thermogravimetry 151
 Neutrophil 179–181, 186,
 188–193, 195–199, 201–204, 206, 207
 Neutrophil isolation..... 185–186
 Ni²⁺-NTA resin..... 16, 18–20, 24
 Nocodazole..... 86–91, 93
 Nuclear magnetic resonance (NMR)
 experiments..... 216–217, 221
 spectrometer 213, 218, 220, 221

P

p21..... 2, 3, 10, 40, 60, 61, 123–137, 158
 p23..... 40

- p25..... 30, 38–40, 119, 120
Pan-Cdk inhibitors..... 168, 177
PCNA. *See* Proliferating cell nuclear antigen (PCNA)
p21 degradation..... 124, 125, 128
Peptide-cyclin binding assays 75–76
Peptide inhibitors 59–65, 68, 77, 158
Peptide quantification..... 74–75
Peptide synthesis 69–74, 78, 80, 142
pGEX plasmid..... 11, 20, 24, 40
Phagocytic uptake..... 196–199
PI staining. *See* Propidium iodide (PI) staining
Plate assay for phagocytosis..... 196–197
PPIs. *See* Protein-protein interactions (PPIs)
pRb phosphorylation..... 168, 169, 171, 174, 176
p21 recruitment 125, 127, 130, 132, 135
Proliferating cell nuclear antigen (PCNA) 124, 125, 128, 135
Propidium iodide (PI) staining..... 91–93, 181, 189, 192–193
Proteasomal inhibitors..... 125, 128
Protein A-sepharose..... 5–7
Protein expression..... 11, 18, 116, 202
Protein G-sepharose..... 5–7
Protein-protein interactions (PPIs) 59–65
Protein purification 11–12
Purification
 CDK1..... 9–12
 CDK2..... 9–12, 34
 CDK7..... 13–27, 40
 CDK8..... 13–27
 CDK9..... 13–27
 cyclin A..... 9–12
 cyclin B..... 9–12
- R**
Recombinant CDKs..... 13–27, 41
Recombinant kinases 14–16, 19, 21–23, 26
Recombinant viruses..... 17–18, 25
Roscovitine (RVT) 59, 112, 119, 143–146, 181, 183, 184, 188–193, 195, 200–202
- S**
Serum starvation..... 86–89, 120, 128
SF9 insect cells 42
SF21 insect cells 37, 42
Small interfering RNA (siRNA) 113–114, 117, 120, 183, 199
Structural determination of protein complexes..... 29–42
Structure based drug design..... 30, 36
- T**
TEM. *See* Transmission electron microscopy (TEM)
Tetramethylrhodamine ethyl ester perchlorate (TMRE) 96–99, 105, 106
Thin layer chromatography (TLC) 70, 71, 78
Thymidine 86–90, 92
Transmission electron microscopy (TEM) 96, 97, 102–103, 142, 148, 151
Trypan blue 88, 91, 173, 186
Tumor volume 169, 170, 175
- U**
UV light irradiation..... 128–129
- V**
VitAL-Viterbi 60, 61, 64
- W**
Western blot..... 5–7, 20, 27, 113, 114, 116–119, 125, 127, 133, 135, 137, 169, 171, 173, 177, 182–183, 188, 195–196, 199, 205
WST-1 methodology 143, 149, 153
- X**
Xenograft model..... 168, 169, 171, 172, 177
X-ray structure..... 36, 55, 68
- Z**
Zebrafish model 184–185, 201–206