

Index

- acquired resistance 140, 167, 218, 234, 298, 490
- activating mutations 12, 26, 56, 80–81, 103, 106, 159, 163–64, 166, 170, 177, 185–87, 195, 204, 287–88
- acute promyelocytic leukemia (APL) 11, 16, 313–17, 323, 326–27, 329–36
- adenocarcinomas 12, 27, 39, 81, 122, 164, 168, 170, 178, 181, 227, 457–58, 468
- adenosine triphosphate (ATP) 156, 158, 164, 167, 178, 188, 423–24, 481
- adjuvant chemotherapy 6, 19, 113, 115, 127, 183, 376–77, 379, 382, 397–98, 400, 410
- adjuvant endocrine therapy 15, 20, 133, 135, 142, 144, 148
- adjuvant systemic chemotherapy 389–90
- adjuvant tamoxifen 115, 134, 138, 147, 150, 376
- adjuvant tamoxifen therapy 97, 125, 140
- ALCL *see* anaplastic large cell lymphoma
- ALK *see* anaplastic lymphoma kinase
- ALK fusion proteins 454, 460
- ALK inhibitors 464, 466–67
- ALK protein expression 460
- ALK-targeted agents 450, 452, 454, 456, 458, 460, 462, 464, 466, 468, 470, 472
- alkylating agents 428
- all-trans retinoic acid (ATRA) 11, 16, 313, 315–16, 320–21, 326–30
- amphiregulin (AREG) 171–72, 181, 184, 214–15, 226, 231
- anaplastic large cell lymphoma (ALCL) 452, 454, 456, 458–61, 464, 469–70
- anaplastic lymphoma kinase (ALK) 10, 450–66, 468–72
- anastrozole 134–38, 147–49, 152, 376–77, 385
- anemia 252, 255, 279, 281, 284, 356, 429
- angiogenesis 13, 184–85, 401–2, 406, 413, 415
- anthracyclines 5–6, 93–96, 337, 400, 429
- anticancer agents 418
- antitumor activity 10–11, 13, 63, 65–67, 108, 164, 209, 283, 285, 353, 478, 482
- APL *see* acute promyelocytic leukemia
- apoptosis 67, 184, 215, 235, 238, 257, 269–70, 317–18, 324–25, 328–29, 373–74, 424–26, 476, 481, 487
- AREG *see* amphiregulin
- aromatase inhibitors 93, 127, 134–39, 146–49, 376, 384
- arsenic trioxide 313, 315–16, 320, 326–27, 329–32, 336
- assay validation 61, 63
- assays, multigene 146, 384, 415

- ATP *see* adenosine triphosphate
 ATRA *see* all-trans retinoic acid
- base excision repair (BER) 13,
 417–18, 422, 425–28, 437
- BCR *see* breakpoint cluster region
 BER *see* base excision repair
- best supportive care 164, 166,
 188, 192, 199–201, 211,
 221
- bevacizumab 13, 25, 28, 57, 188,
 192–93, 203, 222–23, 354,
 449
- bilirubin 247, 356, 360–61, 366
- biomarker evaluation 52–53, 63
- bone marrow 238, 240, 314
- bosutinib 251–53, 263–64
- BRAF, wild-type 481
- BRAF gene 302, 476, 483, 485–86
- BRAF inhibition 482–83, 489–90
- BRAF inhibitors 480, 482,
 484–85, 489
 selective 479, 481
- BRAF mutations 12, 204–5, 227,
 298, 476–81, 487
- BRAF-targeted therapy 474, 477,
 479, 482
- BRCA deficiency 13, 17
- BRCA gene 425, 439
- breakpoint cluster region (BCR)
 9, 234–36, 242, 256–57,
 259, 467
- breast cancer 4–5, 23–25, 86–87,
 91–98, 108–9, 113–17,
 120–28, 132–40, 142–47,
 149–53, 369–72, 383–88,
 398–99, 411–12, 417–20
 advanced 13, 25, 97–98, 112,
 115, 125, 132, 137–38,
 145, 148–50, 445
 cells 8–9, 114, 116–17, 442
 early 9, 17, 19–20, 23, 94, 96,
 113, 115, 143, 145, 147,
 385, 410–12, 415
 invasive 114, 121, 125, 378,
 387
 metastatic 9, 15, 87, 89, 96,
 111–12, 115, 117, 128,
 132, 137, 148, 150, 153
 node-negative 6, 16, 20, 134,
 146–47, 384, 410, 415
 node-positive 6, 18, 20, 24,
 113, 115–16, 146
 recurrence 125, 146, 388,
 397, 408
- breast carcinomas 108–9, 114,
 120
- breast tumors 80–81, 140, 145,
 151, 388
- cancer pathogenesis 7, 12, 187,
 439
- capecitabine 92, 111–12, 223, 337
- carboplatin 37, 57–58, 95,
 159–60, 176, 428, 432,
 434–35, 486
- carcinogenesis 218, 220–21,
 417–18
- cell death 355, 424–26, 476
- cells
 latent 428
 leukemic 254, 278
 mutated 436, 479
- cetuximab 11–12, 15, 26–27, 47,
 158–59, 166, 169–70,
 176–77, 179–80, 188,
 192–94, 199–201, 203–9,
 211–18, 221–31
- chemotherapy
 irinotecan-based 11
 multi-agent 188, 193

- CHR *see* complete hematologic response
- chromosomal translocation 9, 453
- chronic myelogenous leukemia (CML) 9, 14, 17, 233–36, 238, 240, 242, 244–48, 250, 252–56, 258–60, 262–65, 278–79, 282
- blast-phase 252
- imatinib-resistant 252–53, 262
- pathogenesis of 234
- chronic myeloid leukemia 233, 238–39, 241, 243, 245, 247, 249, 256–60, 262–65, 278, 450, 465, 467
- targeted therapies of 238–39, 241, 243, 245
- circulating tumor cells (CTCs) 173–75, 182, 218
- cisplatin 87, 109, 117, 119–20, 159, 176, 180, 304, 418, 422, 428–30, 434, 444, 485
- clinical trials assay (CTA) 82
- CML *see* chronic myelogenous leukemia
- colon cancer 61, 68–69, 219–20, 225, 418
- colorectal cancer 5, 12, 26, 102, 107, 170, 183–88, 194, 198–200, 204, 206–8, 214–16, 218–22, 224–32, 365
- metastatic 12, 15, 27, 74, 180, 184, 187, 207, 221–24, 226–27, 229, 231, 345, 354, 364
- complete hematologic response (CHR) 241, 247, 252, 254–55
- Crigler–Najjar syndrome 360–62
- crizotinib 10, 68, 73, 464–67
- CTA *see* clinical trials assay
- CTCs *see* circulating tumor cells
- cyclophosphamide 6, 94–95, 113–14, 377–79, 385, 407, 428, 432, 445
- cytotoxic agents 3, 40, 426–28
- cytotoxic chemotherapy 64, 155, 159, 165, 194, 408
- dacarbazine 10, 304, 428, 474, 480, 485–86, 488
- dasatinib 9, 14, 69, 242–46, 248–51, 253–55, 261–62, 285–86
- DBD *see* DNA-binding domain
- diarrhea 64, 240, 252, 279, 281, 283–85, 338, 354–55, 364, 429, 465
- dihydropyrimidine dehydrogenase (DPD) 24, 338, 344–47, 349–50
- dihydropyrimine dehydrogenase (DPD) 6, 14, 16, 22, 338–39, 341–43, 346–47, 349–50
- dimerization 79, 93, 123, 157, 185, 236, 269, 452, 454, 479
- DNA-binding domain (DBD) 423
- DNA repair 321, 330, 417–18, 422–23, 425
- DNA sequencing 197–98, 458
- docetaxel 28, 37, 46, 95, 103, 119–20, 160, 166, 168, 177, 181, 377, 385, 465
- double strand DNA breaks (DSBs) 417, 425–28, 436
- DPD *see* dihydropyrimine dehydrogenase
- DPD deficiency 14, 18, 338, 341–44
- DSBs *see* double strand DNA breaks

- ECD *see* extracellular domain
- echinoderm microtubule-associated protein (EMAP) 5, 10, 16, 451, 468
- EGF *see* epidermal growth factor
- EGFR *see* epidermal growth factor receptor
- EGFR activation 157–58, 170, 184, 188
- EGFR agents 156, 158, 164, 166, 168, 170, 172, 174, 176, 178, 182
- EGFR expression 11, 18, 91–92, 214
- EGFR gene amplification 167, 169
- EGFR inhibitors 37, 65, 155, 158–59, 175, 184, 194, 204
- EGFR ligands 171, 214
- EGFR mutations 11, 164, 166, 172, 177–78, 474
- EGFR overexpression 166, 169
- EGFR protein expression 168, 213
- EGFR-targeted therapies 158, 181
- EIA *see* enzyme immunoassay
- ELISA *see* enzyme-linked immunosorbent assay
- EMAP *see* echinoderm microtubule-associated protein
- endocrine resistance 140, 144, 151
- endocrine therapy 2–3, 15, 96–97, 115, 121–22, 124–28, 130, 132–36, 138–44, 146, 150, 377, 379, 381–82, 404
- neoadjuvant 139, 151
- endocrine therapy resistance 139, 143
- endometrial cancer 102, 128, 133, 135, 137
- enzyme activity 357, 359, 361–64
- enzyme immunoassay (EIA) 141–42
- enzyme-linked immunosorbent assay (ELISA) 62, 85, 101, 163, 213, 215
- epidermal growth factor (EGF) 26–27, 78, 103–5, 111–12, 144, 157, 171, 181–82, 184, 214, 468
- epidermal growth factor receptor (EGFR) 10, 16, 24, 26, 28, 56, 78, 104, 106, 113, 155–56, 176–78, 181–82, 184–85, 228–31
- epiregulin 184, 214, 226, 231
- epirubicin 94, 96, 110, 113–14
- EREs *see* estrogen response elements
- erlotinib 11, 14, 27, 53, 70, 158, 160, 164–68, 172–73, 176–78, 181, 193, 223
- estrogen 9, 24–25, 29, 115–16, 122–23, 127, 129, 132, 138, 144, 149, 151, 385–86, 403, 414
- estrogen receptor 2, 4–5, 8–9, 15–16, 18, 24, 97, 115–16, 121–27, 132, 135, 138–42, 144, 151–53, 385–86
- estrogen response elements (EREs) 123
- exemestane 132, 134–38, 148, 150
- extracellular domain (ECD) 9, 98, 101, 116–17, 158, 189, 269–71, 452
- first-line Erbitux (FLEX) 159, 162, 166, 169–70, 176, 180
- FISH *see* fluorescence *in situ* hybridization
- FLEX *see* first-line Erbitux

- fluorescence *in situ* hybridization (FISH) 22, 61, 82–85, 87, 89–96, 99–102, 108, 120, 163, 168–69, 208–9, 211, 217, 316–17, 458–62
- fulvestrant 132, 137–39, 149
- fusion gene 9–10, 316, 370, 450, 463, 469, 471
- fusion protein 314, 321–23, 325–26, 332–33, 452, 454–55
- GAPs *see* GTPase activating proteins
- gastric cancer 77, 99–100, 107, 457
- gastrointestinal stromal tumors 10, 267–68, 270, 272, 274, 278, 280, 282, 284, 286, 288, 290, 292, 296–304, 306–11
- gefitinib 11, 14, 26–27, 37–39, 42, 56, 70, 156, 158, 160, 164–69, 171–73, 175–79, 181–82, 468
- gemcitabine 11, 100–1, 119–20, 176, 428–29, 432, 434, 444
- gene amplification 5–6, 18, 82, 84, 86, 90, 92, 101, 107–8, 115, 118–20, 168, 208–9, 229, 453
- genes, cancer-related 20–21
- germline mutations 62, 274, 302, 304, 419–20, 431, 435, 440
- Gilbert's syndrome 362–63, 368
- GTPase activating proteins (GAPs) 186, 257
- HER-2 *see* human epidermal growth factor receptor 2
- HER-2 overexpression 81–82, 86, 92, 97, 99–100, 102, 118
- hot flushes 130, 132, 135
- human epidermal growth factor receptor 2 (HER 2) 9, 77–104, 106, 108, 110, 112–14, 116, 118, 120, 151, 189, 229
- hyperbilirubinemia 360–61, 363, 366
- ICC *see* interstitial cells of Cajal
- imatinib mesylate 25, 234, 238–39, 258–59, 263–64, 268, 278, 296, 299, 305, 307, 309, 465
- imatinib resistance 234, 240, 242–43, 246, 253–54, 260–61, 264, 281, 284, 291–92
- imatinib therapy 261, 272, 279, 281–82, 287, 291, 293
- interstitial cells of Cajal (ICC) 268, 296, 299
- intestine 271, 274, 354–57
- irinotecan 5, 11, 24, 188, 192, 203, 206, 215–17, 221–23, 225, 227, 229, 353–57, 363–66, 427–28
- irinotecan therapy 355, 363, 365
- irinotecan toxicity 359–60, 364, 366, 368
- KRAS mutations 19, 27, 61, 69–70, 163, 180–81, 195, 197–99, 217, 220, 224–26
- lapatinib 9, 91–93, 99–101, 111–12, 117, 119–20, 140, 152
- LBAs *see* ligand-binding assays
- letrozole 15, 92, 112, 134–38, 147, 150, 152, 400
- leucovorin 192, 222–23, 226, 345, 354

- leukemia 14, 240, 259–60, 263, 265, 314, 318, 324, 330–33, 335–36
- leukemia-initiating cells (LICs) 314, 327–28
- leukemic stem cells (LSC) 314
- LICs *see* leukemia-initiating cells
- ligand-binding assays (LBAs) 141–42, 177
- liver 225, 268, 275, 287, 291, 354–55, 357, 481
- LSC *see* leukaemic stem cells
- lung adenocarcinomas 458, 460, 470–71
- lung cancer 56, 119, 155, 164, 175–78, 180–82, 449–50, 467–70, 472
- lymphomas, large cell 454–55, 458, 460

- major molecular response (MMR) 239–41, 245–47, 251, 255, 258, 417, 426
- MAPs *see* microtubule-associated proteins
- melanoma 10, 270, 272–73, 418, 433, 473–74, 476–79, 481–82, 484–90
 - advanced 482, 485, 488–89
 - malignant 474, 478, 482, 488
 - metastatic 10, 14, 473–74, 476, 478, 480, 482, 484–87, 490
- melanoma cells 484, 486–87, 489
- metastases 7, 157, 182, 205, 209, 225, 227, 276, 399–400, 402–3, 405–6, 414, 462, 473, 477
- metastatic tissue 198–99, 209, 212, 218
- microtubule-associated proteins (MAPs) 451

- MMR *see* major molecular response
- molecular pathogenesis 273, 301, 316–17, 319, 321, 323, 325
- molecular pathogenesis of GIST 269, 271
- molecularly targeted agents (MTAs) 59–60, 63–65, 67–68, 70, 72–73, 155
- MTAs *see* molecularly targeted agents
- multiparameter assays 369–72, 382
- myelosuppression 240, 284, 338, 355, 428, 433–34

- neoadjuvant therapy 110, 139, 405
- neuregulin 80, 105–6, 171
- neutropenia 7, 24, 240, 245, 247, 252, 255, 281, 284, 339, 354, 356, 364, 432–33
- nilotinib 9, 14, 69, 242–43, 246–51, 253–55, 262–63, 285, 308
- non-small cell lung cancer (NSCLC) 10, 56–58, 68–69, 101, 120, 155–56, 158–60, 162–64, 168–82, 189, 207, 449–50, 454–58, 462–66, 471
- NSCLC *see* non-small cell lung cancer

- objective response rate (ORR) 40, 87, 89, 91, 93, 100–1, 138, 168, 193, 199, 207, 280, 283, 289–90, 430–31
- olaparib 14, 28, 64, 428–31, 434, 444–45
- oncogenesis 158, 450, 453

- ORR *see* objective response rate
- ovarian cancer 25, 100–1, 107,
118–19, 419–20, 430, 432,
438, 440–42, 445
- ovarian tumors 420–21, 435, 438,
441
- oxaliplatin 188, 192, 222–23, 226,
229
- paclitaxel 6, 57, 92, 95–96, 108,
110–11, 115, 117, 119,
146, 159–60, 176, 428,
432, 435
- panitumumab 11–12, 15, 26–27,
158, 184, 188, 192–94,
200–4, 211, 214, 221–22,
229
- PAR *see* poly-ADP ribose
- PARP *see* poly-ADP ribose
polymerase
- PARP inhibition 424, 427,
429–30, 432–33, 435
- PARP inhibitor resistance 436,
447
- PARP Inhibitors 13, 61, 64, 73,
418, 420, 422, 425–28,
430–32, 434–38, 445
- PARP inhibitory dose (PID) 433
- pathological complete response
(PCR) 22, 44, 103, 139,
163, 197, 201, 203, 205,
208, 404, 459
- real-time 196–97, 205
- patients
- dasatinib-intolerant 251
 - postmenopausal 134–35,
138, 385
 - premenopausal 127, 133,
135, 147
 - tamoxifen-treated 376–77
- PBMCs *see* peripheral blood
mononuclear cells
- PCR *see* pathological complete
response
- peripheral blood mononuclear
cells (PBMCs) 66, 342,
429, 433, 437
- pertuzumab 93, 100–1, 103,
112–13, 119
- PET *see* positron emission
tomography
- Philadelphia chromosome 9,
234–35, 264
- phototherapy 361
- PID *see* PARP inhibitory dose
- platinum-based chemotherapy
170, 430, 463
- pleural effusions 244–46, 255
- poly-ADP ribose (PAR) 13,
422–23, 433
- poly-ADP ribose polymerase
(PARP) 13, 64–65, 418,
422–26, 428–29, 431–33,
437, 439, 442, 445–46
- ponatinib 249, 254–55
- positron emission tomography
(PET) 279, 286–87, 307,
309
- postmenopausal women 127,
132, 134–37, 145, 147–50,
152, 376–77, 379, 384, 390
- premenopausal women 127–28,
133–34, 137
- progesterone receptor 2, 4–5, 8,
16, 18, 25, 91, 121, 143,
145–46, 151, 153, 430, 433
- progesterone receptors 2, 25, 121,
143, 145–46, 151, 153
- prognosis signature, 70-gene 407,
410–12
- prognostic biomarker 38, 77, 81,
99, 102, 123

- RAR *see* retinoic acid receptor
- reactive oxygen species (ROS) 314, 327, 329
- receptor tyrosine kinases (RTKs) 78, 184, 269, 272, 401, 452–53
- RECIST *see* response evaluation criteria in solid tumors
- recurrence free survival (RFS) 87, 90, 293
- recurrence score, 21-gene 19, 369–71, 373–74, 376, 378, 380, 382, 384–86, 407
- resistance mutations 167, 174, 176
- response evaluation criteria in solid tumors (RECIST) 286, 430
- retinoic acid receptor (RAR) 11, 113, 313, 316–18, 326, 331–32, 334–36
- RFS *see* recurrence free survival
- ROS *see* reactive oxygen species
- RTKs *see* receptor tyrosine kinases
- SCLC *see* small cell lung cancer
- selective ER down-regulators 127, 132, 137
- selective estrogen receptor modulators (SERMs) 9, 25, 97, 125, 127, 129, 137, 139
- SERDs *see* selective ER down-regulators
- SERMs *see* selective estrogen receptor modulators
- single nucleotide polymorphisms (SNPs) 22, 133, 206, 228, 347, 357
- small cell lung cancer (SCLC) 5, 10, 16, 26, 44, 47, 50, 52–53, 56–58, 72, 119–20, 155–56, 168, 176–82, 449
- SNPs *see* single nucleotide polymorphisms
- sorafenib 69, 284–85, 307, 478–79, 486, 488
- sunitinib 69, 282–85, 292, 296, 306, 308
- tamoxifen 9, 15, 69, 97, 115–16, 125–27, 132–40, 143–48, 150, 152–53, 374–79, 385, 400, 406–7, 414
- tamoxifen endocrine therapy 133
- tamoxifen resistance 97, 116, 140, 151
- taxanes 17–18, 93, 96, 159
- temozolomide 304, 426–28, 432, 443–45, 482, 485, 489
- therapeutic agents 33, 187, 260
- therapy
- anti-angiogenesis 13
 - chemoendocrine 379, 381–82
 - cytotoxic 425–27
- thiopurine S-methyltransferase (TPMT) 7, 16, 24
- thrombocytopenia 240, 245, 247, 252–53, 255, 356, 429, 433, 435
- TKIs *see* tyrosine kinase inhibitors
- TKRs *see* tyrosine kinase receptors
- TNBC *see* triple negative breast cancer
- toremifene 129, 137, 139
- toxicities
- 5-fluorouracil 337–38, 340, 342, 344, 346, 348, 350
 - floropyrimidine-related 345–46
- TPMT *see* thiopurine S-methyltransferase
- TPMT deficiency 5, 7, 16, 19
- transcription factors 235, 320, 322, 327, 406

- transcriptional activation 170, 321–22, 327, 414
- transcriptional repression 313, 318–19, 321
- trastuzumab 9, 15, 17–18, 25, 28, 61, 68, 86–91, 93, 95–96, 98–101, 103, 109–13, 117, 119–20
- triple negative breast cancer (TNBC) 64, 419–20, 425, 432, 434, 445–46
- tumor cells 36, 64, 66–68, 98–100, 116, 141, 174, 182, 211, 213, 402–3, 406, 419, 425–26, 435–36
- tumor markers 23, 25, 117, 145, 371, 384
- tumor progression 9, 72, 158, 282–83, 286, 402
- tumor recurrence 287, 389, 397, 401
- tyrosine kinase 78–79, 236, 250, 282, 468
- tyrosine kinase activity 117, 156
- tyrosine kinase inhibitors (TKIs) 9, 91, 158, 167, 169, 171, 188–89, 245, 249, 251–55, 260, 264, 278, 285–86, 295
- tyrosine kinase receptors (TKRs) 268, 295
- veliparib 64, 425, 428, 431–32, 434
- vemurafenib 10, 14, 71, 73, 480, 485
- wild-type tumors 200, 204, 206–7, 215, 294

