

Index

(*f* = figure; *t* = table)

- AA metabolites. *See* Arachidonic acid (AA) metabolites
AAV. *See* Adeno-associated viral (AAV) vector
Abatacept, 121
Abscesses
 endogenous endophthalmitis and, 318, 319, 319–320*f*, 321
 nocardiosis and, 248, 248*f*
 toxocariasis and, 294*f*
 tuberculosis and, 240
ACAID. *See* Anterior chamber–associated immune deviation
Accessory molecules, 34
ACE. *See* Angiotensin-converting enzyme (ACE) testing
Acetazolamide, 348
Acetylated triglycerides, 22. *See also* Platelet-activating factor
Acquired immunity. *See* Adaptive (acquired) immunity
Acquired measles retinopathy, 270
Acquired rubella, 267, 269
Acquired syphilis, 230–232, 231*f*, 233*f*, 234
Actinomycetes, 127*f*, 130
Activated macrophages, 17–18, 18*f*
Activated neutrophils, 14–15, 14*f*
Activating exposure. *See* Priming (activating) exposure
Acute anterior uveitis, 137–151
 clinical pearl, 148
 clinical presentation, 138–139
 delayed hypersensitivity mechanism and, 45*t*
 drug-induced, 148–151, 149–150*f*
 epidemiology, 139
 glaucomatocyclitic crisis, 82*t*, 144–145, 257
 HLA-B27–associated, 64, 65*t*, 87*t*, 120, 139–143, 226–227, 247
 intraocular pressure (IOP) and, 138, 342
 lens-associated, 145–146, 145*t*, 146*f*, 217
 postoperative, 147–148, 148*f*
 treatment, 120, 139
 tubulointerstitial nephritis and uveitis syndrome, 65*t*, 82*t*, 87–88*t*, 143–144, 143*f*, 153, 157
Acute disseminated encephalomyelitis, 207
Acute idiopathic maculopathy (AIM)
 clinical presentation, 195, 195*f*
 overview, 168–171*t*, 194–195
 prognosis, 195–196
 treatment, 196
Acute macular neuroretinopathy (AMN), 190–191
Acute posterior multifocal placoid pigment epitheliopathy (APMPPE)
 clinical presentation, 175–177, 176–177*f*
 diagnosis, 88*t*
 differential diagnosis, 171, 180, 188, 221–222, 297
 overview, 168–171*t*, 175
Acute retinal necrosis (ARN)
 diagnosis, 83*t*
 differential diagnosis, 72*t*, 227, 288, 308
 viral, 256, 259–262, 260–261*f*, 261*t*, 307
Acute retinal pigment epitheliitis (ARPE; or Krill disease), 168–171*t*, 192, 192*f*
Acute zonal occult outer retinopathy (AZOOR)
 clinical presentation, 193–194, 193–194*f*
 diagnosis, 92
 differential diagnosis, 193
 multiple evanescent white dot syndrome association, 190
 overview, 168–171*t*, 193
 prognosis, 194
 treatment, 194
Acyclovir, 258, 261–262, 267, 277, 312
Adalimumab (ADA)
 adverse effects, 120, 149
 Behçet disease treatment, 228
 dosage and monitoring schedule, 112*t*, 120
 efficacy studies, 106–107*t*, 120
 JIA-associated uveitis treatment, 106–107*t*, 120, 154
 overview, 28*t*, 119, 120
 sarcoidosis uveitis treatment, 214
 uveitic macular edema treatment, 348
Adaptive (acquired) immunity, 31–49
 amplification of, 21
 cellular components, 4*f*, 6
 combined antibody and effector mechanisms, 40, 48–49
 cytokines and, 27
 defined, 3
 definitions, 31–32
 effector responses
 antibody-mediated, 41–44, 41*f*, 42*t*
 combined mechanisms, 48–49
 lymphocyte-mediated, 32*f*, 36*f*, 44–48, 45*t*
 overview, 32*f*, 40
 highlights, 31
 immune response arc
 afferent phase, 32–34, 33*f*
 effector phase, 38–39, 38*f*
 overview, 3, 32, 32*f*
 primary and secondary immune responses, 39–40
 processing phase, 34–37, 35–36*f*
ADCC. *See* Antibody-dependent cellular cytotoxicity
Adeno-associated viral (AAV) vector, 59
Adenovirus, 175, 280
Adhesion of neutrophils, 13, 14*f*
Adult T-cell leukemia/lymphoma, 274, 275*f*
Adverse Drug Reaction Probability Scale, 148–149
Aedes aegypti, 274, 277
Aflibercept, 29*t*, 150
Age-related macular degeneration, 282
AIDS. *See* HIV/AIDS infection
AIM. *See* Acute idiopathic maculopathy
AIR. *See* Autoimmune retinopathy
Albendazole, 294, 297
Alkylating agents
 adverse effects, 114, 118
 Behçet disease treatment, 228
 dosage and monitoring schedule, 111*t*
 overview, 118–119
 scleritis treatment, 134

- serpiginous choroiditis treatment, 180
- sympathetic ophthalmia treatment, 217
- Allelic diversity, 63–64, 63*f*
- Allergic granulomatous angiitis, 72*t*, 132*t*
- Allergic reactions, 5, 40, 48–49
- Allograft rejection, 45*t*, 55
- α -Chemokines, 14, 25*t*
- α_2 -Adrenergic agonist. *See* Brimonidine
- Alphavirus*, 276–277
- Altered self, 34
- Alternative activation, 17–18, 18*f*, 20, 20*f*
- American Academy of Ophthalmology, 262
- American Academy of Pediatrics, 285
- American College of Rheumatology, 200
- American Uveitis Society, 260, 261*t*
- AMN. *See* Acute macular neuroretinopathy
- Amoxicillin, 246
- Amphotericin B
 - coccidioidomycosis treatment, 283
 - cryptococcosis treatment, 311
 - endogenous endophthalmitis treatment, 324, 325
 - endophthalmitis treatment, 318
- Ampiginous choroiditis (relentless placoid chorioretinitis), 177, 180–181, 181*f*, 188
- Amyloidosis, 88*t*
- ANA testing. *See* Antinuclear antibody (ANA) testing
- Anakinra, 28*t*
- Anamnestic immune response. *See* Secondary (anamnestic) immune response
- Anaphylatoxins, 14, 20*f*, 21
- Anaphylaxis. *See* Immediate hypersensitivity
- ANCA (antineutrophil cytoplasmic antibodies)-associated vasculitides, 88*t*, 205
- ANCA-negative retinal vasculitis, 204
- ANCA testing, 87*t*, 132*t*, 206
- Ancillary testing, 86–95. *See also specific imaging studies*
 - approach to, 86, 89
 - cytology and pathology, 94–95
 - laboratory tests and imaging studies, 86, 87–88*t*, 89
 - ocular fluid and tissue sampling, 93–94
 - ophthalmic imaging and functional tests, 89–92, 90–92*f*
 - uveitis evaluation scheme, 83–85*t*
- Ancylostoma caninum*, 296
- Angiogenesis, 18, 18*f*
- Angioid streaks, 282
- Angiotensin-converting enzyme (ACE) testing, 87*t*, 213
- Angle
 - secondary angle-closure glaucoma, 78, 153, 211, 343–344
 - secondary open-angle glaucoma, 153, 344
 - uveitis findings (overview), 74*t*, 78
- Animal models of human uveitis, 61–62
- Ankylosing spondylitis (AS)
 - anterior uveitis association, 82*t*, 140–141
 - scleritis association, 126, 132*t*
 - treatment, 119
- Anterior chamber, 52*t*, 56, 57
- Anterior chamber-associated immune deviation (ACAID), 51, 55, 57
- Anterior chamber cells
 - Dengue fever sign, 275
 - Fuchs uveitis syndrome finding, 155
 - nocardiosis finding, 248
 - retinoblastoma finding, 334, 334*f*
 - vitreoretinal lymphoma finding, 328
- Anterior chamber flare, 154, 248
- Anterior chamber paracentesis, 93, 94, 257
- Anterior scleritis
 - classification, 123, 124*t*
 - clinical presentation, 125–130*f*, 125–131
 - diagnosis, 131–133, 132*t*
 - epidemiology, 124–125
 - pathophysiology, 124
 - treatment, 133–135, 134*t*
- Anterior synechiae, 78, 133
- Anterior uvea, 45*t*, 52*t*, 56, 57
- Anterior uveitis. *See also* Complications of uveitis; Masquerade syndromes
 - classification, 69, 69*t*, 70–71, 72
 - clinical presentation, 21, 73, 74–78, 74*t*, 75–77*f*, 77*t*
 - differential diagnosis, 81, 82–83*t*, 317
 - epidemiology, 137
 - granulomatous, 210, 238, 274, 283
 - infectious
 - leptospirosis, 246
 - nocardiosis, 248
 - syphilis, 230, 232
 - tuberculosis, 238, 239
 - viral, 78, 153, 256–258*f*, 256–259, 277, 303, 342
 - Whipple disease, 252
 - noninfectious clinical presentation, 137–157
 - acute, 45*t*, 64, 65*t*, 87*t*, 137–151
 - chronic, 151–157, 339
 - overview, 137
- Anti-CD20 agents, 134
- Anti-citrullinated protein antibody testing, 87*t*
- Anti-idiotypic antibodies, 43
- Anti-interleukin 6 antibody, 112*t*, 348
- Anti-retinal antibodies (ARAs), 197–198
- Anti-vascular endothelial growth factor (anti-VEGF) agents
 - ampiginous choroiditis treatment, 181
 - induced uveitis, 150
 - multifocal choroiditis with panuveitis treatment, 185
 - neovascularization treatment, 161, 282, 350, 351
 - punctate inner choroiditis treatment, 187
 - serpiginous choroiditis treatment, 180
 - uveitic macular edema treatment, 348
- Antibiotics. *See also specific antibiotics*
 - bartonellosis treatment, 251
 - cataracts perioperative management, 340
 - endogenous endophthalmitis treatment, 320
 - induced ocular inflammation, 149, 150
 - leptospirosis treatment, 247
 - Lyme disease treatment, 245, 246
 - nocardiosis treatment, 249
 - postoperative endophthalmitis treatment, 318
 - syphilis treatment, 233*f*, 236–237
 - toxoplasmosis treatment, 289–290, 291
 - Whipple disease treatment, 253
- Antibodies (immunoglobulins), 37, 38–44, 41*f*, 42*t*, 53. *See also specific immunoglobulins*
- Antibody-dependent cellular cytotoxicity (ADCC), 48
- Antibody Fc receptors, 5, 15, 21, 41, 41*f*, 48
- Anticoagulants, 262
- Antifungal therapy, 321, 323–324, 325

- Antigen-presenting cells (APCs)
 delayed hypersensitivity mechanism and, 44–46, 45*t*
 immune response arc and, 32–34, 32*f*, 35–36*f*, 37
 major histocompatibility complex and, 32–34, 32*f*,
 62–63. *See also* Human leukocyte antigen (HLA)
 molecules
 microenvironments of, 52*t*, 53–57
 stimulatory signals for, 6–7, 16, 18*f*, 32
- Antigenic epitope, 31, 32, 33*f*, 37–38, 43, 66
- Antigens
 antibody-mediated responses to, 20–21, 20*f*, 41–48,
 41*f*, 42*t*
 autoantigens, 9, 37, 45*t*, 46, 66
 cellular-mediated responses, 32–34, 33*f*, 35–36*f*,
 37–40, 38*f*, 42*t*
 clinical example, 40
 combined antibody and cellular mechanisms, 40, 48–49
 definitions, 3, 31–32
 integrins, 13
 presentation of, 6–7, 16, 18*f*, 32–34, 32*f*, 35–36*f*, 37,
 62–63. *See also* Human leukocyte antigen (HLA)
 molecules
- Antihistamines, 48
- Antimetabolites
 anterior uveitis treatment, 139
 Behçet disease treatment, 228
 dosage and monitoring schedule, 111*t*
 efficacy studies, 115
 JIA-associated anterior uveitis treatment, 154
 multifocal choroiditis with panuveitis treatment, 185
 overview, 98, 115–117
 serpiginous choroiditis treatment, 180
- Antimicrobial polypeptides, 15
- Antineutrophil cytoplasmic antibody (ANCA) testing,
 87*t*, 132*t*, 206
- Antinuclear antibody (ANA) testing, 87*t*, 132*t*, 151–153,
 152*t*, 200
- Antiphospholipid antibodies testing, 87*t*, 200, 202
- Antiretroviral therapy (ART), 303, 304–306, 312
- Antiviral therapy
 acute retinal necrosis treatment, 261–262
 antiretroviral, 303, 304–306
 cytomegalovirus retinitis treatment, 265–266
 Epstein-Barr virus treatment, 267
 herpetic uveitis treatment, 258–259
 -induced ocular inflammation, 149
 viral uveitis treatment, 263
- APCs. *See* Antigen-presenting cells
- APMPPE. *See* Acute posterior multifocal placoid
 pigment epitheliopathy
- Apoptosis, 47, 47*f*, 55
- APTITUDE study, 121
- Aqueous cellular reaction, 73
- Aqueous flare, 73, 74, 74*t*, 75*f*, 76, 138
- Aqueous humor, 55, 56, 94
- Aqueous polymerase chain reaction (PCR) testing, 93
- Arachidonic acid (AA) metabolites, 21–23, 22*f*. *See also*
 Eicosanoids
- ARAs. *See* Anti-retinal antibodies
- Argyll Robertson pupil, 233–234
- Arlt triangle, 77
- ARN. *See* Acute retinal necrosis
- ARPE. *See* Acute retinal pigment epitheliitis
- ART. *See* Antiretroviral therapy
- AS. *See* Ankylosing spondylitis
- Aspergillus* spp
Aspergillus flavus, 316, 324
Aspergillus fumigatus, 324
 diagnostic tests, 84*t*, 88*t*, 130
 endophthalmitis, 316, 321, 324–325, 325*f*
- Aspirin, 262
- Assassination, 47
- Atovaquone, 290, 291*t*, 308
- Atypical retinitis pigmentosa, 270
- Atypical toxoplasmic retinochoroiditis, 260
- Autoantigens (self antigens), 9, 37, 45*t*, 46, 66
- Autocrine signaling, 23, 34
- Autoimmune retinitis, 260
- Autoimmune retinopathy (AIR)
 clinical presentation, 196–197, 196–197*f*
 diagnosis, 92, 197–198
 differential diagnosis, 171, 193
 overview, 166, 196
 treatment, 198
- Autoimmunity, 4*f*, 9, 34, 45–46
- Azathioprine
 adverse effects, 114, 115
 Behçet disease treatment, 228
 birdshot chorioretinopathy treatment, 175
 intermediate uveitis treatment, 161
 overview, 111*t*, 114, 115
 sarcoidosis uveitis treatment, 214
- Azithromycin, 251, 290, 291*t*, 308
- Azole antifungal drugs, 283
- AZOOOR. *See* Acute zonal occult outer retinopathy
- B-cell lymphomas, 328
- B lymphocytes (B cells)
 antibody production by, 43–44, 46
 as antigen-presenting cell, 34
 antigen processing by, 35*f*
 mediation of, 37, 38–39, 45
 overview, 8
- B-scan ultrasonography, 92, 131–133
- Bacillus* spp, 12, 318
- Bacteria
 cell wall, 17
 -derived formyl tripeptides, 14
 -derived innate immune response molecules, 10–11,
 10*t*, 12, 62, 64
 lipopolysaccharide, 10–11, 13, 15, 18*f*, 19, 64
 neutrophils and, 5, 13, 15
 toxins, 17
- Bacterial infections. *See also* Syphilis; Tuberculosis
 AIDS-related, 304
 bartonellosis, 87*t*, 249–251, 250*f*, 250*t*
 diagnosis, 81, 82–85*t*, 86, 87–88*t*, 93–95
 endogenous endophthalmitis, 318–320, 319–320*f*, 325
 keratitis, 313
 leptospirosis, 246–247
 Lyme disease, 83*t*, 87*t*, 159, 175, 243–246, 244*f*
 nocardiosis, 130, 248–249, 248*f*
 opportunistic infections, 303
 postsurgical endophthalmitis, 315, 316–318, 316*f*
 Whipple disease, 252–253, 252*f*
- Band keratopathy
 anterior uveitis and, 71, 73–74, 74*t*, 78, 153, 153*f*,
 154–155

- intermediate uveitis and, 158
- overview, 339
- panuveitis and, 210
- treatment, 154–155
- Bartonella henselae*, 87*t*, 249
- Bartonella quintana*, 87*t*, 249
- Bartonellosis
 - diagnosis, 87*t*, 251
 - differential diagnosis, 250*t*
 - ocular involvement, 249–251, 250*f*
 - overview, 249
 - treatment, 251
- Basophils, 4*f*, 5
- Bayes theorem, 86, 89
- Baylisascaris procyonis*, 294, 296
- BCG vaccine, 149, 242
- Behçet disease (BD)
 - classification, 72*t*
 - clinical presentation
 - nonocular, 224, 224*f*
 - ocular, 224–226, 225–226*f*
 - diagnosis, 82*t*, 85*t*, 87*t*, 226–227, 227*t*
 - differential diagnosis
 - infectious uveitis, 247, 253, 260, 297
 - for JIA-associated uveitis, 153
 - overview, 226–227
 - for Susac syndrome, 207
 - epidemiology, 68
 - HLA association, 65*t*
 - overview, 223
 - pathogenesis, 226, 227*f*
 - prognosis, 228
 - retinitis, 260
 - treatment
 - alkylating agents, 119
 - biologic agents, 113, 119, 120
 - clinical pearl, 113
 - nonbiologic immunomodulatory therapy, 115, 117, 118
 - overview, 110, 227–228
- Bell palsy, 244
- Benign tertiary syphilis, 231
- Benzathine penicillin, 309
- Berlin nodules, 78
- Beryllium, 17
- β -Chemokines, 25*t*
- β -Integrins, 14*f*
- β_2 -Microglobulin, 33*f*
- Betamethasone, 100
- Bevacizumab, 29*t*, 348
- Bilateral acute nongranulomatous anterior uveitis, 256
- Bilateral acute retinal necrosis, 72*t*
- Bilateral diffuse pigmentary retinopathy, 270
- Bilateral diffuse uveal melanocytic proliferation, 221–222
- Bilateral diffuse uveal melanocytic tumors, 335
- Biologic agents (biologic response modifiers), 119–122, 198
- Biopsies
 - juvenile xanthogranuloma evaluation, 334
 - overview, 82–84*t*, 88*t*, 93–95
 - sarcoidosis evaluation, 213
 - scleritis evaluation, 132*t*, 133
 - vitreoretinal lymphoma evaluation, 329
- Birbeck granules, 7
- Birdshot chorioretinopathy (BR; birdshot uveitis, birdshot retinochoroidopathy, and vitiliginous chorioretinitis)
 - clinical presentation, 167, 170*f*, 171, 172–174*f*
 - delayed hypersensitivity mechanism and, 45*t*
 - diagnosis, 87*t*, 89, 92, 92*f*
 - differential diagnosis, 72*t*, 171–172, 177, 183, 332
 - epidemiology, 68
 - HLA association, 65–66, 65*t*, 84*t*
 - overview, 167, 168–171*t*
 - prognosis, 172–174, 177
 - treatment, 110, 172*f*, 173*f*, 175
- Bisphosphonates, 149
- Bladder cancer, 118
- Blastomyces dermatitidis*, 321
- Blau syndrome, 153, 209
- Blepharitis, 45*t*, 283
- Blepharoconjunctivitis, 257
- Blood dendritic cells, 7
- Blurred vision, 73*t*, 272
- Bone spicule pattern, 268, 270, 336
- Borrelia burgdorferi*, 243
- “Boxcar” segmentation, 207, 207*f*
- BR. *See* Birdshot chorioretinopathy
- Brimonidine (α_2 -adrenergic agonist), 149–150
- Brolucizumab, 150
- Brucella* species serology, 87*t*
- Brucellosis, 87*t*, 274
- “Bull’s eye” rash, 159, 244–246
- Bunyaviridae, 273
- Busacca nodules, 76*f*, 78, 210
- C-ANCA tests. *See* Cytoplasmic ANCA (c-ANCA) tests
- C-reactive protein (CRP) values, 132*t*, 206
- C-type lectin receptors (CTLRs), 8
- Calcific band keratopathy, 339. *See also* Band keratopathy
- CALT. *See* Conjunctiva-associated lymphoid tissue
- CAMs. *See* Cell adhesion molecules
- Can-opener capsulotomy, 340
- Canakinumab, 28*t*
- Cancer-associated retinopathy (CAR), 196, 197, 198
- Candida* spp
 - AIDS-related infections, 304
 - Candida albicans*, 321
 - Candida glabrata*, 321
 - Candida parapsilosis*, 316
 - diagnostic tests, 84*t*, 88*t*
 - endophthalmitis
 - clinical presentation, 322, 323*f*
 - diagnosis, 322–323
 - differential diagnosis, 323, 325
 - overview, 321–322, 321*f*
 - treatment, 323–324
- Candlewax drippings (taches de bougie), 211, 212*f*
- Capsular plaques, 316, 316*f*, 317
- Capsular tension ring, 340–341
- CAR. *See* Cancer-associated retinopathy
- Carbonic anhydrase inhibitors, 98, 122
- Cardiovascular syphilis, 231
- Caspofungin, 324, 325

- Cat-scratch disease (CSD), 87*t*, 249, 250*f*, 274
- Cataracts
 corticosteroid adverse effect, 99, 102, 103, 104, 109
 endophthalmitis complication, 319
 helminthic causes, 300
 protozoal association, 287
 surgery, 339–341
 surgical complications, 342
 as uveitis complication, 16, 74, 153–157, 156*f*, 162, 339–342
 viral causes, 267, 268*f*, 270, 278, 304
 Vogt-Koyanagi-Harada syndrome finding, 218
- Cathepsins D and E, 16
- Ceftazidime, 320
- Ceftriaxone, 237, 253
- Cefuroxime axetil, 246
- Cell adhesion molecules (CAMs), 13, 14*f*, 34, 39
- Cell culture, 93–94
- Cell-mediated immunity, 5–6
- Central nervous system (CNS) lupus, 202
- Central nervous system (CNS) vasculitis, 224
- Central scotomas, 73*t*
- Cerebral vasculitis, 175
- Cerebrospinal fluid (CSF) VDRL, 88*t*, 236
- Certolizumab, 119
- Chancre, 230–231
- Chemokines, 17, 27
- Chemotactic factors, 14, 14*f*, 48
- Chemotaxis, 5, 14*f*, 73
- Chemotherapy, 318, 331
- Chickenpox. *See* Varicella
- Chikungunya fever, 276–277, 277*f*
- Children. *See also* Juvenile idiopathic arthritis
 cytomegalovirus retinitis, 263–266
 ocular toxocariasis, 292
 sarcoidosis, 208
 xanthogranuloma, 81, 334, 335*f*
- Chlamydia trachomatis*, 249
- Chlorambucil, 111*t*, 119, 180, 228
- Chloramphenicol, 237, 253
- Choriocapillaris, 52*t*, 57–59
- Chorioretinal atrophy, 215, 278, 300, 300*f*
- Chorioretinal hemorrhage, 319, 319*f*
- Chorioretinal lesions
 endogenous endophthalmitis finding, 320–321, 322, 323*f*
 fungal endophthalmitis finding, 320–321, 323*f*
 fungal uveitis finding, 283, 284*f*
 imaging studies, 89, 215, 216*f*
 overview, 72, 80
 tubulointerstitial nephritis and uveitis syndrome finding, 143, 143*f*
 viral uveitis finding, 272, 272*f*, 277
 white dot syndrome finding, 172
- Chorioretinal scarring
 fungal uveitis finding, 283
 tubulointerstitial nephritis and uveitis syndrome finding, 143, 143*f*
 viral uveitis finding, 269, 273
 white dot syndrome finding, 174*f*, 178
- Chorioretinitis. *See also* Multifocal chorioretinitis
 fungal endophthalmitis finding, 322, 325
 syphilis ocular manifestation, 230, 232, 233*f*, 309
 with vitritis, 83–84*t*, 232, 233*f*
 without vitritis, 85*t*
- Chorioretinopathies. *See* White dot syndromes
- Choroid
 atrophy, 74, 74*t*
 delayed hypersensitivity mechanism and, 45*t*
 diagnosis, 89
 granulomas, 211, 211*f*, 239, 240*f*, 283
 immunologic microenvironment of, 52*t*, 57–58
 immunoregulatory system of, 58–59
 metastases, 81, 177
 neovascularization
 diagnosis, 89
 differential diagnosis, 282
 fungal, 281–282
 overview, 350
 protozoal, 287
 sarcoidosis uveitis complication, 212
 tuberculosis finding, 240
 uveitis complication, 74*t*, 350
 viral, 266, 268, 273
 posterior segment inflammation signs and, 80
 uveitis and, 71, 74*t*
- Choroidal neovascular membrane, 91
- Choroidal rupture, 282
- Choroidal tubercles (nodules), 239, 240*f*
- Choroiditis
 ampiginous, 177, 180–181, 181*f*, 188
 drug-induced, 149
 fungal, 281
 HIV/AIDS association, 307–310, 308–309*f*
 Lyme disease finding, 245
 multifocal. *See* Multifocal choroiditis
 serpiginous
 clinical presentation, 178, 179*f*
 diagnosis, 85*t*
 differential diagnosis, 177, 180–181, 188, 297, 325
 overview, 168–171*t*, 178
 treatment, 110, 118, 178–180
 serpiginous-like, 178, 180, 239, 241*f*
 toxoplasmosis finding, 308
 tuberculosis finding, 239, 240*f*
 viral uveitis finding, 263
- Chronic anterior uveitis
 complications, 151, 339
 Fuchs uveitis syndrome, 155–157, 156*f*
 JIA-associated, 151–155
 undifferentiated, 157, 339
- Chronic Arthus reaction, 44
- Chronic hypotony, 153
- Chronic peripheral rhegmatogenous retinal detachment, 336
- Chronic postoperative endophthalmitis
 clinical pearl, 317
 clinical presentation, 316–317, 316*f*
 diagnosis, 317
 overview, 315
 treatment, 318
- Churg-Strauss syndrome, 72*t*, 132*t*
- Chymase, 48
- Cicatricial pemphigoid, 94
- Cidofovir, 149, 150
- Ciliary body, 56, 58, 71, 78

- Ciliary flush, 73, 74*t*
- Ciprofloxacin, 251
- Circinate balanitis, 141
- Circumcorneal conjunctival hyperemia, 247
- Classical pathway, for complement activation, 20, 20*f*
- Clindamycin, 290, 291*t*, 308
- Clonal expansion, 39
- Clonality, 43
- Clostridium perfringens*, 12
- CMV. *See* Cytomegalovirus
- CNS lupus. *See* Central nervous system (CNS) lupus
- CNS vasculitis. *See* Central nervous system (CNS) vasculitis
- Coagulation pathway, 21
- Coats disease, 293, 296
- Coccidioides immitis*, 283, 321
- Coccidioidomycosis, 87*t*, 282, 283–284, 284*f*, 325
- Cogan syndrome, 132*t*
- Colchicine, 228
- Collaborative Ocular Tuberculosis Study Consensus Group, 243
- Collagen type II, 56
- Collagenases, 12, 15
- Color photography, 91
- Complement
 - activation by lipopolysaccharides, 10
 - fixation tests, 247
 - fixing antibodies, 19
 - macrophage activation by, 17
 - neutrophil activation by, 15
 - products, 14
 - receptors, 15
 - split products, 20*f*
 - UGH and, 13
- Complications of uveitis, 339–351
 - calcific band keratopathy, 339
 - cataracts, 339–342
 - choroidal neovascularization, 350. *See also* Choroid, neovascularization
 - epiretinal membrane, 74*t*, 287, 349
 - glaucoma, 342–346. *See also* Glaucoma
 - highlights, 339
 - hypotony, 346–347
 - macular hole, 271, 349
 - retinal neovascularization, 90, 162, 212, 350–351
 - rhegmatogenous retinal detachment, 162, 350
 - uveitic macular edema, 347–349. *See also* Macular edema
 - vision loss, 351
 - vitreous opacification, 287, 349–350
 - vitritis, 349–350
- Congenital cataract, 266
- Congenital rubella syndrome (CRS), 267–269, 268*f*
- Congenital syphilis, 230, 231*f*, 236–237
- Congenital toxoplasmosis, 285–286, 286*f*
- Congenital Zika syndrome, 278, 278*f*
- Conjunctiva
 - delayed hypersensitivity mechanism and, 45*t*
 - immunologic microenvironment of, 52*t*, 53
 - immunoregulatory systems, 53–54
 - Kaposi sarcoma, 303
 - uveitis signs and, 74*t*
- Conjunctiva-associated lymphoid tissue (CALT), 53
- Conjunctival biopsies, 94
- Conjunctival hyperemia, 272
- Conjunctival nodules, 53, 209, 209*f*
- Conjunctivitis
 - bacterial, 245
 - fungal, 283
 - reactive arthritis association, 142
 - viral, 256–257, 266, 269, 270, 277, 279, 313
- Contact hypersensitivity, 7, 45*t*
- Cornea
 - clouding, 267
 - delayed hypersensitivity mechanism and, 45*t*
 - endothelium, 74*t*, 77
 - immunologic microenvironment of, 52*t*, 54, 54*f*
 - immunoregulatory system of, 55
 - inflammation of, 68. *See also* Keratitis
 - scarring, 270
 - stromal immune ring, 259
 - uveitis and, 70, 78
- Corticosteroids
 - adjunctive therapies, 98
 - adverse effects
 - cataracts, 339
 - glaucoma, 342, 344–345
 - local administration, 99, 102, 103, 104
 - systemic administration, 109, 114
 - local administration, 100–108
 - acute zonal occult outer retinopathy treatment, 194
 - adverse effects, 99, 102, 103, 104, 265
 - ampiginous choroiditis treatment, 181
 - anterior uveitis treatment, 139
 - autoimmune retinopathy treatment, 198
 - Behçet disease treatment, 227
 - birdshot chorioretinopathy treatment, 175
 - cataract perioperative management, 340, 341
 - cataract postoperative management, 341, 342
 - clinical pearl, 99
 - Dengue fever treatment, 276
 - fungal uveitis treatment, 282
 - immune recovery uveitis treatment, 306
 - intravitreal, 103–104, 108
 - leptospirosis treatment, 247
 - multifocal choroiditis with panuveitis treatment, 185
 - neovascularization treatment, 350–351
 - pars planitis treatment, 159, 160
 - periocular, 100–103, 101–102*f*
 - sarcoidosis uveitis treatment, 213–214
 - scleritis treatment, 135
 - serpiginous choroiditis treatment, 178–180
 - studies on, 105*t*
 - sympathetic ophthalmia treatment, 217
 - syphilis treatment, 237
 - toxocariasis treatment, 294
 - toxoplasmosis treatment, 287, 287*f*, 288*f*, 290
 - uveal lymphoma treatment, 332
 - uveitic macular edema treatment, 348
 - overview, 98, 99
 - precautions with fungal infections, 321
 - studies on, 105–107*t*
 - systemic administration
 - adverse effects, 109, 112*t*, 114
 - ampiginous choroiditis treatment, 181

- anterior uveitis treatment, 139
 autoimmune retinopathy treatment, 198
 Behçet disease treatment, 227, 228
 birdshot chorioretinopathy treatment, 175
 cataract perioperative management, 340, 341
 cataract postoperative management, 341
 clinical pearl, 108
 Dengue fever treatment, 276, 276f
 dosage and monitoring schedule, 112t
 efficacy studies, 105–107t
 fungal uveitis treatment, 282
 JIA-associated uveitis treatment, 153–154
 leptospirosis treatment, 247
 measles retinopathy treatment, 270
 multifocal choroiditis with panuveitis treatment, 185
 overview, 108–109
 pars planitis treatment, 160–161
 punctate inner choroiditis treatment, 187
 sarcoidosis uveitis treatment, 213–214
 scleritis treatment, 134
 serpiginous choroiditis treatment, 178–180
 sympathetic ophthalmia treatment, 217
 syphilis treatment, 237
 toxocariasis treatment, 294
 toxoplasmosis treatment, 290
 uveal lymphoma treatment, 332
 viral uveitis treatment, 258, 262
 Vogt-Koyanagi-Harada syndrome treatment, 223
 tapering, 98, 99, 108–109
 topical
 anterior uveitis treatment, 139
 cataract perioperative management, 340
 cataract postoperative management, 341, 342
 Epstein-Barr virus treatment, 267
 immune recovery uveitis treatment, 306
 iridocyclitis treatment, 133
 JIA-associated anterior uveitis treatment, 153
 leptospirosis treatment, 247
 Lyme disease treatment, 246
 onchocerciasis treatment, 300
 overview, 100
 sarcoidosis uveitis treatment, 213
 uveitic macular edema treatment, 348
 viral uveitis treatment, 258
Corynebacterium spp, 316
 Costimulatory molecules, 16
 Cotton-wool spots, 201, 201f, 205, 304, 304f, 333
 COVID-19 immunization, 114
 COX (cyclooxygenase) inhibitors, 23
 COX pathway. *See* Cyclooxygenase (COX) pathway
 Cranial nerve palsies
 bacterial uveitis association, 229, 244
 fungal uveitis association, 283
 viral uveitis association, 256, 259, 266, 272–273, 310
 Crohn disease, 72t, 142, 178
 CRP. *See* C-reactive protein (CRP) values
 CRS. *See* Congenital rubella syndrome
 Cryptococcosis, 310–311, 311f, 313
Cryptococcus neoformans, 304, 310
 Crystalline lens fragments, 92
 CSD. *See* Cat-scratch disease
 CSF VDRL. *See* Cerebrospinal fluid (CSF) VDRL
 CTLRs. *See* C-type lectin receptors
 CTLs. *See* Cytotoxic T lymphocytes (CTLs)
 Cultures and stains, 317, 320, 322–323, 325
 Curvilinear capsulorrhexis, 340
Cutibacterium acnes (formerly *Propionibacterium acnes*), 147, 316, 316f
 Cyclitic membranes, 21
 Cyclooxygenase (COX) pathway, 22–23
 Cyclophosphamide
 adverse effects, 118
 Behçet disease treatment, 228
 dosage and monitoring schedule, 111t, 118
 overview, 118
 scleritis treatment, 134
 serpiginous choroiditis treatment, 180
 Cycloplegic drugs
 anterior uveitis treatment, 139
 cataract postoperative management, 341, 342
 corticosteroid adjunctive therapy, 98
 Epstein-Barr virus treatment, 267
 overview, 122
 viral uveitis treatment, 258
 Cyclosporine
 adverse effects, 114, 117
 birdshot chorioretinopathy treatment, 175
 dosage and monitoring schedule, 111t, 117
 intermediate uveitis treatment, 161
 overview, 117
 sarcoidosis uveitis treatment, 214
 Cysticercosis, 84–85t, 295–296, 295–296f
Cysticercus cellulosae, 295
 Cysts, 284, 285f, 295f, 296, 308
 Cytochrome b₅₅₈, 15
 Cytokine inhibitors, 26, 28–29t
 Cytokines
 activation by lipopolysaccharides, 10
 apoptosis and, 47, 47f
 families of, 24–26t, 27
 immune response arc and, 34
 inflammatory response and, 23, 24–26t
 leukocyte oxygen metabolism initiation by, 19
 lipopolysaccharides and, 11
 macrophage activation by, 17, 18f
 mast cell-derived, 48–49
 synthesis triggers, 12–13
 Cytology studies, 94
 Cytomegalovirus (CMV), 256–266
 AIDS-related infections, 304–307
 anterior uveitis, 256–259
 diagnosis, 88t
 glaucomatocyclitic crisis association, 144, 257
 posterior uveitis, 259–266
 retinitis, 83t, 263–266, 264–265f, 304–307, 305f, 325
 serology, 87t
 Cytoplasmic ANCA (c-ANCA) tests, 85t, 87t, 132t, 206
 Cytotoxic T lymphocytes (CTLs)
 antibody-mediated response, 47–48, 47f
 immune response arc and, 32–34, 33f, 35f, 38, 38f, 57
 Dacryoadenitis, 266
 Dacryocystitis, 205
 Dalen-Fuchs nodules, 211, 215, 215f, 217
 DCs. *See* Dendritic cells

- Deafness (hearing loss), 207, 267
- Delayed hypersensitivity (DH)
 cells of, 7, 34, 35–36*f*, 38, 38*f*, 44–45
 diseases involving, 40, 45*t*, 46, 124
 induction of, 7
 mechanism, 44–46, 57, 124
 process, 40
- Dendritic cells (DCs), 4*f*, 7, 17, 34
- Dengue fever, 274–276, 276*f*
- Dexamethasone, 100, 103, 290, 348
- DH. *See* Delayed hypersensitivity
- Diagnostic considerations in uveitis, 67–95
 ancillary testing, 86–95
 cytology and pathology, 94–95
 laboratory tests and imaging studies, 86, 87–88*t*, 89
 ocular fluid and tissue sampling, 93–94
 ophthalmic imaging and functional tests, 89–92, 90–92*f*
 classification of uveitis, 69–70*t*, 69–72, 72*t*
 differential diagnosis scheme, 81, 82–85*t*
 epidemiology, 68–69
 highlights, 67
 overview, 67–68
 patient history and review of systems, 80–81, 81*t*
 signs, 73–80, 74*t*, 75–77*f*, 77*t*
 symptoms, 73, 73*t*
- Diethylcarbamazine, 149
- Diffuse anterior scleritis, 124, 124*t*, 125*f*, 126, 136
- Diffuse infiltrating retinoblastoma, 334*f*
- Diffuse unilateral subacute neuroretinitis (DUSN), 84*t*, 166, 193, 296–297, 297–299*f*
- Difluprednate, 100, 345, 348
- Dilating agents, 139, 139*f*
- Disciform keratitis, 45*t*
- Disease-modifying antirheumatic drugs (DMARDs), 110. *See also* Immunomodulatory therapy
- Disseminated choroiditis, 239, 240*f*
- DMARDs, 110
- Doxycycline, 237, 246, 247, 251, 300
- Drainage device surgery, 345–346
- Drug-induced ocular inflammation, 148–151, 149–150*f*
- Drugs. *See* Medical management of uveitis
- DUSN. *See* Diffuse unilateral subacute neuroretinitis
- E-selectins, 13, 14*f*
- Eales disease, 72*t*, 239–240, 241*f*, 247
- Early disseminated Lyme disease, 244, 245
- EAU. *See* Experimental autoimmune uveoretinitis
- Ebola virus disease (EVD), 88*t*, 279, 280*f*
- EBV. *See* Epstein-Barr virus
- Edema
 macular
 anterior uveitis finding, 138
 diagnosis, 90, 91*f*
 intermediate uveitis association, 158, 159, 162
 JIA-associated sequelae, 153
 lipid mediators of inflammatory immune response, 23
 sarcoidosis association, 212
 subacute sclerosing panencephalitis finding, 271
 toxoplasmosis complication, 287
 treatment, 102, 103, 104, 160
 tuberculosis finding, 238, 239*f*
 as uveitis complication, 71, 74*t*, 347–349
- optic disc
 anterior uveitis finding, 138
 bartonellosis and, 249–250, 250*f*, 251
 diffuse unilateral subacute neuroretinitis finding, 297
 West Nile virus finding, 272–273
 Whipple disease finding, 252
- optic nerve, 215, 273, 310
- uveal, 74*t*, 279, 280*f*
- EDI OCT. *See* Enhanced depth imaging (EDI) OCT
- Effector cells
 adaptive immunity and
 antibody-mediated, 41–44, 41*f*, 42*t*
 combined mechanisms, 48–49
 lymphocyte-mediated, 32*f*, 36*f*, 44–48, 45*t*
 overview, 32*f*, 40
 immune response arc and, 32, 32*f*, 38–39, 38*f*, 40
 macrophage response, 15–18, 18*f*
 neutrophil response, 13–15, 14*f*
 ocular microenvironment
 anterior chamber, 56–57
 conjunctiva, 53–54
 cornea, 54, 55
 overview, 51, 52*t*
 retina, 58
 phagocyte killing mechanism, 19
 triggers, 8, 9, 10
 types of, 4*f*, 5–7
- Eicosanoids
 endophthalmitis and, 11
 inflammatory response mediator, 18*f*, 21–23, 22*f*
 uveitis-glaucoma-hyphema (UGH) syndrome, 12–13
- Elastase, 15
- Electro-oculogram (EOG), 189, 192, 194
- Electroretinogram (ERG)
 overview, 92
 white dot syndrome, 189, 192, 194, 197, 198
- ELISA testing, 246, 247
- Elschnig spots, 203
- Encephalopathy, 207
- Endocrine signaling, 23
- Endophthalmitis, 315–325
 AIDS-related, 311
 definitions, 315
 diagnosis, 83*t*, 85*t*
 endogenous
 bacterial, 315, 318–320, 319–320*f*
 fungal, 177, 217, 315, 320–325, 321*f*, 323*f*, 325*f*
 molds, 324–325, 325*f*
 highlights, 315
 postoperative, 315, 316–318, 316*f*
 posttraumatic, 315
 tests for, 93–94
 toxocariasis finding, 293, 294*t*
- Endotoxins, 10–11, 62, 64
- Enhanced depth imaging (EDI) OCT, 89, 90*f*, 171, 173*f*, 216, 216*f*, 220, 221*f*
- Enteropathic arthritis, 132*t*
- Enthesitis-related arthritis (ERA), 152
- Enucleation, 217
- EOG. *See* Electro-oculogram

- Eosinophils, 4*f*, 5, 48
 Epiphora, 73*t*
 Epiretinal membranes, 74*t*, 287, 349
 Episcleritis
 acute posterior multifocal placoid pigment epitheliopathy association, 175
 coccidioidomycosis finding, 283
 Epstein-Barr virus association, 266
 herpes zoster ophthalmicus association, 256
 Lyme disease finding, 245
 Epithelial keratitis, 266, 269
 Epithelioid cells, 6, 17
 Epitopes, 31, 32, 33*f*, 37–38, 43, 66
 Epstein-Barr virus (EBV), 87*t*, 88*t*, 266–267
 ERA. *See* Enthesitis-related arthritis
 ERG. *See* Electroretinogram
 Erythema chronicum migrans, 244, 244*f*
 Erythema multiforme, 283
 Erythema nodosum, 175, 283
 Erythrocyte sedimentation rate (ESR), 83*t*, 87*t*, 132*t*, 206
 Erythromycin, 251
 ESR. *See* Erythrocyte sedimentation rate
 Etanercept, 119, 149, 154, 214
 Ethambutol, 242–243
 European League Against Rheumatism, 200, 228
 EVD. *See* Ebola virus disease
 Evisceration, 217
 Exciting eye, 214, 215, 216–217
 Experimental autoimmune uveoretinitis (EAU), 61
 External beam radiotherapy, 332
 Extraocular muscles, 68. *See also* Myositis
 Exudative retinal detachments
 AIDS-related, 310–311
 leukemia finding, 333, 333*f*
 Lyme disease finding, 245
 Vogt-Koyanagi-Harada syndrome finding, 218, 219–220*f*
 FA. *See* Fluorescein angiography (FA) studies
 FAF. *See* Fundus autofluorescence (FAF) studies
 FAi Trial. *See* Fluocinolone Acetonide Insert (FAi) Trial
 Famciclovir, 258, 262
 Familial exudative vitreoretinopathy, 293
 Familial juvenile systemic granulomatosis, 208, 209
 Fas ligand (FasL), 47, 47*f*, 55
 FAST (First-line Antimetabolites as Steroid-sparing Treatment) uveitis trial, 107*t*, 115, 161
 Fc receptors, 5, 15, 21, 41, 41*f*, 48
 Fibrin, 13, 21, 74, 74*t*, 75*f*, 319
 Fibrin net, 138, 138*f*
 Fibrin split products, 14
 Fibrinogen, 21
 Fibrinolytic agents, 98, 122
 Fingolimod, 163
 Flaviviridae, 272, 274, 277
 Fleas, 249
 Floaters, 73, 73*t*
 Fluconazole, 283, 323–324, 325
 Flucytosine, 324
 Fluocinolone, 348
 Fluocinolone Acetonide Insert (FAi) Trial, 105*t*
 Fluocinolone acetonide insert or implant
 adverse effects, 344–345
 birdshot chorioretinopathy treatment, 175
 efficacy studies, 104, 105*t*
 multifocal choroiditis with panuveitis treatment, 185
 overview, 103
 Fluorescein angiography (FA) studies
 acute idiopathic maculopathy, 195, 195*f*
 acute posterior multifocal placoid pigment epitheliopathy, 176, 176*f*
 acute retinal pigment epitheliitis, 192, 192*f*
 acute zonal occult outer retinopathy, 193, 193*f*
 ampiginous choroiditis, 181
 autoimmune retinopathy, 196
 Behçet disease, 225–226*f*, 226
 birdshot chorioretinopathy, 167, 172–174*f*
 Dengue fever, 275
 fungal uveitis, 282
 intermediate uveitis, 159, 162, 163*f*
 multifocal choroiditis with panuveitis, 182, 184*f*
 multiple evanescent white dot syndrome, 189, 190*f*
 punctate inner choroiditis, 185, 186*f*
 retinal vasculitis, 71
 scleritis, 131–132
 serpiginous choroiditis, 178, 179*f*
 subretinal fibrosis and uveitis (SFU) syndrome, 188
 sympathetic ophthalmia, 215, 215–216*f*
 syphilis, 232, 233, 233*f*
 tuberculosis, 239, 240*f*, 241*f*
 vitreoretinal lymphoma, 329, 330*f*
 Vogt-Koyanagi-Harada syndrome, 219, 220*f*
 West Nile virus, 272, 272*f*
 Fluorescent treponemal antibody absorption (FTA-ABS) assay, 87*t*, 235–236, 235*t*
 Fluorometholone, 100
 Fluoroquinolone, 149
 Flurbiprofen, 134*t*
 fMLP. *See* N-formyl-methionyl-leucyl-phenyl-alanine
 Focal chorioretinitis, 232
 Focal retinal vascular sheathing and occlusion, 272–273
 Focal retinitis, 232
 Folinic acid, 291*t*
 Follicular conjunctivitis, 245, 266
 Foreign bodies, 17, 336–337
 Foscarnet, 258–259, 262–263, 266, 305
 Foveal atrophy, 162
 Foveal avascular zone, 275, 276*f*
 “Foveolitis,” 275
 Free radicals, 19, 21
 “Frosted-branch” angiitis, 72*t*, 264, 265*f*, 305*f*, 328
 FTA-ABS assay. *See* Fluorescent treponemal antibody absorption (FTA-ABS) assay
 Fuchs uveitis syndrome (Fuchs heterochromic iridocyclitis or Fuchs heterochromic uveitis)
 clinical presentation, 78, 155, 156*f*
 diagnosis, 83*t*, 156
 differential diagnosis, 153
 Goldmann-Witmer coefficient of, 44
 treatment, 97–98, 156–157
 viral infection association, 257, 269
 Fundus autofluorescence (FAF) studies
 acute posterior multifocal placoid pigment epitheliopathy, 176, 177*f*
 acute zonal occult outer retinopathy, 193, 193*f*

- autoimmune retinopathy, 196
- birdshot chorioretinopathy, 167
- multifocal choroiditis with panuveitis, 182–183, 184*f*
- multiple evanescent white dot syndrome, 189, 191*f*
- overview, 90, 91
- punctate inner choroiditis, 185
- scleritis, 133
- sympathetic ophthalmia, 216–217
- syphilis, 232
- Vogt-Koyanagi-Harada syndrome, 220
- Fungal infections
 - AIDS-related, 304, 310–311, 311*f*
 - Aspergillus* endophthalmitis, 316, 321, 324–325, 325*f*
 - Candida* endophthalmitis, 321–324, 321*f*, 323*f*
 - coccidioidomycosis, 283–284, 284*f*
 - diagnosis, 87–88*t*, 93–94
 - differential diagnosis, 177, 217
 - keratitis, 313
 - ocular histoplasmosis syndrome, 281–282*f*, 281–283
 - opportunistic infections, 303
 - postsurgical endophthalmitis, 315, 316–318
 - scleritis, 130
- Fusarium* spp, 130
- Gamma-delta ($\gamma\delta$) T cells, 8
- Ganciclovir, 258–259, 262–263, 266, 267, 305
- “Gass plaques,” 207
- Gelatinase, 15
- Gell and Coombs type I hypersensitivity. *See* Immediate hypersensitivity
- Gene replacement therapy, 59
- Gentamicin, 251
- Geographic choroidopathy. *See* Serpiginous choroiditis
- German measles (acquired rubella), 267, 269
- “Ghost” (nonperfused) stromal vessels, 230
- Giant cell arteritis
 - delayed hypersensitivity mechanism and, 45*t*
 - diagnosis, 87*t*
 - scleritis association, 132*t*
- Giant cells, 17
- Glaucoma
 - congenital viral infections and, 267, 278
 - corticosteroid-induced, 344–345
 - diagnosis, 342–343
 - Fuchs uveitis syndrome association, 155, 156
 - JIA-associated complication, 153
 - onchocerciasis complication, 300
 - overview, 342–343
 - sarcoidosis uveitis complication, 211
 - secondary glaucoma, 153, 211, 238, 343–344
 - treatment, 155, 345–346
 - uveitic ocular hypertension and, 343, 345
 - Vogt-Koyanagi-Harada syndrome finding, 218
- Glaucoma drainage device surgery, 345–346
- Glaucoma filtering surgery, 345
- Glaucomatocyclitic crisis (Posner-Schlossman syndrome), 82*t*, 144–145, 257
- Gliotic scar, 271
- Goldmann-Witmer (GW) coefficient, 43–44
- Golimumab, 119
- GPA. *See* Granulomatosis with polyangiitis
- Graft rejection, 54*f*, 55
- Grafting, scleral, 135, 135*f*
- Gram-negative bacteria, 316, 318
- Gram-positive bacteria, 17, 130, 248–249, 248*f*, 316
- Granulocytes, 5. *See also* Mast cells; Neutrophils
- Granulomas
 - Aspergillus* endophthalmitis finding, 325*f*
 - toxocariasis finding, 293, 293*f*, 294*t*
 - Vogt-Koyanagi-Harada syndrome finding, 72
 - xanthogranuloma, 81, 334, 335*f*
- Granulomatosis with polyangiitis (GPA; formerly Wegener granulomatosis)
 - acute posterior multifocal placoid pigment epitheliopathy association, 175
 - clinical presentation, 205–206, 205*f*
 - diagnosis, 85*t*, 88*t*, 206
 - differential diagnosis, 72*t*, 227
 - overview, 204–205
 - scleritis association, 128, 129*f*, 132*t*
 - treatment, 118, 206
- Granulomatous conjunctivitis, 249, 283, 313
- Granulomatous inflammation
 - cells of, 6, 45–46
 - clinical example, 46
 - clinical findings associated with, 76*f*, 77–78, 210, 220–221
 - fundus lesions, 282
 - scleritis classification, 128
 - uveitis classification, 72, 138, 139, 217–218
 - uveitis complication, 238
- Group A streptococcus, 175
- Growth factors, 26*t*, 27, 37
- Gumma, 231
- GW coefficient. *See* Goldmann-Witmer (GW) coefficient
- Haemophilus influenzae*, 318
- 1/2 STOP-Uveitis randomized clinical trial, 121
- Hamartoma, 293
- HAM/TSP. *See* HTLV-1-associated myelopathy/tropical spastic paralysis
- Haplotypes, 63, 63*f*
- Haze. *See* Vitreous haze
- “Headlight in the fog,” 287, 287*f*
- Hearing loss, 207, 267
- Heerfordt syndrome (uveoparotid fever), 208
- Helicoid choroidopathy. *See* Serpiginous choroiditis
- Helminthic uveitis, 292–301
 - cysticercosis, 295–296, 295–296*f*
 - diagnosis, 83–85*t*
 - diffuse unilateral subacute neuroretinitis, 166, 193, 296–297, 297–299*f*
 - onchocerciasis, 300–301, 300*f*
 - overview, 292
 - toxocariasis, 159, 282, 292–295, 293–294*f*, 294*t*, 297
- Helper T lymphocytes (CD4⁺), 33*f*, 34–37, 35–36*f*
- Hemolysin BL toxin, 12
- Hemolysins, 12
- Hemorrhage
 - chorioretinal, 319, 319*f*
 - intraretinal, 203*f*, 205, 271, 272–273, 322, 333
 - retinal
 - Behçet disease finding, 225, 225–226*f*
 - Chikungunya fever finding, 277, 277*f*
 - coccidioidomycosis finding, 283

- cytomegalovirus retinitis finding, 264, 264f
 - Eales disease finding, 241f
 - HIV-related, 304
 - Rift Valley fever finding, 273
- subconjunctival, 275, 276f, 279
- suprachoroidal, 319
- viral uveitis finding, 263
- vitreous, 81, 162, 202, 206, 212, 319
- Hemorrhagic fever, 279
- Heparin, 48
- Hepatitis, 87t, 203
- Herpes simplex virus (HSV)
 - AIDS-related infections, 304
 - anterior uveitis, 256–259, 257–258f, 342
 - diagnosis, 87t, 88t, 93
 - posterior uveitis, 259–263
 - retinal vasculitis association, 72t
 - scleritis and, 130
- Herpes zoster ophthalmicus (HZO), 256, 256f, 312
- Herpesviruses, 255–267. *See also* Cytomegalovirus; Herpes simplex virus; Varicella-zoster virus
 - AIDS-related infections, 304
 - anterior uveitis, 78, 153, 256–258f, 256–259
 - choroiditis, 180
 - EBV-related manifestations, 87t, 88t, 266–267
 - encephalitis, 207
 - iritis, 82t
 - Kaposi sarcoma cause, 312
 - overview, 255–256
 - posterior uveitis and panuveitis, 259–266
 - acute retinal necrosis, 259–262, 260–261f, 261t
 - cytomegalovirus retinitis, 263–266, 264–265f
 - nonnecrotizing herpetic retinopathy, 263
 - progressive outer retinal necrosis (PORN), 262–263, 263f
- Heterochromia, 74, 74t, 78, 155–156, 156f
- High blood pressure, 74t, 109
- Histamine, 21, 48
- Histo spots, 281, 281f, 282
- Histoplasma capsulatum*, 281, 304, 321
- Histoplasmosis, 85t, 273. *See also* Ocular histoplasmosis syndrome
- History and review of systems, 80–81, 81t
- HIV/AIDS infection
 - diagnosis, 87t
 - endogenous endophthalmitis risk, 318
 - external eye manifestations
 - granulomatous conjunctivitis, 313
 - herpes zoster ophthalmicus, 312
 - Kaposi sarcoma, 303, 312, 313f
 - keratitis, 313, 313f
 - molluscum contagiosum, 312
 - overview, 311
 - highlights, 303
 - ophthalmic manifestations, 303–313
 - acute retinal necrosis, 259
 - cryptococcosis, 310–311, 311f
 - cytomegalovirus retinitis, 263–265, 304–307, 305f
 - external eye manifestations, 311–313
 - multifocal choroiditis, 309–310
 - necrotizing herpetic retinitis, 307, 307f
 - ocular syphilis, 309
 - overview, 303–304, 304f
- Pneumocystis jirovecii* choroiditis, 310, 310f
 - Toxoplasma* retinochoroiditis, 307–309, 308–309f
 - toxoplasmosis and, 290–291
 - viral uveitis and, 262–263
- overview, 303
- retinal vasculitis association, 72t
- tuberculosis association, 238
- HLA-B27-associated anterior uveitis. *See* Human leukocyte antigen (HLA)-B27-associated anterior uveitis
- HLA molecules. *See* Human leukocyte antigen (HLA) molecules
- Honeycomb lesions, 192, 192f
- Hookworms, 296
- Horner syndrome, 245
- HSV. *See* Herpes simplex virus
- HTLV-1. *See* Human T-cell lymphotropic virus type 1
- HTLV-1-associated keratopathy (formerly HTLV-1-related chronic interstitial keratitis), 274, 275f
- HTLV-1-associated myelopathy/tropical spastic paralysis (HAM/TSP), 274
- Human leukocyte antigen (HLA)-B27-associated anterior uveitis
 - clinical example, 64
 - clinical presentation, 138
 - diagnosis, 87t
 - differential diagnosis, 226–227, 247
 - disease associations, 64, 65t, 140–143, 141–142f
 - overview, 65t, 139–140
 - treatment, 120, 139
- Human leukocyte antigen (HLA) molecules
 - allelic variations, 63–64, 63f, 167, 227, 244–245
 - classes of, 7, 16, 32–34, 33f, 35f, 62–64
 - disease associations, 64–66, 65t. *See also* Human leukocyte antigen (HLA)-B27-associated anterior uveitis
 - epidemiology, 138
 - immune response arc and, 32–34
 - major histocompatibility complex and, 62–63
- Human T-cell lymphotropic virus type 1 (HTLV-1), 157, 274, 275f
- Hutchinson sign, 256
- Hutchinson triad, 230
- Hyalocytes, 56
- Hydrogen peroxide, 19
- Hydrolytic enzymes, 15
- 5-Hydroperoxyeicosatetraenoic acid, 22, 22f
- Hydroxychloroquine, 202
- Hydroxyl radical, 19
- Hypertension (ocular), 99, 109, 343, 345
- Hypertension (systemic), 74t, 109
- Hypertensive retinopathy, 203
- HypHEMA, 12–13, 147, 148f, 257, 317, 334, 335f
- Hypopyon
 - Behçet disease finding, 225
 - endophthalmitis finding, 319, 321, 324
 - masquerade syndrome finding, 333
 - uveitis finding, 74, 77, 138, 138–139f
- Hypotony, 319, 346–347
- HZO. *See* Herpes zoster ophthalmicus
- IBD. *See* Inflammatory bowel disease
- Ibuprofen, 134t

- ICGA. *See* Indocyanine green angiography (ICGA) studies
- Idiopathic pars planitis, 247
- Idiopathic retinal vasculitis, aneurysms, and neuroretinitis (IRVAN), 72*t*
- Idiopathic (undifferentiated) uveitis, 45*t*, 68, 81, 82*t*, 157, 188–192, 189–191*f*, 293
- Idiotypes, 43
- IFN- α . *See* Interferon α
- IFN- γ . *See* Interferon gamma
- IFNs. *See* Interferons
- IGRA. *See* Interferon-gamma release assay
- ILs. *See* Interleukins
- IM. *See* Infectious mononucleosis
- Immediate hypersensitivity (formerly Gell and Coombs type I or anaphylaxis), 48–49
- Immune checkpoint inhibitors, 149, 150*f*
- Immune-mediated keratitis, 245
- Immune recovery uveitis (IRU), 306
- Immune response arc
- afferent phase, 32–34, 33*f*
 - effector phase, 38–39, 38*f*
 - overview, 3, 32, 32*f*
 - primary and secondary immune responses, 39–40
 - processing phase, 34–37, 35–36*f*
- Immune responses. *See* Ocular immune responses
- Immunity versus inflammation, 8–9
- Immunizations. *See* Vaccines
- Immunoglobulin A, 41–43, 41*f*, 42*t*
- Immunoglobulin D, 37, 41, 41*f*, 42*t*
- Immunoglobulin E, 5, 41, 41*f*, 42*t*, 48–49
- Immunoglobulin G, 39, 41–44, 41*f*, 42*t*
- Immunoglobulin M, 37, 39, 41–43, 41*f*, 42*t*
- Immunoglobulin superfamily, 13, 14*f*
- Immunoglobulin therapy, 122, 198
- Immunologic memory, 39–40
- Immunology concepts, 3–29. *See also* Adaptive (acquired) immunity; Ocular immune responses
- autoimmunity, 4*f*, 9, 34, 45–46
 - cellular components, 4–8, 4*f*
 - definitions, 3
 - highlights, 3
 - innate immunity
 - clinical example, 9, 11, 16
 - macrophage recruitment and activation, 15–18, 18*f*
 - neutrophil recruitment and activation, 13–15, 14*f*
 - overview, 8–9
 - phagocyte killing mechanisms, 18–19
 - triggers and mechanisms, 10–19, 10*t*
 - mediator systems for response amplification, 19–27
 - cytokine inhibitors, 28–29*t*
 - cytokines, 23–27, 24–26*t*
 - histamine, 21
 - lipid mediators, 21–23, 22*f*
 - neutrophils, 27
 - overview, 19, 19*t*
 - plasma-derived enzyme systems, 20–21, 20*f*
- Immunomodulatory therapy (IMT), 110–122
- acute zonal occult outer retinopathy treatment, 194
 - adverse effects, 113–114
 - ampiginous choroiditis treatment, 181
 - anterior uveitis treatment, 139
 - autoimmune retinopathy treatment, 198
 - Behçet disease treatment, 227–228
 - biologic agents, 112*t*, 119–122
 - birdshot chorioretinopathy treatment, 172*f*, 173*f*, 175
 - cataract surgical management, 340, 341, 342
 - clinical pearl, 113
 - contraindications, 114
 - corticosteroid use and, 98, 109, 110
 - cytomegalovirus retinitis association with, 264
 - dosage and monitoring schedule, 113
 - efficacy studies, 105*t*, 106*t*, 110
 - endogenous endophthalmitis risk factor, 318
 - intermediate uveitis treatment, 159
 - multifocal choroiditis with panuveitis treatment, 184*f*, 185
 - neovascularization treatment, 350–351
 - nonbiologic, 111*t*, 115–119
 - overview, 28–29*t*, 98, 110
 - pars planitis treatment, 161
 - sarcoidosis uveitis treatment, 213–214
 - scleritis treatment, 134
 - serpiginous choroiditis treatment, 180
 - subretinal fibrosis and uveitis syndrome treatment, 188
 - treatment, 111–112*t*, 113–114
 - tuberculosis testing prior to, 238, 243
 - uveitic macular edema treatment, 348
 - Vogt-Koyanagi-Harada syndrome treatment, 223
- Indocyanine green angiography (ICGA) studies
- acute idiopathic maculopathy, 195
 - acute posterior multifocal placoid pigment epitheliopathy, 176, 176*f*
 - acute retinal pigment epitheliitis, 192
 - birdshot chorioretinopathy, 167, 171, 172–174*f*
 - multifocal choroiditis with panuveitis, 182, 184*f*
 - multiple evanescent white dot syndrome, 189, 190–191*f*
 - overview, 91, 92*f*
 - punctate inner choroiditis, 185, 186*f*
 - scleritis, 133
 - serpiginous choroiditis, 178, 179*f*
 - sympathetic ophthalmia, 215, 216*f*
 - syphilis, 232
 - tuberculosis, 239, 240*f*
 - vitreoretinal lymphoma, 329
 - Vogt-Koyanagi-Harada syndrome, 219
 - West Nile virus, 272
- Indomethacin, 134*t*
- Inducible NOS (iNOS), 19
- Infectious endophthalmitis, 82*t*, 84*t*, 147, 293
- Infectious mononucleosis (IM), 236, 266, 280
- Infectious scleritis
- classification, 123, 124*t*
 - clinical presentation, 126–127, 127–128*f*, 128, 130–131
 - diagnosis, 133
 - epidemiology, 124–125
 - pathophysiology, 124
 - prognosis, 136
 - treatment, 134–135
- Infectious uveitis
- bacterial. *See also* Syphilis; Tuberculosis
 - AIDS-related, 304
 - bartonellosis, 87*t*, 249–251, 250*f*, 250*t*
 - diagnosis, 81, 82–85*t*, 86, 87–88*t*, 93–95

- endogenous endophthalmitis, 318–320, 319–320f
 - endogenous endophthalmitis, differential diagnosis, 325
 - keratitis, 313
 - leptospirosis, 246–247
 - Lyme disease, 83t, 87t, 159, 175, 243–246, 244f
 - nocardiosis, 130, 248–249, 248f
 - opportunistic infections, 303
 - postsurgical endophthalmitis, 315, 316–318, 316f
 - Whipple disease, 252–253, 252f
 - clinical presentation, 139
 - as contraindications to local corticosteroid therapy, 102
 - diagnosis, 81, 82–85t, 86, 87–88t, 93–95
 - fungal, 280–284
 - helminthic, 292–301
 - as masquerade syndrome, 337
 - overview, 68, 69
 - protozoal, 284–292
 - viral, 157, 255–280, 303–313. *See also* Viruses and viral diseases
- Inferior peripheral retinal phlebitis, 158
- Inflammation mediators
- cytokines, 23, 24–26t, 27, 28–29t. *See also* Cytokines
 - histamine, 21, 48
 - lipids, 21–23, 22f
 - neutrophils, 27. *See also* Neutrophils
 - overview, 19, 19t
 - plasma-derived enzyme systems, 9, 13, 20–21, 20f
- Inflammation versus immunity, 8–9
- Inflammatory bowel disease (IBD), 82t, 126, 142, 226–227
- Inflammatory cells
- in anterior uveitis, 74, 75f, 76–77, 77t
 - in intermediate uveitis, 157
- Inflammatory chorioretinopathies. *See* White dot syndromes
- Infliximab
- adverse effects, 120–121
 - Behçet disease treatment, 227–228
 - dosage and monitoring schedule, 112t, 120–121
 - efficacy, 120
 - overview, 28t, 43, 119, 120–121
 - sarcoidosis uveitis treatment, 214
 - uveitic macular edema treatment, 348
- Influenza, 274, 280
- Influenza vaccine, 149
- Innate immune responses (natural immunity)
- cellular components, 4–7, 4f
 - clinical example, 9
 - cytokines and, 27
 - defined, 3
 - overview, 8–9
 - triggers and mechanisms, 10–19, 10t
 - bacteria-derived molecules, 10–12
 - macrophage recruitment and activation, 15–18, 18f
 - neutrophil recruitment and activation, 14f
 - other triggers, 12–13
 - phagocyte killing mechanisms, 18–19
 - recruitment and activation of neutrophils, 13–15
- INOS. *See* Inducible NOS
- Integrins, 13
- Interferon alfa-2a/2b, 121, 228, 348
- Interferon gamma (IFN- γ ; macrophage-activating factor), 18f, 26t, 34, 38, 44, 162
- Interferon-gamma release assay (IGRA), 87t, 241–242
- Interferon α (IFN- α), 26t
- Interferons (IFNs), 26t, 27
- Interleukins (ILs)
- 1 (IL-1), 11
 - 1 β (IL-1 β), 24t, 28t
 - 2 (IL-2), 24t, 34
 - 4 (IL-4), 24t, 35
 - 5 (IL-5), 24t, 35
 - 6 (IL-6), 11, 24t, 28t
 - 8 (IL-8), 14, 25t
 - 10 (IL-10), 36f, 37
 - 12 (IL-12), 25t
 - 13 (IL-13), 35
 - 17 (IL-17), 35–36
 - 17A (IL-17A), 25t, 28t
 - 21 (IL-21), 35–36
 - 22 (IL-22), 35–36
 - overview, 24–25t, 27, 36f
- Intermediate uveitis. *See also* Complications of uveitis; Masquerade syndromes
- classification, 69, 69t, 71
 - clinical presentation, 71, 78–80, 79f, 79t, 157
 - differential diagnosis evaluation scheme, 83t
 - diseases associated with, 65t, 157, 303
 - infectious. *See* Infectious uveitis
 - noninfectious
 - multiple sclerosis, 162–163, 163f, 271
 - pars planitis, 157–162, 158f, 160f
 - symptoms of, 73
 - treatment, 303
- International Committee Revised Diagnostic Criteria, 221
- Interphalangeal joint inflammation, 142, 142f
- Interstitial keratitis, 230, 238
- Intracranial tumor, 193
- Intraocular fluid analysis, 88t
- Intraocular foreign bodies, 336–337
- Intraocular lens (IOL) implants
- associated uveitis, 145–148, 145t, 146f, 148f, 217, 317
 - cataract surgery with, 155, 156–157, 162, 341
 - complications, 12–13, 89, 92, 316, 318
 - contraindications, 341
- Intraocular lymphoma, 166, 171
- Intraocular pressure (IOP)
- with anterior uveitis, 138, 257, 258, 342
 - corticosteroid adverse effect, 102, 103
 - glaucoma cause, 342, 344
 - hypotony and, 346–347
 - sympathetic ophthalmia finding, 215
 - uveitis finding, 73, 74t, 78
- Intraretinal cysts, 171
- Intraretinal hemorrhage, 203f, 205, 271, 272–273, 322, 333
- Intravenous immunoglobulin, 122
- IOL implants. *See* Intraocular lens (IOL) implants
- IOP. *See* Intraocular pressure
- Iridocyclitis, 70, 133
- Iris, 56, 58, 74t, 76f, 78
- Iris atrophy, 257, 257f, 259
- Iris bombé, 78, 138, 211, 343–344
- Iris coloboma, 278

- Iris granulomas, 283
 Iris heterochromia, 279, 280*f*, 333
 Iris nodules
 endogenous endophthalmitis finding, 321
 Fuchs uveitis syndrome association, 156*f*
 Fuchs uveitis syndrome finding, 155
 retinoblastoma finding, 334, 334*f*
 tuberculosis finding, 238, 238*f*
 Iris stromal atrophy, 78, 155–156, 156*f*
 Iritis, 70, 82*t*
 IRU. *See* Immune recovery uveitis
 IRVAN. *See* Idiopathic retinal vasculitis, aneurysms, and neuroretinitis
 Isoniazid, 242–243
 Itraconazole, 283, 325
 Ivermectin, 300–301
Ixodes pacificus, 244
Ixodes scapularis, 243–244
- Jarisch-Herxheimer reaction, 237, 246
 Juvenile idiopathic arthritis (JIA; formerly juvenile chronic arthritis and juvenile rheumatoid arthritis)
 cataract treatment, 154–155
 cataracts and, 340, 341
 clinical presentation, 339
 eye screening guidelines, 152, 152*f*
 glaucoma treatment, 155
 HLA association, 65*t*
 overview, 151
 sarcoidosis association, 208
 scleritis association, 132*t*
 subtypes, 151–153, 152*t*
 uveitis-associated
 clinical presentation, 73, 78, 153, 153*f*
 diagnosis, 83*t*, 87*t*, 90
 differential diagnosis, 153, 226–227
 prognosis, 153, 153*f*
 treatment, 106–107*t*, 116, 119, 120, 121, 153–154
 Juvenile xanthogranuloma, 81, 334, 335*f*
- Kaposi sarcoma, 312, 312*f*
 Keratic precipitates (KPs)
 acute anterior uveitis finding, 138
 endogenous endophthalmitis finding, 321
 endophthalmitis finding, 316
 grading method, 77–78
 granulomatous, 215, 218
 immune response and, 54
 mutton-fat, 76*f*, 77, 78, 210, 238
 stellate, 77, 78, 155–156, 156*f*, 257
 uveitis finding, 74, 74*t*
 viral, 257
 Keratitis
 AIDS-related, 313
 Epstein-Barr virus association, 266
 herpes zoster ophthalmicus association, 256
 measles finding, 270
 nocardiosis finding, 248
 reactive arthritis association, 142
 with scleritis, 70
 Keratoconjunctivitis, 283
 Keratoderma blennorrhagicum, 141, 141*f*
 Keratouveitis, 70, 230
- Ketoconazole, 325
 Khodadoust line of endothelial rejection, 54*f*
 Kill cells, 47, 47*f*
 Killer cells. *See* Natural killer (NK) cells
 Kinetic perimetry, 92
Klebsiella spp, 318
 Koeppe (pupillary margin) nodules, 76*f*, 78, 210, 210*f*
 KPs. *See* Keratic precipitates
 Krill disease. *See* Acute retinal pigment epitheliitis
- L-selectins, 13
 Lactoferrin, 15
 Langerhans cells (LCs), 4*f*, 7
 Laser therapy, 161, 262, 297, 299*f*, 346, 350–351
 Late disseminated Lyme disease, 244–245
 LCMV. *See* Lymphocytic choriomeningitis virus
 LCs. *See* Langerhans cells
 LD. *See* Lyme disease
 Leber congenital amaurosis, 59
 Leflunomide, 214
 Lens-associated uveitis, 145–148, 145*t*, 146*f*, 148*f*, 217, 317
 Leopard-spot pattern, 329
Leptospira interrogans, 246
 Leptospirosis, 246–247
 Leukemia, 81, 118, 260, 274, 275*f*, 333, 333*f*
 Leukocoria, 296
 Leukocytes (white blood cells)
 cells types, 4–8, 4*f*
 immune response amplification and, 20*f*, 21, 23, 24–26*t*, 27
 neutrophils and, 13
 oxygen metabolism and, 19
 Leukotrienes, 5, 11, 14, 15, 19, 22, 22*f*
 Linear equatorial streaks, 281, 282*f*
 Linkage disequilibrium, 65
 Lipid inflammatory mediators, 21–23, 22*f*
 Lipopolysaccharide (LPS)
 neutrophil activation by, 13, 15
 overview, 10–11, 18*f*
 oxygen metabolism and, 19
 uveitis and, 64
 Lipoxins, 22, 22*f*
 5-Lipoxygenase pathway, 22, 23
Loa loa, 300–301
 Löfgren syndrome, 208
 Loteprednol, 100
 LPS. *See* Lipopolysaccharide
 Lupus choroidopathy, 202, 202*f*
 Lupus retinopathy, 200–201
 Lyme disease (LD)
 acute posterior multifocal placoid pigment epitheliopathy association, 175
 clinical presentation, 244–245, 244*f*
 diagnosis, 83*t*, 87*t*, 245–246
 differential diagnosis, 274
 intermediate uveitis association, 159
 overview, 243–244
 treatment, 246
 Lymphocytes
 differentiation and activation, 34–37, 35–36*f*
 effector phase overview, 38–39, 38*f*
 effector responses, 36*f*, 40–49, 41*f*, 42*t*, 45*t*, 47*f*

- overview, 4*f*, 7–8. *See also* B cells; T cells
- priming of, 16, 33*f*, 34, 40
- T cell receptors (CD4 and CD8), 24–25*t*, 32–34, 35*f*, 66
- Lymphocytic choriomeningitis virus (LCMV), 269
- Lymphoid cells, 4, 4*f*, 7–8
- Lymphoid dendritic cells. *See* Resident (lymphoid) dendritic cells
- Lymphoid organ dendritic cells, 7
- Lymphokine-activated cells, 38
- Lymphokines, 27
- Lymphomas. *See also* Vitreoretinal lymphoma
 - B-cell lymphomas, 328
 - diagnosis, 87*t*, 88*t*, 94
 - differential diagnosis, 177, 221–222, 227, 260
 - HIV-related, 303
 - intraocular, 166, 171
 - as masquerade syndromes, 327–333, 328–333*f*
 - T-cell lymphomas, 247, 275*f*, 328
 - tumor necrosis factor inhibitors and, 113
- Lysosomes, 5, 15
- Lysozyme testing, 82–83*t*, 87*t*, 132*t*, 213
- Macroaneurysms, 211
- Macrophage-activating factor. *See* Interferon gamma
- Macrophage chemotactic protein-1/CCL2, 25*t*
- Macrophages
 - antibody-dependent cellular cytotoxicity and, 48–49
 - categorization of, 15–16
 - immune response arc and, 34
 - overview, 4*f*, 6
 - recruitment and activation of, 11, 15–18, 18*f*
- Macula-threatening multifocal choroiditis with panuveitis, 110
- Macular atrophy, 162
- Macular degeneration, 282, 304
- Macular edema
 - anterior uveitis finding, 138
 - diagnosis, 90, 91*f*
 - intermediate uveitis association, 158, 159, 162
 - JIA-associated complication, 153
 - sarcoidosis association, 212
 - subacute sclerosing panencephalitis finding, 271
 - toxoplasmosis complication, 287
 - treatment, 102, 103, 104, 160
 - tuberculosis finding, 238, 239*f*
 - as uveitis complication, 23, 71, 74*t*, 347–349
- Macular hole, 271, 349
- Macular pucker, 293*f*
- Macular scarring, 274, 319
- Macular star, 239, 240*f*, 249–250, 250*f*, 270
- Maculopathy, 271, 275, 276, 277, 282
- Magnetic resonance imaging (MRI), 88*t*, 329, 330*f*
- MAGNOLIA extension study, 102
- Major histocompatibility complex (MHC), 32, 62–63.
 - See also* Human leukocyte antigen (HLA) molecules
- Malignancy laboratory tests, 88*t*
- Malignant tumors, 33*f*, 34, 81, 318
- Mannose-binding lectin pathway, 20, 20*f*
- MAR. *See* Melanoma-associated retinopathy
- Masquerade syndromes, 327–337
 - differential diagnosis, 81, 227, 317
 - highlights, 327
 - neoplastic
 - bilateral diffuse uveal melanocytic tumors, 335
 - leukemia, 333, 333*f*
 - lymphomas (systemic), 333
 - metastatic tumors, 335
 - nonlymphoid tumors, 333–334
 - overview, 327
 - uveal lymphoma, 332–333, 332*f*
 - vitreoretinal lymphoma, 327, 328–332
 - nonneoplastic
 - chronic peripheral rhegmatogenous retinal detachment, 336
 - infectious uveitis, 337
 - intraocular foreign bodies, 336–337
 - ocular ischemic syndrome (OIS), 336
 - pigment dispersion syndrome, 337
 - retinitis pigmentosa, 335–336
 - overview, 327
- Mast cells
 - degranulation of, 48–49
 - overview, 4*f*, 5–6
 - types of, 5
- Matrix metalloproteinases (MMPs), 15, 17–18
- Measles (rubeola), 270–271, 271*f*, 274
- Medical management of uveitis, 97–122. *See also specific drugs*
 - corticosteroids, 99–109. *See also* Corticosteroids
 - cycloplegic drugs, 122
 - immunomodulatory therapy, 110–122. *See also* Immunomodulatory therapy
 - mydriatic drugs, 122
 - overview, 97–98
- Melanoma-associated retinopathy (MAR), 196, 197, 198
- Membrane attack complex, 20*f*, 21
- Membrane peel, 349
- Memory lymphocytes, 39, 40
- Metamorphopsia, 282
- Metastases
 - diagnosis, 88*t*
 - differential diagnosis, 81
 - as masquerade syndrome, 335
- Methotrexate (MTX)
 - adjunctive therapies for, 120
 - adverse effects, 114, 116
 - Behçet disease treatment, 228
 - birdshot chorioretinopathy treatment, 175
 - efficacy studies, 115
 - intermediate uveitis treatment, 161
 - JIA-associated anterior uveitis treatment, 154
 - overview, 106*t*, 107, 111*t*, 115–116
 - sarcoidosis uveitis treatment, 214
 - uveitic macular edema treatment, 348
 - vitreoretinal lymphoma treatment, 331
- Methylprednisolone, 109, 134, 160
- Methylprednisolone acetate, 100
- MEWDS. *See* Multiple evanescent white dot syndrome
- MFCPU. *See* Multifocal choroiditis, with panuveitis
- MHC. *See* Major histocompatibility complex
- Micafungin, 324
- Miconazole, 325
- Microaneurysms, 304, 333
- Microangiopathy of retina, 303
- Microglia, 57

- Microperimetry, 92
 Microphthalmia, 267, 278
 Microscopic polyangiitis (MPA), 132*t*, 205
 Microsporidia, 304, 313, 313*f*
 Migratory dendritic cells, 7
 Military tuberculosis, 237–238
 Mitomycin C, 130, 345
 MMPs. *See* Matrix metalloproteinases
 Molluscum contagiosum, 304, 312
 M1/M2 model of activated macrophages, 17, 18*f*
 Monoclonal antibody therapy, 27
 Monocytes
 activation by lipopolysaccharides, 10
 mast cell degranulation and, 48
 overview, 4*f*, 6
 resting monocytes, 16, 18*f*
 Monokines, 27
Morbillivirus genus, 270
 “Moth-eaten appearance,” 156, 156*f*
 Moxifloxacin, 149
 MPA. *See* Microscopic polyangiitis
 MPO. *See* Myeloperoxidase
 MRI. *See* Magnetic resonance imaging
 MS. *See* Multiple sclerosis
 MTX. *See* Methotrexate
 Mucosal immune system, 53–54
 Mucosal mast cells, 5
 Mucous membrane pemphigoid (ocular cicatricial pemphigoid), 110
 Mucous membrane ulcers. *See* Oral ulcers
 Multicenter Uveitis Steroid Treatment Trial (MUST), 78, 79*t*, 105*t*
 Multifocal chorioretinitis
 coccidioidomycosis finding, 283
 histoplasmosis finding, 281
 syphilis finding, 232, 233*f*
 West Nile virus finding, 272–273, 272*f*
 Whipple disease finding, 252, 252*f*
 Multifocal choroiditis
 AIDS-related, 309–311, 311*f*
 Lyme disease finding, 245
 with panuveitis (MFCPU)
 clinical presentation, 182–183, 183–184*f*
 diagnosis, 84*t*, 183
 differential diagnosis, 171, 177, 185, 187, 273, 282, 297
 overview, 168–171*t*, 182
 treatment, 183–185, 184*f*
 white dot syndrome association, 190
 punctate inner choroiditis
 clinical presentation, 182, 185–187, 186–187*f*, 350
 diagnosis, 92
 differential diagnosis, 177, 183, 282
 overview, 168–171*t*, 185
 syphilis finding, 232
 treatment, 187
 Multifocal electroretinogram (ERG), 189
 Multifocal serpiginoid choroiditis. *See* Serpiginous-like choroiditis
 Multifocal *Toxoplasma* retinochoroiditis, 308*f*
 Multifocal yellow-white peripheral retinitis, 259–260, 260*f*
 Multimodal imaging, 89
 Multinucleated giant cells, 6
 Multiple evanescent white dot syndrome (MEWDS), 188–192
 clinical presentation, 188–189, 189–191*f*
 differential diagnosis, 171, 193, 297
 disease associations, 190–192
 overview, 168–171*t*, 188
 prognosis, 97, 190
 Multiple sclerosis (MS)
 diagnosis, 83*t*, 88*t*
 differential diagnosis, 207, 271
 epidemiology, 162
 HLA association, 65*t*
 intermediate uveitis association, 157, 159, 162–163, 163*f*
 pathogenesis, 162
 retinal vasculitis association, 72*t*
 tumor necrosis factor inhibitor adverse effect, 113
 Mumps virus, 175, 269, 270
 MUST. *See* Multicenter Uveitis Steroid Treatment Trial
 Mutton-fat keratic precipitates (KPs), 76*f*, 77, 78, 210, 238
Mycobacterium spp
 endophthalmitis, 316
 Mycobacterium avium-intracellulare, 304
 Mycobacterium tuberculosis, 39–40, 237–238, 304, 310
 scleritis, 130
 tuberculosis, 237–243. *See also* Tuberculosis
 Mycophenolate mofetil
 adverse effects, 114, 116
 Behçet disease treatment, 228
 birdshot chorioretinopathy treatment, 175
 efficacy studies, 107*t*, 115, 116
 intermediate uveitis treatment, 161
 overview, 111*t*, 116–117
 sarcoidosis uveitis treatment, 214
 Mydriatic drugs, 122, 154, 246
 Myeloid cells, 4–7, 4*f*
 Myeloperoxidase (MPO), 15, 205, 206
 Myopic degeneration, 282
 Myositis, 68
 N-formyl-methionyl-leucyl-phenyl-alanine (fMLP), 14, 19
 NADPH (nicotinamide adenine dinucleotide phosphate), 19
 Naive lymphocytes, 34, 35*f*, 37, 39
 NALT. *See* Nasal-associated lymphoid tissue
 Naproxen, 134*t*
 Naranjo Algorithm, 148
 Nasal-associated lymphoid tissue (NALT), 53–54
 Nasolacrimal drainage system, 53–54
 National Health and Nutrition Examination Survey (NHANES), 285
 National Institutes of Health grading system for vitreous haze, 78
 Natural immunity. *See* Innate immune responses
 Natural killer (NK) cells, 8, 35*f*, 38, 48
 Nd:YAG laser capsulotomy, 342
 Necrotizing retinitis, 88*t*, 307, 307*f*, 308
 Necrotizing scleritis
 classification, 124*t*
 clinical presentation, 125, 126–130, 126*f*
 differential diagnosis, 305
 granulomatosis with polyangiitis association, 205
 nocardiosis finding, 248

- pathophysiology, 124
- polyarteritis nodosa association, 203
- prognosis, 136
- systemic process association, 123
- treatment, 110, 115, 118
- tuberculosis finding, 238, 239
 - without overt inflammation, 124*t*, 129–130, 130*f*
- Necrotizing vasculitis, 204
- Neisseria meningitidis*, 318
- Nematode infection, 296
- Neoplasia, 33*f*, 34, 88*t*
- Neovascular glaucoma, 206
- Neovascularization
 - bacterial infections and, 240
 - diagnosis, 89, 90
 - differential diagnosis, 282
 - fungal infections and, 281–282
 - granulomatosis with polyangiitis complication, 205–206, 205*f*
 - leukemia and, 333
 - protozoal infections and, 287
 - systemic lupus erythematosus complication, 202
 - as uveitis complication, 74*t*, 158, 162, 212, 350–351
 - viral infections and, 266, 268, 273
- Neparovec-rzyl, 59
- Neural larva migrans, 297
- Neuro-Behçet disease, 224
- Neuropeptides, 14, 26*t*
- Neuroretinitis
 - bartonellosis finding, 249–250
 - differential diagnosis, 250*t*, 270, 293, 296
 - leptospirosis finding, 247
 - Lyme disease finding, 245
 - toxocariasis finding, 293
 - tuberculosis finding, 238
- Neurosyphilis, 231–232, 234, 236
- Neurotrophic keratitis, 257
- Neutral proteases, 48
- Neutrophil rolling, 13, 14*f*
- Neutrophils
 - antibody-dependent cellular cytotoxicity and, 48–49
 - categorization of, 13
 - mast cell degranulation and, 48
 - overview, 4*f*, 5, 27
 - recruitment and activation of, 10, 13–15, 14*f*, 21
- NHANES. *See* National Health and Nutrition Examination Survey
- Nicotinamide adenine dinucleotide phosphate, 19
- Nitric oxide (NO), 19
- Nitric oxide synthetase (NOS), 19
- Nivolumab, 150*f*
- NK cells. *See* Natural killer (NK) cells
- NLRs. *See* Nucleotide-binding oligomerization domain-like receptors
- NO. *See* Nitric oxide
- Nocardia asteroides*, 248
- Nocardia endophthalmitis*, 318
- Nocardiosis, 130, 248–249, 248*f*
- NOD-like receptors. *See* Nucleotide-binding oligomerization domain-like receptors
- Nodular anterior scleritis, 126–127
- Nodular episcleritis, 277
- Nodular scleritis, 124, 124*t*, 127*f*, 136
- Non-Hodgkin lymphomas, 328
- Non-T, non-B lymphocytes, 8, 35*f*, 38, 48. *See also* Natural killer (NK) cells
- Non-uveitic ocular inflammatory disease, 67–68. *See also* Diagnostic considerations in uveitis
- Noncaseating granulomas, 209, 209*f*, 212
- Nongranulomatous anterior uveitis
 - clinical presentation, 138, 139*f*
 - glaucomatocyclitic crisis, 144
 - HLA-B27-associated, 140, 141–142
 - lens-associated uveitis, 145, 145*t*
 - overview, 138–139
 - viral, 256, 272
- Nongranulomatous inflammation, 72, 138
- Noninfectious scleritis, 123–124
- Noninfectious uveitis, 98
- Noninflammatory phagocytosis, 15–18, 18*f*
- Nonmelanoma skin cancer, 114
- Nonnecrotizing herpetic retinopathy, 259, 263
- Nonnecrotizing retinitis, 256
- Nonparaneoplastic autoimmune retinopathy (npAIR), 196, 196–197*f*, 198
- Nonpenetrating deep sclerectomy, 345
- Nonperfused stromal vessels. *See* “Ghost” (nonperfused) stromal vessels
- Nonpigmented ciliary epithelium, 56
- Nonsteroidal anti-inflammatory drugs (NSAIDs)
 - adverse effects, 109, 122
 - corticosteroid adjunctive therapy, 98
 - indications, 122
 - mechanism of action, 22*f*, 23
 - postoperative macular edema management, 342
 - scleritis treatment, 134*t*
 - uveitic macular edema treatment, 348
- Nontreponemal serologic testing, 87*t*, 235–236, 235*t*
- Nonulcerative stromal interstitial keratitis, 230
- NOS. *See* Nitric oxide synthetase
- Nozik technique. *See* Sub-Tenon (Nozik technique) injection
- NpAIR. *See* Nonparaneoplastic autoimmune retinopathy
- NSAIDs. *See* Nonsteroidal anti-inflammatory drugs
- Nucleotide-binding oligomerization domain-like receptors (NOD-like receptors, or NLRs), 8
- Nyctalopia, 73*t*
- Nystagmus, 269, 273, 310
- Occlusions. *See* Vascular occlusions
- Occlusive retinal arteriolitis, 259–260
- Occlusive retinal vasculitis, 199
- Ocrelizumab, 162
- OCT. *See* Optical coherence tomography (OCT) studies
- OCTA. *See* Optical coherence tomography angiography
- Ocular cicatricial pemphigoid. *See* Mucous membrane pemphigoid
- Ocular fluid sampling, 93–94
- Ocular histoplasmosis syndrome (OHS)
 - differential diagnosis, 85*t*, 166, 171, 183, 188, 297
 - overview, 281–282*f*, 281–283
- Ocular hypertension, 99, 109, 343, 345
- Ocular hypotensive medications, 149–150
- Ocular immune privilege, 51
- Ocular immune responses, 51–59
 - of anterior chamber, anterior uvea, and vitreous, 56–57
 - clinical examples, 55, 58–59

- of conjunctiva, 53–54
- of cornea, 54–56, 54*f*
- highlights, 51
- immunologic microenvironment overview, 51, 52*t*
- regional immunity, 51
- of retina, retinal pigment epithelium, choriocapillaris, and choroid, 57–59
- Ocular ischemic syndrome (OIS), 81, 336
- Ocular motor nerve palsies, 233–234
- Ocular mucosal immune system (OMIS), 53–54
- Ocular toxocariasis (OT)
 - diagnosis, 83–85*t*, 159
 - differential diagnosis, 282, 296, 297
 - granuloma (clinical example), 46
 - intermediate uveitis association, 159
 - overview, 292–295, 293–294*f*, 294*t*
- OHS. *See* Ocular histoplasmosis syndrome
- OIS. *See* Ocular ischemic syndrome
- Oligoarticular arthritis, 151
- OMIS. *See* Ocular mucosal immune system
- Onchocerca volvulus*, 300
- Onchocerciasis, 84*t*, 85*t*, 300–301, 300*f*
- 1/2 STOP-Uveitis randomized clinical trial, 121
- Open-globe injuries, 336–337
- Ophthalmic imaging and functional tests, 89–92
 - color photography, 91
 - electroretinography, 92
 - fluorescein angiography (FA), 90, 91*f*
 - fundus autofluorescence, 91
 - indocyanine green angiography (ICGA), 91–92, 92*f*
 - optical coherence tomography (OCT), 89–90, 89*f*
 - ultrasonography, 92
 - visual field testing, 92
- Opportunistic infections, 87*t*, 113–114, 118
- Opsonization. *See* Phagocytosis
- Optic disc
 - drusen, 270
 - edema
 - anterior uveitis finding, 138
 - bartonellosis and, 249–250, 249*f*, 251
 - diffuse unilateral subacute neuroretinitis finding, 297
 - West Nile virus finding, 272–273
 - Whipple disease finding, 252
 - inflammation, 271
- Optic nerve
 - atrophy
 - AIDS-related, 310
 - congenital Zika syndrome finding, 278
 - lymphocytic choriomeningitis virus finding, 269
 - onchocerciasis complication, 300, 300*f*
 - Rift Valley fever complication, 274
 - subacute sclerosing panencephalitis finding, 271
 - toxoplasmosis complication, 287
 - West Nile virus finding, 272–273
 - differential diagnosis, 193
 - edema, 215, 273, 310
 - head inflammation, 251
 - hypoplasia, 278
 - lesions, 283, 284*f*
 - neuritis, 92, 193, 240, 245, 297
 - neuropathy, 203, 205, 212, 233–234
 - uveitis signs and, 74*t*
- Optical coherence tomography (OCT) studies
 - acute idiopathic maculopathy, 195, 195*f*
 - acute posterior multifocal placoid pigment epitheliopathy, 176, 177*f*
 - acute retinal pigment epitheliitis, 192
 - acute zonal occult outer retinopathy, 193–194, 194*f*
 - autoimmune retinopathy, 196, 197*f*
 - birdshot chorioretinopathy, 167, 171, 173–174*f*
 - Dengue fever, 275, 276*f*
 - intermediate uveitis, 159, 160
 - multifocal choroiditis with panuveitis, 183, 184*f*
 - multiple evanescent white dot syndrome, 189, 191*f*
 - overview, 89–90, 89*f*
 - punctate inner choroiditis, 187, 187*f*
 - scleritis, 132
 - serpiginous choroiditis, 178, 179*f*
 - subretinal fibrosis and uveitis (SFU) syndrome, 188
 - sympathetic ophthalmia, 216, 216*f*
 - syphilis, 232, 233*f*
 - vitreoretinal lymphoma, 329, 330*f*
 - Vogt-Koyanagi-Harada syndrome, 220, 220*f*
- Optical coherence tomography angiography (OCTA), 89
- Oral ulcers (mucous membrane ulcers), 223, 223*f*, 224
- Orbit, 45*t*, 68
- Orbital cellulitis, 205
- Orbital pseudotumor, 205
- OT. *See* Ocular toxocariasis
- Oxidative metabolism, 9, 17, 18–19, 18*f*, 21
- P-ANCA pattern. *See* Perinuclear ANCA (p-ANCA) pattern
- P-selectins, 13, 14*f*
- Paecilomyces lilacinus*, 316
- PAF. *See* Platelet-activating factor
- PAIR. *See* Paraneoplastic AIR
- PAMPs. *See* Pathogen-associated molecular patterns
- PAN. *See* Polyarteritis nodosa
- Panophthalmitis, 240, 248
- Panuveitis. *See also* Masquerade syndromes
 - bartonellosis complication, 251
 - classification, 69, 69*t*, 71
 - cysticercosis treatment complication, 296
 - diagnosis, 85*t*
 - nocardiosis association, 248
 - overview, 199
 - with retinal vasculitis, 247
 - with systemic manifestations, 208–228
 - Behçet disease, 223–228, 225*f*
 - sarcoidosis, 208–214
 - sympathetic ophthalmia, 214–217
 - Vogt-Koyanagi-Harada syndrome, 217–223
 - Whipple disease finding, 252
 - treatment, 116
- Papilledema, 245, 271, 311
- Papillitis, 212, 245, 297
- Paracrine signaling, 23
- Paramyxoviridae, 270
- Paraneoplastic AIR (pAIR), 196, 198
- Parasitic infections
 - diagnosis, 83–85*t*, 88*t*, 288–289, 289*f*
 - helminthic uveitis, 159, 282, 292–301, 293–300*f*

- immune response, 5, 17, 36*f*, 45–46
- protozoal uveitis, 284–292, 285–289*f*, 291*t*
- Paratope, 37
- Parinaud oculoglandular syndrome, 249, 266
- Pars plana lensectomy, 340–341
- Pars plana vitrectomy (PPV), 161, 340–341, 348, 349
- Pars planitis
 - clinical presentation, 74*t*, 80, 157, 158, 158*f*
 - complications, 162
 - diagnosis, 83*t*, 159
 - differential diagnosis, 323
 - epidemiology, 157–158
 - overview, 71
 - prognosis, 159, 160*f*
 - toxocariasis finding, 293
 - treatment
 - medical, 97–98
 - principles of, 159–161
- Pathogen-associated molecular patterns (PAMPs), 8
- Patient history and review of systems, 80–81, 81*t*
- Pattern recognition receptors (PRRs), 7, 8
- PCNSL. *See* Primary central nervous system lymphoma
- PCR. *See* Polymerase chain reaction
- PEACHTREE study, 102
- Peau d'orange appearance, 189
- Penicillin, 233*f*, 236–237, 247, 309
- Pentamidine, 310
- Perforin, 47, 47*f*
- Peri-Ocular vs. INTravitreal corticosteroids for uveitic macular edema (POINT) Trial, 104, 105*t*, 160, 348
- Perilimbal vitiligo (Sugiura sign), 218, 219*f*
- Perimetry. *See* Visual field testing
- Perinuclear ANCA (p-ANCA) pattern, 206
- Peripapillary angiomatosis, 251
- Peripapillary serous retinal detachment, 250
- Peripheral anterior synechiae
 - intraocular lens-associated uveitis, 147, 148*f*
 - prevention, 210–211, 213
 - sarcoidosis and, 210–211, 213
 - uveitis finding, 74*t*
- Peripheral corneal melting syndromes, 15
- Peripheral laser photocoagulation, 161
- Peripheral lymphocytic cuffing, 158
- Peripheral multifocal choroiditis, 245
- Peripheral necrotizing retinochoroiditis, 232
- Peripheral retina, uveitis and, 71
- Peripheral retinal vasoproliferative tumor, 158
- Peripheral scotomas, 73*t*
- Peripheral toxocariasis, 157
- Peripheral ulcerative keratitis, 203
- Periphlebitis, 162, 240, 241*f*
- Persistent fetal vasculature, 293, 296
- Phacoanaphylactic uveitis, 145
- Phacoantigenic uveitis (also called phacoantigenic glaucoma), 145–146, 145*t*, 146*f*
- Phacolytic uveitis (phacolytic glaucoma), 16, 145*t*, 146, 146*f*
- Phagocytes, 5, 15
- Phagocytosis (opsonization), 15, 16, 18–19, 18*f*, 21
- Phagosomes, 15
- Phlyctenular conjunctivitis, 283
- Phlyctenulosis, 45*t*, 238
- Phospholipase A₂, 22, 23
- Phospholipases, 12
- Photophobia, 73*t*, 272
- Photopsias, 73*t*
- Phthisis bulbi, 153, 319
- PIC. *See* Punctate inner choroiditis
- Pigment dispersion, 74, 74*t*
- Pigment dispersion syndrome, 81, 337
- Pigmentary retinopathy, 267
- Pigmented ciliary epithelium, 56
- Pigmented retinochoroidal, 287, 287*f*
- Pilocarpine, 149
- Pituitary tumor, 193
- Plasma cells, 38–39, 38*f*, 43–44
- Plasma-derived enzyme systems, 9, 13, 20–21, 20–21*f*
- Plasma factors, 21
- Plasmapheresis, 198
- Plasmin, 21
- Plasminogen, 21
- “Plasmoid aqueous,” 21
- Plasticity of macrophages, 17, 18*f*
- Platelet-activating factor (PAF)
 - endophthalmitis and, 11
 - leukocyte oxygen metabolism initiation by, 19
 - lipid mediators of, 21–22, 22*f*, 23
 - neutrophil activation by, 13, 15
- Platelet-derived growth factors, 17–18, 26*t*
- Platelet granules, 21
- Platelets, deregulation of, 11
- PMNs. *See* Polymorphonuclear neutrophils
- Pneumocystis choroiditis, 177
- Pneumocystis jirovecii*, 109, 114, 118, 304, 310, 310*f*
- POINT Trial. *See* Peri-Ocular vs. INTravitreal corticosteroids for uveitic macular edema Trial
- Polarization, 17. *See also* Activated macrophages
- Polyarteritis nodosa (PAN)
 - acute posterior multifocal placoid pigment epitheliopathy association, 175
 - clinical presentation, 203, 203*f*
 - diagnosis, 203–204
 - differential diagnosis, 227, 253
 - necrotizing scleritis association, 128
 - prognosis, 204
 - retinal vasculitis association, 72*t*
 - scleritis association, 132*t*
 - serpiginous choroiditis association, 178
 - treatment, 204
- Polychondritis, 118
- Polyclonal response, 43
- Polymerase chain reaction (PCR)
 - acute retinal necrosis, 260
 - cytomegalovirus, 258
 - endogenous endophthalmitis, 320, 323
 - endophthalmitis, 317
 - overview, 88*t*, 93
 - syphilis, 236
 - vitreoretinal lymphoma, 330–331
- Polymorphonuclear leukocytes. *See* Neutrophils
- Polymorphonuclear neutrophils (PMNs). *See* Neutrophils
- Population-wide immunity, 63
- PORN. *See* Progressive outer retinal necrosis
- PORT. *See* Punctate outer retinal toxoplasmosis

- Posner-Schlossman syndrome. *See* Glaucomatocyclitic crisis
- Post-Ebola virus disease syndrome, 279, 280f
- Posterior chamber lenses, 12
- Posterior multifocal placoid pigment epitheliopathy, 97
- Posterior scleritis
 - classification, 123, 124t
 - clinical presentation, 125–126, 130, 131f
 - diagnosis, 131–133, 132t
 - differential diagnosis, 221–222
 - epidemiology, 124–125
 - pathophysiology, 124
 - polyarteritis nodosa association, 203
 - prognosis, 136
 - treatment, 133–135, 134t
- Posterior synechiae
 - Behçet disease–associated uveitis, 225–226, 228
 - JIA-associated uveitis, 153
 - prevention, 133, 154, 213
 - sarcoidosis-associated uveitis, 210–211, 213
 - sympathetic ophthalmia finding, 215
 - syphilis-associated uveitis, 232
 - treatment, 122, 139, 139f
 - tuberculosis-associated uveitis, 238
 - uveitis finding, 74t, 77f, 78, 138–139, 138–139f, 158, 259
 - viral, 257
- Posterior uveitis. *See also* Complications of uveitis; Masquerade syndromes
 - classification, 69, 69t, 71
 - defined, 165
 - diagnosis, 83–85t, 90
 - infectious uveitis. *See* Infectious uveitis
 - noninfectious, with systemic manifestations
 - Behçet disease, 225
 - granulomatosis with polyangiitis, 204–206, 205f
 - highlights, 199
 - overview, 199–200
 - polyarteritis nodosa, 203–204, 203f
 - Susac syndrome, 206–207, 207f
 - systemic lupus erythematosus, 200–202, 201f
 - noninfectious, without systemic manifestations, 165–196. *See also* White dot syndromes
 - signs of, 71, 74t, 80
 - symptoms of, 73
 - treatment, 100
- Postoperative complications
 - anterior uveitis, 147–148, 148f
 - infectious endophthalmitis, 315, 316–318, 316f
 - scleritis, 128, 129f, 130–131
 - surgically induced necrotizing scleritis (SINS), 128, 129f
- Posttraumatic endophthalmitis, 315
- Postvaccination encephalitis, 269
- Poxvirus, 312
- PPD (purified protein derivative of *Mycobacterium bovis*), 241–242
- PPV. *See* Pars plana vitrectomy
- Prednisolone, 100
- Prednisolone acetate, 348
- Prednisone, 108–109, 112t, 134, 262
- Primary central nervous system lymphoma (PCNSL), 328, 328f, 330f, 331–332
- Primary immune response, 39–40
- Primary intraocular lymphoma. *See* Vitreoretinal lymphoma
- Primary syphilis, 230–231
- Primed macrophages, 16–17, 18f
- Priming (activating) exposure, 34, 38
- Programmed cell death. *See* Apoptosis
- Progressive outer retinal necrosis (PORN), 72t, 85t, 259, 262–263, 263f, 307
- Propionibacterium acnes*. *See* *Cutibacterium acnes*
- Prostacyclin production, 22
- Prostaglandin analogues, 149, 345
- Prostaglandins, 18, 22, 22f, 23
- Protective immunization, 39
- Proteoglycans, 48
- Protozoal uveitis
 - clinical presentation, 286–288, 286–288f
 - diagnosis, 88t, 288–289, 289f
 - overview, 284–286, 285f
 - toxoplasmosis, 284–292. *See also* *Toxoplasma* spp
 - treatment, 288f, 289–292, 291t
- PRRs. *See* Pattern recognition receptors
- Pseudofolliculitis, 224
- Pseudohypopyon, 146f, 333, 334
- Pseudomonas* infection, 15, 130
- Psoriatic arthritis, 82t, 142–143, 142f, 152, 156f
- “Punched-out appearance” lesions, 182, 183f
- Punctate inner choroiditis (PIC)
 - clinical presentation, 182, 185–187, 186f, 350
 - diagnosis, 92
 - differential diagnosis, 177, 183, 282
 - overview, 168–171t, 185
 - syphilis finding, 232
 - treatment, 187
- Punctate keratitis, 142
- Punctate outer retinal toxoplasmosis (PORT), 288, 289f
- Pupillary margin nodules, 218. *See also* Koeppe (pupillary margin) nodules
- Pupillary miosis, 74
- Purified protein derivative of *Mycobacterium bovis*. *See* PPD
- Pyrazinamide, 242–243
- Primethamine, 291, 291t, 308
- Quadruple drug therapy (isoniazid, rifampin, pyrazinamide, and ethambutol), 242–243
- Radiotherapy, 332
- Ranibizumab, 29t, 348
- Rapid plasma reagin test. *See* RPR (rapid plasma reagin) test
- Reactive arthritis (formerly Reiter syndrome)
 - anterior uveitis association, 82t, 141–142, 141f
 - clinical example, 64
 - differential diagnosis, 226–227
 - HLA association, 64, 65t
 - scleritis association, 126
- Reactive nitrogen products, 19
- Receptor- α (ROR- α), 36
- Recombinant tissue plasminogen activator, 122
- Rehabilitation of vision, 351
- Relapsing polychondritis, 72t, 118, 126
- Relative risk, 64–65, 65t

- Relentless placoid chorioretinitis. *See* Ampiginous choroiditis
- Reparative macrophages. *See* Stimulated (reparative) macrophages
- Resident (lymphoid) dendritic cells, 7
- Restimulation exposure, 38, 47*f*
- Resting monocytes (macrophages), 16, 18*f*
- Retained lens fragments, 89
- Retina
- delayed hypersensitivity mechanism and, 45*t*
 - detachments
 - AIDS-related, 310–311
 - bacterial infections and, 248
 - differential diagnosis, 81, 296
 - endophthalmitis complication, 319
 - exudative, 218, 219–220*f*, 245, 310–311, 333, 333*f*
 - masquerade syndromes and, 336
 - peripapillary serous, 250
 - protozoal infections and, 287
 - rhegmatogenous, 162, 350
 - sarcoidosis complication, 211
 - serous, 283, 347
 - sympathetic ophthalmia finding, 215
 - tractional, 21, 162
 - viral infections and, 306–307
 - hemorrhage
 - Behçet disease finding, 225, 225–226*f*
 - Chikungunya fever finding, 277, 277*f*
 - coccidioidomycosis finding, 283
 - cytomegalovirus retinitis finding, 264, 264*f*
 - Eales disease finding, 241*f*
 - HIV-related, 304
 - Rift Valley fever finding, 273
 - imaging studies, 90
 - immunologic microenvironment of, 52*t*, 56, 57–58
 - immunoregulatory system of, 58–59
 - ischemia, 274
 - macroaneurysms, 211
 - microangiopathy of, 303
 - necrosis, 85*t*, 232
 - neovascularization
 - diagnosis, 90
 - granulomatosis with polyangiitis complication, 205–206, 205*f*
 - intermediate uveitis complication, 162
 - sarcoidosis uveitis complication, 212
 - systemic lupus erythematosus complication, 202
 - as uveitis complication, 350–351
 - phlebitis, 158
 - posterior segment inflammation signs and, 80
 - uveitis and, 70, 71, 74*t*
 - vasculitis
 - classification, 71–72
 - diagnosis, 90
 - differential diagnosis, 260
 - diseases associated with, 72*t*
 - drug-induced, 149
 - HLA association, 65*t*
 - Lyme disease finding, 245
 - multiple sclerosis association, 271
 - polyarteritis nodosa association, 203, 203*f*
 - as posterior uveitis, 165
 - syphilis finding, 232–233
 - tuberculosis finding, 239
 - viral uveitis and, 263
 - Whipple disease finding, 252
- Retinal gene therapy, 58–59
- Retinal pigment epithelium (RPE)
- diagnosis, 91
 - immunologic microenvironment of, 52*t*, 57–58
 - immunoregulatory system of, 58–59
 - uveitis signs and, 74*t*
- Retinitis
- Chikungunya fever finding, 277, 277*f*
 - cytomegalovirus, 83*t*, 263–266, 264–265*f*, 304–307, 305*f*, 325
 - macular, 273, 273*f*
 - paramacular, 273
 - rubella complication, 269
 - subacute sclerosing panencephalitis finding, 271
 - syphilis finding, 232
 - uveitis finding, 74*t*
 - viral, 277
- Retinitis pigmentosa (RP), 81, 270, 335–336
- Retinoblastoma, 81, 293, 296, 334, 334*f*
- Retinochoroidal lesions, 286, 286*f*
- Retinochoroiditis, 263, 286, 287*f*, 288*f*, 291–292
- Retinoic acid–inducible gene-I-like receptors (RIG-I-like receptors, or RLRs), 8
- Retinoic acid receptor–related orphan receptor- γ t (ROR- γ t), 36
- Retinopathy, 279, 304, 304*f*
- Retinopathy of prematurity, 293, 296
- Retinoschisis, 162
- Retrobulbar optic neuritis, 233–234
- Reverse sequence syphilis screening algorithm, 235
- Review of systems, 80–81, 81*t*
- RF (rheumatoid factor)-negative, polyarticular arthritis, 152
- RF-positive, polyarticular arthritis, 152
- Rhegmatogenous retinal detachment, 162, 350
- Rheumatoid arthritis, 87*t*, 126, 132*t*
- Rheumatoid arthritis–associated peripheral keratitis, 15
- Rheumatoid factor testing, 87*t*
- Rickettsial diseases, 274
- Rifabutin, 149
- Rifampin, 242–243, 251, 324
- Rift Valley Fever, 273–274, 273*f*
- RIG-I-like receptors. *See* Retinoic acid–inducible gene-I-like receptors
- Rituximab, 121, 134, 188, 198, 331
- River Blindness, 300
- RLRs. *See* Retinoic acid–inducible gene-I-like receptors
- ROR- α . *See* Receptor- α
- ROR- γ t. *See* Retinoic acid receptor–related orphan receptor- γ t
- Roseola subitum, 269
- Roth spots, 322
- Roundworms, 292, 296
- RP. *See* Retinitis pigmentosa
- RPE. *See* Retinal pigment epithelium
- RPE65 gene, 59
- RPR (rapid plasma reagin) test, 87*t*, 235, 235*t*
- Rubella
- acquired, 267, 269
 - congenital rubella syndrome, 267–269, 268*f*

- diagnosis, 88*t*
- differential diagnosis, 245, 274
- Rubeola. *See* Measles
- Rubeosis, 321
- Sacroiliitis, 142, 143
- Salt and pepper fundus, 268, 268*f*
- Salt-and-pepper retinopathy, 230, 270
- Sarcoidosis
 - acute posterior multifocal placoid pigment epitheliopathy association, 175
 - animal models of, 62
 - anterior uveitis association, 139
 - clinical presentation, 76*f*, 209–212, 217
 - conjunctival immune responses and, 53
 - conjunctival nodules, 53, 209, 209*f*
 - diagnosis, 82–83*t*, 85*t*, 87*t*, 88*t*, 91, 91*f*, 94, 212–213
 - differential diagnosis
 - Behçet disease, 226–227
 - diffuse unilateral subacute neuroretinitis, 297
 - infectious uveitis, 253
 - JLA-associated uveitis, 153
 - leptospirosis, 247
 - Lyme disease, 245
 - ocular histoplasmosis syndrome, 282
 - Susac syndrome, 207
 - sympathetic ophthalmia, 217
 - uveal lymphoma, 332
 - Vogt-Koyanagi-Harada syndrome, 221–222
 - West Nile virus, 273
 - white dot syndromes, 166, 171, 177, 183, 188
 - epidemiology, 208
 - HLA association, 65*t*
 - intermediate uveitis association, 157
 - overview, 208–209
 - retinal vasculitis association, 72*t*
 - scleritis association, 132*t*
 - serpiginous choroiditis association, 178
 - treatment, 116, 120, 213–214
- SARS-CoV-2, 279
- “Sausage” digits, 142, 142*f*
- Scavenging macrophages, 16
- Sclera
 - biopsies, 94
 - delayed hypersensitivity mechanism and, 45*t*
 - grafting, 135, 135*f*
 - immunologic microenvironment of, 52*t*
 - inflammation of, 68, 123–136. *See also* Scleritis thinning, 74*t*
 - uveitis and, 70
 - uveitis signs and, 74*t*
- Scleritis, 123–136
 - acute posterior multifocal placoid pigment epitheliopathy association, 175
 - classification, 123, 124*t*. *See also* Anterior scleritis; Posterior scleritis
 - clinical presentation, 125–131, 125–131*f*
 - coccidioidomycosis finding, 283
 - diagnosis, 131–133, 131*f*, 132*t*
 - drug-induced, 149
 - epidemiology, 124–125
 - granulomatosis with polyangiitis association, 205
 - herpes zoster ophthalmicus association, 256
 - highlights, 123
 - overview, 123
 - pathophysiology, 124
 - prognosis, 136
 - treatment, 116, 133–135, 134*t*, 135*f*
 - tuberculosis finding, 238
 - without inflammation, 129
- Sclerokeratitis, 70
- Scleromalacia perforans, 124*t*, 129–130, 130*f*
- Sclerouveitis, 70, 131, 142
- Scotomas, 73*t*
- Seclusion membrane, 138
- Secondary (anamnestic) immune response, 39–40
- Secondary angle-closure glaucoma, 78, 153, 211, 343–344
- Secondary choroidal neovascularization, 90
- Secondary open-angle glaucoma, 153, 344
- Secondary syphilis, 231, 231*f*, 232, 233*f*
- Secukinumab, 28*t*
- Segmental arterial plaques, 287
- Selectins, 13, 14*f*
- Self antigens. *See* Autoantigens
- Sepsis, 322
- Serine proteases, 15
- Serologic tests, 87*t*
- Seronegative spondyloarthritis, 82*t*, 140, 153.
 - See also* Ankylosing spondylitis; Inflammatory bowel disease; Psoriatic arthritis; Reactive arthritis
- Serotonin, 48
- Serous macular detachment, 271
- Serous retinal detachment, 283, 347
- Serpiginous choroiditis (geographic or helicoid choroidopathy)
 - clinical presentation, 178, 179*f*
 - diagnosis, 85*t*
 - differential diagnosis, 177, 180–181, 188, 297
 - overview, 168–171*t*, 178
 - treatment, 110, 118, 178–180
 - tuberculosis finding, 239, 240*f*
- Serpiginous-like choroiditis (multifocal serpiginoid choroiditis), 178, 180, 181, 239, 241*f*
- SFU syndrome. *See* Subretinal fibrosis and uveitis (SFU) syndrome
- Shock, with bacterial sepsis, 11
- “Shotgun” uveitis workup, 86
- Sickle cell anemia, 318
- SICRET syndrome. *See* Susac syndrome
- SINS. *See* Surgically induced necrotizing scleritis
- SITE Cohort Study. *See* Systemic Immunosuppressive Therapy for Eye Diseases (SITE) Cohort Study
- Sjögren syndrome, 36, 157, 200, 266
- SLE. *See* Systemic lupus erythematosus
- Snowball opacities, 80, 163*f*, 211, 274
- Snowballs, 317, 322, 323
- Snowbanks, 74*t*, 80, 157, 158, 158*f*, 159
- SO. *See* Sympathetic ophthalmia
- Spiramycin, 290, 291*t*
- Spirochete infection, 229, 243–244. *See also* Leptospirosis; Lyme disease; Syphilis
- Spondyloarthritis, 87*t*, 88*t*
- Sporothrix schenckii*, 321
- Sporotrichosis, 249
- Squamous cell carcinoma, 303

- SSPE. *See* Subacute sclerosing panencephalitis
- Stains. *See* Cultures and stains
- Standardization of Uveitis Nomenclature (SUN) Working Group
 anterior chamber cell grading, 76–77, 77t
 Behçet disease diagnosis guidelines, 227, 227t
 ocular syphilis guidelines, 235
 uveitis classification, 69, 69–70t, 72
 vitreous haze grading, 78, 79f
 Vogt-Koyanagi-Harada syndrome diagnosis guidelines, 221, 222t
- Staphylococcus aureus*, 318
- Staphylococcus epidermidis*, 147, 316
- Staphylococcus pneumoniae*, 130
- Static perimetry, 92
- Stellate keratic precipitates (KPs), 77, 78, 155–156, 156f, 257
- Still disease. *See* Systemic arthritis
- Stimulated (reparative) macrophages, 17–18, 18f
- Stool test, 88t
- Strabismus, 267, 269
- Streptococcus* spp, 130, 175, 318
- Streptolysin O, 12
- “String-of-pearls,” 211, 317, 322, 323f
- Stromal atrophy, 78, 155–156, 156f
- Stromal keratitis, 257, 266
- Stromal punctate keratitis, 300
- Sub-Tenon (Nozik technique) injection, 100–101, 101f
- Subacute sclerosing panencephalitis (SSPE), 271
- Subconjunctival hemorrhage, 275, 276f, 279
- Subepithelial keratitis, 142
- Subretinal fibrosis and uveitis (SFU) syndrome
 clinical presentation, 187–188, 188f
 differential diagnosis, 187, 188
 overview, 168–171t, 187
 treatment, 188
- Substance P, 14, 26t
- Substantia propria, 53
- Sugiura sign. *See* Perilimbal vitiligo
- Suicide induction, 47
- Sulfadiazine, 291, 291t, 308
- Sulfamethoxazole, 308, 310
- Sulfonamides, 149, 249, 290
- SUN Working Group. *See* Standardization of Uveitis Nomenclature (SUN) Working Group
- “Sunset-glow” fundus, 218, 219f
- Superoxide anion, 19
- Suprachoroidal hemorrhage, 319
- Surface markers, 8
- Surgical complications
 anterior uveitis, 147–148, 148f
 infectious endophthalmitis, 315, 316–318, 316f
 scleritis, 128, 129f, 130–131
- Surgical management of uveitis, 122
- Surgically induced necrotizing scleritis (SINS), 128, 129f
- Susac syndrome (SICRET syndrome), 72t, 206–207, 207f, 226–227
- SYCAMORE study, 106t, 120
- Sympathetic ophthalmia (SO)
 clinical example, 46
 clinical presentation, 214–217, 215–216f, 343–344
 delayed hypersensitivity mechanism and, 45t
 diagnosis, 72, 84t, 85t, 89, 91, 217
 differential diagnosis, 166, 188, 221–222, 317
 HLA association, 65t
 overview, 214
 treatment, 110, 115, 118, 119, 217
- Sympathizing eye, 214, 215, 216–217
- Synechiae
 Behçet disease and, 225–226, 228
 fibrin and, 21
 intraocular lens–associated uveitis, 147, 148f
 JIA-associated uveitis, 153
 onchocerciasis and, 300
 prevention, 133, 154, 210–211, 213
 sarcoidosis and, 210–211, 213
 sympathetic ophthalmia and, 215
 syphilis and, 232
 treatment, 122
 tuberculosis and, 238
 uveitis finding, 74, 74t, 77f, 78, 138–139, 138–139f, 158, 259
- Syphilis
 acquired
 primary, 230–231
 secondary, 231, 231f, 232, 233f
 tertiary, 231–232, 234
 AIDS-related, 309
 clinical ocular manifestations, 72t, 232–234, 233–234f
 clinical presentation, 309
 congenital, 230, 231f, 236–237
 diagnosis, 82t, 84–85t, 86, 87–88t, 235–236, 235t, 246
 differential diagnosis
 acute retinal necrosis, 260
 bartonellosis, 249
 Behçet disease, 227
 cytomegalovirus retinitis, 305
 leptospirosis, 247
 Lyme disease, 245
 measles, 270
 ocular histoplasmosis syndrome, 282
 sympathetic ophthalmia, 217
 West Nile virus, 273
 white dot syndromes, 166, 171, 177, 180, 183, 188
 intermediate uveitis association, 157, 159
 overview, 229–230
 retinitis, 308
 treatment, 236–237, 309
- Systemic arthritis (Still disease), 152
- Systemic immunomodulatory therapy. *See* Immunomodulatory therapy
- Systemic Immunosuppressive Therapy for Eye Diseases (SITE) Cohort Study, 106t, 110, 114, 117, 161
- Systemic lupus erythematosus (SLE)
 clinical presentation, 200–202, 201f
 diagnosis, 85t
 differential diagnosis, 227, 253
 endogenous endophthalmitis risk, 318
 overview, 200
 retinal vasculitis association, 72t
 scleritis association, 126, 132t
 treatment, 202
- Systemic vasculitis, 224

- T-cell inhibitors (cyclosporine or tacrolimus)
 adverse effects, 114, 117
 Behçet disease treatment, 228
 birdshot chorioretinopathy treatment, 175
 dosage and monitoring schedule, 111*t*, 117
 efficacy studies, 117
 intermediate uveitis treatment, 161
 multifocal choroiditis with panuveitis treatment, 185
 overview, 117–118
 sarcoidosis uveitis treatment, 214
 serpiginous choroiditis treatment, 180
- T-cell lymphomas, 247, 275*f*, 328
- T-cell subset blood test, 87*t*
- T cells. *See* T lymphocytes
- T helper cells
 Th-0 cells, 36*f*
 Th1 cells, 34, 35*f*, 45, 45*t*, 46, 57
 Th2 cells, 34–35, 35*f*, 45–46, 57
 Th17 cells, 34–36, 35*f*
 Treg cells, 34, 35*f*, 37
- T lymphocytes (T cells)
 antibody-dependent cellular cytotoxicity and, 48–49
 as antigen-specific effectors, 38
 innate immunity and, 8
 priming of, 16, 33*f*, 34, 40
 receptors (CD4 and CD8), 24–25*t*, 32–34, 35*f*, 66
 “T-sign,” 131*f*, 133
- Taches de bougie. *See* Candlewax drippings
- Tacrolimus
 Behçet disease treatment, 228
 birdshot chorioretinopathy treatment, 175
 dosage and monitoring schedule, 111*t*, 117
 efficacy studies, 117
 overview, 117–118
 sarcoidosis uveitis treatment, 214
- Taenia solium*, 295
- Takayasu arteritis, 132*t*
- Talc, 17
- Tapeworms, 295
- TB. *See* Tuberculosis
- Tectonic grafting, 135, 135*f*
- Tertiary syphilis, 231–232, 234
- Tetracycline, 237, 253
- Therapy for uveitis, 97–122
 corticosteroids, 99–109. *See also* Corticosteroids
 cycloplegic drugs, 122. *See also* Cycloplegic drugs
 highlights, 97
 immunomodulatory therapy, 110–122. *See also*
 Immunomodulatory therapy
 mydriatic drugs, 122, 154, 246
 overview, 97–98
 surgical treatment, 122
- Thiabendazole, 297
- Thiopurine S-methyltransferase (TPMT), 115
- Thrombin, 21
- Thromboxanes, 11, 22, 22*f*
- Thyroid orbitopathy, 45*t*
- Tinnitus, 207
- TINU syndrome. *See* Tubulointerstitial nephritis and uveitis (TINU) syndrome
- Tissue biopsy, 88*t*, 93, 94
- Tissue dendritic cells, 7
- Tissue sampling, 93–94
- TLRs. *See* Toll-like receptors
- TNF- α . *See* Tumor necrosis factor α
- TNF- β . *See* Tumor necrosis factor β
- Tocilizumab, 28*t*, 112*t*, 121, 348
- Toll-like receptors (TLRs), 7, 8, 11, 58
- Topical mydriatic and cycloplegic drugs, 122
- TORCH syndrome (toxoplasmosis, other agents, rubella, cytomegalovirus, and herpesviruses), 269, 270
- Torulopsis candida*, 316
- Touton giant cells, 334
- Toxic anterior segment syndrome, 82*t*
- Toxocara* spp
Toxocara canis, 46, 292, 296
Toxocara cati, 292
 toxocariasis
 diagnosis, 83–85*t*, 159
 differential diagnosis, 282, 296, 297
 granuloma (clinical example), 46
 intermediate uveitis association, 159
 overview, 292–295, 293–294*f*, 294*t*
- Toxoplasma* spp
 retinochoroiditis, 307–309, 308*f*, 323, 325
Toxoplasma gondii, 87*t*, 88*t*, 284, 285*f*, 304, 308
 toxoplasmosis
 AIDS-related, 307–309, 308–309*f*
 clinical presentation, 286–288, 286–288*f*
 diagnosis, 83–85*t*, 87*t*, 88*t*, 93, 288–289, 289*f*
 differential diagnosis, 72*t*, 188, 227, 269, 274, 282, 293, 305
 overview, 284–286, 285*f*
 treatment, 288*f*, 289–292, 291*t*
- TPMT. *See* Thiopurine S-methyltransferase
- Trabeculitis, 74*t*, 78, 215
- Traction bands, 74*t*
- Tractional retinal detachment, 21, 162
- Transient receptor potential cation channel (TRMP1), 198
- Transmigration of neutrophils, 13–14, 14*f*
- Transseptal corticosteroid injection, 100, 101, 102*f*
- Traumatic iritis, 82*t*
- Treponema pallidum*, 229, 230, 304. *See also* Syphilis
- Treponemal serologic testing, 235–236, 235*t*
- Triamcinolone acetonide
 contraindications and precautions, 288*f*, 290
 intermediate uveitis treatment, 160
 overview, 100, 101–102*f*, 103, 105*t*
 scleritis treatment, 135
 uveitic macular edema treatment, 348
- Triamcinolone suspension, 102, 105*t*
- Trigeminal nerve, 312
- Trimethoprim, 308, 310
- Trimethoprim-sulfamethoxazole
 bartonellosis treatment, 251
 nocardiosis treatment, 249
 as prophylaxis, 109, 114, 118
 toxoplasmosis treatment, 290, 291*t*
 Whipple disease treatment, 253
- TRMP1. *See* Transient receptor potential cation channel
- Tropheryma whipplei*, 252, 253
- Tryptase, 48
- Tuberculin skin test, 40, 149, 241–242

- Tuberculosis (TB)
 acute posterior multifocal placoid pigment epitheliopathy association, 175
 AIDS-related, 313
 clinical example, 39–40
 clinical pearl, 242
 diagnosis, 83*t*, 88*t*, 241–242
 differential diagnosis
 bartonellosis, 249
 leptospirosis, 247
 ocular histoplasmosis syndrome, 282
 sympathetic ophthalmia, 217
 Vogt-Koyanagi-Harada syndrome, 221–222
 West Nile virus, 273
 white dot syndromes, 166, 171, 177, 183, 188
 epidemiology, 68
 intermediate uveitis association, 157
 ocular manifestations, 238–240, 238–240*f*
 overview, 237–238
 serpiginous-like choroiditis, 178, 180, 181, 239, 241*f*
 treatment, 242–243
- Tubulointerstitial nephritis and uveitis (TINU) syndrome
 anterior uveitis association, 143–144, 143*f*
 diagnosis, 82*t*, 87–88*t*
 differential diagnosis, 153
 HLA association, 65*t*
 intermediate uveitis association, 157
- Tularemia, 249
- Tumor antigens, 33*f*, 34
- Tumor necrosis factor α (TNF- α), 11, 25*t*, 34, 35–36, 44
- Tumor necrosis factor β (TNF- β), 25*t*, 27, 28*t*, 34, 38
- Tumor necrosis factor inhibitors
 adverse effects, 113, 119
 anterior uveitis treatment, 139
 Behçet disease treatment, 227–228
 birdshot chorioretinopathy treatment, 175
 contraindications, 163
 contraindications and precautions, 119
 dosage and monitoring schedule, 112*t*, 113
 -induced ocular inflammation, 149, 149*f*
 JIA-associated anterior uveitis treatment, 154
 multifocal choroiditis with panuveitis treatment, 185
 overview, 119
 sarcoidosis uveitis treatment, 214
 scleritis treatment, 134
 serpiginous choroiditis treatment, 180
 TB testing prior to, 238, 243
 uveitic macular edema treatment, 348
- UBM. *See* Ultrasound biomicroscopy
- UGH syndrome. *See* Uveitis-glaucoma-hyphema (UGH) syndrome
- Ulcerative colitis, 142, 175
- Ulcerative keratitis, 203
- Ultrasonography, 92, 220*f*, 329
- Ultrasound biomicroscopy (UBM), 92, 132, 159
- UME. *See* Uveitic macular edema
- Undifferentiated uveitis. *See* Idiopathic (undifferentiated) uveitis
- Urine studies, 88*t*
- Urokinase, 150
- Uvea (uveal tract), 67–68, 70
- Uveal effusion syndrome, 221–222
- Uveal lymphoma, 332–333, 332*f*
- Uveal melanoma, 333–334
- Uveal tract. *See* Uvea
- Uveitic macular edema (UME)
 birdshot chorioretinopathy finding, 167
 cataract surgery complication, 23, 341, 342
 diagnosis, 89, 90*f*, 347
 human T-cell lymphotropic virus type 1 uveitis finding, 274
 immune recovery uveitis finding, 306
 nonnecrotizing retinitis finding, 263
 overview, 347
 prostaglandins and, 23
 treatment, 29*f*, 103, 104, 105*t*, 121, 122, 160, 341, 347–349
- Uveitis. *See also* Masquerade syndromes
 animal models of, 61–62
 classification, 69–70*t*, 69–72. *See also* Anterior uveitis; Intermediate uveitis; Panuveitis; Posterior uveitis
 complications, 339–351. *See also* Complications of uveitis
 evaluation and diagnosis, 67–95. *See also* Diagnostic considerations in uveitis
 HLA-associated, 62–66, 65*t*. *See also* Human leukocyte antigen (HLA) molecules
 infectious, 229–253, 255–301. *See also* Infectious uveitis
 terminology, 67–68, 69, 70*t*
 treatment options, 97–122. *See also* Therapy for uveitis
- Uveitis-glaucoma-hyphema (UGH) syndrome, 12–13, 82*t*, 147, 317
- Uveoparotid fever. *See* Heerfordt syndrome
- Vaccines
 acute posterior multifocal placoid pigment epitheliopathy association, 175
 immunomodulatory therapy and, 114
 for rubella, 267
 for tuberculosis, 149, 242
 uveitis risk factor, 149
- Valacyclovir, 258, 261–262
- Valganciclovir, 259, 266, 305
- Vancomycin, 320
- Varicella (chickenpox), 256
- Varicella-zoster sine herpete, 256–257
- Varicella-zoster virus (VZV)
 AIDS-related infections, 304
 anterior uveitis, 256–259, 256*f*
 herpes zoster ophthalmicus, 312
 posterior uveitis, 259–266
 retinal vasculitis association, 72*t*
 scleritis and, 130
- Vascular endothelial cells, 10, 13, 14*f*
- Vascular endothelial growth factor (VEGF), 18, 26*t*, 28*t*
- Vascular endothelial growth factor (VEGF) inhibitors, 150, 282
- Vascular occlusions
 bartonellosis finding, 251
 Behçet disease finding, 225
 COVID-19 finding, 279
 diagnosis, 87*t*

- granulomatosis with polyangiitis association, 205
- polyarteritis nodosa association, 203, 203f
- sarcoidosis association, 211
- Susac syndrome association, 207
- toxoplasmosis finding, 287
- Whipple disease finding, 252
- Vasculitic branch retinal vein occlusion, 245
- Vasculitides, 128, 129f
- Vasculitis, 72t, 85t, 87t, 273. *See also* Retina, vasculitis
- Vasculopathy, 71
- Vaso-occlusive necrotizing scleritis, 128, 128f
- Vasoactive amines, 11
- Vasoactive intestinal peptide, 26t
- VDRL (Venereal Disease Research Laboratory) test, 88t, 235–236, 235t
- VEGF. *See* Vascular endothelial growth factor
- VEGF inhibitors. *See* Vascular endothelial growth factor (VEGF) inhibitors
- Verticillium* spp, 316
- Viral gene therapy, 58–59
- Viruses and viral diseases, 255–280. *See also* HIV/AIDS infection
 - acute posterior multifocal placoid pigment epitheliopathy association, 175
 - Chikungunya fever, 276–277, 277f
 - Dengue fever, 274–276, 276f
 - diagnosis, 88t, 93
 - differential diagnosis, 317
 - Ebola virus, 88t, 279, 280f
 - herpesviruses, 255–267. *See also* Herpesviruses
 - human T-cell lymphotropic virus type 1, 157, 274, 275f
 - immune response and, 5, 33f, 34
 - lymphocytic choriomeningitis virus, 269
 - measles (rubeola), 270–271, 271f, 274
 - Mumps virus, 175, 269, 270
 - Rift Valley Fever, 273–274, 273f
 - rubella, 267–269, 268f
 - SARS-CoV-2, 279
 - scleritis and, 130
 - West Nile virus, 88t, 272–273, 272f
 - Zika virus, 88t, 277–278, 278f
- Visceral toxocariasis (VT), 292
- Visceralostomy, 345
- Vision loss
 - anterior uveitis, 153
 - bacterial infections, 230, 237, 249
 - bilateral diffuse uveal melanocytic tumors, 335
 - cataracts, 340
 - corticosteroid-induced, 237
 - epiretinal membranes, 349
 - granulomatosis with polyangiitis, 206
 - intermediate uveitis, 158
 - macular holes, 349
 - panuveitis, 211, 214, 215, 218, 224, 228
 - scleritis complication, 127, 136
 - uveal lymphoma, 332
 - uveitic macular edema, 347
 - viral infections, 259, 262, 268, 279
 - vision rehabilitation, 351
 - white dot syndromes, 175, 177, 183–184, 185, 192, 194–196
- Vision rehabilitation, 351
- Visual field testing (perimetry)
 - acute retinal pigment epitheliitis, 192
 - acute zonal occult outer retinopathy, 194
 - autoimmune retinopathy, 196, 198
 - birdshot chorioretinopathy, 167, 174f
 - multiple evanescent white dot syndrome, 189
 - overview, 92
- VISUAL I, II, III study, 106t, 120
- Vitamin B₁₂-binding protein, 15
- Vitiliginous chorioretinitis. *See* Birdshot chorioretinopathy
- Vitiligo, 74t, 218, 219f
- Vitrectomy, 262
- Vitreoretinal lymphoma (VRL; formerly primary intraocular lymphoma), 328–332
 - clinical presentation, 328–329f, 328f
 - diagnosis, 83–84t, 88t, 94, 328f, 329–331, 330–331f
 - differential diagnosis, 81, 221–222, 253, 317
 - genomic testing for, 93
 - intermediate uveitis association, 159
 - overview, 328
 - prognosis, 331–332
 - treatment, 116, 331
- Vitreous, 52t, 56, 57
- Vitreous biopsy, 94–95
- Vitreous haze
 - Behçet disease finding, 225
 - endogenous endophthalmitis finding, 319, 319f
 - overview, 71, 74t, 78–80, 79f, 79t, 157
 - pars planitis finding, 158
 - Susac syndrome finding, 207
- Vitreous hemorrhage, 81, 162, 202, 206, 212, 319
- Vitreous inflammatory cells
 - coccidioidomycosis finding, 283
 - Dengue fever finding, 275
 - overview, 73, 74t, 78–80, 79f, 79t
 - sarcoidosis finding, 211
 - vitreoretinal lymphoma finding, 328
 - West Nile virus finding, 272
- Vitreous opacification, 287, 349–350
- Vitreous polymerase chain reaction (PCR) testing, 93
- Vitreous traction bands, 74t
- Vitritis
 - AIDS-related, 310–311
 - Behçet disease finding, 225
 - classification, 71
 - diffuse unilateral subacute neuroretinitis finding, 297
 - Lyme disease finding, 245
 - multiple sclerosis association, 162
 - nocardiosis finding, 248
 - retinoblastoma finding, 334
 - Rift Valley fever finding, 273
 - sympathetic ophthalmia finding, 215
 - as uveitis complication, 349–350
 - viral, 259–260, 274
- Vogt-Koyanagi-Harada syndrome (VKH)
 - clinical presentation, 217, 218, 219–221f, 343–344, 350
 - delayed hypersensitivity mechanism and, 45t
 - diagnosis, 84–85t, 88t, 89, 90f, 91, 221–223, 222t
 - differential diagnosis, 166, 177, 214–215, 217, 221–222, 270

- granulomas and, 72
- HLA association, 65*t*
- overview, 217–218
- prognosis, 223
- treatment, 110, 115, 118, 120, 223
- Vogt-Koyanagi-Harada syndrome–like panuveitis, 149, 150*f*
- Voretigene neparovec-rzyl, 59
- Voriconazole, 283, 318, 323–324, 325
- VRL. *See* Vitreoretinal lymphoma
- VT. *See* Visceral toxocariasis
- VZV. *See* Varicella-zoster virus

- Wegener granulomatosis. *See* Granulomatosis with polyangiitis
- Weil disease, 247
- West Nile virus (WNV), 88*t*, 272–273, 272*f*, 274
- Western immunoblot testing, 246
- Whipple disease, 252–253, 252*f*
- White blood cells. *See* Leukocytes
- White dot syndromes, 165–196
 - acute idiopathic maculopathy, 194–196, 195*f*
 - acute posterior multifocal placoid pigment epitheliopathy, 175–177, 176–177*f*. *See also* Acute posterior multifocal placoid pigment epitheliopathy
 - acute retinal pigment epitheliitis, 192, 192*f*
 - acute zonal occult outer retinopathy, 92, 193–194, 193*f*
- ampiginous choroiditis, 177, 180–181, 181*f*, 188
- bartonellosis complication, 251
- birdshot chorioretinopathy, 167–175, 172–174*f*.
See also Birdshot chorioretinopathy
- defined, 165–166
- diagnosis, 85*t*, 89, 90, 91, 168–171*t*
- highlights, 165
- multifocal choroiditis, 182–188, 183–184*f*, 186–188*f*.
See also Multifocal choroiditis
- multiple evanescent white dot syndrome, 97, 171, 188–192, 189–191*f*, 193, 297
- overview, 166–167, 168–171*t*
- punctate inner choroiditis, 92, 177, 185–187, 186–187*f*, 232, 282
- serpiginous choroiditis, 178–180, 179*f*. *See also* Serpiginous choroiditis
- subretinal fibrosis and uveitis syndrome, 187–188
- White retinochoroiditis, 287
- Wide-field fluorescein angiography (FA), 90
- WNV. *See* West Nile virus
- Wolbachia* spp, 300
- Wound healing, 6, 17–18, 18*f*
- Wreathlike lesions, 189, 190*f*

- Xanthogranuloma, juvenile, 81, 334, 335*f*
- Zika virus (ZIKV), 88*t*, 277–278, 278*f*

