

Author Index

A

Aaskov J, 220, 227
Abraham J, 247
Abram ME, 282
Acevedo A, 49, 192, 194, 198, 210
Adiwijaya BS, 293
Aebischer T, 243
Agudo R, 205–206, 256, 306, 333
Aguirre J, 203
Ahmed R, 234, 250–251, 253, 260
Aita T, 48–49
Albarino CG, 239–241, 244, 248
Alexander HK, 282
Alizon S, 289
Altenberg L, 68
Althaus CL, 285
Alves D, 14, 122
Ancliff M, 135, 137
Anderson JP, 328
Anderson PW, 73
Andino R, 48–49, 220
Andrei G, 255
Appleby TC, 309
Arbiza J, 220
Archer AM, 241, 244–245, 249
Arias A, 14, 205–206, 311, 317, 330, 334
Armstrong KL, 208
Arnold JJ, 5, 305, 307, 309–312
Arora P, 285
Arribas M, 205–206
Arslan E, 82
Ashkenasy G, 149
Asquith B, 289
Astrovskaia I, 189
Athavale SS, 49, 52, 75
Austin DJ, 286
Avetisyan Zh, 137

B

Baake E, 70, 76–77, 110, 122, 124, 126–128, 137
Babajide A, 49
Baccam P, 294–295
Backofen R, 53
Baglolle DJ, 233
Bagnoli F, 136–137
Bakhanashvili M, 304
Balagam R, 284, 289
Ballana E, 290
Baranovich T, 334
Baranowski E, 251, 253
Barber DL, 234
Barouch DH, 290
Barrera Oro JG, 233, 258
Barria MA, 17
Bartel DP, 52
Bass BL, 246
Bateman DA, 17
Batorsky R, 284
Batschelet E, 11
Beauchemin CA, 294–295
Beaucourt S, 250, 305
Beerenwinkel N, 68, 183–184, 210
Bergthaler A, 251
Bernacki JP, 17
Bernard LC, 304
Bernhart SH, 53
Betancourt AJ, 66
Beyer WR, 235
Bezzi M, 136–137
Biebricher CK, 4–5, 11, 13, 18, 46, 67, 70, 163, 169, 204
Billeter MA, 11, 246
Binder M, 293
Blasdell KR, 249

Blows MV, 64
 Bocharov G, 284
 Bodewes R, 241–242, 245
 Boerlijst MC, 284
 Bolken TC, 255
 Bollback JP, 66
 Bonhoeffer S, 208, 282–283, 285, 290
 Bonnac LF, 255
 Bonnaz D, 164
 Borden KL, 237
 Borenstein E, 211
 Bornberg-Bauer E, 49
 Borrow P, 251
 Botten J, 259
 Boulay F, 227
 Bowen MD, 241, 247, 249, 258–259
 Bratus AS, 77
 Bray M, 233
 Bressanelli S, 309
 Bretscher MT, 284–285
 Brown AJ, 284
 Brown RJ, 250
 Brumer Y, 142–143, 145
 Brunotte L, 237, 239
 Buchmeier MJ, 232, 234–236
 Buckheit RW Jr, 208
 Buesa-Gomez J, 251–252
 Bull JJ, 163–169, 205, 208
 Burch CL, 208
 Bürger R, 76
 Buss LW, 51, 55
 Butcher SJ, 309

C

Cabot B, 250
 Cajimat MN, 242, 244
 Cale EM, 324
 Cameron CE, 5, 163, 256, 306, 309–312, 328
 Campbell Dwyer EJ, 237
 Campbell KP, 249
 Candurra NA, 255
 Cann AJ, 315
 Cao W, 251
 Carr J, 13
 Carrasco P, 207
 Carrion R Jr, 259
 Carvajal-Rodriguez A, 285
 Casals J, 258
 Cascales E, 147
 Cases-González C, 205
 Castilla J, 17
 Castro C, 5, 163, 309, 311–312
 Cattaneo R, 238, 246
 Cen S, 289

Chaitin GJ, 34
 Chan HS, 49
 Chang DB, 294
 Chao L, 202, 208
 Charleston MA, 247
 Charlesworth B, 70, 110
 Charrel RN, 241, 244–245, 249
 Chatterjee A, 291
 Chen C, 309
 Chen IA, 148
 Chen M, 240
 Chen P, 166, 168
 Cheng-Mayer C, 250
 Cheung PPH, 306, 314, 317
 Childs JE, 247
 Choe H, 247–248
 Choi KH, 309
 Chou H-H, 68
 Christiansen FB, 285
 Chun TW, 284
 Ciota AT, 220–221
 Ciurea A, 243
 Clark AG, 284
 Clavel F, 281
 Codoñer FM, 174, 211
 Coffey LL, 205, 208, 306, 312, 314, 317
 Coffin JM, 284
 Combe M, 308
 Coombs D, 295
 Cordo SM, 255
 Cornu TI, 237, 239, 242
 Coto CE, 233, 255
 Coulibaly-N'Golo D, 247
 Covacci A, 195
 Covert AW, 208
 Cowperthwaite MC, 164
 Crick FHC, 75
 Crotty S, 205, 329
 Crow JF, 2, 76, 122
 Cuesta JA, 203
 Cupples CG, 329

D

Dadon Z, 148
 Dahari H, 291, 293
 Dahlberg JE, 223, 227
 Dalldorf G, 248
 Damonte EB, 233, 244, 255
 Dapp MJ, 205, 253, 288–289, 304, 312, 328
 Das SR, 208
 De Boer RJ, 289–290
 De Clercq E, 255, 334
 de la Torre JC, 171, 237, 239, 242–243, 249
 de Lamballerie X, 241, 249

- de Visser JAGM, 211
Deeks SG, 281, 290
Deem MW, 122, 138
Deforges S, 250
Deisboeck TS, 16, 175
Delgado S, 244
Demetrius L, 83
Demogines A, 247–248
Denison MR, 254
Derrida B, 10
Di Giallonardo F, 186
Dimitrov RA, 53
Dixit NM, 284–286, 289, 291, 293, 324, 326
Djavani M, 237
Dobzhansky T, 25
Domingo E, 11–12, 14–16, 163, 171, 195,
205–206, 220, 243, 249–250, 257, 316,
324–329, 332, 335–336
Domingo-Calap P, 207
Downs WG, 247
Doyon L, 286
Drake JW, 11, 76, 206, 243, 249, 304, 329
Drossel B, 122, 136
Duchêne S, 76
Duffy S, 220
- E**
Eckerle LD, 308–309, 312, 317
Edwards SF, 73
Eigen M, 2, 4, 6, 10–11, 13–14, 26, 28, 30–31,
38–40, 45–46, 53–54, 76–77, 86–87,
90–92, 122–123, 162–163, 169, 204–205,
220, 252, 257, 283, 288, 316, 329
Ejima T, 289
Elemans M, 289
Elena SF, 66, 173, 208
Ellenberg P, 242–245
Ellington AD, 47
Emery VC, 291
Emmerich P, 259
Emonet SF, 239–240, 247, 249
Enns RH, 6
Enria DA, 233, 258
Erdős P, 110
Erlich HA, 47
Escarmís C, 204
Esté J, 290
Evans CF, 251, 253
- F**
Fahy E, 47
Falugi P, 195
Falzarano D, 233, 258
Feldman MW, 173
Feldmann H, 233, 258
Fellay J, 290
Ferré-D'Amaré AR, 48, 75
Ferrer-Orta C, 309–311
Ferretti AC, 54
Fichet-Calvet E, 233
Fischer W, 324
Fisher RA, 62
Flamm C, 45
Flanagan ML, 247–248
Flanagan JB, 11
Flatz L, 239
Flavell RA, 11
Flury F, 304
Fontana W, 51, 55, 73, 75
Fontanari JF, 14, 122, 126, 149–150
Forst CV, 49
Fox EJ, 16
Franz S, 122
Fraser C, 285, 290
Freedman DO, 233
Frey E, 148, 163
Frieden BR, 16, 18
Froissart R, 172
Fulhorst CF, 244, 249, 258
Fullerton SWB, 309
Furió V, 312
- G**
Gabriel W, 77, 122
Gadhamsetty S, 284, 290
Gago S, 8, 14, 76, 206
Galluccio S, 77
Galstyan V, 122, 138
Galtier N, 209
Gandhi N, 156
Gandon S, 167–168
Gansterer WN, 98
Ganusov VV, 289
Gao H, 173
Garcia JB, 249, 258
García-Arriaza J, 202
Gardiner WC Jr, 4
Gatenby RA, 16–18
Gavrilets S, 64
Geisbert TW, 233
Geleziunas R, 242
Gerland U, 136–137
Gerold G, 326
Ghaemmaghami S, 17
Ghany MG, 291, 293
Gheorghiu-Svirschevski S, 284
Giarré L, 195
Gilbert W, 49

Gillespie DT, 82–84, 168
 Gillin FD, 304
 Gilmore JB, 286
 Gladkih I, 47
 Glémin S, 209
 Gnädig NF, 307–308, 312, 314
 Gohara DW, 310–11
 Gold L, 47
 Gong P, 307, 309, 311
 Gonzalez-Lopez C, 171–172, 249, 253, 330, 334
 Good BH, 210
 Gorodetsky P, 146
 Gorodkin J, 49–50
 Graci JD, 174, 206, 253, 255–256, 315, 328
 Graham RL, 312, 314–315
 Grande-Pérez A, 171–172, 203, 205–206, 243, 246, 249, 253–254, 257, 329–330, 332, 334
 Greene WC, 283, 288
 Greenwood AG, 248
 Gross MD, 304
 Gruener W, 51
 Gruez A, 309
 Grüner W, 110
 Guedj J, 293

H

Hall JD, 304
 Hall JS, 250
 Hamming RW, 64
 Hance AJ, 281
 Hancioglu B, 294
 Hansen JL, 309
 Happel R, 45
 Harki DA, 255
 Harris KS, 253, 255, 288–289
 Harris RS, 206
 Harrison DN, 308
 Hartl DL, 284
 Hashiguchi T, 221–222
 Hass M, 239
 Hastie KM, 237
 Hayashi Y, 48
 Haydon DT, 250
 He X, 309
 Heim MH, 291–292
 Heldt FS, 295
 Hermisson J, 122–123, 125, 163
 Herrmann E, 195
 Herz AV, 286
 Hetzel U, 241–242, 245
 Hicks C, 255
 Hietpas RT, 48
 Higgs PG, 122, 128

Hinkley T, 184
 Ho DD, 279
 Ho SYW, 76
 Hoetelmans RM, 283
 Hofacker IL, 73
 Hofbauer J, 54
 Hogeweg P, 14, 163–164, 205
 Holder BP, 295
 Holland JJ, 11–12, 163, 171, 205–206, 220, 243, 249, 252, 304, 328–329, 336
 Holmes EC, 207
 Holtz CM, 206
 Hopfield JJ, 312
 Hordijk W, 55
 Horga MA, 242
 Hosaka Y, 223, 227
 Hotchin J, 250
 Howard CR, 235
 Hu C-K, 14, 77, 122, 125–127, 135, 137–138, 205, 288
 Huang IC, 242
 Huggins JW, 233
 Hugot JP, 247
 Hull R, 202
 Hundley HA, 246
 Huynen MA, 10, 52, 211
 Hwa T, 136–137

I

Iranzo J, 171–172, 174, 203, 205–206, 335
 Irwin NR, 247
 Isaacson M, 233
 Ishii A, 242
 Itan E, 146–147

J

Jabara CB, 187
 Jackson AP, 247
 Jahrling PB, 233, 258
 Jain K, 64
 Janet A, 62
 Jay MT, 249
 Jefferson T, 294
 Jelcic I, 250
 Jilek BL, 288
 Jimenez JI, 48–49
 Jiménez JI, 75
 Johnson VA, 281
 Jones BL, 6, 77
 Josefsson L, 284
 Joyce GF, 54
 Jridi C, 250
 Julias JG, 206
 Jung A, 284

Jyssum K, 304

K

Kama A, 146
 Kaneko K, 126, 137
 Kang Y-G, 77
 Kapheim KM, 220–221
 Katz JM, 238
 Kauffman SA, 55, 68, 69
 Kawaoka Y, 238
 Ke R, 227
 Kessler D, 146
 Keulen W, 304
 Kiedrowski G, 47
 Kilgore PE, 233
 Kimura M, 2, 32, 52, 76, 110, 122, 166, 209
 King AMQ, 242
 Kingman JFC, 69
 Kirakosyan Z, 122–123, 125, 134
 Kirkegaard K, 205–206, 250, 256, 305, 312–313
 Kirkpatrick S, 73
 Klavinskis LS, 251
 Kleiman M, 149, 153
 Knöppel A, 147
 Koch AJ, 164
 Koelle K, 211
 Koonin EV, 311
 Korneeva VS, 306
 Kosmrlj A, 290
 Kouyos RD, 2, 19, 49, 67–68, 208, 210–211, 284–285
 Krall P, 163
 Kramer FR, 27, 30, 46
 Kranzusch PJ, 237, 242
 Krug J, 64
 Kunz S, 236–237, 251
 Küppers B-O, 24–26, 28, 30–31, 33–36, 40
 Kwang J, 305, 314

L

Lalić J, 208, 209
 Lamb RA, 221, 223
 Lan S, 239–240
 Lanfear R, 76
 Laurenzi IJ, 82
 Lauring AS, 48–49, 211, 220, 315
 Lázaro E, 204, 206, 208
 LeClerc JE, 304
 Lecompte E, 247
 Lee AM, 256
 Lee B, 149, 151
 Lee CH, 205, 252
 Lee DH, 46

Lee KJ, 239
 Leitner T, 284
 Lelke M, 239
 Lenz O, 235
 Lesburg CA, 309
 Leuthausser I, 76, 122
 Levi LI, 305, 307, 312, 316
 Levin S, 68
 Levine H, 146
 Levine HA, 48
 Levy DN, 284
 Lewicki H, 243
 Li J, 17
 Li T, 47
 Li YP, 326
 Liang Y, 240
 Lifson S, 88
 Lincoln TA, 54
 Lindenbach BD, 326
 Lipsitch M, 146
 Little SJ, 279
 Litwin S, 163, 288
 Liu X, 307–308, 311–312, 314–315
 Lobkovsky AE, 49
 Loeb LA, 16, 163, 205, 252, 288–289, 328–329
 Lopez N, 239
 Lorenz R, 49–51, 73
 Lou DI, 187, 192
 Loureiro ME, 242
 Lourenço J, 209
 Love RA, 309
 Lu G, 309
 Lucas-Hourani M, 336
 Luce R, 46
 Lukashevich IS, 233, 244–245, 250
 Luo J, 16
 Luque D, 227
 Luthra R, 47

M

Magnus C, 289
 Mahal SP, 17
 Maldarelli F, 281
 Malet H, 309
 Malim MH, 289
 Mallela A, 246
 Manrubia SC, 171–172, 203–206, 253
 Mansky LM, 206, 282, 304
 Marcotte LL, 310
 Marin A, 19
 Markowitz M, 281
 Martin G, 167–168
 Martín V, 174, 246, 249–250, 254

- Martínez JP, 208
 Martínez-Sobrido L, 237, 240
 Martín-Hernandez AM, 306
 Maruyama T, 166, 209
 Mas A, 15, 249
 Mathews DH, 49
 Matloubian M, 250–251
 May R, 167, 279
 Maynard Smith J, 211
 McBride JL, 6, 77, 122, 126
 McCaskill J, 6
 McCormick JB, 233
 McCoy JW, 62
 McGhee GR Jr, 64
 McGinnes LW, 242
 McKee KT Jr, 233
 McLean AR, 289
 McMinn PC, 314
 Medeiros LJ, 47
 Melikyan A, 130
 Meng T, 305, 314
 Merkler D, 240
 Messer PW, 190–191
 Mets MB, 233
 Meyer BJ, 236
 Miao H, 294
 Miller JH, 329
 Mills DR, 10, 16, 26–27, 30, 37, 67
 Mills JN, 244
 Minoche AE, 186
 Mohanty U, 286
 Mohri H, 291
 Mollison D, 79
 Monath TP, 258
 Moreno E, 203
 Moreno H, 173, 205, 242–245, 249, 253–258, 335
 Morens DM, 294
 Morimoto K, 250
 Morin B, 236, 239
 Morrison TG, 242
 Moshkoff DA, 245
 Mostowy R, 289
 Moya A, 208
 Mühlebach MD, 221
 Muller G, 235
 Muller HJ, 204
 Mullins JI, 288–289, 328
 Mullis KB, 46
 Murillo LN, 291
 Murphy DG, 246
 Murphy RM, 17
 Musso F, 193
 Muzyczka N, 304
- N**
 Nájera I, 325
 Nakashima M, 221
 Násell I, 80
 Nathans R, 289
 Nee S, 202
 Neher RA, 190–191, 284
 Neuman BW, 238
 Neumann AU, 291
 Neumann G, 238
 Neves AGM, 135
 Ng K, 309
 Nicolaou KC, 47
 Nicolson GL, 16
 Niederbrucker G, 98
 Nijhuis M, 257, 284, 324
 Nilsen-Hamilton M, 48
 Nilsson M, 146
 Nishikura K, 245–246
 Nonacs P, 220–221
 Nossal NG, 304
 Novella IS, 173, 249
 Nowak MA, 14, 16, 87, 148, 167, 279, 285–286, 289, 291
 Nowell P, 16
 Noyce RS, 221
 Nunberg JH, 237
 Núñez JI, 208
- O**
 O’Dea EB, 174
 O’Farrell D, 309
 Obermayer B, 148, 163
 Ochoa G, 14
 Oelschlegel AM, 17
 Oestereich L, 334
 Ojosnegros S, 15, 17, 203, 206
 Oldstone MB, 234, 248–251, 253
 Orgel LE, 328, 330
 Orr HA, 209
 Ortega-Prieto AM, 253, 333–334
 Ortiz-Riano E, 336
 Otwinowski J, 48
- P**
 Padmanabhan P, 292–293, 324, 326
 Palacios G, 233, 245
 Palmer ME, 146
 Palmer S, 281
 Pan J, 309
 Pariente N, 205, 257, 335
 Park JM, 14, 135, 137
 Park J-M, 77, 122, 138
 Parks GD, 221, 223

Pasqual G, 236
 Pathak VK, 206
 Paul N, 54
 Pawelek KA, 294
 Pawlowsky JM, 293
 Peersen OB, 307, 309, 311
 Peliti L, 10, 122–124
 Peng W, 136–137
 Pennings PS, 284–285
 Perales C, 172, 174, 205–206, 220, 249, 253, 257, 324, 326, 330–331, 333–336
 Perelson AS, 279, 281, 286, 289–291
 Perez M, 235, 237–239
 Peters CJ, 233, 247–248, 258
 Pfau CJ, 250
 Pfeiffer JK, 205–206, 250, 256, 305, 312–313
 Phillips AN, 279
 Phillips PC, 207
 Pietschmann T, 326
 Pillai S, 174
 Pinschewer DD, 235–237, 239–240
 Pircher H, 243
 Pita JS, 206
 Pitt JN, 48, 75
 Plattet P, 221
 Plemper RK, 221
 Plöger TA, 47
 Plotkin JB, 48
 Poch O, 237
 Poelwijk FJ, 210–211
 Polson AG, 246
 Prabhakaran S, 188
 Prince GA, 250
 Prosperi MC, 189
 Provine WB, 62
 Pulkkinen AJ, 250

Q

Qi X, 237

R

Rabi SA, 287
 Radford AD, 210
 Radoshitzky SR, 247
 Rager M, 223, 227
 Ramratnam B, 281
 Rangnekar SS, 6
 Rappuoli R, 195
 Rasmussen S, 47
 Raz Y, 147–148
 Reetz MT, 48
 Regoes RR, 289
 Reha-Krantz LJ, 304
 Reidys C, 51, 64, 110

Reifman J, 48–49, 211
 Remold SK, 208
 Rényi A, 110
 Ribeiro RM, 279, 283–285, 289, 291, 293
 Richman DD, 324
 Richmond JK, 233
 Rico-Hesse R, 241, 244–245, 249
 Rima BK, 246
 Riviere Y, 244–245, 249, 251
 Robertson MP, 54
 Rodrigo AG, 284
 Rodrigo WW, 240
 Rogers DJ, 233
 Rojek JM, 236, 240
 Rokyta DR, 208
 Romero PA, 48
 Rong L, 293
 Rosenbloom DI, 286, 288
 Rouzine IM, 137, 284
 Rowe W, 48–49
 Rozen-Gagnon K, 307–308, 314, 317
 Rueda P, 246
 Ruiz-Jarabo CM, 243, 254, 256, 334
 Ruppin E, 211
 Ruse M, 62
 Ruzzo WL, 49–50

S

Saakian DB, 14, 77, 122–123, 125–126, 128–129, 133–138, 205, 288
 Sabeti PC, 236
 Sadeghipour S, 305, 314
 Saenz RA, 294
 Salazar-Bravo J, 247–248
 Salemi M, 189
 Salgado PS, 309
 Salvato MS, 241, 248–251
 Sampah ME, 287
 Sanchez AB, 239
 Sanchez S, 248
 Sánchez-Navarro JA, 203
 Sanchis J, 48
 Sanjuán R, 11, 66, 183, 206–208, 211, 250, 308
 Sanz-Ramos M, 254
 Sardanyés J, 164, 166, 173–174
 Sato K, 126, 137
 Saunders AA, 237
 Schaaper RM, 304
 Scheidel LM, 256
 Schlub TE, 282, 284
 Schmidt LD, 78
 Schrödinger E, 36
 Schultes EA, 52

- Schuster P, 2, 6, 9–10, 14, 19, 26, 38–40, 45, 51, 53–54, 68–69, 71, 73, 83, 86–88, 90–92, 94, 102, 109–111, 122–123, 163, 169, 288, 324–328, 336
- Schwarz G, 89
- Seidaghat AR, 286
- Segel LA, 47
- Seifert D, 195
- Seneta E, 77, 86
- Seo TK, 284
- Seronello S, 206
- Severson WE, 205
- Sevilla N, 243, 249, 251
- Shakhnovich EI, 141–145, 166–168, 173
- Sheldon J, 326–327
- Shen L, 287
- Sherrington D, 73
- Sheward DJ, 187
- Shimomaye EM, 251
- Shirogane Y, 172, 220, 223–226
- Sicard A, 203
- Sidwell RW, 256
- Siegel EC, 304
- Sierra M, 174, 306
- Sierra S, 205, 257, 329
- Sigmund K, 54, 83
- Sikora E, 250
- Siliciano RF, 283, 288
- Simek MD, 290
- Simon EH, 223, 227
- Skipper RA Jr, 62
- Slemrod M, 47
- Smith AM, 289
- Smith EC, 254, 256
- Smith HC, 291, 294
- Smith JI, 55
- Smith MA, 52
- Smith RJ, 286
- Smither SJ, 334
- Sniegowski PD, 304, 308
- Snoad N, 146
- Sobrinho F, 12
- Sogoba N, 233
- Solé RV, 15–16, 175
- Southern PJ, 236
- Spiegelman S, 27, 30, 67
- Spieß EB, 12
- Stadler BMR, 54–55, 148
- Stadler PF, 45, 54–55, 69, 110, 148
- Stafford MA, 279, 282
- Steinhauer DA, 11, 195
- Steinmeyer SH, 173, 334
- Steitz TA, 309
- Stenglein MD, 241, 245
- Stephan-Otto Attolini C, 55
- Stephenson KE, 290
- Stiegler P, 49–50
- Strecker T, 235, 237–238
- Streeter DG, 256
- Strogatz SH, 80
- Suárez P, 306, 317
- Subbarao K, 238
- Sullivan BM, 251
- Summers J, 163, 288
- Sumper M, 37
- Suryavanshi GW, 284–285
- Swetina J, 87–88, 90, 102, 111, 122–123
- Szathmáry E, 47
- Szendro IG, 210
- Szostak JW, 47
- T**
- Taddei F, 304
- Takeuchi N, 14, 163–164, 205
- Tamura K, 242
- Tannenbaum E, 141–143, 145–147, 149–157
- Tao Y, 309
- Tapia N, 257, 335
- Tarazona P, 77, 89, 122
- Tatsuo H, 221
- Taubenberger JK, 294
- Tebas P, 288
- Tejero H, 92, 163, 164, 169, 173, 329, 333
- Temin HM, 282
- Teng MN, 252
- Thangavelu PU, 289
- Thomas E, 291
- Thompson AA, 309
- Thompson CJ, 6, 77, 122, 126
- Tishon A, 251, 253
- Töpfer A, 189
- Torarinsson E, 52
- Tortorici MA, 236
- Toulouse G, 73
- Tripathi K, 289
- Trivedi P, 250
- Tssetsarkin KA, 208
- Tsibris AM, 324
- Tsimring LS, 136–137
- Tuerk C, 47
- Turner DH, 49
- Turner PE, 208
- U**
- Urata S, 237–238, 240

V

Vaidya NK, 291
 Valsamakis A, 251
 van Kampen NG, 82
 Van Slyke GA, 306, 308, 314, 317
 Vanni I, 17
 Varga S, 47
 Vasilakis N, 205
 Vazquez-Calvo A, 255
 Vignuzzi M, 205, 208, 220–221, 250, 305, 313, 315
 Vijay NN, 284, 289
 Villarreal LP, 220
 Vives-Adrian L, 309
 Volberding PA, 281
 Volkenstein MV, 38
 Volpon L, 237
 von Kiedrowski G, 46, 148
 von Messling V, 238

W

Wachsmann MB, 255
 Wagner A, 211
 Wagner GP, 163
 Wagner H, 70, 76–77, 110, 122, 127–128, 136–137
 Wagner N, 148, 149, 155
 Wahl LM, 286
 Wainberg MA, 304
 Wakita T, 326
 Walker BD, 290
 Walsh B, 64
 Wang C, 185
 Ward CD, 11
 Ward SV, 246
 Watson JD, 75
 Weaver SC, 208, 244, 248–249, 258
 Wei X, 279
 Weinberger ED, 68
 Weinreich DM, 68
 Weiss JN, 287
 Weissmann C, 10, 17, 18

Whelan SP, 237, 242
 Wickner RB, 17
 Wiehe T, 70, 94
 Wilke CO, 13–14, 102, 143, 163–164, 173, 183, 288–289, 334
 Wills PR, 47
 Withlock MC, 210
 Witzany G, 220
 Wolf JB, 184
 Woo HJ, 48–49, 211
 Woodall J, 233
 Woodcock H, 122, 128
 Wright CF, 250
 Wright S, 62–63, 183, 209
 Wu B, 167
 Wu H, 286
 Wu-Hsieh B, 251, 253
 Wylie CS, 166–167, 173

X

Xie X, 307, 314, 317

Y

Yang X, 311–312
 Yap TL, 309
 Yates A, 289
 York J, 237
 Young CS, 294
 Young KC, 256–257
 Young PR, 235

Z

Zagordi O, 186, 188, 210
 Zahn RC, 245–246
 Zapata JC, 241, 248–249
 Zeng J, 305–306, 312, 314
 Zhang J, 291, 326
 Zimm BH, 89
 Zinkernagel RM, 234
 Zuker M, 49–50, 53, 73

Subject Index

A

Adaptation, 202, 205
Adaptive MCMC, 197
Adaptive peaks, 210
ADAR1-L, 246
Aenome, mutation rates, 76
Alfalfa mosaic virus, 203
Algorithm, Gillespie, 84
Alpha-dystroglycan (α DG), 236
Ambisense coding strategy, 234
Analogue, 328
 mutagenic, 328
Animate, 156
Antagonistic pleiotropy, 208
Antibiotic drug resistance, 141, 142, 147
Antibiotic resistance, 147
Antiviral activity, broad-spectrum, 336, 337
Antiviral agents, 18
Antiviral designs, mutagenesis-based, 333
Antiviral inhibitors, 324
Antiviral interventions, 19
Antiviral therapies, 205
Antiviral treatments, 336
Argentine HF (AHF), 233
Artificial chemistry, 55
Asexual replication, 152
Asexual reproduction, 153
 unicellular organisms, 150
Associative learning, 142
Auasi-equilibrium, 13
Autocatalysis, 5, 78, 82
Autocatalytic chemical reaction, 44

B

Back mutation, 28
Bacteriophage, 205
Bacteriophage $\Phi 6$, 208
Bacteriophage Q β , 10, 67

Baker's yeast, 152, 153
Base pair distance, 72
Bifurcation, transcritical, 80
Bimodality, bimodal, 82
Bipartite viruses, 202
Branching process, multi-type, 83
Broad-spectrum antiviral drug, 256
Budding, 237

C

Cancer, 141
Cancer cell, 15, 16, 18
 dynamics, 16
 mitosis, 18
 proliferation, 16
Candida, 233
Catalytic networks, 142, 148
Cell-based minireplicon (MR), 236, 239
Center manifold, 13, 14
 reduction, 13
Changing environments, 205
Chemical mutagens, 156
Chikungunya virus, 208
Chromosomal instability, 141, 142
Chronic infections, 232
CIN, 147
CIN tumors, 145
Circadian rhythms, 155
Class merger, complementary, 89, 96, 106, 109
Clonal evolution, 16
Coevolution hypothesis, 247
Cognition, 142
Combination therapy, 257, 335
Compensatory mutations, 204, 207, 208
Competition dynamics, 15
 among cells, 15
Complementation, 13, 249

- Consensus, 335
 - sequence, 4, 113, 326
- Conservative replication, 142, 144
- Constant environments, 205
- Constant organization, 45
- Cooperative interactions, 206
- Cooperative transition, 89
- Cross-catalysis, 149
- Crow-Kimura model, 2, 124
- CTL escape mutants, 243

- D**
- Darwinian evolution, 26–27, 44
- Deep sequencing, 12, 14
- Defective genome, 203
- Defectors, 254, 335, 170–171
 - genomes, 330
- Degree of independence (DI), 288
- Deleterious mutations, 204
- Dendritic cells (DCs), 251
- Derepression, 142
- Diploid organisms, 152
- Diploids, 152
- Direct acting antivirals (DAAs), 293
- Discrete-Time Eigen Model, 124
- Distribution of beneficial effects, 209
- Division of labor, 142, 154, 155
- DNA proofreading, 141
- Drug pharmacokinetics, 286–288
- Drug resistance, 282–286
 - during treatment, 285
 - mutation-selection balance, 283–284
 - preexistence of, 283–285
- Drug resistant subpopulations, 282
- Dynamic environments, 147
- Dynamic landscape, 141, 148

- E**
- Ebola hemorrhagic disease virus, 334
- Effects of mutations, 207
- Eigen model, 123
- Eigenvalues, 78, 86
- Eigenvector, 78, 86
- Endocytosis, 235
- Environment, 208
- Environmental stress, 147
- Epigenetic mechanisms, 18
- Epistasis, 184, 207, 209, 210
 - epistatic interactions, 68
- Error-prone replication, 249
- Error cascade, 143
- Error catastrophe, 16, 143, 162–165, 169–170, 254, 328
 - in cancer, 16
 - limits of, 163–165
- Error rate, 7, 205, 206
 - critical, 92
 - uniform, 7, 84, 86
- Error threshold, 8, 18, 76, 86, 89, 90, 93, 95, 98, 106, 110, 114, 149, 162–165, 204, 288, 328, 329
 - violation, 333
- Evolution
 - adaptive, 67
 - experimental, 67
 - forces influence, 284
 - reactor, 26–27
- Evolutionary innovations, 211
- Evolutionary optimisation of information, 30–33
- Evolutionary trajectories, 211
- 3'-5' Exoribonucleases, 237
- Extinction, 169–170, 203, 255, 329
 - mutagenesis-driven, 329
- Extinction of the unfittest, 47

- F**
- F-plasmid, 148
- Faba bean necrotic stunt virus, 203
- Favipiravir, 334
- Features, 156
- Fidelity variants, 308
 - high-fidelity variants, 305
 - low-fidelity variants, 306
 - in vitro, 311
 - in vivo, 312
- Fitness, 2–4, 7, 79, 208, 325–327
 - cost, 325, 326
 - drug-resistant determinant, 327
 - effects of mutations, 208
 - factor, 147
 - highest, 2
 - increase, 327
 - landscape, 2
 - mean, 2, 4
 - optimization, 3, 4
 - recovery, 326
 - replicative, 327
 - viral, 333
- Fitness landscape, 14, 19, 45, 86, 87, 183, 205, 209, 324
 - fully resolved, 66
 - HIV, 67
 - Nk, 75
 - rugged, 324
 - simple, 64, 65, 86, 98

single-peak, 89
 tunable, 68
 variable, 14
 Flow rate, 79
 Flow reactor, 78, 82, 84
 Fluctuating environments, 146
 Fluctuations, 204
 Fluorouracil (FU), 329, 333, 334
 Folding, free energy, 74, 75
 Foot-and-mouth disease virus (FMDV), 204,
 206, 208, 230
 Fujiyama-like landscape, 209
G
 Genetic diversity, 205
 Genetic drift, random, 62
 Genetic information, stability, 333
 Genetic instability, 147
 Genetic mismatch repair, 146
 Genetic repair, 141, 146, 150
 Genome segmentation, 203
 Genome space, 211
 Genotype-phenotype maps, 51, 70
 Genotype, fittest, 85
 Genotype space, 62
 Global fitness maximum, 209
 Graphs, random, 110
 Growth hormone disease syndrome, 251
H
 Hamilton-Jacobi equation, 128
 Hamming distance, 4, 7, 10, 63, 64, 66, 71, 87,
 93, 95, 104, 110, 111
 Haploid, 151, 152
 fusion, 153
 Haplotype inference, 186
 Hemorrhagic fever, 233
 Hepatitis B virus (HBV), 326
 Hepatitis C virus (HCV), 291–293, 326
 Heterooligomer, 221–227
 Highly mutating environments, 149
 Horizontal gene transfer (HGT), 141, 147, 148
 Host, 208
 Host cell, 206
 Host switching, 247
 Human immunodeficiency virus (HIV), 149,
 208, 278
 quasispecies theory, 288–289
 type 1, 326
 Human transferrin receptor, 236
 Hypermutated LCMV, 246

I
 Immortal strand co-segregation, 145
 Immune suppression, 234
 Immunosuppressive variants, 250–251
 Imperfect lesion repair, 143
 Inclusion body disease (IBD), 245
 Infectivity, specific, 329
 Infinitely large population, 203
 Inflow, 80, 83
 Influenza A virus (IAV), 294
 Influenza virus, 334
 Information, 2
 genetic, 2
 Inhibitor escape mutants, 257
 Inhibitor resistance, 325, 335
 Instantaneous inhibitory potential (IIP), 287
 Interference, 13, 172–173
 Intersection theorem, 51
 Intra-host viral variability, 250
 Intraspecific competition, 203
J
 Junin virus (JUNV), 233
K
 Kinetics, 4
 autocatalytic, 4
L
 Labor, 153
 Landscape
 adaptive, 62
 bacterial, 68
 Nk, 68
 realistic, 68, 98
 simple, 89, 94
 single-peak, 65, 66, 70, 84, 102
 Lassa fever (LF), 233
 Lassa virus (LASV), 233
 Late (L) domain motifs, 238
 Lethal defection, 170–173, 253, 330, 331, 334
 complementation, 172–173
 interference, 172–173
 stochastic extinction model, 171–172
 Lethal defective particles, 206
 Lethality, 169–170
 Lethal mutagenesis, 8, 161–176, 205, 206, 252,
 316, 328, 329, 334
 hypothesis, 205
 theories. *See* Theories of lethal mutagenesis
 Level crossing, 89, 96, 100, 102, 106, 109

- Like-acetylglucosaminyltransferase (LARGE),
236
- Live-attenuated Candid1 strain, 258
- Living matter, 24–26
- Lymphocytic choriomeningitis virus (LCMV),
233
- M**
- Malthusian fitness, 167
- Mappings, sequence, 71
- Marginal fitness effects, 192
- Master, 7
superiority, 7
- Master cluster, 114
- Master equation, 80, 83
- Master genotype, 64
- Master sequence, 4, 8, 9, 18, 87, 90, 110, 202,
328
superiority, 8, 333
- Matrix
adjacency, 114
mutation, 86
stochastic, 78
value, 77, 86
- Matrix (M) protein, 238
- Measles virus
F protein, 223
membrane entry, 221–222
membrane fusion, 221–222
mixed genomes, 226
- Metabolic pathways, 154
- Metabolic replicators, 155
- Metabolism, 142, 155
- Micro-RNAs, 211
- MIN, 147
- MIN tumors, 145
- Mismatch repair, 143
- ML29, 233
- Model, 209
2D Ising, 76
mutation, 76
paramuse, 76, 77
quasispecies, 76, 77
selection-mutation, 76
- Molecular clock, 76
- Move set, 62, 65
- Muller's ratchet, 150, 204
- Multidrug resistance, 326, 327
- Multiplicity of infection, 202
- Multivesicular body (MVB), 236
- Mutability, 29
- Mutagen, 205
- Mutagenic agent, 257
- Mutagens and inhibitors
interplay, 335
- Mutant
cloud, 6, 7
distribution, stationary, 86
mutagen-resistant, 335
- Mutation-selection balance, 283–284
- Mutation-selection-based models, 165–170
- Mutants, 324
inhibitor-escape, 324
- Mutation, 2, 44
rate, 2
- Mutational backflow, 6–9, 86, 90
zero, 90
zero assumption, 6, 7, 9
- Mutational flow, 93, 113
- Mutation class, 64
- Mutation flow, 108
- Mutation matrix, 77, 87
- Mutation mechanism, 76
- Mutation rate, 4, 7, 8, 70, 85, 86, 206,
304, 332
critical, 87
single nucleotide, 7
- Mutant spectra, 324, 335
dynamic, 324
- Mutant spectrum, 325, 327
broadening, 327
- Mutation-selection equilibrium, 212
- Mutations, 141, 325, 326
compensatory, 326
mutations, 325
resistance, 326
- Mutator bacteria, 15
- Mutators, 143
- N**
- Natural fitness landscapes, 48
- Nucleotide Excision Repair (NER), 146
- Neutral drift, 13
- Neutral evolution, 110
- Neutral network, 51, 64, 110, 111, 211
- Neutral paths, 52
- Neutral selection models, 32
- Neutral theory, 111
- Neutrality, 67, 69, 70, 110, 114
degree, 110
- Next-generation sequencing (NGS), 182, 210,
324
- Non-living matter, 24
- Norovirus, 334
- Nucleotide alphabet
alphabet, 64

Nucleotide analogue, 11, 336
 mutagenic, 11

O

Optimization, 79
 Organ-specific LCMV variants, 250
 Origin of life, 155
 Oscillatory dynamics, 155
 Outflow, 83

P

Panhandle structure, 239
 Perfect lesion repair, 143
 Phase transitions, 77
 Phenomenological approach, 6, 8, 9, 86, 88, 91, 93
 Phenotype, 49
 Pituitary, 251
 Plasmids, 141, 142
 Point mutations, 64, 65
 Poliovirus (PV), 328
 Poliovirus polymerase, 5
 Polymorphism, 12
 genetic, 12
 Polyploidy, 223
 prebiotic matter, nucleation of, 23–41
 Polysomic quasispecies model, 146
 Population, 10
 clonal, 10
 Population bottlenecks, 204, 206
 Potential surface, 62
 Preextinction populations, 254
 Prion, 17, 18
 replicative fitness, 17
 strains, 17
 Product inhibition, 47, 54
 Protein
 multifunctional, 332
 trans-acting, 333
 trans-networks, 331
 Punctuated-equilibrium, 52

Q

Q β , 46
 Q β replicase, 10, 67
 Q β RNA, 10, 11
 synthesis, 10
 Quantum chain, Ising, 77
 Quasi-equilibrium, 13, 14
 theories, 13
 Quasispecies, 13, 15, 18, 45, 70, 86, 87, 98, 202, 220, 252
 definitions, 15
 distribution, 29

dynamics, 83
 equations, 142
 limitations and strengths, 18
 models, 204, 211
 strong, 103, 106, 110
 theory, 204, 288–289
 transition, 100, 103, 106
 as a unit of selection, 13
 ‘Quasi-steady state’ approximation, 47
 Quorum sensing, 17
 in bacteria, 17

R

Random landscape, 209
 Random scatter, 69, 70, 100, 102, 106, 107, 109, 110
 Random segregation, 143, 145
 Random selection, 110
 Rapid evolution, 249
 RdRp structure, 308
 Reassortment events, 241
 Reciprocal sign epistasis, 207
 Recombinant arenaviruses, 239
 Recombination, 212, 244
 Reductionistic research, 24
 REM, 155
 Repair catastrophe, 143
 Repairers, 143
 Replication, 2–4, 7, 44, 325
 error-free, 2, 4, 7
 error-prone, 325
 kinetics, 3
 Replication-mutation, 3–6, 8, 18, 19
 kinetics, 5
 mechanism, 6
 Replicator, 53
 equation, 54
 Repressed state, 147
 Repression, 142
 Reptilian arenaviruses, 241
 Resistance, 325
 genotypic barrier, 325
 phenotypic barrier to, 325
 Reverse genetics, 10, 11, 238
 Ribavirin, 206, 233, 329, 333
 Ribonucleoprotein (RNP), 235
 RNA evolution, 10
 in vitro, 10
 RNA folding, 49
 RNA landscapes, 49
 RNA ligase ribozyme, 54
 RNA networks, 142
 RNA polymerase, 4
 RNA replicase ribozyme, 54

- RNA retrovirus
 human immunodeficiency, 67
RNA-RNA interaction, 53
RNA viruses, 11, 149, 211, 324, 336
 as moving targets, 324
 mutation rate, 11
RNA virus mutant spectra, 219–228
RNAcifold, 55
Robustness, 211
Rugged fitness landscapes, 210
Ruggedness, 67, 70, 100, 110, 114
- S**
- Segregation, 145
Selective pathways, 324
 transient, 324
Selective sweep, 190
Self-awareness, 157
Self-fertilization, 153
Self-replicating ribozyme, 54
Self-replication, 149
 first-order replication, 149
 second-order catalysis, 149
Self-reproduction, 28
Semantic code of evolution, 40–41
Semantic information, 23–41
 context-dependence, 33–37
 evolutionary optimisation, 30–33
 information barriers, 37–40
 living matter, 24–26
 metabolism, 28
 mutability, 29
 natural selection of, 26–30
 neutral selection models, 32
 in prebiotic matter, 23–41
 quasi-species distribution, 29
 reaction kinetics, 28
 self-reproduction, 28
 semantic code of evolution, 40–41
Semiconservative replication, 141–144, 148
Set-point viral load (SPVL), 279, 290
Sequence, 335
Sequence space, 7, 10, 13–15, 62, 63, 72, 75, 110, 204, 325
 connectivity, 13
 drift in, 333
 exploration, 15
 movements, 14
 occupation of, 333
 size, 10
Sequential treatment, 335, 336
Sexual replication, 152
Sexual reproduction, 142, 149, 150, 153
Sexually reproducing organisms, 150
- Shape space, 72
Signaling lymphocyte activation molecule (SLAM), 221, 223
Sign epistasis, 207
Single-fitness-peak approximation, 152
Single-fitness peak, 143
Site-directed mutagenesis, 11
Sleep, 155
SOS response, 146
Space of genotypes, 211
Spin glass, 77, 73
Spores, 151
Sporulation, 142, 151
State
 quasistationary, 80, 82, 85
 stationary, 79
Static environments, 147
Stem cells, 141
Stochastic extinction model, 171–172
Stochastic models, 18
 group-specific, 18
Structure
 distance, 71
 minimum free energy, 73
 secondary, 70, 73, 110
Sublethal mutagenesis, 174–175
Subpopulation, 13, 14
 FMDV, 333
 genome, 14
 minority, 13
Superinfection inhibition, 242
Superiority, 90
Survival of the fittest, 47, 143
Survival of the flattest, 143, 164, 173–174
Susceptible cells, 203
Synergistic epistasis, antagonistic epistasis, 207
Systems, dynamical, 62
Systems chemistry, 148
- T**
- Terminal complementarity, 235
Theorem
 Perron-Frobenius, 86
Theoretical modeling, 141
 steady-state solutions, 141
 stochastic simulations, 141
Theories of lethal mutagenesis, 161–176.
 See also Lethal defection
 defectors, 170
 error catastrophe, 162–165, 169–170
 error threshold, 162–165
 extinction, 169–170
 lethality, 169–170
 mutation-selection-based models, 165–170

resistance problem, 173–174
sublethal mutagenesis, 174–175
Theories of viral evolution, 207
Tobacco etch virus (TEV), 207, 208
Transferring receptor 1, 247
Tri-segmented rLCMV, 240
Tumor cell, 16, 141
 heterogeneity, 16
Two-strain model, 282
Type I interferon (IFN-I), 237

U

Uniform distribution, 69, 87, 95
 stationary distribution, 85
Unit of selection, 14
‘Universal’ LASV vaccine, 259
Unspecific outflow, 45

V

Value matrix, 87
Vesicular stomatitis virus (VSV), 205, 207,
 328
Viral disease, 324
 control, 324
Viral ecology, 202

Viral evolution, 212
Viral extinction, 205, 328
Viral fitness landscapes, 210
Viral genomes, defective, 334
Viral load, 327
Viral persistence, 234
Viral population, 277–295
 basic model, 279–282
 drug pharmacokinetics, 286–288
 hepatitis C virus, 291–293
 and immune response, 289–290
 influenza A virus (IAV), 294
 quasispecies theory, 288–289
Viroids, 8, 211
Virus, migration, 334

W

Walk, adaptive, 62
Wild type subpopulations, 282
Winter Seminar, 12
 Max Planck, 12
Wright-Fisher model, 13
 mutation-selection, 13
Wrightian terms, 165–166