

Index

- Ab, *see* antibody
- acquired immunity, 17, 43, 52
- affinity, 20, 45, 61–62, 66, 67, 93
- affinity maturation, 21, 61, 63
- Ag, *see* antigen
- Ag-Ab complementarity, 58
- allopoetic, 93
- antibody, 12, 18, 21, 22, 25, 26, 36, 37, 47, 52–54, 58, 61, 63, 64, 71
- antigen, 17–23, 25, 32, 33, 35, 36, 43–45, 49, 53, 54, 58, 59, 61–64, 66, 71, 89, 101
- antigen-presenting cell, 11, 19, 30, 64, 66, 67, 101
- antigenic determinant, 22
- APC, *see* antigen-presenting cell
- assay, 26, 27, 30, 32
 - enzyme-linked immuno adsorbent, 32
 - radio immuno, 32
- asymptomatic state, 2
- autopoetic, 93
- avidity, 45

- B-cell, 12, 18, 20, 21, 30, 49, 53, 54, 61, 62, 64, 71, 89, 104
 - activated, 36, 54, 71
 - mature, 71
 - receptor, 18–21
- bang-bang control, 56, 58
- binding
 - multiple, 43
 - multisite, 45, 47
 - multivalent, 44–48
- binomial distribution, 75
- bivalent, 49
- blood cell
 - red, 17, 26
- burst size, 98, 99

- capsid, 97

- Cayley tree, 93
- CD4 receptor, 1, 11
- CD8 receptor, 11
- cell-mediated response, 94
- centroblast, 67
- checkpoint control, 78
- chemical kinetics, 3, 11, 33, 36, 44, 45, 64, 80, 95, 101
- chi-squared, 31–32
- clearance rate, 3, 12
- clonal elimination, 23
- clone, 21–23, 61, 64, 66, 93, 94
- combination therapy, 9
- complement, 20, 30, 31, 37, 38, 43, 46, 52, 98, 101
- complement cascade, 20, 52, 53
- CTL, *see* cytotoxic T-lymphocyte
- cytokine, 17, 43, 73, 93–95
- cytotoxic T-lymphocyte, 11, 18, 73

- dark zone, 67
- delay equation, 14
- dendritic cell, 19
- detailed balance, 43, 44, 47
- diffusion, 33, 34, 40, 48, 78, 82
- diffusion cloud, 39, 40
- diffusion equation, 34, 36, 38, 39
- dimer, 20, 45, 93
- DNA, 1, 62, 97, 98
- drug efficiency, 3
- drug interference, 4

- effector cell, 11
- effector molecule, 17
- efficiency, 8, 9
- ELISA, *see* assay, enzyme-linked immuno adsorbent
- envelope, 97, 98
- epitope, 18–19, 58, 63, 89
- equilibrium, 5, 8, 43–48, 77, 78, 82, 91, 95

- estimator, 30
 evolution, 54, 59, 61, 98
 FDCs, *see* follicular dendritic cell
 feedback, 13, 71
 Fick's law, 34
 figure of merit, 54
 first-passage time, 101
 Flory, P. J., 28
 fluctuations, 26, 33, 80–82
 focal singularity, 85
 follicular dendritic cell, 101
 Fourier transform, 35, 39
 free energy, 44
 gelation, 51–53
 generating function, 50, 51, 59–61, 74, 77, 83
 germinal center, 21, 67
 Green's function, 34, 38
 heavy chain, 20, 63
 hematopoietic stem cell, 17, 43
 hemolytic plaque, 36
 HIV, vii, 1, 7, 12, 23, 98, 101, 104
 homeostatic control, 8, 9, 15, 78
 humoral, 12, 21, 43, 71
 idiotope, 89
 Ig, *see* immunoglobulin
 IgA, 20
 IgC, 20
 IgD, 20, 43
 IgE, 20
 IgM, 20, 43, 45, 49, 52, 93
 image method, 39
 immune surveillance, 78
 immunoelectrophoresis, 25
 immunoglobulin, 18, 20, 36, 63
 innate, vii, 17
 integrase, 2
 interleukin, 17
 isotype, 20
 Jacobian matrix, 84
 Jerne, 36, 89
 kidney, 17, 67
 killer cell, *see also* natural killer cell
 killer cell, 17
 Lagrange parameter, 54, 55, 62, 65
 lentivirus, 98
 ligand, 45
 light chain, 63
 light zone, 67
 limiting dilution analysis, 30–32
 logistic, 82, 92
 logistic equation, 9
 Lotka-Volterra, 48, 67
 low resolution, 67
 Lyapunov function, 44
 lymph, 17
 lymph node, 17, 23, 67
 lymphocyte, 17–20, 22, 23, 26, 27, 43, 54, 57, 63, 73, 79, 82–84, 86, 87
 lymphokine, 18, 71, 78
 macrophage, 12, 18–20, 26, 30, 73
 major histocompatibility complex, 19
 master equation, 74, 80
 memory cell, 21, 22, 43, 53, 89
 MHC, *see* major histocompatibility complex
 Michaelis-Menten, 5, 8, 37, 95
 microcancer, 78, 82
 MK3, 97
 mortality rate, 98–100
 mutate, 9, 12, 61–64, 98
 natural killer cell, 17
 network, 49–53, 89–95
 NK, *see* natural killer cell
 nodal singularity, 84
 normal distribution, 32
 operating curve, 10
 opsonization, 20
 optimal switching, 66
 optimal trajectory, 57
 paralysis, 46, 71
 parking problem, 27
 particle conservation, 34
 peptide, 19, 20
 phage T4, 97
 phasic schedule, 66, 67
 plasma cell, 21, 43, 53, 63
 Poisson distribution, 27, 30
 Poisson transformation, 39
 poliovirus, 97, 98
 Pontryagin, 55, 65
 predator-prey, 21, 67, 68
 primary response, 22, 71
 proliferation, 49, 54, 58, 62–64, 67, 82, 91
 proliferative, 11, 91
 protease, 1, 9, 13
 random sequential adsorption, 27, 28
 RBC, *see* blood cell, red

- reaction loop, 49
- reaction rate, 43, 44, 67, 72
- regulatory molecule, 17
- replication schedule, 98
- reverse transcriptase, 1, 8, 98
- rhabdovirus, 97
- RIA, *see* assay, radio immuno
- RNA, 1, 97
- rocket electrophoresis, 26, 40
- rosette formation, 26–30
- RSA, *see* random sequential adsorption

- saddle point, 84–86, 95
- sanctuary, 12
- Scatchard plot, 45
- secondary response, 22, 71
- segments
 - V, J, D, 63
- self-antigen, 23, 58
- self-tolerance, 23
- self/nonself discrimination, 23
- separatrix, 95
- sequence space, 61
- single radial immunodiffusion, 25
- sol-gel, 49, 52
- somatic hypermutation, 21, 61
- somatic mutation, 89
- somatic mutations, 22
- spleen, 17, 67
- stable sink, 85
- stationary point, 7, 48, 67
- stationary solution, 6, 7
- stationary state, 6, 8
- stochastic kinetics, 80
- suppressed, 91, 92
- symbolic dynamics, 69–71

- T-cell, 1, 3, 8–12, 15, 18–20, 23, 43, 61, 71, 73, 94, 98, 101
 - helper, 1, 11, 18, 21, 71
 - receptor, 18–21
- Th1, 18, 20, 94, 95
- Th2, 18, 94, 95
- thymus, 9, 17, 23
- time delay, 14–89
- TMV, 97
- tolerant, 89, 93
- tree, 49, 50, 52, 53
- trivalent, 49, 52
- tumor escape, 82–83
- two-threshold function, 90, 91, 94

- unstable source, 85

- V, *see* variable region
- valence, 37, 46, 51
- van't Hoff, 44
- variable region, 20, 63
- virgin, 71, 91, 92
- virgin state, 91
- virion, 1, 3, 9, 15, 97, 98, 101
- viroid, 97
- virtual source, 39

- well-mixed, 44, 90