

Subject index

- Acid phosphatase
 - lysosomal, 91
 - as tumor marker, 112-114
- Actinomycin D, 256, 257
- Adrenal cancer
 - neuroblastomas, 124-125, 285
 - NMR imaging of, 337-338
 - pheochromocytomas, 124-125, 337-338
 - tumor markers in, 124-126
- Adriamycin
 - action of, 52-53
 - in combination therapy, 54-55, 56-57, 63-65, 78
 - in disseminated testicular cancer, 257, 258
 - in prostatic cancer, 54-59, 63-65, 78
 - as single agent, 58-59
- AFP. *See* Alpha-fetoprotein (AFP)
- Agar assay, double-layer soft, 94-104, 108-109
- Agar gel electrophoresis, 41
- Alkaline phosphatase, 130, 199
- Alpha-fetoprotein (AFP)
 - as surgical contraindication, 261-262
 - as tumor marker, 126-128, 197, 199, 260
- Aminoglutethimide, 70-71
- Ammonium sulfate precipitation, 40-41
- Androgen receptors
 - levels in prostatic cancer, 20-28
 - measurement of, 18-20, 39-45
 - vs. non-receptor steroid binding proteins, 42-43
 - in stromal-epithelial interactions, 28-33
 - temperature effect on, 18, 43
- Angiogenesis
 - capillary stimulation in, 10
 - defined, 1
 - inhibition of, 8-11, 15
 - lymphocytes in, 14
 - macrophages in, 14
 - mechanism of, 2-5
 - techniques for studying, 14
 - tumor detection based on, 5-8, 14-15
 - tumor vs. normal, 15
- Anti-androgens, 69-70
- Antibody, as tumor marker, 119
- Antigens
 - blood group, 18-19
 - carcinoembryonic, 120
 - embryonic, 192-196
 - fetal, 192-196, 291
 - HLA. *See* HLA antigens
 - Ia, 280, 287
 - prostate, 114-115
 - resistance, 281
 - stage-specific, 193, 194
 - tumor-associated, 195-196
- Avascular phase, 1-2
- Bacillus Calmette-Guerin. *See* BCG therapy
- BCG therapy
 - for carcinoma in situ, 177-179, 186
 - vs. chemotherapy, 176-177
 - clinical trials of, 170-176
 - cyclophosphamide and, 175-176
 - dosage in, 181-182
 - historical background of, 169-170
 - vs. interferon, 245
 - in invasive transitional cell carcinoma, 187
 - maintenance schedules for, 186
 - mechanism of action of, 186-187
 - mode of administration in, 181, 185-186
 - oral, 174-175
 - patient selection for, 172, 182
 - for recurrent superficial bladder tumor, 170-177
 - for residual bladder tumor, 179-181
 - side effects of, 171, 175, 176-177
 - toxicity of, 181-182, 185

- Bladder cancer**
 animal models for, 246
 BCG therapy for. *See* BCG therapy
 carcinoma in situ, 177-179, 182, 186
 HLA antigens in, 285-287, 288, 289
 interferon in, 221-228, 243, 244-245, 247
 invasive, 187
 NMR imaging in, 343-344, 345, 346
 recurrent superficial, 170-177, 221-228
 residual, 178-181
 tumor markers in, 118-122
- Bleomycin**
 in disseminated testicular cancer, 256-257, 258, 263, 269
 in prostatic cancer, 67-68
- Blood group antigens, 18-19**
- Buserelin, 309**
- Calcitonin, 130**
- Capillary growth. *See* Angiogenesis**
- Carbohydrate metabolism, inhibition of, 90-91**
- Carcinoembryonic antigen (CEA), 120, 195-196**
- Carmustine. *See* BCNU**
- Cartilage, angiogenesis inhibitor in, 8-9, 14**
- Castration. *See* Orchiectomy, bilateral**
- Catecholamines, 125**
- CAT scans. *See* Computed axial tomographic (CAT) scans**
- CCNU, 62**
- CEA, 120**
- Centrifugation, 95-100**
- Cerebrospinal fluid, 8**
- Ceruloplasmin, 5**
- Charcoal, dextran-coated, 18, 40, 93**
- Chemical shift images, 358**
- Chemosensitivity testing**
 clonogenic assays, 94-104
 hormone receptor assays, 93
 morphologic assays, 90
 with radioactive compounds, 92-93
 visual indicator tests, 90-91
- Chemotherapy**
 vs. BCG therapy, 176-177
 in disseminated testicular cancer, 256-259
 in prostatic cancer, 51-73, 78-84. *See also under specific agents*
 in vitro testing for. *See* Chemosensitivity testing
- Chlorambucil, 256**
- Chloroethyl-cyclohexy-nitrosourea (CCNU), 62**
- Cholesterol, 117, 120, 124**
- Chorionic gonadotropin. *See* Human chorionic gonadotropin (HCG)**
- Chromatography, hydrophobic, 41**
- Chromosomes**
 in bladder cancer, 121-122, 137
 in renal cell carcinomas, 140
- Cis-diamminedichloroplatinum. *See* Cis-platinum**
- Cis-platinum**
 action of, 54
 in combination therapy, 64, 66-67
 in disseminated testicular cancer, 257, 258, 268-269
 in prostatic cancer, 60, 64, 66-67, 79-80
 with radiation therapy, 79-80
 as single agent, 60
- Cloning efficiency, 102**
- Clonogenic assays, 94-104, 108-109**
- Colony counting, 101-103**
- Complement, 117**
- Computed axial tomographic (CAT) scans, 259-260, 262-263, 270**
 vs. NMR imaging, 322-323, 326-328, 356
- Contraception, immunologic, 195, 200**
- Copper, in angiogenesis, 4-5**
- Creatine kinase-BB, 117**
- CT scans. *See* Computed axial tomographic (CAT) scans**
- Cyclophosphamide**
 action of, 52
 with BCG therapy, 175-176
 in combination therapy, 54-57, 62-67
 in prostatic cancer, 54-58, 62-67, 79-80
 with radiation therapy, 79-80
 as single agent, 57-58
 in superficial bladder cancer, 175-176
- Cyproterone acetate, 69**
- Cystectomy, 187**
- Cystitis cystica, 6**
- Cytometry, flow, 121-122, 137**
- Dacarbazine. *See* Imidazole carboxamide (DTIC)**
- Dactinomycin. *See* Actinomycin D**
- Daunorubicin, 52-53**
- DCC, 18, 40, 93**
- Dehydrogenase inhibition, 91**
- DES. *See* Diethylstilbestrol (DES)**
- Dextran-coated charcoal (DCC), 18, 40, 93**
- DFMO, 240, 246**
- DHT. *See* Dihydrotestosterone (DHT)**
- Dialysis, 144-145, 167**
- Diethylstilbestrol (DES)**
 in combination therapy, 66, 72
 vs. LHRH analogs, 307-308, 309, 311, 313, 314
- α -Difluoromethylornithine (DFMO), 240, 246**

- Dihydrotestosterone (DHT)
 binding to plasma proteins, 42
 dissociation from androgen receptor, 39-40, 43
 metabolism of, 41-42
- Disseminated testicular cancer
 chemotherapy for, 256-259
 diagnosis and staging of, 259-261
 early approach to, 255-256
 post-chemotherapy surgical management of, 261-272, 275-276
 tumor markers in, 260-261
- DNA tumor markers, 121-122, 137
- Doxorubicin. *See* Adriamycin
- Drug incubation, 100-101
- DTIC. *See* Imidazole carboxamide (DTIC)
- EC, 129, 198, 206-208, 291
- Electrophoresis, 41
- Embryoid bodies, 192
- Embryonal carcinoma (EC), 129, 198, 206-208, 291
- Embryonic antigens, 192-196. *See also* Fetal antigens
 stage-specific, 193, 194
 tumor-associated, 195-196
- Embryonic cells, 189-190, 191-192
- End cells, 102, 103
- Endothelial cells, in angiogenesis, 3-4, 15
- Enucleation, in renal carcinoma, 147-150, 164
- Epithelial cells
 after centrifugation, 95-96
 floater, 96
 in prostatic cancer, 31-33
- Epithelium, urogenital sinus (UGE), 31-32, 33
- Estradiol, 116
- Estramustine phosphate, 54, 59, 66-67
- Estrogen therapy
 androgen receptors following, 20
 in combination chemotherapy, 66, 72
 vs. LHRH analogs, 307-308, 309, 311, 313, 314
 sex steroid binding globulin following, 20
- Exclusion dye testing, 91, 103
- Family studies, 282
- Fetal antigens, 192-196, 291. *See also* Alpha-fetoprotein (AFP); Embryonic antigens
 tumor-associated, 195-196
- Fetal cells, 189-190, 191-192
- Fetoprotein. *See* Alpha-fetoprotein
- Fibrinogen, 120, 123
- FID, 323
- Flow cytometry, 121-122, 137
- 5-Fluorouracil (5-FU)
 action of, 53
 clinical trials with, 54-57
 in combination therapy, 62-63, 64-65, 66-68, 78
 as single agent, 57-58
- Flutamide, 69-70
- Folinic acid, 53-54
- Follicle stimulating hormone (FSH), 311
- Free inductive decay (FID), 323
- FSH, 311
- 5-FU. *See* 5-Fluorouracil (5-FU)
- Gel electrophoresis, 41
- Gel filtration, 41
- Genetic susceptibility, 280-281
- Germ cell research, 194-196, 200
- Giant cells, 102-103
- Glomerulonephritis
 from interferon, 230-231
 NMR imaging of, 333
- Glycoprotein, pregnancy specific, 129, 199
- HAP, 41
- Haptoglobin, 123-124
- HCG. *See* Human chorionic gonadotropin (HCG)
- Hemodialysis, 144-145, 167
- Heparin, 3-4, 10, 15
- Hexamethylmelamine, 60-62
- Histocompatibility antigens. *See* HLA antigens
- HLA antigens
 in bladder cancer, 285-287, 288, 289
 class II, 297-303
 DR, 297-303
 frequencies of, 282, 283
 inheritance of, 280
 mechanisms of disease association, 280-282
 in neuroblastoma, 285
 in prostatic cancer, 287-290, 302, 303
 in renal cell carcinoma, 284, 302, 303
 resistance from, 281
 structure of, 279-280
 in teratocarcinoma, 195-196
 in testicular cancer, 291-293, 302, 303
 tumor susceptibility from, 280-281
 in Wilms' tumor, 284-285
- Homovanilic acid (HVA), 125
- Hormone receptor assays, 93
- Hormone receptors, 115, 123. *See also* Androgen receptors
- Hormones, as tumor markers, 116, 122-123, 124-126
- Hormone therapy. *See* Estrogen therapy

- HPL, 129
 HT, 190, 192-196, 208
 Human chorionic gonadotropin (HCG)
 as surgical contraindication, 261-262
 as tumor marker, 127-128, 197, 199, 200, 260
 Human leucocyte antigens. *See* HLA antigens
 Human placental lactogen (HPL), 129
 Human teratocarcinoma (HT), 190, 192-196, 208
 Human tumor stem cell assay, 94-104, 108-109
 HVA, 125
 Hydrophobic chromatography, 41
 Hydroxylapatite (HAP), 41
 Hydroxyproline, 116
 Hydroxyurea, 59-60, 66
 Hypercalcemia, 121
 Hyperplasia, atypical, 6
 Hypertension, in renal carcinoma, 122
- Ia antigens, 280, 287
 IFN. *See* Interferon (IFN)
 Imidazole carboxamide (DTIC), 55-56, 60, 61, 65-66
 Immune response (Ir) genes, 280
 Immunoassays, 112-113
 Immunoglobulin A (IgA), 119
 Immunotherapy. *See* BCG therapy; Interferon (IFN)
 Interferon (IFN)
 alpha, 212
 vs. BCG therapy, 245
 beta, 212
 cell structure modification by, 240
 cell surface receptors for, 215-216
 clinical trials of, 219-221, 242-243
 composition of, 212
 cytolytic, 216
 with DEMO, 240
 dosage of, 229-231, 242
 early trials with, 211
 gamma, 212
 inhibitory effect of, 213-216, 239-240
 mechanisms of action of, 213-219, 241
 modulation of immune response by, 217-218, 241
 and NK cells, 241
 pharmacokinetics of, 218-219
 phenotype alteration by, 240
 renal clearance of, 219
 side effects of, 229-231
 standardization of, 212
 subclasses of, 211, 212, 215
 toxicity of, 229-231
 in urologic tumors, 221-229, 243, 244-247
 Inversion recovery (IR), 323-324, 328-329
 Ir genes, 280
- 17-Ketosteroids, 126
 Kidney
 cancer of. *See* Renal cell carcinoma
 in interferon metabolism, 219
 NMR imaging of, 329-336, 359
- Labeling index, 92-93
 Lactate dehydrogenase (LDH)
 in contraception, 200
 as tumor marker, 117, 129, 260-261
 Leiomyosarcoma, 338-339, 340-341
 Leuprolide, 309, 312, 313
 LH, 308, 311
 LHRH analogs. *See* Luteinizing hormone releasing hormone (LHRH) analogs
 Ligand exchange method, 26-28, 30, 43-44
 Liver, NMR imaging of, 339-341
 Lomustine. *See* CCNU
 Luteinizing hormone (LH), 308, 311
 Luteinizing hormone releasing hormone (LHRH) analogs
 clinical trials with, 309-310, 312-313
 mechanisms of action of, 308, 311-312
 sexual activity with, 313, 314
 side effects of, 309, 313, 314
 structure of, 308
 Lymph node dissection, radical retroperitoneal (RPLND)
 complications following, 268-269
 indications for, 261
 operative set-up for, 264
 preoperative evaluation for, 263
 results of, 266-267
 surgical procedure for, 265
 Lymphocyte adenosine deaminase, 121
 Lymphocytes, in angiogenesis, 14
 Lysosomal acid phosphatase, 91
- Macrophages, in angiogenesis, 14
 Major histocompatibility complex (MHC) antigens. *See* HLA antigens
 Malignant transformation, and angiogenesis, 5-7, 14-15
 Mast cells, 3-4
 Melphalan, 67
 Mersalyl acid, 19, 44
 Mesenchyme, urogenital sinus (UGM), 29, 31-32, 33
 Metanephrine, 125
 Methotrexate
 in disseminated testicular cancer, 256
 in prostatic cancer, 53-54, 64-65, 67-68

- Methyl-chloroethyl-cyclohexy-nitrosourea (methyl-CCNU), 60, 61, 66
- Methyl-GAG, 247
- MHC antigens. *See* HLA antigens
- β_2 -Microglobulin
and HLA antigens, 291
as tumor marker, 124, 130
- Mithramycin, 256
- Mitomycin-C, 78
- Mixed lymphocyte culture (MLC), 279, 280
- Monoclonal antibody, 119
- Monolayer cultures, 90
- Morphologic assays, 90
- Murine teratocarcinoma (MT), model, 189-190, 191-192, 206-208
- Natural killer (NK) cells, 241
- Nephrectomy
bilateral, 167
extracorporeal partial, 150-154, 165-167
radical, 143-144
in situ partial, 147, 164
- Neuroblastomas, 124-125, 285
- Nitrogen mustard, 60
- NK cells, 241
- NMR imaging. *See* Nuclear magnetic resonance (NMR) imaging
- Non-seminomatous tumors (NSGCT), 197, 199, 292, 302, 303
- NP-40, 98-100
- NSGCT, 197, 199, 292, 302, 303
- Nuclear magnetic resonance (NMR) imaging
of adrenal glands, 337-338
advantages and disadvantages of, 326-327
of bladder, 343-344, 345, 346
chemical shift images with, 358
contrast agents with, 352
future capabilities of, 351-352, 358, 359-360
history of, 317-318
instrumentation for, 324-326
interpretation of, 328
of kidney and ureter, 329-336, 359
of liver, 339-341
with paramagnetic agents, 358, 359
of pelvis, 341-343
of phosphorus concentrations, 360
physical principles of, 318-323, 355-357
of prostate, 345-351, 359
of retroperitoneum, 338-339, 340-341, 342
of sodium concentrations, 360
spectroscopy, 357-358, 360
techniques of, 323-324, 328-329
of testes, 359
toxicity of, 327
in tumor staging, 359
- Orchiectomy, bilateral, 307, 309, 311, 313, 314
- Papillomatosis
with BCG therapy, 178-179
interferon in, 221, 243, 244, 247
- Paramagnetic agents, 358, 359
- Parathormone, 123
- Pelvis, NMR imaging of, 341-343
- Pheochromocytomas, 124-125, 337-338
- Phosphorus concentrations, 360
- Placental alkaline phosphatase (PLAP), 199
- Plating efficiency, 102
- Polyclonal antibody, 119
- PPD skin test, 172-173, 182, 186
- Prednimustine, 59
- Prednisone, 67-68
- Pregnancy allosera, 193-194
- Pregnancy specific beta-1 glycoprotein (SP1), 129, 199
- Procarbazine, 62, 65-66
- Prostaglandins, 4, 5
- Prostate
endocrine dependency of, 17
NMR imaging of, 345-351, 359
- Prostate antigens, 114-115
- Prostatectomy, radical, 84
- Prostatic cancer
androgen receptor levels in, 20-28
animal model systems for, 71-72
bilateral orchiectomy in, 307
chemotherapy in, 51-73, 78-84. *See also under specific agents*
estrogen treatment of, 20-23, 307-308
HLA antigens in, 287-290, 302, 303
interferon in, 226, 229, 243, 246
LHRH analogs in, 308-310, 311-314
metastatic, 81-82
NMR imaging of, 347-351, 359
radiation therapy in, 57
receptor assays in, 93
stromal-epithelial interactions in, 28-33
tumor kinetics in, 80-82
tumor markers in, 112-117
- Protamine sulfate
in androgen receptor measurement, 40
in angiogenesis inhibition, 10-11, 15
- Proton imaging. *See* Nuclear magnetic resonance (NMR) imaging
- Putrescine, 120
- Radiation therapy, in prostatic cancer, 57, 79-80, 84
- Radical retroperitoneal lymph node dissection. *See* Lymph node dissection, radical retroperitoneal (RPLND)

- Radioactive compounds, in chemosensitivity testing, 92-93
- Red cell adherence assay, 118
- Renal autotransplantation, 153-154, 165
- Renal cell carcinoma
 conservative surgery for, 145-147, 161
 etiology of, 139-140
 extracorporeal partial nephrectomy in, 150-154, 165-167
 familial, 139-140
 growth patterns of, 142-144, 161
 HLA antigens in, 284, 302, 303
 interferon in, 224-225, 228-229, 244, 245-246, 247
 NMR imaging of, 332-336, 359
 radical nephrectomy in, 143-144
 simple enucleation in, 147-150, 164
 in situ partial nephrectomy in, 147, 164
 synchronous vs. nonsynchronous bilateral, 140-142, 159-161
 treatment options for, 144-145, 161, 167
 tumor markers in, 122-124
- Renal dialysis, 144-145, 167
- Renal hypothermia, 147, 164
- Renal transplantation, 145, 167
- Renin, 122
- Resistance antigens, 281
- Retroperitoneum, NMR imaging of, 338-339, 340-341, 342
- Rheumatoid factor, 121
- RPLND. *See* Lymph node dissection, radical retroperitoneal (RPLND)
- Salmon assay, 109
- Saturation recovery (SR), 323
- Scintillation index, 92
- SE, 323-324, 328-329
- Seminal vesicle invasion, 84
- Seminomas
 HLA antigens in, 292-293, 302, 303
 metastasis from, 197
 tumor markers in, 126, 127, 130, 199
- Semustine. *See* Methyl-CCNU
- Sex steroid binding globulin (SSBG), 20-23, 42
- Sialic acid, 116-117, 121, 129
- Single cell suspension, 94-100
- Sinus, urogenital (UGS), 32
- Skin test, PPD, 172-173, 182, 186
- Sodium concentrations, 360
- Sodium molybdate, 19, 25-26
- Soft agar assay, double-layer, 94-104, 108-109
- SP1, 129, 199
- Spectroscopy, 357-358, 360
- Spermatogenesis, 194-195, 200
- Spin echo (SE), 323-324, 328-329
- SR, 323
- SSBG, 20-23, 42
- SSEA, 193, 194
- Stage-specific embryonic antigen (SSEA), 193, 194
- Stem cell assay, 94-104, 108-109
- Stem cells
 in colony counting, 102, 103
 of human teratocarcinoma, 198-199, 208
- Sternotomy, 261, 268
- Steroid receptors, 123, *See also* Androgen receptors
- Stromal-epithelial interactions, 28-33
- Subtraction method, of colony counting, 102-103
- Sucrose density gradient analysis, 41
- TAFEA, 195-196
- Temperature, and androgen receptors, 18, 43
- Teratocarcinoma
 cellular differentiation in, 206-208
 and contraception, 195, 200
 embryoid body formation in, 192
 and embryonic antigens, 192-193
 embryonic-fetal cells in, 189-190, 191-192
 and germ cell research, 194-196, 200
 HLA antigens in, 291-293
 human, 190, 192-196, 208
 metastasis and recurrences in, 197-199
 murine, 189-190, 191-192, 206-208
 pregnancy allosera and, 193-194
 primary tumor in, 196-197
 staging in, 199
 tumor markers, 199-200
- Testicular cancer. *See also* Disseminated testicular cancer; Seminomas; Teratocarcinoma
 familial, 293
 HLA antigens in, 291-293, 302, 303
 incidence of, 189
 NMR imaging of, 359
 nonseminomatous, 197, 199, 292, 302, 303
 tumor markers in, 126-130, 199-200
- Testosterone suppression, 308-309, 311-312, 313, 314
- Thiotepa, 174, 176
- Thoracoabdominal incision, 261, 264
- Thoracotomy, 261, 264, 268
- Tomographs, whole lung, 259, 262-263.
See also Computed axial tomographic (CAT) scans
- Transferrin, 117
- Transitional cell carcinoma
 angiogenesis in, 6, 7
 animal models for, 246
 BCG therapy for, 187

- Transitional cell carcinoma (cont'd.)
 blood group antigens in, 118, 169
 HLA antigens in, 285, 288
 interferon in, 221-227, 243, 244
 NMR imaging of, 344, 345, 346
- Transitional cells, 102, 103
- Translocation and extraction procedure, 26-28
- Trypan blue exclusion testing, 91, 103
- T/t complex, 196
- Tumor-associated fetal and embryonic antigens (TAFEA), 195-196
- Tumor growth
 avascular phase of, 1-2
 tumor kinetics in, 80-82
 vascular phase of, 2
- Tumor markers
 in adrenal cancer, 124-126
 angiogenesis as, 5-8
 in bladder cancer, 118-122
 defined, 111
 half-life determination for, 128
 in prostatic cancer, 112-117
 in renal cancer, 122-124
 sensitivity of, 111, 137
 specificity of, 111, 137
 in testicular cancer, 126-130, 199-200, 260-261
- UGE, 31-32, 33
- UGM, 29, 31-32, 33
- UGS, 32
- Ultrasound, 259, 263
- Ureter, NMR imaging of, 329-336
- Urinary polyamines, 120, 124
- Urinary proteins, 120-121
- Urogenital sinus (UGS), 32
- Urogenital sinus epithelium (UGE), 31-32, 33
- Urogenital sinus mesenchyme (UGM), 29, 31-32, 33
- Vanilmandelic acid (VMA), 125
- Vascularization. *See* Angiogenesis
- Vascular phase, 2
- Vinblastine
 in disseminated testicular cancer, 256-258, 269
 in prostatic cancer, 53
- Vincristine, 53, 60, 67-68
- Visual indicator tests, 90-91
- Vital staining assays, 91, 103, 109
- VMA, 125
- Von Hippel-Lindau syndrome, 140, 141
- Whole lung tomographs (WLT), 259, 262-263
- Wilms' tumor, 284-285
- WLT, 259, 262-263