Index

Page numbers in italic refer to figures.
Page numbers in bold refer to tables.
Sorting is in letter-by-letter alphabetical order
so that, for example, 'A gene' comes after 'ageing'.
Numerals sort before letters.

5% dextrose, haemolysis, 469
9a antigen, 570
A,B cells, plasma antibody screening with, 332
A, subgroup, 120–121, 428
ABO haemolytic disease, 535
B antigen acquired, 126
cis AB phenotype, 122
red cell destruction, passively acquired anti-A, 465
red cell testing, 328–329
A,B group, missed incompatibilities, 334
A2m(–1) phenotype, anaphylactoid reactions, 674
A; subgroup, 120–121, 428
ABO haemolytic disease, 535
A, phenotype, 121
A4GALT gene, 146, 147, 287
A antigen, 153
alloimmunization, pregnancy, 136
development, 125
ethnicity, 121
neonates, 534
number of sites, 124–125
platelets, 573
storage of serum on, 128
subgroups on red cell destruction, 428
abbreviated crossmatching, 333–334
ABC6 mutations, 239
abciximab, platelet transfusion and, 624
ABO gene, 119
alleles, 120t
carcinoma of pancreas, 126
abortions
anti-D antibody injections, 524, 527
anti-PP,P5 antibody, 149, 150
habitual, HLA antigens, 565
IgG3 antibodies, 150
maternal fetal haemoglobin, 504
transplacental haemorrhage, 507
ABO system, 118–138
antibodies see specific antibodies
anti-Lea antibody and, 144
bedside group confirmation, 337
biosynthetic relationships with other systems, 153
blood grouping, 328–329
bedside confirmation, 337
coagulation factors and, 60
compatible platelets, 581
competition with other systems, 84, 85
development, 61–62
discovery, 53
haemolytic disease of the newborn, 531–537
management, 535–537
immune responses, 74
incompatibility
on D immunization, 193, 509
haematopoietic stem cell transplantation, 636–637
maternal fetal red cells, 505, 506
incompatible bone marrow transplantation, 636
delayed haemolytic transfusion reactions, 484–485
incompatible transfusions, 459–469, see also spontaneous red cell agglutination
differential agglutination, 490
frequency, 460–461
mortality, 461–462
severity of reactions, 462
leukaemia, 125–126
on Lewis phenotypes, 138
Lewis substances and, 142–143
red cell destruction, 414–415, 462–465,
see also anti-A antibody; anti-B antibody
reticulocytes, 62
soluble antigens, 55
A(B) phenotype, 123
abruptio placentae, haemolytic reaction in mother, 460
absolute neutrophil counts, leucapheresis donors, 773
absorption (gastrointestinal), vitamin K, 821
absorption methods, antibody isolation, 339–340
AB substance horse, 136
plasma screening with, 332
ABTI antigen, 239
accelerated red cell destruction, see also hyperhaemolysis
delayed haemolytic transfusion reactions, 483–484
D-positive transfusion, 443
without demonstrable antibodies, 444–445
‘acceptable’ mismatches, platelet transfusion, 582
accessory spleens, 425
acetate, platelet storage, 619
acetylcholine receptor antibody, removal by plasma exchange, 782
acetylcholinesterase, Yt antigens and, 231
acid–citrate–dextrose method, red cell labelling, 360
acid–citrate–dextrose solutions (ACD), 883
blood storage aggregates, 682
complement, 306
red cell storage, 368, 369, 370, 372, 374
freezing point, 378

© 2014 Harvey G. Klein and David J. Anstee. Published 2014 by John Wiley & Sons, Ltd.
acid citrate–phosphate–dextrose, 883
acid–digoxin method, 340
acid-elution methods
  fetal red cells, 501–502, 884–885
  platelet antibodies, 589
  transplacental haemorrhage, 502–503
acidified solutions, red cell storage, 367–368, 370, 372
acidosis, citrate load, 680
acid-treated platelets, 583
acquired antithrombin deficiency, 863
acquired resistance of red cells, 262–263,
  –deficient escape mutants, hepatitis B virus, 702, 705
  for red cells, 882
  for premature infants, 392
  for platelets, 872
  for red cells, 882
acquired thymic injury compromises, 374–375
acrylafline, 281
activated partial thromboplastin time,
  fresh-frozen plasma on, 640
activated prothrombin complex concentrates,
  for enzyme-treated red cells, 287–288
  for premature infants, 392
  for red cells, 882
Activators, enzymes, 310
activating proteins, 279
activating proteins, 279
activating sites, 77–78
activating sites, 77–78
activating sites, 77–78
adenine
  red cell storage, 368, 370, 373
  packed cells, 374–375
  rejuvenation, 375
  toxicity, 373
adenine–dextrose solution, 882
adenosine, red cell storage, 368
adenosine monophosphate, stored red cells, 370
adhesion
  leucocytes, leukaemia, 788
  red cells, sickle cell disease, 394
  adjacent genes, D antigen variants, 175
  adoptive immunotherapy, 637, 639
  adrenaline, for anaphylaxis, 677
adsorption
  bacteria, 285–286
  drugs, 279–280
  adult respiratory distress syndrome, 45
  adult T-cell leukaemia (ATL), 718, 719
Advanced Trauma Life Support protocols, 32
adverse reactions, see also haemolysis;
  hypersensitivity
  anti-D antibody injections, 203
  anti-HPA-1a antibody, 672
  apheresis donors, 777–778
  immunoglobulins, 861–862
  transfusion, 660–684, see also haemolytic
  transfusion reactions; infections
  affinities, monoclonal antibodies, 77–78
  affinity constants
    functional, 89–90
    Rh antibodies, 187–188
  age
    of consent, 1
    donors, 1
  ageing
    ABO agglutinins, 130
    population, 3
    on red cell survival, 362
    ageing (of red cells), 358–359
    A, B and H antigens, 125
    storage, 369–370
  no effect on viability, 377–378
  A gene, secretions, 139
  agglutinates, detection, 490
  agglutination of red cells, 91–93
  ABO agglutinins, 132, 287
  ABO haemolytic disease, 534
  ABO system, 131
  anti-I antibodies, 311
  red cell storage, 373–375
  for premature infants, 392
  for platelets, 872
  for red cells, 882
  α-deficient escape mutants, hepatitis B virus, 702, 705
  by incompatible plasma, 450
  inhibition in IgA deficiency, 592
  secondary D immunization, 195–196
  warm autoantibodies, 273
agglutination tests, 303, 311–314
  false-positives, 314
  granulocytes, 571
  human T-cell leukaemia virus antibodies, 720
agglutinins, see also anti-A antibody; anti-B
  antibody; autoagglutinins
  anti-C, 185
  D immunization, persistence, 196
  for enzyme-treated red cells, 287–288
  fatty-acid-dependent, 281
  Lima beans, 87
  aggregates, 682–683
  agitation
  antiglobulin test, 323
  granulocyte storage, 628
  platelet storage, 617–618
  AHG reagents sees antiagglutinins
AIDS see HIV infection
  A intermediate, 121
  air embolism, 681
  donor's, 13
  alanine aminotransferase (ALT), non-A, non-B hepatitis, 706
albumin
  antiagglutinins, 321
  congenital absence, 850
  hydrops fetalis, 509–510
  125I-labelled, plasma volume estimation, 875
  plasticizers and, 684
  on red cell agglutination, 92
  a solution, 30, 31, 32, 849–850
  burns, 44
  cold autoagglutinins in, 262
  false-positive agglutination tests, 314
  fatty-acid-dependent agglutinin and, 281
  plasma exchange, 780
  synthesis, plasmapheresis donors, 769
  albumin autoagglutinins, 311
  ALeα antigen, 138, 142
alkalization
  additive solutions, red cell storage, 373
  urine, for transfusion reactions, 469
  alkylating agents, effect on IgM, 70
  alkylation, IgG3 antibodies, 311
  allele discrimination assay, 345
  alleles
    blood groups, 58–59, 120t
    frequencies, 58–59
    terminology, 54
    weak alleles, A (group), 123–124
    allele-specific primers (ASP), red cell
      grouping, 343
    allelic enhancement, 123–124
allegris
apheresis donors, 778
dextran, 35, 37
exclusion of donors, 5
management, 676–677
plasma alternatives, 37
plasma transfusions, 673
protamine, 825
alloimmunized patients
blood for, 345
delayed haemolytic transfusion reactions, 482–483
sickle cell disease, 766
allootypes, IgG, 590–591
allootypic markers, immunoglobulins, 67
α, α-antitrypsin, 863
αα-haemoglobin, dissociation curve, 829f
alpha-alpha six-barrel fold, complement
αfucosyltransferases,
amniotic fluid
amniocentesis, 504, 511, 515–516
ammonia salts, fainting and, 11–12
ammonia, blood storage, 681
aminoglycoside antibiotics, 305
2-aminoethylthiouronium bromide, 339
2-aminoethylisothiouronium bromide
AMG 531 (TPO peptide-agonist), 812–813
amegakaryocytic thrombocytopenia,
alternative pathway, complement, 101–102
Alsever’s solution, 305
Alphanate, 854
Alphameric terminology, IgG subclasses, 591
α allotypic markers, immunoglobulins, 67
allotypes, IgG, 590–591
alloimmunized patients
blood for, 345
delayed haemolytic transfusion reactions, 482–483
sickle cell disease, 766
allopos, IgG subclasses, 591
alphameric terminology, IgG subclasses, 591
α allotypic markers, immunoglobulins, 67
allotypes, IgG, 590–591
alloimmunized patients
blood for, 345
delayed haemolytic transfusion reactions, 482–483
sickle cell disease, 766
lytic, tests for, 315
monoclonal
crossreactivity, 78
mouse, 130
naturally occurring, 71–72
platelet destruction, 581
red cell sequestration, 423
red cell survival curves, 428
removal
by plasma exchange, 781
from sera, 341
volume of incompatible red cells, 436
saliva, 132
serology, 75
anti-Bg' antibody, 459
anti-BI antibody, 152–153
antibiotics, 279, 280, 281
anti-B lectin, 134
removal
red cell survival curves, 428
red cell sequestration, 423
platelet destruction, 581
naturally occurring, 71–72
monoclonal
lytic, tests for, 315
stored blood, 735
blood grouping and, 306
anticoagulant activity, reversal, 824
aminoglycosides, 305
Kell system, 216–218
in vitro
identification, 337–342
human T-cell leukaemia virus infections, 719
hysterical, see also
antibodies
ABO system, 129–134, see also specific antibodies
antenatal testing, 510–511
in antiglobulin reagents, 316–317
artificial construction, 78
binding fractions, 433
against bound antigens, 279–281
complement activation, 104
complement on binding, 103
crossreactivity see crossreactivity of antibodies
cytomegalovirus, 723
delayed haemolytic transfusion reactions, plasma levels, 482–483
disappearance between transfusions, 334–335
Duffy system, 220
effects on red cells, 93–95, 414–429, 443–448, see also anti-A antibody; anti-B antibody; anti-K antibody
eutation see elution, antibodies
febrile reactions, 660–662
freshly-washed red cells, 288
haemolytic disease of the newborn, 501
HIV infection, 712, 713
human T-cell leukaemia virus infections, 719
identification, 337–342
in vitro sensitization of red cells, 429–431
Kell system, 216–218
autoimmune haemolytic anaemia, 275–276
pregnancy, 528–530
Kidd system, 221, 421
on enzyme-treated red cells, 307
as haemolysins, 459
CD55
Knops system, 237
Lewis system see Lewis system, antibodies to low-frequency antigens, 241–242
Lutheran system, 229–230
macrophage-bound, 448
maternal, 499–501
MN systems, 224–228
multiple transfusions, 336
naturally occurring see naturally occurring antibodies
to neutrophil antigens, 570
not found after incompatible transfusions, 443–448
number of molecules per red cell, 91–92, 429–434
P and GLOB systems, 148–150
passively acquired, 448–451, 490, 676
platelets, see also platelet-specific antibodies
tests for, 586–588
reactions with antigens, 88–97
blood grouping, 303–304, 317–319
cold haemagglutinins, 265–266
factors affecting, 306–311
cold red cell polyagglutinability, 282, 283
of red cells, 62–87
frequency, 78–81
removal by immunoaffinity apheresis, 786
removal by plasma exchange, 781–782
Rh system see Rh system, antibodies
screening
false-negative results, 330
solid-phase systems, 325
subclasses, 69, 87
to thrombopoietin, 812
titres, blood grouping, 325–326
transfusion-associated acute lung injury and, 666
Treponema pallidum, 731
Trypanosoma cruzi, 740
antibody-dependent cell-mediated cytotoxicity assays, 96–97
ABO haemolytic disease, 533
haemolytic disease of the newborn, 514
antibody-mediated rejection, 562
anti-C3 antibodies, AHH reagents, 316
anti-C3d reagents
ABO haemolytic disease and, 334
prozone phenomenon, 319
anti-C antibody, 185, 196–197, see also anti-C specificity
d-Negative patients, 331
haemoglobinuria, 479
naturally occurring, 184
pregnancy, 528
anti-c antibody, 184, 185
haemolysis, 424–425, 433
anticoagulants
on complement, 103–104
heparin-induced thrombocytopenia and, 590
paediatric autologous blood collection, 802
protamine as, 824
relative excess, 374
reversal, 640, 814, 821–825, 855
volume, 2
anti-Co antibodies, 234
anti-complement reagents, 316
in antiglobulin test, 319, 322
for Lewis antibodies, 145
anti-Cr antibodies, 236–237
anti-C specificity, warm autoantibodies, 275
anti-Cw antibody
naturally occurring, 184
pregnancy, 528
anti-Cw' antibody, 184
anti-D antibodies, 184, 185–196, see also Rh system, antibodies; rhesus immunoglobulin
accidental transfusion, 476–477
agglutination of red cells, 490
acellular bioassays, 427
as cold agglutinins, 275
cold-reacting, 72, 183
cyclical fluctuations, 196
to D antigen variants, 177
differences between, 434
differences in amounts injected, 434–436
donor-derived, 487
dosage, 199–201, 203, 884–885
donor-D positive red cells and, to D-negative subjects, 431–433
D-positive transfusion see D-positive transfusion
elution, 340
equilibrium constants, 90
error rate in detection, 330
frequency, 78, 79
haemolysis, 415, 424, 425, 426, 862
donor red cells, 475
recipient red cells, 450–451
haemolytic disease of the newborn, 528
neonate case, 76
pregnancy, 83
preventing formation of, 331
renal transplantation, 486–487
anti-carbonic anhydrase, 503
anti-CD147, 238
anti-CE antibody, 180, 185
anti-Ce antibody, 180
haemoglobinuria, 479
anti-Ce antibody, 180
anti-ce antibody, 180
anti-CD antibody, 234
anti-CG antibody, 184
anti-CM antibody, 721, 723–724, 861
anti-C antibody, 184
anti-complement reagents, 316
in antiglobulin test, 319, 322
for Lewis antibodies, 145
anti-Cr antibodies, 236–237
anti-C specificity, warm autoantibodies, 275
anti-Cw antibody
naturally occurring, 184
pregnancy, 528
anti-Cw' antibody, 184
anti-D antibodies, 184, 185–196, see also Rh system, antibodies; rhesus immunoglobulin
accidental transfusion, 476–477
agglutination of red cells, 490
acellular bioassays, 427
as cold agglutinins, 275
cold-reacting, 72, 183
cyclical fluctuations, 196
to D antigen variants, 177
differences between, 434
differences in amounts injected, 434–436
donor-derived, 487
dosage, 199–201, 203, 884–885
D-positive red cells and, to D-negative subjects, 431–433
D-positive transfusion see D-positive transfusion
elution, 340
equilibrium constants, 90
error rate in detection, 330
frequency, 78, 79
haemolysis, 415, 424, 425, 426, 862
donor red cells, 475
recipient red cells, 450–451
anti-D antibody, see also anti-e specificity
anti-e antibody, see also anti-e specificity
pregnancy, 528
renal transplantation, 487
anti-En antibodies, 227
anti-Wr antibodies, 231
anti-E specificity, warm autoantibodies, 275
anti-I specificity, warm autoantibodies, 275
anti-F(ab')2 antibodies, cold haemagglutinin disease, 262
antifibrinolytic agents
aprotinin, 813, 819, 820
lysin analogues, 813, 817–820
anti-Fy3 antibody, 220, 249
anti-Fy4 antibody, 220
anti-Fy5 antibody, 220
anti-Fy6, 218–219
antihistamines, 664, 676–677
anti-D antibodies
incomplete, febrile reactions, 476
injection after D-positive transfusion, 438, 475
in vitro red cell sensitization, 430–431
laboratory separation, 69
monoclonal, 77, 78, 172, 526
D+ antigen and, 178
suppression of primary immune responses, 201
naturally occurring, 183–184
neonates, 500
estimation, 518–519
quantification, 187–188, 326–327, 513
see also dosage under anti-D antibodies
reference solutions, 328
removal by plasma exchange, 781
serology, 75
serum 'Ripley', 131, 186–187
storage, 858
suppression by passive antibody, 85–86
suppression of primary immune responses
delayed administration, 201
D-positive transfusion, 199–204, 438
tests for, 510–511, see also quantification under anti-D antibodies
error rates, 330
therapeutic, see also anti-D under intravenous immunoglobulin
historical aspects, 199
platelet transfusion, 625
recipient serum screening after, 330
safety, 675
transient DAT positivity, 198
two-component red cell survival curve, 429
anti-D-coated particles, transplacental haemorrhage measurement, 503
anti-dextran, IgG, 35
anti-Di antibodies, 231
anti-D0 antibodies, 234
anti-Du(a)- antibody, 576
anti-E antibody, 185, 196, 197, 241, see also anti-E specificity
D-negative patients, 331
haemolysis, 425–426
immunoglobulin classes, 72
naturally occurring, 184
neonate case, 76
pregnancy, 79, 528
two-component red cell survival curve, 429
anti-D antibodies
neonatal alloimmune thrombocytopenia, 530
red cell destruction, 421, 424
Rh D immunization on formation, 83
anti-Fy antibody, frequency, 80
anti-Fy3 antibody, 220
anti-G antibody, 179, 196
anti-Ge3 antibody, 236, 530
anti-Ge antibodies, 235–236
antigenic determinants, 58
detection, 91
antigen induced naturally occurring antibodies, 71
antigen-negative platelets (HPA-1a antigen), for post-transfusion purpura, 671–672
antigen presentation, immunosuppression and, 86
antigen-presenting cells, 554
alloimmunization to HLA antigens, 577, 580
antigens
ABO system, 118–129
blood groups, 118
on drug–antibody complex binding, 281
HIV infection, 712–713, 717
monocytes, 570, 573
platelets, 573–590
reactions with antibodies, 88–97
blood grouping, 303–304, 317–319
cold haemagglutinins, 265–266
factors affecting, 306–311
red cells: see red cells, antigens
serum proteins as, 590–592
anti-Glm(z) antibody, 675
antiglobulin reagents, 303
antibodies, 316–317
diluents, 318
manual polybrene test, 313
antiglobulin sera, on red cell agglutination, 131
antiglobulin test, 315–323, see also direct antiglobulin test; indirect antiglobulin test
abbreviated crossmatching vs; 333–334
automation, 324
crossmatching and, 334
enzyme-linked, 326–327
false-negative results, 323
false-positive results, 323, 330
serum ratio to red cells, 320, 332
technique, 319–323
anti-Gm antibodies, 591, 675–676
anti-GY antibody, 234
anti-H antibody, 134
group O serum, 128
haemolytic disease of the newborn, 537
red cell destruction, 419–420
anti-HBC antibody, 700, 701–702, 703
non-A, non-B hepatitis, 706
anti-HBe antibody, HepAg and, 702
anti-Hbf antibody, 503
anti-HBs antibody, 700, 701, 859, 861
immunoassays, 702
anti-HI antibody, 134, 152–153, 419
anti-Hi antibody, 152–153
anti-HLeE antibody, 152–153
antihistamines, 664, 676–677
anti-HJK antibody, 241
anti-HLeE antibody (anti-LeE antibody), 139, 144
anti-H lectin, 134
anti-HPA-1a antibody
adverse reactions, 672
neonatal alloimmune thrombocytopenia, 584
post-transfusion purpura, 588, 670
removal by plasma exchange, 781
anti-HPA-5b antibody
neonatal alloimmune thrombocytopenia, 584
post-transfusion purpura, 670
anti-HPA antibodies, post-transfusion purpura, 670
anti-human globulin reagents see antoglobulin reagents
anti-Hy antibody, 234
two-component red cell survival curve, 428
anti-I antibodies, 152, see also anti-I specificity; auto-anti-I antibody
autoimmune haemolytic anaemia, 262
cold agglutinins, 263–264, 266
as cold antibody, 90, 340
complement and, 103, 262–263
enzymes on, 307
infectious diseases, 263–264
mycoplasma infection, 260
normal cold autoagglutinins, 261
removal, 336
anti-I antibodies, 152
cold autoagglutinins
identification, 340
normal, 261
enzymes on, 307
infectious diseases, 263–264
anti-IFC antibody, 236
anti-IgA antibodies, 591–592
anaphylaxis, 673–675
in antiglobulin test, 319, 321
of limited specificity, 592, 674
on red cell agglutination, 131
washed red cells for patients with, 397
anti-IgG antibodies
complement binding, 421–423, 431
125I-labelled, 326
reaction with IgG-coated red cells, 317–319
on red cell agglutination, 131
serum sickness-like syndromes, 675–676
anti-IgM antibody, 131, 319
anti-I specificity, 275
anti-I antibody, 152
anti-Jk3 antibody, 221
anti-Jk2 antibody, 221
autoimmune haemolytic anaemia, 222
errors in detection, 330
haemolysis, 421–422, 475
haemolytic disease of the newborn, 530
Rh D immunization on formation, 83
anti-Jk2, 221
anti-Jk antibodies, frequency, 80
anti-Jk2 antibody, 221
red cell destruction, 421–422, 475
renal failure, 479–480
anti-Jr antibody, 531
anti-Js antibody, 217, 530
anti-Js antibody, 217
anti-K antibody, 216–218
antiglobulin test, 321
ethnicity, 81
frequency, 80
haemolysis, 85, 421, 424, 430, 433
haemolytic transfusion reactions, 218, 475–476
neonate case, 76
pregnancy, 79, 217, 528–530
preventing formation of, 331
Rh D immunization on formation, 83
serology, 217
anti-K antibody, 217, 530
anti-Kn antibodies, 217, 592
anti-Kp antibody, 217, 530
anti-Kp antibody, 217
hydrocortisone and, 442
negative direct antiglobulin test, 276
anti-Ku antibody, 217, 530
anti-Kx antibody, 217
anti-Lea antibody, 143
in antiglobulin test, 319
haemolysis, 415, 419, 474
immunoglobulin classes, 72
monoclonal, 144
red cell protection from, 263
serology, 145
anti-Lea antibody, 144
red cell destruction, 415, 419, 474
red cell protection from, 263
anti-Lea, 143
anti-Lea antibody, 139, 144
anti-Lea antibody, 144
anti-Lea antibody, 144
anti-Lea antibody, 144
anti-Lea antibody, 144
anti-Lea antibody, 144
anti-Lea antibody, 144
anti-Lea antibody, 144
anti-Lea antibody, 144
anti-Lea antibody, 144
anti-Lea antibody, 144
anti-Lea antibody, 144
anti-Lea antibody, 144
anti-Lea antibody, 144
anti-Lea antibody, 144
anti-Lea antibody, 144
anti-Lea antibody, 144
arrhythmias
citrateric toxicity, 679
cold blood transfusions, 678
arterial puncture, inadvertent, 13
AS-3 (preservative), 383
ascitic fluid, immunoglobulins, 68
ascorbic acid, arrest of red cell labelling, 360–361
aseptic meningitis, intravenous
immunoglobulin, 862
Asians
anti-Mi* antibody, 223
D antigen variants, 179
D-negative phenotype, 173–174
aspargillosis, granulocyte transfusions, 629, 630f
aspirin
as antipyretic, 664
DDAVP on bleeding, 817
donors ingest
deferrals, 5
platelet transfusion, 626, 772
association constants, IgG anti-A antibody, 132
asthma, Fy(a– b–) phenotype, 219
association
autoantibodies, 84, 259–278
autoimmune haemolytic anaemia
autoimmune responses, infections, 259
autoimmune neutropenia, 570–571
band 3 genes, Diego system, hereditary
autoimmune thrombocytopenic purpura
autoimmune thrombocytopenia, 588–589
autoantibodies
autoanti-I antibody
autoanti-L antibody
autoanti-LW antibody
autoanti-N antibody
autoanti-idiotypes
autoantibodies
autocontrols, crossmatching tests, 336
autogrouper (Technicon), 324
autohaemolysins
cold-secreting haemolysins
intravenous
autoimmunities
autoimmune diseases
autoimmune neutropenia
autoimmune thrombocytopenic purpura
autoimmune reactions, infections, 259
autoimmune transfusion reactions, 482–483
drug-induced, 280
identification, 340–341
immunotherapy, 588–589
neutropenia, 570–571
post-transfusion purpura, 671
removal, 336, 782
to thrombopoietin, 812
‘auto-anti-En’, 227
autoanti-I antibody
red cell destruction, 420
complement as limiting factor, 436–437
autoanti-I antibody
autoanti-idiotypes
autoanti-LW antibody
autoanti-N antibody
autoantibodies to low-frequency antigens, 241
anti-I antibodies
anti-Jk* antibody
biphasic haemolysins
to trypsinized red cells, 288
warm
autoimmune diseases
on immune responses, 75
intravenous immunoglobulin for, 861
vasculitides, treatment, 782
autoimmune haemolytic anaemia
alloantibodies
277, 278, 336
antibodies to low-frequency antigens, 241
anti-I antibodies
anti-Jk* antibody, 222
biphasic haemolysins, 267
cold autoagglutinins, specificity, 263–264
cold haemagglutinin disease, 261–266
transfused red cell destruction, 365
complement, 272, 471
direct antiglobulin test
negative, 273
reagents, 316–317
spontaneous remission, 270
drug-induced, 279
haemoglobin-based oxygen carriers, 830
haemoglobinopathies, 482–483
haemoglobinuria after transfusion, 471
Kell antibodies, 218, 275–276
Lu antigen, 230
‘mimicking anti-Rh’, 188
naturally occurring antibodies, 72
non-steroidal anti-inflammatory drugs, 279
sequestration studies, 366
warm-antibody type, 75, 188, 270, 277–278
warm with cold autoantibodies, 273
weakening of Rh antigens, 181
autoimmune neutropenia, 570–571
autoimmune responses, infections, 259
autoimmune thrombocytopenic purpura
(ATIP), see also immune
thrombocytopenic purpura
intravenous anti-D immunoglobulin, 450
neonatal, 585–586
transient Kell antigen depression, 218, 276
autologous blood transfusion, 41, 42, 800–803
bacterial contamination, 734
cardiopulmonary bypass, 43
frozen red cell storage, 384
autologous platelets, 621
autologous red cell survival, 364–365
donor selection, 377
automation
blood cell harvesting, 769
blood grouping, 323–325
fetal D grouping, 517
molecular biology, 345
quantitation, 326
sensitivity, 328
HLA typing, 566
plasmapheresis, 767, 768
platelet concentrate manufacture, 872–873
polymerase chain reaction, 364
red cell salvage, 802–803
autopsy, cultures, 737
avidin, 363
Avtene Flour, 826
AYD antigen, 570
azide see sodium azide

Babesia divergens, glycoporphin B binding, 228
babesiosis, 741–742, 766
bacteraeemia
donors, 733
recipients, 734
bacteria
α-N-acetylgalactosaminidases, 127
on anti-B titres, 71–72
A and B antigens, 129, 465
blood contamination, 471, 730–737
blood transfusions on postoperative infections, 364–565
deacetylase, 126
Nitrosomonas europaea, RHAG
homologue, 171, 182
platelet storage, 619
proteins A and G, 69
P system antigens as receptors, 148
pyrogens, 677–678
red cell polyagglutinability, 282, 283, 284, 285–286
red cell sensitization, 286
bacteriophages, antibody construction, 78
Bak antigens see HPA-3 system
band 3
deficiency, 182
eovalocytosis, 243
tetrameric, 55
band 3 genes, Diego system, hereditary
spherocytosis, 230–231
B antigen, 153
acquired
in A; subgroup, 126
T and Tk activation, 285
biotinylation, red cells, 363
B cells
B-cell receptor
biotinylated monoclonal anti-D (BRAD-5),
biotinylated monoclonal anti-D (BRAD-3),
Biotest Solid Screen System, 325
Biopack (Optipress), platelet concentrates,
Bauhinea purpurea
battle casualties, 38–39
Basigin (CD147), 238
basal oxygen consumption, 27
bar codes, 337
B(A) phenotype, 123
bedside filtration
bedside confirmation, ABO system, 337
beating heart surgery, 42, 43
bioassays
binding studies, Rh antigen, 170
binding fractions, antibodies, 433
binding constants, 74
big endothelins, 215
discernment, 477
bilirubinaemia, 474, 477
ABO haemolytic disease, 535, 536
detection, 489
haemolytic disease of the newborn, 522
mother–infant ABO incompatibility, 531
binding constants, 74
IgG anti-A antibody, cord red cells, 132
intrinsic, 89–90
binding fractions, antibodies, 433
binding studies, Rh antigen, 170
bioassays see cellular bioassays
Biopack (Optipress), platelet concentrates,
Biotest Solid Screen System, 325
biotinylated monoclonal anti-D (BRAD-3),
biotinylated monoclonal anti-D (BRAD-5),
quantification, 327, 431, 432
biotinylation, red cells, 363
biphasic haemolsins, 260t, 266–268
antibody mimicking, 264
anti-I antibodies vs, 262
anti-P antibody as, 149, 267
2,3-bisphosphoglycerate see
2,3-diphosphoglycerate
birthweight see very-low-birthweight infants
bishydroxycoumarin, 821
bivalency
anti-A antibody binding, 132, 534
monomannos, 89
black people
ABO haemolytic disease, 532
ABO phenotypes, 118
anti-U antibody, 226–227
Duffy antibodies, 220
D variants, 178–179
K antigen, 214
bladder
carcinoma on red cell antigens, 142–143
lysine analogues, 820
Blk' antigen, 138
bleeding time
aspirin on, 626
DDAVP on, 817
platelet counts vs, 614–615
uraemia, oestrogens on, 825
‘blocking’ antibodies, 75
blood banks, 367
cord blood, 636
serum samples, antibiotics, 281
blood-borne viruses, 4, see also specific viruses
autologous blood, 802
on availability of blood, 4
deferrals of donations, 5
directed donations, 14–15
family-replacement donors, 1
fetal transfusion and, 520
blood components
premature infants, irradiation for, 392
for transfusion reactions, 469
blood conservation, 800–844
blood films, fetal red cells, 502
blood grouping, 303–355, see also blood grouping under automation
errors, 329, 330
fetal D grouping, 511–513, 516–517
full identification, 339
omission in emergencies, 337
solid-phase systems, 325
blood groups
alleles, 58–59, 120t
frequencies, 58–59
terminology, 54
antigens, 118
clinical importance, 55
immunology, 53–117
neoplastic change on, 60–61
malaria and, 60, 142
terminology, 54–55
bloodless surgery, 800–844
blood loss, see also oligaemia
diagnostic phlebotomy, 804
intermittent, 390–391
stools, 365–366
surgical, 24–25, 42, 43
vasoconstriction, 25, 26
blood pressure
donors, 2, 9–10
haemorrhage on, 23, 25
blood processors, 382
blood sampling
blood loss from, 366, 391
fetus, 516
thrombocytopenia, 586
haemolytic transfusion reactions, 488, 489
platelet transfusion, 879–880
red cell volume estimation, 874
blood volume, 875–876
haemorrhage on, 23–24
transfusion on, 385–387
Blundell, James (blood transfusion pioneer), 22–23
B lymphocytes, see also B-cell receptor
apheresis donors, 776–777
HLA antigens, 554
humoral response, 72
immunoglobulins on surfaces, 69
lymphocytotoxicity test, 566
B-natriuretic peptide (BNP)
circulation overload, 29
transfusion-associated acute lung injury and, 665
boluses, intravenous iron, 805
Bombay phenotype see hh genotype; Oh phenotype
bonds
antigen–antibody, 88
thioketal, complement molecules, 99, 100, 102
bone
deformities, thalassaemia, 393
grafts
D immunization, 195
Duffy antibodies, 220
granulocyte colony stimulating factor, 809
plasmapheresis donors, 769
plateletpheresis donors, 772
bone marrow
granulocytes, 627
PBSC donors, 775
stimulation, leucapheresis donors, 773
thalassaemia, 393
transplantation
cytomegalovirus infection, 722
delayed haemolytic transfusion reactions, 484–485
effect of previous transfusions, 561
granulocyte transfusions, 632
incompatible ABO, 636
intravenous immunoglobulin, 861
lymphocytes from, 487
citric acid–phosphate buffer, removal of HLA antigens, 587
classical pathway, complement, 98–101
classifications, see also nomenclatures
  partial D antigens, 174–175
class-specific anti-IgA, 591–592, 673–674
clonal thombocytosis, 789
cloning, hybridoma cells, 77
clonorickiaus, P, antigen, 148
clopidogrel, platelet transfusion and, 624
Clostridium perfringens, 284
clothed blood, red cell antigens, 305
c-Mpl (thrombopoietin receptor), 809
cogulation factors, see also prothrombin
  complex concentrates; specific factors
  ABO system and, 60
  fresh-frozen plasma, 639–640
  inhibitors, immunoabsorption, 786
  plasma exchange, 780, 787
coagulopathy
  cardiopulmonary bypass, 43
  immunoabsorption for, 786
  plasma alternatives, 35–36, 37
  transfusion reactions, 466
  trauma, 39–40
  Co antigens, 234
COBE® Spectra Apheresis System, 771f
cold blood, 28, 678
cold autohaemolysins see biphasic haemolysins
  cold haemagglutinin disease
  autoimmune haemolytic anaemia, 261–266, 365
  Chido/Rodgers antibodies, 235
  complement, 103
  red cell destruction
    acquired resistance, 422
    auto-anti-I antibody, 420
    autoimmune haemolytic anaemia, 365
    hypothermia, 420–421
    red cell sequestration, 423
  red cell transfusion, 264–265
  cold-reacting anti-D, 72, 183
  cold-reacting auto-anti-LW, 184
  cold-reacting auto-anti-N, 226
collagen, microfibrilar, 826
collapse curves, 443–444, 446–448
  collection of blood, see also venesection
    avoiding bacterial contamination, 737
  for components, 368–369, 769–776, see also apheresis
cord blood, 306, 889–890
errors, 461
for plasmapheresis, 847
preoperative autologous, 800–803
collections (antigen families), 55, 239–240
colloidal silica, 289
colloids, 30–34, see also alternatives under plasma
cold blood grouping, 306
burns, 44
polymers, on red cell agglutination, 92
colon carcinoma
  blood transfusions on, 564
  on red cell antigens, 142–143
  colony-forming cell content, placental cord
  blood transfusion, 634
  colony-stimulating factors see granulocyte colony stimulating factor
  colostomum
  ABO agglutinins, 132
  immunoglobulins, 68
colour
  plasma and urine, haemolytic transfusion reactions, 489
  stored red cells, 737
colouring agents, blood grouping reagents, 306
Colton system, 234
colones on antibodies, 307
combat casualties see battle casualties
  combination, antigens with antibodies, 88–95
  commercial cord blood banks, 636
  compartment syndrome, 12
  compatibility testing, see also blood grouping; crossmatching
  neonates, 335
  competition
    blood groups, 84, 85
    A vs B transferrases, 122
competitive assays, infectious agents, 698
complement, 95, 97–104, see also anti-complement reagents; specific components
  acquired resistance of red cells to destruction, 422–423
  anti-D antibody and, 186–187
  antibody test, 323
  anti-I antibodies, 103, 262–263
  autoimmune haemolytic anaemia, 272, 471
  bacteria killing, 733
  biphasic haemolysins and, 267
  cardiopulmonary bypass, 43
  cellular bioassays, 97
  Chido/Rodgers system, 234
  glycoporphin A binding, 227–228
  haemolysis, 458
  as limiting factor, 436–437
  IgG antibodies binding, red cell destruction, 421–423, 431
  IgG warm autoantibodies, 271
  IgM on, 66–67, 417–421
  immunoaffinity apheresis and, 786
  immunoglobulin classes, ABO agglutinins, 130–131
  inhibitors, 99, 442
  Kidd antibodies and, 221
  lumphocytotoxicity test, 566
  MN system antibodies, 225
  serum sources, 315
  storage, 306
  transfusion-associated acute lung injury and, 666
  transfusion reactions, 465–466
  warm autoantibodies
  IgG, 271
  and Rh antigens, 274
complementary DNAs, nucleic acid testing, 699
complementoid, 104
Compomat, platelet concentrates, 612
computer issue, abbreviated crossmatching, 333–334
centrations for agglutination, ABO agglutinins, 132
confirmation of ABO group, bedside, 337
confirmatory assays
  anti-HCV, 707
  HIV infection, 717–718
  human T-cell leukaemia viruses, 720
  infectious agents, 698
conformation
  ABO glycosyltransferases, 119
  prion proteins, 728
  congenital aibrinogenemia, 850
  congenital cataracts, li system, 151, 152
  congenital dyserythropoietic anaemias, 61
  consent, 1
  constant regions, immunoglobulins, 62–63
Index

DCE/ce red cells, D immunization, 191
DCE/Dec red cells, D immunization, 191
Dc− haplotype, 180–181
DDAVP (desmopressin), 813, 815–817
delayed surgery, due to blood shortages, 3
delayed serological transfusion reactions, 636
deferrals of donations, 3–6
deferasirox, 686
deferoxamine (DFO), 685–686
deficiency, 471
defi ciency of donors, 4–6
DIFA VP (desmopressin), 813, 815–817
d scepticemia, 825
dice of onset, 480–481
diluents, antiglobulin reagents, 318
dialysis, 460
diffused intravascular coagulation (DIC), 40, 462, 467–468, 640
dilute, 318
dilutions
blood grouping, 326
2,3-diphosphoglycerate (DPG), 370, 372
dimethylsulphoxide (DMSO), 885
direction, 471
disability, 460
diseases, 17–18, 384
disqualifi cation of donors, 4–6
divergion of aliquot, 377
divided doses, anti-D antibody injections, 203
DNA gene, 556
DMB gene, 556
DNA-based blood grouping, 304, 343–345, 804
DNA-based genotyping, 304, 343–345, 804

Dermatitis herpetiformis, 431
desensitization, factor VIII, 853–854
desciroroxamine (DFO), 685–686
desmopressin see DDAVP
dexamethasone, granulocyte collection and storage, 628, 773, 774
dextran, 31, 35–36
d eft of blood storage, 305
degradability loss, stored red cells, 371, 378
deferasirox, 686
deferriprole (L1), 686
deferasirox, 686
delayed haemolytic transfusion reactions, 490
delayed fainting, 10, 11
delayed donor red cell engraftment, 636
delayed haemolytic transfusion reactions, 458, 477–488
Duffy antibodies, 220
deldation, 485
discrimination, 488
deil antibodies, 222
dependency, 485–486
red cell antibodies, 80, 81
relative frequencies of alloantibodies, 484
speed of onset, 480–481
undetectable antibodies, 446
delayed haemolytic transfusion reactions, 485
delayed surgery, due to blood shortages, 3
Delta(1) ligand, cord blood progenitor cell expansion, 635
delta virus, 705
dendritic cells
HLA antigens, 554
macrophages vs, 86
prion proteins, 728
UV-B irradiation, 580
dengue virus, 727
density, red cell separation by, 358
dental treatment
antifrinalytic agents, 818, 819 donors, 5
dermatitis herpetiformis, 431
desensitization, factor VIII, 853–854
desciroroxamine (DFO), 685–686
desmopressin see DDAVP
dexamethasone, granulocyte collection and storage, 628, 773, 774
dextran, 31, 35–36
d eft of blood storage, 305
degradability loss, stored red cells, 371, 378
deferasirox, 686
deferriprole (L1), 686
deferasirox, 686
delayed haemolytic transfusion reactions, 490
delayed fainting, 10, 11
delayed donor red cell engraftment, 636
delayed haemolytic transfusion reactions, 458, 477–488
Duffy antibodies, 220
deldation, 485
discrimination, 488
deil antibodies, 222
dependency, 485–486
red cell antibodies, 80, 81
relative frequencies of alloantibodies, 484
speed of onset, 480–481
undetectable antibodies, 446
delayed haemolytic transfusion reactions, 485
delayed surgery, due to blood shortages, 3
Delta(1) ligand, cord blood progenitor cell expansion, 635
delta virus, 705
dendritic cells
HLA antigens, 554
macrophages vs, 86
prion proteins, 728
UV-B irradiation, 580
dengue virus, 727
density, red cell separation by, 358
dental treatment
antifrinalytic agents, 818, 819 donors, 5
dermatitis herpetiformis, 431
desensitization, factor VIII, 853–854
desciroroxamine (DFO), 685–686
desmopressin see DDAVP
dexamethasone, granulocyte collection and storage, 628, 773, 774
dextran, 31, 35–36
d eft of blood storage, 305
degradability loss, stored red cells, 371, 378
deferasirox, 686
deferriprole (L1), 686
deferasirox, 686
delayed haemolytic transfusion reactions, 490
delayed fainting, 10, 11
delayed donor red cell engraftment, 636
delayed haemolytic transfusion reactions, 458, 477–488
Duffy antibodies, 220
deldation, 485
discrimination, 488
deil antibodies, 222
dependency, 485–486
red cell antibodies, 80, 81
relative frequencies of alloantibodies, 484
speed of onset, 480–481
undetectable antibodies, 446
delayed haemolytic transfusion reactions, 485
delayed surgery, due to blood shortages, 3
Delta(1) ligand, cord blood progenitor cell expansion, 635
delta virus, 705
dendritic cells
HLA antigens, 554
macrophages vs, 86
prion proteins, 728
UV-B irradiation, 580
dengue virus, 727
density, red cell separation by, 358
dental treatment
antifrinalytic agents, 818, 819 donors, 5
dermatitis herpetiformis, 431
for premature infants, 391–392
qualifications, 1–2, see also disqualification of donors
red cells from
by cell separators, 777–778
destruction, 475–476, 536, see also
incompatible transfusions under red cells
immunization from, 521
monitoring, 8
phenotype determination, 345
quantitative differences, 304
syphilis, 731
toxoplasma-negative, 741
transfusion-associated acute lung injury
and, 666
universal, 448–449
dangerous, 462–463
vaccinations, 136–137
variation, red cell survival, 376–377
donor-specific blood transfusions, 563
dopamine, 469
Doppler blood flow velocity, fetus, 516
double dose of dexamethasone, leucapheresis, 773
double-label method, red cell survival estimation, 375–376
double membranes, congenital
dyserythropoietic anaemias, 61
double plasmapheresis, 767–768
D phenotypes, see also weak D antigens
dCcCe phenotype, sickle cell disease, 81
D•• phenotype, 180
D – phenotype, 180
elution of antibodies, 340
d polypeptide, autoimmune haemolytic anaemia, 278
D-positive transfusion, 330–331
anti-D antibodies and, 188–189
to D-negative subjects, 431–433
injection after, 438, 475
primary immune responses, 188–195
antibodies not found, 443
suppression by anti-D antibodies, 199–204, 438
red cell destruction, 437–438
DPx genes, HLA system, 556
DQx genes, HLA system, 556, 584, 585
drains (surgical), blood from, 803
mediastinal, 43
Dr‘-negative red cells, 236
DR antigens
matching, renal transplantation, 563
neonatal alloimmune thrombocytopenia, 584–585, 671
dropper pipettes, antiglobulin test, 320
drotrecogin alpha, 856
drug abuse, D immunization, 195
drug adsorption mechanism, 279–280
drug-dependent antibodies, 259
drug-induced immune haemolytic anaemia, 279–281
drug-induced immune neutropenia, 571
drug-induced immune thrombocytopenia, 589–590
drugs see medications
DRx genes, HLA system, 555–556, 557
DSLK antigen, 182
DTT (dithiothreitol), 70–71, 130, 310, 340–341
D type 4 cluster, 178
D•• see weak D antigens
Duclos antigen, 182
Duffy glycoprotein, 218–219
Duffy system, 218–220
duration of collections, fainting, 11
Duv antigens, 576
DUZO antigen (obsolete), 576
DWI (D variant), 178
Dw polymorphism, 557
dyes
antiglobulin reagents, 318
fetal D grouping, 512
dyserythropoiesis, see also hereditary erythropoietic multinuclearity with a positive acidified serum aquaporin 1 deficiency, 234
on red cell antigens, 61
EI antigen, 179
EII antigen, 179
EIII antigen, 179
EIV antigen, 179
E-64 (papain inhibitor), 312
E antigen
immunization, 82, 196–197
numbers of red cell sites, 170
structure, 170–173
variants, 179
e antigen
immunization, 197
numbers of red cell sites, 170
structure, 170–173
warm autoantibodies, 273–274
car lobe puncture, haemoglobin levels, 9
early loss, 35Cr from red cells, 362
car-piercing, deferrals of donations, 5
Echinococcus cyst fluid, P, antigen and antibody, 148, 150
ectopic gestation, maternal fetal haemoglobin, 504
eculizumab
cold haemagglutinin disease, 265
paroxysmal nocturnal haemoglobinuria, 472
EDTA
on complement, 104
antiglobulin test, 323
platelet agglutination, 589
Ee antigen, 171
Ehrlichia spp., 733
EKLF gene see erythroid transcription factor
EKLF gene
electric potential, red cells, 91
electrolysis, deferrals of donations, 5
electronically controlled processes, error prevention, 337
electronic remote blood issue, 334
electrophoresis, 56
emollopapag, 813
elution, see also acid-elution methods
antibodies, 92–93, 340
ABO haemolytic disease, 534
from platelets, 589
\textsuperscript{51}Cr from red cells, 360, 362
Fy antigens, 219
radioactivity from platelets, 880–881
weak A and B antigens, 122
EM antigens, monocytes, antibodies, 573
embolism, 682–683, see also air embolism;
venous thromboembolism
embryonic stem cells, human, 831
embryos
A, B and H antigens, 129
red cell antigens, 61–62
emergencies, see also battle casualties; disasters
group O blood transfusion, 332
omission of compatibility testing, 337
Emm PEL antigen, 241
EMMPRIN (extracellular matrix metalloproteinase inducer), 238
emphysema, \( \alpha \)-antitrypsin on, 863
En(a–) red cells, 222–223
encephalopathy
dimethylsulphoxide, 633
hypertensive, 388
endo-\( \beta \)-galactosidases, 285
endo-\( \beta \)-galactosidase F on Fy\( ^\prime \) antigen, 219
endoscopy, thrombocytopenia, 624
endothelial cells
HPA-1 system antigens, 576
leukaemia, 788
endothemic reactions, 90
dendoxygenaemia, 26
detoxydinosis, 677–678
engulfment, red cells, 94, 95
entropy, 90
ever gene
HIV-1, 711
human T-cell leukaemia viruses, 718
retroviruses, 710
enzyme-linked antiglobulin test, 326–327
enzyme-linked immunosorbent assay, 697–698
anti-HCV, 707
blood grouping, 303
HIV screening, 697–698, 716, 717human T-cell leukaemia virus antibodies, 719–720
IgG antibodies, 326
malaria, 739
platelet antibodies, 586
enzyme-only antibodies, 313
enzymes on agglutination of red cells, 92, 262,
287–288, 307–310
agglutination tests using, 312–313
in antiglobulin test, 321, 323
automation, 324
converting A and B red cells to O, 127
on lysis of red cells, 104
red cells treated with
dextran on, 36
isolation of antibodies, 340
epitopes see antigenic determinants
eplets, HLA molecules, 582
Epex\( ^\circledR \), pure red cell aplasia, 807
epsilon-aminocaproic acid (EACA), 43, 817, 818
Epstein–Barr virus, 724
lymphocyte transformation, monoclonal
antibody production, 77
lymphoproliferative disorders, 638
equilibrium constants
ABO agglutinins, 132
antibodies, 89, 90
IgG anti-K antibody, 217–218
Er antigens, 240
errors abbreviated crossmatching, 334
arterial puncture as, 13
blood grouping, 329
recipient serum screening, 330
D-positive blood transfusion, anti-D antibody for, 201, 203–204, 438
of identification, 336–337, 461, 488
reporting of, 460–461
eryptosis see apoptosis
erythema migrans, 732
erthroblasts
ABO haemolytic disease, 535
red cell antigens, 62
erythrocytapheresis, 763–766
alloimmunization, 81
erthrocyte-magnetized technology, 324
erthrocyte membrane-associated protein (ERMAP), Sc antigens, 233
erthrocyte sedimentation rate, 288
erythrocyte sedimenting agents, see also
hydroxymethyl starch
eucapheresis, 774
erthrocytosis, 15
erthroderma syndrome, postoperative, 667
erythroid transcription factor EKLF gene, 234
erythroleukaemia, ABO system, 126
erythropoiesis
exchange transfusion on, 521
experimental suppression, 359
fetus, anti-K antibody, 529
normal levels, 392
preoperative, 801
red cell antigens appearing, 62
red cell transfusion on, 388–389
erythropoietin (therapeutic), 806–808
ABO haemolytic disease, 536
iron supplements with, 804, 805, 806
preoperative, 801
very-low-birthweight infants, 392
escalating dose regimen, donor lymphocyte infusion, 638
escape mutants
\( \alpha \)-deficient, hepatitis B virus, 702, 705
Escherichia coli, uropathogenic
Dr\( ^\circledR \) antigen and, 236
P system antigens as receptors, 148
Tamm–Horsfall glycoprotein and, 241
Escherichia coli O\textsubscript{86} on anti-B titres, 71–72
anti-T and anti-Tn, 282
Escherichia coli O\textsubscript{125}: B15, anti-K antibody and, 216
Escherichia coli O\textsubscript{157}, group O and, 142
ether-elution method, platelet antibodies, 589
ebics, 636, see also Jehovah’s Witnesses
ethnicity, see also Arabs; Asians; black people;
Melanesians
ABO haemolytic disease, 532
ABO phenotypes, 118, 119t
non-secretors, 127
anti-A and anti-B antibodies, 129
anti-A antibody lysins, 131
antibody identification, 338
A antigen, 121
D-negative phenotype, 173–174
Duffy antibodies, 220
gene frequencies, 59
haemoglobin levels, 9
K\( ^{6} \) antigen, 478
Le\( (a+b+) \) phenotype, 139t
lele genotype, 140
Rh genotypes, 170
sickle cell disease
alloimmunization, 81
donor blood selection, 331
West African, gene frequencies, 59
ethylene oxide, 684
etiocholanolone, 773
European ethnicity, gene frequencies, 59
evidence retention, haemolytic transfusion reactions, 488
Ex30 (Compomat), platelet concentrates, 612
examination, donors, 2
exchange transfusion, 394–396, 763–766, see also plasma exchange
ABO haemolytic disease, 536
babesiosis, 742, 766
D-negative red cells, 203–204
for haemolytic disease of the newborn, 521–522
malaria, 738, 766
partial, delayed haemolytic transfusion reactions, 485
for post-transfusion purpura, 671
potassium levels, 681
red cell abnormalities, 6
Exjade (deferasirox), 686
exons, 58
exothermic reactions, 90
expansion, cord blood progenitor cells, 635
explosion risk, sodium azide, 306
expansion, cord blood progenitor cells, 831
extracorporeal photopheresis, 789
extracorporeal volume, apheresis, 777
extracellular matrix metalloproteinase inducer (EMMPRIN), 238
external cephalic version, transplacental
exsanguination–transfusion, 763
fainting, 10–12, 773, 777
false-negative results
antibody screening, 330
antiglobulin test, 323
HIV screening, 717
false-positive results
agglutination tests, 314
antiglobulin test, 323, 330
exclusion of donors due to, 4
familial hypercholesterolaemia, 783, 785, 786
familial incidence, ABO haemolytic disease, 533
fatality, 851–854
family-replacement donors, blood-borne
cancers, 365, 773, 777
F(ab')2 fragment
antibodies against, cold haemagglutinin disease, 262
IgG splitting, 65
Fab fragments
cold haemagglutinins, 265
cold haemagglutinin
contact with D polypeptide, 179
dimeric, 311
IgG, 64
complement binding, 99
Fabry disease, plasma exchange, 784f
delivery, I see fibrinogen
delivery V
antibodies to bovine thrombin, 827
fresh-frozen plasma, 639
factor VII
fresh-frozen plasma, 639, 640
plasma-derived concentrate, 855
vitamin K on levels, 821
factor VIIa, recombinant, 813, 814–815, 823–824, 893, 895
factor VIII, 851–854
ABO system and, 60
antibodies, 590, 853–854
immunoaffinity apheresis, 786
concentrates, 852–854
anti-A and anti-B antibodies, 464
hepatitis A virus, 710
HIV infection, 715
von Willebrand disease, 854
DDAVP on, 815, 816
dextran on, 35–36
donors, 851–852
hydroxyethyl starch on, 37
prophylactic, 851
treatment with, 851
factor IX deficiency, 854–855
factor XIII, 855–856
factor B, C3Bi complex, 102, 104
doctor D, 102
factor H, 102, 103
factor I, 102
faeces, blood loss, 8, 365–366
failure of response to transfusion, 29
fainting, 10–12, 773, 777
false-negative results
antibody screening, 330
antiglobulin test, 323
HIV screening, 717
false-positive results
agglutination tests, 314
antiglobulin test, 323, 330
exclusion of donors due to, 4
familial hypercholesterolaemia, 783, 785, 786
familial incidence, ABO haemolytic disease, 533
family-replacement donors, blood-borne
viruses, 1
fatality, see also mortality
donors, 13
Jehovah’s Witnesses, 44
neonates, potassium, 392
fatty-acid-dependent agglutinin, 281
FcRn (Fc receptor), 499–500
FcR III, 93
FcR III (IgG receptor), 86, 93, 94, 272
FcR III (IgG receptor), 431
FcR IIIA, 271–272
FcR IIIIB, 93, 272, 568–569
deficiency, 568–569
granulocyte-specific antigens, 570
FCGR3 genes, 567–568, 569
genotyping, 573
FCR III, 93
Fc receptor blocking antibodies, on ADCC assays, 514
FcRn (Fc receptor), 499–500
intensive plasma exchange on, 519
neonatal, 66
febrile neutropenia, chemotherapy, 808
febrile reactions, 476–477, 660–669
FEIBA (activated prothrombin complex), 855
Fenwal ALYX cell separator system, 771
ferritin, iron status monitoring, 8, 584–585
Ferrlecit, 805
fetal haemoglobin
hereditary persistence, 501
induction, 393
pregnancy, 503–504
fetus, see also haemolytic disease of the newborn; hydrops fetalis
anti-A and anti-B antibodies, 130
anti-PP, Pk antibody on, 149
blood sampling, 516
thrombocytopenia, 586
cytomegalovirus infection, 722
determination of D group, 511–513
immunoglobulins, 68
intravenous immunoglobulin in, 520
maternal Rh D immunization and, 508–509
red cells, 501–506
acid-elution methods, 501–502
antigens, 153
maternal, 506
thrombocytopenia, 584, 585
transplacental haemorrhage on, 506
ultrasonography, 516
faint, see also
febrile reactions, 661
red cell destruction, 365, 488
fibreoptic blankets, phototherapy, 522
fibrin, screen filtration pressure, 682
fibrin bandage, 826t
fibrin degradation products, DIC, 467
fibrinogen, 850
concentrate, 850
cryoprecipitate, 641–642, 850
DIC, 40, 467, 640
fresh-frozen plasma, 639
plasma exchange, 780, 787
fibrinolysis, cardiopulmonary bypass, 43
fibrin sealants, 641–642, 826t, 827
fibrin-stabilizing factor, 855–856
fibronectin, 863
ficolins, 101
filgrastim, 808
filtration
aggregates, 682, 683
leucocyte removal, 577–579
bedside, 580, 664
cytomegalovirus and, 723
effect on blood, 470
plasma exchange, 778–779
of platelets, leucocyte reduction, 772
prion protein removal, 730
reactions, 677
selective, 785
fingerprick, haemoglobin levels, 9
first-time donors
fainting, 10, 11
testing for D antigens, 174
fixation of red cells, automated blood grouping, 325
Index

glucuronide complexes, 280
GLUT 1 (glucose transporter), 55–56
glutathione, 310
glycans, 56, 142
glycine, 15N-labelled, red cell labelling, 364
'glycigel', 305, 883
glycerol, 305, 379–383, 883–884
glycophorins, red cell precursors, 62
glycophorin D, Ge antigens, 235
glycophorin C, 55
glycophorin B, 182, 222, 224
glycophorin A, 222
GP.IIIa molecules, human platelet antigens, 617
GP Ib molecules, platelets, 617, 670
GP Ib/IIIa molecules, platelets, 617
gp41 (transmembrane protein), 711
GP (B−A−B) hybrid protein, 223
GP.Mur (phenotype), 223
graft versus-host disease, 559
cord blood progenitor cell transplantation, 634
directed donations, 14
donor lymphocyte infusion, 638
haematopoietic progenitor cell transplantation, 632–633
infants, 521, 667
photopheresis, 789
transfusion-associated, 487, 667–669
graft-versus-leukaemia effect, 559, 637–638
graft-versus-tumour effect, 559
granulocyte colony stimulating factor, 628, 808–809
adverse effects, 774
leucapheresis, 773
stem cell mobilization, 775–776
granulocytes
antibody detection, 571–572, 630
antigen typing, 572–573
A, B and H antigens and, 128
collection, 773–774
immunofluorescence technique, 571–572, 630
transfusions, 626–632
cytomegalovirus infection, 722
reactions, 571, 662
toxoplasmosis, 741
granulocyte-specific antigens, 570
graphs, red cell survival estimation, 876–877
Griffonia simplicifolia lectins, 88, 285
Gro' antigen, 575
group A
ABO haemolytic disease, 532
anti-A antibody in subjects, 134
conversion of O red cells to, 127
conversion of red cells to O, 127
donors, high-titre anti-B, 465
neonates, 335
stomach carcinoma, 59
weak alleles, 123–124
group A, red cells, 11Cr release method, 315
Groupmatic (Kontron), 324
testing for D antigens, 174
group B
ABO haemolytic disease, 532
anti-B antibody in subjects, 134
conversion of O red cells to, 127
conversion of red cells to O, 127
neonates, 335
subgroups, 122
group O, 123
P gene product, 147
Sid and Cad antigens and, 241
Gm allotypes, 590–591
anti-D antibody and, 186
GM-CSF (cytokine), 775
neonatal sepsis, 809
gold-induced thrombocytopenia, 590
Goodpasture syndrome, treatment, 782
Gov antigens, 576
GP Ib molecules, platelets, 617, 620, 670
GP Ib/IIIa molecules, platelets, 617
GP Ib/IIIa molecules, human platelet antigens, 574, 670
gp41 (transmembrane protein), 711
Gly (B−A−B) hybrid protein, 223
Glyc A (phenotype), 223
Lewis phenotypes, 139
molecular biology, 123
mothers, 335, 533, 537
red cells
A and B substance uptake, 128
converting to A or B cells, 127
serum, crossreacting antibodies, 132–133
universal donors, 448–449
growth, thalassaemia, 393
growth factors, 806–808
cord blood progenitor cell expansion, 635
growth hormone, exclusion of donors, 4
GS II lectin, 285
Gy' antigen, 233
GYPA/GYPB gene, 175
Gypsies, Ir' antigen, 239
habitual abortion, HLA antigens, 565
Haemaccel, 36
haemagglutination, see also passive
haemagglutination assay
inhibition, IgA deficiency, 592
haematocrit, see packed cell volume
haematoma, see bruising
haematopoietic progenitor cell transplantation, 632–637, see also peripheral blood-derived progenitor cells
compatibility testing, 630
HLA system and, 559–561
haematoside, red cell agglutination experiment, 91
haemochromatosis, 15–17
apheresis donors, 774
cardiocvascular disease, 14
red cell apheresis, 766
haemodialysis
anti-N antibody, 226
cold-reacting IgM autoantibodies, 561
on immune responses, 76
haemodilution
acute normovolaemic, 41–42, 802
haemoglobin-based oxygen carriers, 830–831
perfluorochemicals, 828
isovolaemic, polycythaemia, 766
haemoglobin, see also fetal haemoglobin
catabolism, 358
levels, see also anaemia
ABO haemolytic disease, 535
after donation, 9
donor screening, 8–9
fetus, 516
hereditary haemochromatosis, 16, 17
mother−infant ABO incompatibility, 531
neonates, 517–518
oxygen delivery, 27
premature infants, 391
preoperative, 41
red cell transfusion, 386–387
targets for erythropoietin therapy, 807
transfusion trigger, 389
on viscosity of blood, 28
loss from red cells, 364
per unit stored blood, 368
in plasma, 371, 372, 828
clearance, 472–474
DEHP and, 371, 379
detection, 489
extravascular red cell destruction, 415–417
nephrotoxicity, 468
transfused, 470
transfusion reactions, 465
variants, donor vs recipient, red cell survival estimation, 364
haemoglobin-based oxygen carriers, 828–831
haemoglobinopathies, 6
haemoglobin peroxidase, blood grouping, 6
haemoglobinopathies, 6
haemoglobin-based oxygen carriers, 828–831
transfused red cells, destruction, 365–366
haemolytic disease of the newborn, 499–548
ABO incompatibility, 137, 532
ADCC(L) assay, 97
ADCC(M) assay, 96
anti-Ge3 antibody, 236, 530
evaluation of severity
antenatal, 513–517
neonates, 517–519
clinical manifestations, 509–510
D antigen variants and, 177
D\textsuperscript{v} antigen, 177
epidemiological trends, 526–527
haemolytic transfusion reactions, 335
non-anti-D, 527–537
haemolytic transfusion reactions, 458–498
anti-P, antibody, 148
cold autoagglutinins, 265
delayed see delayed haemolytic transfusion reactions
D immunization, 197–198
haemolytic disease of the newborn, 335
HLA antigens, 243
investigations, 342–345, 488–491
Kell antigens, 218
Kidd antibodies, 221–222
Lewis system, 145
management, 469
MNSs system, 227
pathophysiology, 465–467
premature infants, adult A or B red cells, 536–537
red cell antibodies, 134
frequency, 80
relative importance, 81–82
sickle cell disease, 331
T activation, 284
undetectable antibodies, 446
vaccinated donors, 136–137
haemolytic uraemic syndrome
atypical, factor H, 102
post-diarrhoeal, 148
haemopexin, 473
haemophilia, 851, see also factor VIII
DDAVP, 852
factor VIII inhibitors, 853–854
hepatitis A virus, 710
hepatitis B virus, 701, 705
hepatitis C, 707
HIV infection, 713, 714–715
HPV B19, 726
lysin analogues, 819
haemophilia B, 854–855
Haemophilus influenzae, AnWj as receptor, 238
haemorrhage, see also blood loss
dextran as cause, 35–36
disseminated intravascular coagulation, 467
drugs for, 813–827
gastrointestinal tract
lysin analogues, 818
oesophageal varices, rebleeding, 390
oestrogens on, 825
red cell survival, 365–366
geatins on, 36
hydroxyethyl starch on, 37
after massive transfusion, 39
neonatal thrombocytopenia, 583–584
recurrent, anaemia, 390
red cell survival, 365–366
into soft tissues, 472
transplacental see transplacental haemorrhage
haemosiderinuria, 474
haemosiderosis, 14, 684–686, 766
haemostasis
cardiopulmonary bypass, 43
drugs for, 813–827
hetastarch vs pentastarch, 774
half-lives (T\textsubscript{1/2}), see also survival
anti-D antibodies in neonates, 500
\textsuperscript{51}Cr, 413, 874
factor IX, 855
fibrinogen, 850
IgG, 66
lysin analogues, 818
plasma alternatives, 36
protamine, 825
recombinant erythropoietin, 807
red cells, D immunization, 188, 190f, 191f
half-survival (T\textsubscript{1/2})
neocytes, 394
red cells, 361
H allele, 138
H antigen, 124
development, 61–62, 125
plasma, 153
red cells, 153
number of sites, 124–125
H antigen acceptor, 119, 138
haplotypes, 554
hapten–carrier complexes, 279
haptooglobin, 472–473
deficiency and antibodies, 675
estimation, 489
harmful cold autoantibodies, 261–268
harmful warm autoantibodies, 270–278
harmless cold autoantibodies, 260–261
harmless warm autoantibodies, 268–270
harnesses, plasmapheresis, 768
hay fever, 5
HBsAg, 700
absence
HBV carriers, 704
liver disease, 705
anti-HBe and, 702
carriers, 701
HBsAg see hepatitis B surface antigen
HBsAg, 700
HBV-DNA, serum, 702
H chains, immunoglobulins, 62
head injuries, from fainting, 12
health benefits of donation, 13–14
health-care workers, HBsAg-positive, 704
heart
iron accumulation, 685–686
oxygen extraction, 27
surgery, see also cardiopulmonary bypass
aprotinin, 820
DDAVP, 817
HLA immunization, 558
lysine analogues, 819
off-pump, 42, 43
polymerized haemoglobin solution, 830
red cell salvage, 803
TA-GvHD, 668
transplants
cytomegalovirus infection, 722
HLA compatibility, 562
heart–lung transplants
cytomegalovirus infection, 722
passenger lymphocyte syndrome, 487
heart rate, anaemia, 385
heat, see also temperature
ABO agglutinins, immunoglobulin classes, 132
antibody elution, 340
on complement, 104
effect on blood, 470
eletion, 93
heat exchangers, 678
heat lability, immunoglobulins, 71
heat-treated antithrombin concentrates, 862
‘heavy’ platelets, 614
Hédon, E. (1902)
delayed haemolytic transfusion reactions, 478
red cell transfusion, 397
height (body), blood volume estimation, 876
Helgeson phenotype, 237
Helicobacter pylori, Leα antigen and, 60, 142
helminths, Tn antigen, 282
helper T cells, 259
HLA antigens, 554, 557–558
hemizygosity, 58
HEMPAS (hereditary erythroblastic multinucletarity with a positive acidified serum), 152, 243
hereditary haemochromatosis, 15–17
red cell apheresis, 766
hereditary persistence of fetal Hb, 501
hereditary spherocytosis
Diego system band 3 genes, 230–231
transfused red cells, survival, 366
herpes viruses, 724–725
hetastarch, 774
heteroagglutinins, 71–72, 317, 323
removal, trypsin-treated red cells, 91
heterophil antibodies, 136
hexokinase, red cell ageing, 359
HFE gene, 16, 551
H gene, 124
HLA genotype, 125
HHV-6 (human herpes virus), 724–725
HHV-8 (human herpes virus), 725
high expressers, A and B antigens, 573, 581
high-incidence antigens, 240–241
high-molecular-weight iron dextran, 804
high-risk activities see blood-borne viruses
high-titre, low-avidity antibodies, Knops system, 237
hinge regions, immunoglobulins, 63
hip fracture surgery, effects of transfusion, 390
histocompatibility, 549
historical aspects, 22–23, 411
anti-D antibodies, 184
therapeutic, 199
blood groups, 53–55
crossmatching, 332
delayed haemolytic transfusion reactions, 478
enzymes on red cell agglutination, 307
exchange transfusion, 763–764
haemolytic disease of the newborn, 501
HLA system, 549
Lewis system, 143
mortality, 461
passenger lymphocyte syndrome, 486
plasma fractionation, 846–847
plasmapheresis, 766–767
platelet transfusion, 611–612, 621–623
red cell freezing, 380–381
red cell storage, 366–368
red cell transfusion, anaemia, 397
topical haemostatic agents, 825–826
transfusion-associated acute lung injury and, 665
transfusion-associated AIDS, 713–714
transfusion reactions, 466
HIV-1 and HIV-2, 711–712, 713
screening tests, 717
HIV infection, 710–718, see also blood-borne viruses
CD147 on, 238
cold autoagglutinins, 264
course, 712–713
cytomegalovirus infection, 722–723
Duffy groups and, 219–220
febrile reactions, 660, 663–664
intravenous immunoglobulin, 859
ITP, thrombopoietin, 812
пα antigen and, 148
prevention, 715–718
RANTES (chemokine), 238
recombinant erythropoietin, 807
risk, 718
TA-GvHD and, 667–668
HLA antibodies, 557–559
detection, 567
febrile reactions, 661–662
as haemolysins, 459
platelet-specific antibodies vs, 587
refractoriness to platelet transfusions, 576–577
transfusion-associated acute lung injury and, 666
HLA antigens, 549–567, see also DR antigens
class I, 551–553
prevention of alloimmunization, 577–580
soluble, 557
class II, 551–552, 553–554, 555–556
inactivation of positive cells, 580
neonatal alloimmununme
thrombocytopenia, 584–585
on Fc receptor function, 431
febrile reactions, 669
on immune responses, 75
platelets, 573, 581–582, 672
on red cells, 242–243, 426
TA-GvHD and, 668
tests for, 565–567
HLA genes, 551, 554–557
Chido/Rodgers system and, 234
class II, 555–556
tests for, 565–566
HLA-matched platelets, 581–582
HLAMatchmaker, 582
HLA restriction, 552–553
HNA-1 system, 567–568
genotyping, 572–573
Index

HNA-2 system, 569
HNA-3 system, 569
HNA-4 system, 569
HNA-5 system, 569
HOFM antigen, 180
hogen pepsin, vaccines, 136–137
homologous restriction factor (HRF) see C8 binding protein
homozygotes
antigens, 304, 428
HLA loci, TA-GvHD and, 668
homologous familial hypercholesterolaemia, 783, 785, 786
horse A and B substances, 138
horse serum
horse A and B substances, 138
human parvovirus B19
human neutrophil antigens, 567–569
human monoclonal antibodies, 77
human T-cell leukaemia viruses, 718–720, see also blood-borne viruses
human thymbin, 864
Humate-P, 854
humoral response, 72
husband’s blood, 217
Hy antigen, 233
hybrid ABO alleles, 124
hybrid genes, Rh system, 173–175, 511–512
hybridoma cells, 77
hydatid cyst fluid, P, antigen and antibody, 148, 150
hydrocortisone
before anti-D antibody injections, 203
red cell destruction inhibition, 442
H-thymidine, granulocyte labelling, 627
hydrops fetalis, 509–510
ABO incompatibility, 533–536
transfusion for, 520
transplacent al haemorrhage and, 506
ultrasonography, 516
hydroxyethyl starch (HES), 31, 36–37
adverse effects, 778
allergy, 37
catabolism, 37–38
frozen red cell storage, 383
leucapheresis, 774
hyperacute rejection, 562
hyperbilirubinaemia see bilirubinaemia
hypercholesterolaemia, homozygous familial, 783, 785, 786
hypergammaglobulinaemia, direct antiglobulin test, 269
hyperhaemolysis, sickle cell disease, 472
hyperimmune immunoglobulins, 858
hyperimmunization, see also vaccines/vaccinations
antibodies to low-frequency antigens, 241
anti-D antibody, 186
hypersensitivity, see also anaphylaxis
anti-D antibody injections, 203
ethylen oxide, 684
immediate-type, 672–675
hypersplenism, 366
hypertension
haemoglobin-based oxygen carriers, 831
recombinant erythropoietin, 807
hypertensive encephalopathy, 388
hypertonic saline, 32–34
burns, 45
hypertransfusion, thalassaemia, 393
hypervariable domains, immunoglobulins, 62
hyperviscosity syndrome, 783
hypocalcaemia, citrate-induced, 13
hypogammaglobulinaemia, 75
anti-A and anti-B antibodies, 129, 418
immunoglobulin replacement, 859, 860
incompatible transfusion, 467
reactions to IgG, 675
hypoglycaemia, neonates, 681
hypoponatraemia, DDA VP, 817
hypoplastic anaemia, 392–393
hypotension
haemorrhage, 25
transfusion reactions, 467, 469
hypothermia
cold alloantibodies, 420–421
intravenous immunoglobulin, 862
massive transfusion, 39, 678
hypothermia (induced), 330
hypotonic shock, platelets, 619
I antigen, 150–153
i antigen, 150–153
iC3b (complement product), 98, 102
icatibant, 857
ice-binding proteins, 306
icterus gravis neonatorum, 509
identification
donors, 2
errors of, 336–337, 461, 488
idiotypes, antibodies, 67
idiotypes, antibodies, 67
IgA, 62–63, 66t, 67, see also anti-IgA antibodies
ABO agglutinins, 130, 131–132
immune responses and, 138
anti-D antibody, 186
autoantibodies, with anti-I cold agglutinins, 266
deficiency, 591–592
anaphylaxis, 673–675
gastrointestinal, immunological tolerance, 87
neonates, 68–69
serology, 75
warm autoantibodies, 272
IgD, 67
IgE, 67
IgG, 66t, see also anti-IgG antibodies
ABO agglutinins, 130, 131, 132, 138
ABO haemolytic disease, 533–534
ADCC assays, 96, 97
adverse reactions, 861
anti-D antibody, 185–186
affinity constants, 187
passive, 202–203
anti-dextran, 35
antigen-binding sites, 89
anti-Le‘ antibody, 145
anti-M antibody, 225
anti-P antibody, abortions, 149
autoantibodies
with anti-I cold agglutinins, 266
IgM autoantibodies with, 273
biphasic haemolysins as, 268
blood grouping, 303
C3b with, 95
chemiluminescence assay, 97
complement binding, 98–99
subclasses, 99
distribution, 65
dithiothreitol, testing, 340–341
effect of reduction, 70
on enzyme-treated red cells, 92
Fc receptors, 93
half-lives, 66
human T-cell leukaemia virus infections, 719
immune responses with, 73, 74
immune thrombocytopenia, 588
immunosuppression, 86
intensive plasma exchange on, 519
laboratory separation, 69
maternal, 499–501
maternal–fetal transport, 514–515, 524, 570
microwave radiation, removal from red cells, 341
mixed red cell adherence assay, 587
molecule, 62–65
monoclonal antibodies, conversion to IgM, 311
monocyte–red cell interactions, 94
neonates, 68
non-complement-binding antibodies, differences between, 433–434
non-destructive, 426–427
non-specific attachment, 91
P1PK and GLOB system antibodies, 149–150
reactions, 675–676
red cell ageing, 359
red cell agglutination, 91, 317–319
red cell assay, 326
red cell destruction, 415, 421–422, 424–427
serology, 74–75
subtypes, 65–66
subclasses, 590–591
ABO haemolytic disease, 533
anti-D antibody, 185–186, 430–431, 513–514, 526
apparently normal donors, 269
complement binding, 99
harless warm autoantibodies, 268
immunoaffinity apheresis, 785, 786
maternal, 500
warm autoantibodies, 271–273
synthesis, plasmapheresis donors, 769
transplacental transfer, 66
transfused, 449, 857–858
transfusion reactions, 481
ulcerative colitis, 281
anamnestic responses; primary immune responses; secondary immune responses; A and B antigens, 134–138
immediate-type hypersensitivity reactions, 672–675
immune complexes, 327
immunodefi ciency
anti-D antibody quantifi cation, 280
granulocyte immunofl uorescence
immunity, 150–153
immunoaffinity apheresis, 785–786
immunodefi ciency
hapten, 149–150
non-D antigens, 196–198, 331–332, 520–521
organ transplantation, 81, 194
platelet antigens, 576–590
post-transfusion purpura, 670–671
sickle cell disease, 79, 80–81
HLA molecules, 557–558, 577–580
leucocytes, habitual abortion, 565
non-D antigens, 196–198, 331–332, 520–521
organ transplantation, 81, 194
platelet antigens, 576–590
post-transfusion purpura, 670–671
sickle cell disease, 79, 80–81
immunization (prophylactic)
hepatitis B virus, 704
with immunoglobulin, 858–860
immunoaffinity apheresis, 785–786
immunodefi ciency
immunodefi ciency
cytomegalovirus infection, 722
HIV infection, 713
immunoglobulin replacement, 859
TA-GvHD, 667–668
immunodominant groups, antigenic determinants, 58
immunofl uorescence technique, see also platelet immunofl uorescence test
granulocytes, 571–572, 630
immunogenecity see potency
immunoglobulins, 62–72, see also hepatitis B
immunoglobulin; specifi c Ig classes
cold haemagogglutinins, 265–266
copying variable domains, 78
deferrals of donations, 5
deficiency, 859
flexibility, 63
heat lability, 71
laboratory methods, 69–71
markers on, 67–68
neonatal, 68–69
reduction, 69–71, 311
removal from plasma, 778–779
superfamily, 69
therapeutic, 857–862, see also intravenous immunoglobulin
anti-HAV, 710
parvovirus antibodies, 726
reactions, 674, 675
virus transmission, 846
immunological tolerance, 84–86
induction, D antigens, 526
oral antigens causing, 87
immunology of blood groups, 53–117
neoplastic change on, 378
immunomodulation, by transfusion,
562–565
immunosuppression
by passive antibody, 85–86
by rhesus immunoglobulin, 443
therapeutic, 559
for autoimmune haemolytic anaemia,
277
chimerism, 84
on D immunization, 193, 526
HBV recrudescence, 701
TA-GvHD and, 668
by transfusion, 562–565
Inab phenotype, 236
inadvertent arterial puncture, 13
inadvertent transfusion
D-positive blood, anti-D for, 201,
203–204, 438
In antigens, 237–238
incompatible donors, apparent, 335–336
incompatible transfusions, 134–135, see also
haemolytic transfusion reactions
antibodies not found, 443–448
differential agglutination, 490
hypergammaglobulinaemia, 467
plasma, 448–450, 464
red cells see red cells, incompatible
transfusions
incomplete antibodies, 75, see also IgG,
cancer, anti-D antibody
antiglobulin test, 315–323
anti-IgM as, 319
anti-S antibody, 226
febrile reactions, 476
normal cold, 134, 260t, 261
red cell test transfusion, 413
warm autoantibodies, 271, 272
incubation of red cells
at 37°C, 360–361, 368, 375
at high temperatures, viability, 378
incubation periods
agglutination tests, 311
antiglobulin test, 320
babesiosis, 742
infectious mononucleosis, 724
malaria, 738
post-transfusion hepatitis, 703
syphilis, 731
index of therapeutic effectiveness (ITE),
stored red cells, 383
Indian system, 237–238
indicator rosette test, 884
indirect antiglobulin test, 315, 317–319
crossmatching, 332
immunoglobulin treatment and, 861
polyethylene glycol, 322, 324, 328, 330
recipient serum screening, 330
sensitivity, 327
testing for IgG, 533
transplacental haemorrhage, 502
indirect differential agglutination, 356–357,
877
indirect differential haemolysis, 877
111In granulocyte labelling, 627
platelets labelled with, 613, 878–879
red cell labelling, 364, 413
red cell volume estimation, 873
111In, platelets labelled with, 613
infants
ABO agglutinins, 130
exchange transfusion, 764
febrile reactions, 662
graft-versus-host disease, 521, 667
granulocyte transfusions, 631–632
HIV infection, 714
indications for transfusion, 392
Lewis system, 140
Rh D immunization, 509
vaccinated mothers, 137
infected blood, 471, 730–737
infections, see also specific pathogens
anti-I antibodies, 263–264
anti-i antibodies, 263–264
anti-Pr antibodies, 263
apheresis, 778
autoimmune responses, 259
autologous blood, 802
biphasic haemolysins, 266–267
cancer chemotherapy, 808
cold haemagglutinin disease, 261–262
exclusion of donors, 4
neonatal alloimmune neutropenia, 570
parental iron and, 806
postoperative, blood transfusions on,
564–565
prevention, see also vaccines
immunoglobulin, 858–860
protection by ABH and Le substances,
142–143
red-cell loading of reticuloendothelial
system, 477
transmission by transfusion, 696–762
fresh-frozen plasma, 639
granulocyte transfusions, 628–630
investigations, 736–737
infectious mononucleosis
cold autoagglutinins, 264
HLA-B7 and, 242
post-transfusion, 724
InF antigen, 237
inflammation, role of Fy glycoprotein, 219
inflammatory bowel disease, frequency of red
cell antibodies, 78–79
influenza vaccine, anti-A antibody and, 136
information, for donors, 1
inherance, red cell antigens, 58–59
inherited defects, platelets, 624
INJA antigen, 237
Injectafor, 804
In (Lu) gene, 228, 237
inosine, red cell rejuvenation, 375
integrin-associated protein see CD47
integrins
CD151 and, 238
LW antigen and, 183
intensive care
blood loss from sampling, 391
transfusion and mortality, 390
vitamin K deficiency, 822
intensive plasma exchange, anti-D antibodies,
198, 519
intercellular adhesion molecule, anti-D antibodies,
198, 519
intercellular adhesion molecule, LW antigen
as, 183
interchange of samples, haemolytic
transfusion reactions, 342
interferon-alpha see α-interferon
interleukin-8
FY antigen as receptor, 219
transfusion reactions, 466
interleukin-10, on regulatory T cells, 278
interleukin-11, thrombopoiesis stimulation,
809
intermittent blood loss, 390–391
intermittent-flow cell separators, 770
International Committee on Standardization
in Haematology (ICSH), use of 51Cr, 439
International Normalized Ratio (INR),
vitamin K on, 822
International Standard Unit, HBsAg, 702
interstitial fluid, shock, 31
interviews, donors, 2
intestinal mucosa
Inab phenotype, 236
Sd’ antigen, 241
intracranial haemorrhage
haemophilic, 851
leukaemia, 787–788
neonatal thrombocytopenia, 583, 584
recombinant factor VIIa, 814, 815
subarachnoid haemorrhage, lysine
analogues, 819
intramuscular injections
anti-D antibody, transplacental
haemorrhage, 438
IgG, 857
IgG anti-D, 199–200, 203, 432–433
incompatible blood, 135
iron, 804
of red cells, 397
vitamin K, 822
intra-operative haemodilution see acute
normovolaemic haemodilution
intra-operative red cell salvage, 802–803
intraperitoneal transfusion, 396, 397f
to fetus, 520
intrauterine transfusions see transfusions, to fetus
intraocular injection, 340
intravenous KCl, 825
intravenous vitamin K, 822, 823
intravenous iron, 804, 805–806
IPEX (syndrome), 259
iron supplements, 8
parenteral, 804–806, 807
irradiation (ionising)
  blood components, for premature infants, 392
  granulocyte concentrates, 628
  mixed lymphocyte culture, 566–567
on red cells, 379
  before freezing, 379
  potassium leak, 372, 379
  T lymphocytes, prevention of TA-GvHD, 668–669
irradiation (ultraviolet B), platelet concentrates, 578, 580
ISBT 128 (identification code), 2
ISBT/ICSH Working Party, one-stage vs two-stage agglutination tests, 313
isolaotyos, 591
isolaoty markers, immunoglobulins, 68
isotype switching, immunoglobulins, 63
isotypic markers, immunoglobulins, 68
isovolumic haemodilution, polycythaemia, 324
J antigen, 214
K antigen, 214
complement activation, 187
immunogenicity, 82
k antigen vs, 215, 529
potency, 216–217
single nucleotide polymorphism, 343
suppression of anti-D response, 85
K antigen
K antigen vs, 215, 529
red cells, 214
single nucleotide polymorphism, 343
Kaposi’s sarcoma-herpes virus (HHV-8), 725
κ light chains, cold haemagglutinins, 266
KAU antibody, 265
Kawasaki syndrome, intravenous immunoglobulin, 860
Kell antigens, 214–216
weakening, immune responses, 76
Kell protein, 57
Kell system
antibodies, 216–218
autoimmune haemolytic anaemia, 275–276
pregnancy, 528–530
clinical importance, 55
kernicterus, 509
ABO haemolytic disease, 535
Kidd glycoprotein, 221
Kidd system, 221–222
antibodies, 221, 421
on enzyme-treated red cells, 307
as haemolysins, 459
persistence, 74
delayed haemolytic transfusion reactions, 81
kidney, see also renal failure; renal transplantation
2,8-dioxoyadenine deposition, 373
factor H defect, 102
haemoglobin clearance, 473
haemoglobin on, 831
Klebsiella pneumoniae, egg drop soup
platelets, 734, 735f
Kleihauer–Bette method, fetal red cells, 503
Kleihauer immunoglobulin-silver staining, 506
Km antigen, 214
K6 antigen, 214
complement activation, 187
immunogenicity, 82
K antigen vs, 215, 529
potency, 216–217
single nucleotide polymorphism, 343
suppression of anti-D response, 85
K antigen
K antigen vs, 215, 529
red cells, 214
single nucleotide polymorphism, 343
Kaposi’s sarcoma-herpes virus (HHV-8), 725
κ light chains, cold haemagglutinins, 266
KAU antibody, 265
Kawasaki syndrome, intravenous immunoglobulin, 860
Kell antigens, 214–216
weakening, immune responses, 76
Kell protein, 57
Kell system
antibodies, 216–218
autoimmune haemolytic anaemia, 275–276
pregnancy, 528–530
clinical importance, 55
kernicterus, 509
ABO haemolytic disease, 535
Kidd glycoprotein, 221
Kidd system, 221–222
antibodies, 221, 421
on enzyme-treated red cells, 307
as haemolysins, 459
persistence, 74
delayed haemolytic transfusion reactions, 81
kidney, see also renal failure; renal transplantation
2,8-dioxoyadenine deposition, 373
factor H defect, 102
haemoglobin clearance, 473
haemoglobin on, 831
Klebsiella pneumoniae, egg drop soup
platelets, 734, 735f
Kleihauer–Bette method, fetal red cells, 503
Kleihauer immunoglobulin-silver staining, 506
Km antigen, 214
K6 antigen, 214
complement activation, 187
immunogenicity, 82
K antigen vs, 215, 529
potency, 216–217
single nucleotide polymorphism, 343
suppression of anti-D response, 85
K antigen
K antigen vs, 215, 529
red cells, 214
single nucleotide polymorphism, 343
Kaposi’s sarcoma-herpes virus (HHV-8), 725
κ light chains, cold haemagglutinins, 266
KAU antibody, 265
Kawasaki syndrome, intravenous immunoglobulin, 860
Kell antigens, 214–216
weakening, immune responses, 76
Kell protein, 57
Kell system
antibodies, 216–218
autoimmune haemolytic anaemia, 275–276
pregnancy, 528–530
clinical importance, 55
kernicterus, 509
ABO haemolytic disease, 535
Kidd glycoprotein, 221
Kidd system, 221–222
antibodies, 221, 421
on enzyme-treated red cells, 307
as haemolysins, 459
persistence, 74
delayed haemolytic transfusion reactions, 81
k
Laburnum alpinum lectin, A subgroups, 120
leakage, 138
Lebek antigen, 575
lectin pathway, complement, 101
Leishmania donovani
left atrial pressure, haemorrhage on, 25–26
Leb antigen, 138
left ventricular pressure, 309
Leb epitope, 138
Lea epitope, 138
Leach phenotype, 235
L chains, immunoglobulins, 62, 63
law of mass action, 89
Leb substance, red cell destruction inhibition, 440–442
Le(a– b–) phenotype, 138, 140
LAN (granulocyte-specific antigen), 570
Landsteiner, K., 53, 54
Landois, L., blood incompatibilities, 53
Lan antigen, 239
laminin 511/521, Lutheran glycoprotein
laminin 511/521, 574
laminin 521, 111
Lambert–Eaton myasthenic syndrome,
lag' before red cell destruction, 443–444
lactose-treated red cells, antibodies, 281
lactate dehydrogenase, transfusion reactions,
Laburnum alpinum
labels (for identification), 337
L1 (deferiprone), 686
916
Leukocyte reduction criteria, platelets, 772
leukocyte reduction filter, blood forced
leukocyte reduction
Le(a– b–) phenotype, 138, 140
Le(a– b–) phenotype, ethnicity, 140
Le(a– b–) phenotype, 139
Le(a– b–) phenotype
anti-Lea antibody, 143
Le(a– b–) phenotype, 140
leucopenia
platelet transfusions, 672
transfusion reactions, 460
leucoreduced red cells see leucocyte-reduced
red cells
Le(a– b–) phenotype
Le(a– b–) phenotype
leukemia, 139
leucocyte-reduced red cells, 663–664
leucocyte-reduced red cells; universal
leucoreduction
T activation, 284
leucovorin
platelet transfusions, 672
transfusion reactions, 460
leucoreduced red cells see leucocyte-reduced
red cells
leukostasis, 788
leukemia, see also specific types
A, B and H antigens, 125–126
cord blood progenitor cell transplantation,
633–634
directed donations, 14
donor lymphocyte infusion, 637–638
febrile reactions, 660–662, 663
I and i antigens, 151
immunization, habitual abortion, 565
Lewis antigens, 142
platelet concentrates, 619
removal, 577–580, 613, 619, 663–664
reduction, 663–664, see also leucocyte-
reduced red cells; universal
leucoreduction
Lewis antigens, 142
immunization, habitual abortion, 565
Le(a– b–) phenotype, 140
Le(a– b–) phenotype
Le(a– b–) phenotype
Le(a– b–) phenotype
anti-Lea antibody, 143
carcinoma, 142
Le(a– b–) phenotype
Le(a– b–) phenotype
leucopenia
platelet transfusions, 672
transfusion reactions, 460
leucoreduced red cells see leucocyte-reduced
red cells
leukostasis, 788
leukemia, see also specific types
A, B and H antigens, 125–126
cord blood progenitor cell transplantation,
633–634
directed donations, 14
donor lymphocyte infusion, 637–638
febrile reactions, 660–662, 663
I and i antigens, 151
immunization, habitual abortion, 565
Lewis antigens, 142
platelet concentrates, 619
removal, 577–580, 613, 619, 663–664
reduction, 663–664, see also leucocyte-
reduced red cells; universal
leucoreduction
Index 919

mouse
anti-D antibody from human lymphocyte transplantation, 196
autoimmune haemolytic anaemia, CD47 and, 276
Fc receptors, 272
FcRn defect, 499
transfusion reactions, 466
UMRh antibody, 182
mouse monoclonal antibodies, 77
ABO agglutinins, 130
antiglobulin reagents, 316
blood grouping and, 311
to M, N and s, 225
mouthwash, AMCA, 819
MPS (mononuclear phagocyte system) see reticuloendothelial system
multicomponent curves, red cell survival, 428–429, 439
multi-organ dysfunction syndrome, 640
multiple cord blood collections, 635–636
multiple myeloma, see also monoclonal proteins
immunoglobulin therapy, 860
multiple pregnancies, anti-D antibodies, 508, 510
multiple sclerosis
FCGR3B genes, 569
plasmapheresis, 785
multiple transfusions, see also repeated transfusions
antibodies detected, 76, 336
anti-D after, 178, 192
anti-Gm antibodies, 591
anti-N after, 225
blood grouping of patients after, 344–345
crossmatching, 334–335
sickle cell disease, 766
fever, 661
haemosiderosis, 684
HLA immunization, 558
non-D immunization, 331
sickle cell disease, 766
transfusion reactions, 463
multivalency, antibodies, 89–90
multivitamins, 8
murine monoclonal antibodies see mouse monoclonal antibodies
mutant recombinant anti-D, 526
mutations
group O, 123
weak A and B antigens, 122
myasthenia gravis
autoantibody removal, 782
FCGR3B genes, 569
*Mycobacterium leprae*, 732
*Mycobacterium tuberculosis*, CD44 binding, 238
mycoplasma infection, anti-I antibody, 260
*Mycoplasma pneumoniae*, anti-I cold autoagglutinins, 263–264, 266
mycosis fungoides, 718
myelodysplasia
ABO system, 126
granulocyte colony stimulating factor, 809
myeloid cytokines see granulocyte colony stimulating factor
myeloma proteins, IgG, 66
myeloproliferative disease, on red cell antigens, 61
myocardial infarction, ABO system, 126
N-acetyl-DL-tryptophan, 850
N-acetylgalactosamine, 88, 240–241, 286
Nageotte chamber, leucodepleted platelet concentrates, 578
Nak\(^+\) antibody, 576
N antigen, 222
NANBH (non-A, non-B hepatitis), 705–706
N antigen, 222, 224
narrow orifices, blood forced through, 470
NASBA technique, nucleic acid testing, 699
naturally occurring antibodies, 55, 71, 72, 129
anti-A and anti-B antibodies, temperature, 132
anti-K antibody, 216–217
anti-N antibody, 225
Re system, 183–184, 425–426
NCI (granulocyte-specific antigen), 570
ND1 (granulocyte-specific antigen), 570
NE1 (granulocyte-specific antigen), 570
necrotizing enterocolitis, neonates, red cell polyagglutinability, 284
needle exposure, deferrals of donations, 4, 5
needles blood forced through, 470
nickel, 676
neocytes, 358, 394
neomycin, 305
neonatal alloimmune neutropenia, 569, 570
neonatal alloimmune thrombocytopenia, 584–586
antibody detection, 588
post-transfusion purpura and, 671
neonatal Fc receptor (FcRn), 66
neonatal isoimmune neutropenia, 570
neonatal thrombocytopenia, 583–586
neonates, see also haemolytic disease of the newborn; premature infants; walking donors
ABO agglutinins, 130
adenine, 373
B antigen, 428
compatibility testing, 335
complement, 103
glucose-6-phosphate dehydrogenase deficiency and, 6
granulocyte transusions, 631–632
hepatitis B virus, 700
hypoglycaemia, 681
immune responses, 76
immunoglobulins, 68–69
Lewis system, 140
maternal IgG allotypes, 591
necrotizing enterocolitis, red cell polyagglutinability, 284
neutropenia, 809
numbers of A and B sites, 125
potassium fatalities, 392
red cell antigens, 61–62, 153
A, B and H, 125
red cell survival, 362
red cell transfusion, blood volume, 386
sepsis
GM-CSF, 809
IVIG, 859–860
A subgroups, 120
Th activation, 285
transfusion-associated GvHD, 667
transplacental haemorrhage on, 506
universal leucoreduction policy, 579
neoplastic change, on red cell antigens, 60–61
nerve injury, donors, 12–13
Netherlands, frequency of donations, 7
neuraminidase, on red cell agglutination, 92
neutropenia
ABO incompatibility, 415
autoantibodies, 570–571
granulocyte colony stimulating factor for, 808–809
granulocyte transfusions, 628–630, 632
infants, 631–632
neonatal alloimmune, 569, 570
neutrophil elastase, 863
neutrophils
antigens see human neutrophil antigens
red cell phagocytosis, 95, 415
NF antigen, haemodialysis, 226
N-glycans, 56
nickel, 676
Nigeria
fetal ABO agglutinins, 130
frequency of anti-A antibody lysins, 131
nitric oxide, 371–372
haemoglobin-based oxygen carrier binding, 831
renal failure, 468
transfusion reactions, 465
\(^1^5\)N-labelled glycine, red cell labelling, 364
nitroglycerine patches, venous spasm, 28
*Nitrosomonas europaea*, RHAG homologue, 171, 182
N-methylthiotetrazole side chain, antibiotics, 824
nomenclatures, see also numerical nomenclatures
blood groups, 54–55
complement, 99
plasma components

blood group phenotypes, 60, 142
Duffy groups and, 219
frequencies of transmission, 738

plasminogen

blood storage, 368
damage, 888
frozen red cell storage, 382
paedipacks, 391, 802
platelets, 617, 772
plasticizers
platelet storage, 617
on stored red cells, 371, 379
toxicity, 683–684
platelet additive solution, 872
platelet-bound Ig, radioimmunoassay, 589
platelet factor 4, 590
platelet immunofluorescence test (PIFT), 582, 586, 588, 589
plateletpheresis, 789
donors, 7, 470, 582–583, 772–773, 777–778
manual, 612
PEG-rHuMGDF, 809–811
on platelet counts, 772, 776
single-donor platelets from, 464–465, 578, 580
platelet-rich plasma (PRP), 612, 615, 770, 872, 878
platelets
antibodies, see also platelet-specific antibodies
reactions, 669–672
tests for, 586–588
transfusion, 672
antigens, 573–590
aspirin on, 626
A, B and H antigens, 128
cardiopulmonary bypass, 43, 624
CD147 on, 238
collection, 770, 772–773
autologous, 802
from normally disqualified donors, 6
concentrates, 615–616
anti-A and anti-B antibodies in, 464–465
bacterial contamination, 733–734, 736, 737
leucocyte removal, 577–580, 613, 619, 663–664
preparation, 872–873
from whole blood, 612–613
counts, plateletpheresis on, 772, 776
defective, 624
DDAVP for, 817
frequency of donations, 7
gelatin on, 36
hypothermia, 39
I and i antigens, 151
immune thrombocytopenia, 588
increments after transfusion, 625
Klebsiella pneumoniae on, 734, 735f
Lewis antigens, 142
metabolism, 616
acetate media, 619
neonates, counts, 583
plasmapheresis donors, 769
red cell contamination, D immunization, 193–194
storage, 369, 613, 615–621
cytokines, 663
T activation, 284
transfusion, 611–626
allergies, 673
dosage, 624
febrile reactions, 660, 663
after haematopoietic stem cell transplantation, 637
indications, 621–625
intrauterine, 585
neonates, 585
recovery and survival, 613–615, 878–882
refractoriness, 576–584
trauma, 40
Trypanosoma cruzi, 740
platelet sealant, 826t
platelet-specific antibodies, 577
febrile reactions, 669
HLA antibodies vs, 587
neonatal alloimmune thrombocytopenia, 584
post-transfusion purpura, 588, 669, 670
platelet-specific antigens, 573–576
genotyping, 587–588
plerixafor, 775, 776
plethora, on red cell survival, 360
neumococcal vaccine, anti-A antibody and, 136
Polge, C., red cell freezing, 380
pol gene, 710
HIV-1, 711
human T-cell leukaemia viruses, 718
poliomyelitis epidemic, intramuscular blood, 135
polyacrylamide gel electrophoresis see SDS-PAGE
polyagglutinability, red cells, 282–287
polybrene
blood grouping tests, 310
missed incompatibilities, 334
manual test (MPT), 313, 322, 328
on red cell agglutination, 92, 283, 284t
plasminogen
blood group phenotypes, 60, 142
duffy groups and, 219
frequencies of transmission, 738
plasminogen
blood storage, 368
damage, 888
frozen red cell storage, 382
paedipacks, 391, 802
platelets, 617, 772
plasticizers
platelet storage, 617
on stored red cells, 371, 379
toxicity, 683–684
platelet additive solution, 872
platelet-bound Ig, radioimmunoassay, 589
platelet factor 4, 590
platelet immunofluorescence test (PIFT), 582, 586, 588, 589
plateletpheresis, 789
donors, 7, 470, 582–583, 772–773, 777–778
manual, 612
PEG-rHuMGDF, 809–811
on platelet counts, 772, 776
single-donor platelets from, 464–465, 578, 580
platelet-rich plasma (PRP), 612, 615, 770, 872, 878
platelets
antibodies, see also platelet-specific antibodies
reactions, 669–672
tests for, 586–588
transfusion, 672
antigens, 573–590
aspirin on, 626
A, B and H antigens, 128
cardiopulmonary bypass, 43, 624
CD147 on, 238
collection, 770, 772–773
autologous, 802
from normally disqualified donors, 6
concentrates, 615–616
anti-A and anti-B antibodies in, 464–465
bacterial contamination, 733–734, 736, 737
leucocyte removal, 577–580, 613, 619, 663–664
preparation, 872–873
from whole blood, 612–613
plasminogen
blood group phenotypes, 60, 142
duffy groups and, 219
frequencies of transmission, 738
plasmanagel, 774
Plasmodium (spp.)
blood group phenotypes, 60, 142
duffy groups and, 219
frequencies of transmission, 738
plasmanagel, 774
Plasmodium falciparum
Cad-positive red cells, 241
CD147 as receptor, 238
direct antiglobulin test, 270
enzyme-linked immunosorbent assay, 739
Gerich system, 235
glycophorin B binding, 228
Sl– phenotype and, 237
plasmanagel, 774
plasmanagel, 774
Plasmodium falciparum
Cad-positive red cells, 241
CD147 as receptor, 238
direct antiglobulin test, 270
enzyme-linked immunosorbent assay, 739
Gerich system, 235
glycophorin B binding, 228
Sl– phenotype and, 237
plasmanagel, 774
plasmanagel, 774
Plasmodium falciparum
Cad-positive red cells, 241
CD147 as receptor, 238
direct antiglobulin test, 270
enzyme-linked immunosorbent assay, 739
Gerich system, 235
glycophorin B binding, 228
Sl– phenotype and, 237
plasmanagel, 774
plasmanagel, 774
Plasmodium falciparum
Cad-positive red cells, 241
CD147 as receptor, 238
direct antiglobulin test, 270
enzyme-linked immunosorbent assay, 739
Gerich system, 235
glycophorin B binding, 228
Sl– phenotype and, 237
plasmanagel, 774
plasmanagel, 774
polycythaemia, 766
polycythaemia vera, 15, 61
Lutheran glycoprotein, 230
polyester filters, platelet concentrates, 579
polyethylene glycol
ABH antigen masking, 127
autoantibody tests, 274
haemoglobin coupled to, 829
indirect antiglobulin test, 322, 324, 328, 330
red cell IgG assay, 326
polymerase chain reaction, 529
anti-CMV, 724
tet D grouping, 511–512
for genotypes, 59
HCV RNA, 707
HLA typing, 566
HPA system genotyping, 587–588
K antigen vs k antigen, 215, 259
malaria, 739–740
nucleic acid testing, 698–699
red cell grouping, 343–344
‘polymerized albumin’, 306
polymerized haemoglobin solution, 830, 831
polymers, on red cell agglutination, 92
polymyxin B, stored blood, 735
polyvinyl chloride
platelet storage, 617
toxicity, 683
polyvinyl pyrrolidone (PVP), 305
frozen red cell storage, 383
pooled plasma, transfusion reactions, 464
poor responders, D antigen, 190–191
porcine factor VIII, 853
portal circulation, 416
positive end-expiratory pressure, on blood loss, 43
positive pressure, rapid transfusion, 28
post-diarrhoeal haemolytic uraemic syndrome, 148
postmenopausal women, D-positive
transfusion, 331
postoperative erythroderma syndrome, 667
postoperative infections, blood transfusions on, 564–565
postoperative mortality, blood transfusions on, 565
postoperative red cell salvage, 803
postpartum period
ABO agglutinins, 136
anti-D administration, 199, 522–524
anti-D antibodies found, 508
neonatal alloimmune thrombocytopenia, treatment, 585
neonatal haemoglobin levels, 518
postponed surgery, due to blood shortages, 3
post-storage leucoreduction, 580
post-transfusion blood sampling, 488, 489
post-transfusion hepatitis
epidemiological trends, 708–710
hepatitis B virus, 703
post-transfusion purpura, 669–672
antibody detection, 588
universal leucoreduction policy, 580
post-transfusion syndrome
cytomegalovirus, 721–722
Epstein–Barr virus, 724
posture, fainting, 11
potassium
citrate and, 680–681
red cells, radiation on, 372, 379
stored plasma, 372, 374
for premature infants, 392
potency (immunogenicity)
D antigen variants, 175–177
K antigen, 216–217
red cell antigens, 82–84
potentiators, blood grouping, 306–307, 314
precore mutants, hepatitis B virus, 704–705
pre-deposit donations, 800–803
prednisone
leucapheresis, 773
post-transfusion purpura, 671
pre-eclampsia, ABO system, 126
pregnancy
alloimmunization by A and B antigens, 136
anti-Gm antibodies, 591
anti-K antibody, 79, 217, 528–530
anti-P,P⁺ antibody, 149, 150
autologous blood donation, 801
deferrals of donations, 6
frequency of anti-D, 79
frequency of red cell antibodies, 78, 79, 80
HLA antibodies, 558
HNA-2 system, 569
on immune responses, 76
transfusion vs, 82–83
immunization to platelets, 577
Lewis system, 140, 145
platelet refractoriness, 578
recipient serum screening, 330
red cell alloantibodies, 501
Rh system, 167, 198
anti-D antibody subclasses, 186
immunization frequency, 506–508, 510
suppression of immune response, 199–204
sickle cell disease, exchange transfusion, 395–396, 765
trimesters for transplacental haemorrhage, 503–504, 508
prekallikrein activator, 677
premature delivery, for haemolytic disease of the newborn, 521
premature infants, see also very-low-birthweight infants
ABO haemolytic disease and, 535
blood sampling, 391
cytomegalovirus infection, 722, 723
danger of adult A or B red cells, 536–537
directed donations for, 14
hypoglycaemia, 681
intravenous immunoglobulin, 859–860
red cell survival, 362
red cell transfusion, 391–392
transfusion effects, 390
transfusions for, 335
premedication, 676–677
preoperative assessment
transfusion avoidance, 804
transfusion triggers, 41
preoperative autologous blood collections, 800–803
preoperative haemodilution see acute normovolaemic haemodilution
pre-S1 region, hepatitis B virus genome, 700
pre-S2 antigen, hepatitis B virus, 700
pre-storage leucoreduction, 580, 663, 664
pretransfusion samples, 488
pretransfusion tests, frequency of red cell antibodies, 79
primary immune responses, 73
delayed haemolytic transfusion reactions, 478
D-positive transfusion, 188–195
antibodies not found, 443
suppression by anti-D antibodies, 199–204, 438
priming, pump-oxygenators, 43
prion proteins, 728–730
prisons, exclusion of donors, 4
private antigens, 557
private idiotypes, 67
probiotics, high-titre anti-B induced by, 465
Promacta (eltrombopag), 813
pronormoblasts, D antigen, 62
properdin, 102
propylene oxide, 281
prostatectomy
retropubic, recombinant factor VIIa, 815
transurethral, 469
protamine, 824–825
blood grouping tests, 310, 313
proteases, on red cell agglutination, 92
protein, see also plasma proteins
serum levels, adult respiratory distress syndrome, 45
protein 4.2, 182
Protein A (bacterial), 69
protein C, 856
disseminated intravascular coagulation, 40
Protein G (bacterial), 69
drug binding, 279
D sites, numbers of, 170
elimination with no signs of destruction, 436
exchange transfusion, 203–204, 764, 765–766
ex vivo generation, 831
fetus see fetus, red cells
fixation in antibody tests, 325
Fy sites, 218–219
gel test, 322
glucose-treated antibodies, 281
anti-M antibody and, 225
anti-N antibody and, 226
granulocyte concentrates, 630–631
K antigen, 214
Jk antigens, 221
I and i antigens, 151
HLA antigens on, 242–243, 426
O group, 63
granulocyte concentrates, 630–631
A and B substance uptake, 128
converting to A or B cells, 127
HLA antigens on, 242–243, 426
I and i antigens, 151
incompatible transfusions attempts to inhibit destruction, 440–443
destruction without demonstrable antibodies, 443–448
larger amounts, 429–443
small amounts, 411–457, 466–467
survival estimation, 873–878
therapeutic amounts, 436, 437–438, 444–448
Jk antigens, 221
K antigen, 214
lactose-treated, 281
leucocyte removal, 663–664
Lewis substance uptake, 141–143
lysis see haemolysis
number of molecules of antibody, 91–92, 429–434
numbers of D sites, 170
panels, 337–338
paroxysmal nocturnal haemoglobinuria, 236, 366, 398, 471–472
PBSC collections, 775
phagocytosis see phagocytosis of red cells
polyagglutinability, 282–287
preoperative regeneration, 800
recipient serum screening with, 330
recovery after donation, 9
reference preparations, 328
removal from marrow, 636
removal of antibodies with, 519
salvage, 802–803, see also recovered blood sensitization in vitro, 429–431
separation by age, 358–359
separation by volume, 358–359
S, s and U antigens, 223
storage see storage of blood and components, red cells
substitutes, 827–831
survival see survival, red cells
transfusion, 356–410
anaemia, 384–398
biphasic haemolysins and, 268
cytomegalovirus and, 723
after haematopoietic stem cell transplantation, 637
incidence trends, 3
platelet refractoriness after, 578
potassium and citrate, 680, 681
trauma-associated coagulopathy, plasma ratios, 39–40
trypsin-treated, 287, 288
cold red cell volume (RCV) blood volume from, 875–876
estimation, 873–875
incompatabile red cells on survival, 439–440
red cell survival estimation, 376
for red cell test transfusion, 413–414
reductases, vitamin K, 821
reduction (chemical) immunoglobulins, 69–71, 311
thiol proteases, 307
reference solutions blood grouping, 328 enzymes, 307
reflexance spectroscopy, 9
refrigerated storage, 735, see also cold blood blood, 28, 38, 378
peripheral blood-derived progenitor cells, 633
platelets, 619–620
red cells, 383, 663
Refsum disease, 783
refusal of transfusion see Jehovah’s Witnesses regression analysis, platelet increments, 625
regulator Rhnull, 181
regulatory T cells, 259
interleukin-10 on, 278
rejection, solid organs, 562
rejuvenation of stored red cells, 371, 375
freezing after, 383
related donor transplants, cord blood progenitor cells, 633–634, 636
religion see Jehovah’s Witnesses remote blood issue electronic, 334
transport (land and air), platelets, 618
renal failure chronic, anaemia, 804, 805–807
delayed haemolytic transfusion reactions, 479–480
dextran 40, 35
intravenous immunoglobulin, 862
oligemia, 26
red cell transfusion on blood volume, 386–387
transfusion reactions, 463–464, 468, 476–477
treatment of anaemia, 393–394
TURP, 469
renal transplantation
antibody-mediated rejection, 562
anti-Nf antibody, 226
cytomegalovirus infection, 722
D immunization, 194
directed donations, 14
Duffy antigens, 220
HLA system, 561
immunofaftinity apheresis before, 786
Kidd antigens, 222
Lewis system and, 145
malaria, 738
passenger lymphocyte syndrome, 486–487
previous transfusions, 563–564
removal of antibodies, 781
repeated transfusions, see also multiple transfusions cold autoagglutinins, 266
repeat tests
after haemolytic transfusion reactions, 342
infectious agents, 698
repertoire shift, genes, 187
replacement donations, 15
replacement fluids, 26–34, 764–765, 779
plasma exchange, 779–780
reporter dye, fetal D grouping, 512
reporting mortality (FDA), 461–462
transfusion errors, 460–461
resistance of red cells to complement-mediated lysis, 262–263, 422–423
respiratory burst, 101
responders vs non-responders, D antigen, 189–191
restriction fragment length polymorphism, 343
resuspended red cells, storage, 375
reticulocytes
ABO haemolytic disease, 535
donors, 9
donors’ vs recipient’s red cells, 343
HLA antigens on, 242
iron labelling, 364
mother–infant ABO incompatibility, 531
red cell antigens, 62
reticuloendothelial system (RES) immunosuppression, 442–443
loading with non-viable red cells, 477
red cell destruction, 416, 458
saturability, 429, 434–436
retinal detachment, sickle cell disease, surgery, 395
retroviruses, 710–711, see also HIV infection; specific viruses
p24 (protein), 711, 717
simian foamy virus, 728
reversal of anticoagulants, 640, 814, 821–825, 855
reverse passive haemagglutination, 697
reversibility of changes, red cell storage, 373–374
Index 925
Index

926

v‘reversor’ factor, 287
r‘ phenotype, 179, see also anti-C\(^+\)d\) antibody
rhabdomyolysis, 819
Rh-associated proteins, 182–183
RHCE gene, 173–174, 179, 511–512, see also \(RHD/RHCE\) gene
‘joint products’, 180
\(RHD–CE–Ds\)
\(RHCE\)
Rh-associated proteins, 182–183
rhabdomyolysis, lysine analogues, 819
rG phenotype, 179, 287
‘reversor’ factor, 287
926
rhesus immunoglobulin (RhIg), 451, 583
rhesus boxes, 173–174, 514
rhesus immunoglobulin (RhIg), see also anti-D antibodies
for immune thrombocytopenic purpura, 451, 583
immunosuppression by, 443
platelet transfusion and, 583
rhesus system see Rh system
rheumatoid agglutinators, 591
Rh membrane complex, 182
Rh\(_{null}\) blood, 181, 182
glycophorin B deficiency, 223
Rh(D) immune globulin, immune
thrombocytopenic purpura, 475
Rho-GAM (anti-D), safety, 675
Rh-related glycoprotein (RHAG), 171
Rh system, 167–213, see also D antigens;
D-positive transfusion
agglutination tests, capillary tubes, 312
antibodies, 183–188, see also anti-D antibodies
on enzyme-treated red cells, 307
to low-frequency antigens, 241
naturally occurring, 183–184, 425–426
non-anti-D, 184, 528
quantification, 187–188
red cell destruction, 424
relative frequencies, 80
renal transplantation, 486
blood grouping, 329
error rates, 330
serology vs molecular biology, 345
crystalloids
\(D\) gene, 58, 168–169, 171, 173–174
discovery, 53–54
haemolytic disease see haemolytic disease
of the newborn
haemolytic transfusion reactions, 81–82
hybrid genes, 173–175, 511–512
idiotypes, 67
immunization see immunization, D antigens
immunoglobulin see rhesus
immunoglobulin
incompatible red cell labelling, 412–413
indirect antiglobulin test, 317–319
lymphocytes, 69
mixed field agglutination, 314
neonates, crossmatching, 335
phenotypes, 169–170
polycythaemia vera, 61
red cell contamination of platelet
centrates, 625
terminology, 54
warm autoantibodies, 273–275, 341
ricin, 87
ricketsital disease, 732–733
right atrial pressure (central venous pressure), haemorrhage on, 23, 25
rigidity, stored red cells, 371, 378
Ringer’s lactate, 31
‘Ripley’ serum, anti-D antibody, 131, 186–187
rituximab
cold haemagglutinin disease, 265
immune cytopenias, 277
rodenticide poisoning, 824
\(Rodgers\) gene, 234
Romiplostim (AMG 531), 812–813
‘Ripley’ serum, anti-D antibody, 131,
186–187
saline
rotation thromboelastometry, trauma, 40
rotation of inventory, frozen red cell storage,
884
saline–adenine–glucose–mannitol solution
saliva
saline agglutinins, anti-D, 196
Salvia sclarea lectin, 284t, 286
sandwich assays, infectious agents, 698
S antigen, 222, 223, 224
enzymes on, 310
s antigen, 222, 223, 224
satellite packs, 802
Sc antigens, 233
schistocytes, thrombotic thrombocytopenic
purpura, 784
Scintianna system, 233
scleroderma, cold haemagglutinin disease,
265
scores, titles vs, 326
SCR 20, factor H, 102
scrapie isoforms, 728
screen filtration pressure, 682
screening
antenatal, 510–511, 523, 527
anti-HCV, 706
anti-K antibody, 217
bacterial contamination, 737
donors, 2
anaemia, 8–9
title, 4
single nucleotide polymorphisms, 345
hepatitis B surface antigen, 702
HIV infection, 716–718
human T-cell leukaemia virus antibodies,
719–720
infectious agents, 696–699
plasma, 331–332, 333
recipient serum, 329–330
stored red cells, 384
syphilis, 731
West Nile virus, 727
Sda antigen (Sid antigen), 240, 241
SDS-PAGE, 56
Rh system antigens, 170–171
se\(^{es}\) allele, 140
seasonal allergy, 5
\(SEC23\) mutations, 243
secondary immune responses, 73
D antigen, 84, 195–196, 197–198
platelet refractoriness, 578
secretors, ABH antigens, 127–128, 535
secretory piece, IgA, 67
sedimentation
granulocyte concentrates, 630–631
red cells
agents, 774
rates, 288
sedormid-induced thrombocytopenia, 590
Se gene, 138, 153
secretions, 139t
seizures, donors, 13
selective removal of plasma components,
785–786
self-exclusion of donors, 716
sepsis see ageing
‘sensibilization’, 189
sensitization of red cells
by antibodies, 429–431, 458, 625
to bacteria, 286
SEN virus, 709
sepharose-bound staphylococcal protein A, 786
sepsis
from contaminated transfusions, 734, 736
neonates
GM-CSF, 809
IVIG, 859–860
systemic inflammatory response syndrome, 26
September 11, 2001, World Trade Center disaster, 17
septic shock, C1 esterase inhibitor, 857
sequence-specific primers, HLA typing, 566
SERPINC1, 675–676
SERODIA HTLV-1 (agglutination test), 720
serology
ABO haemolytic disease, 533–535
anti-B antibody, 75
anti-D antibody, 75
blood grouping, 345
delayed haemolytic transfusion reactions, 482–484
IgA, 75
IgG, 75
IgM, 74–75
Kell antigens, 217
Lewis antibodies, 145
transplacental haemorrhage, 502–503
SERPINC1 mutations, 862
serum, see also horse serum
albumin vs. red cell agglutination, 92
antiglobulin test, ratio to red cells, 320, 332
A, B and H antigens, 128
blood grouping, 306
complement from, 315
cord blood, ABO system, 130
a haemolysis in vitro, 131
recipients, screening, 329–330
‘Ripley’ serum, anti-D antibody, 131, 186–187
storage see storage of blood and components, serum
serum normal agglutinators, 591
serum proteins, antigens and antibodies, 590–592
serum sickness-like syndromes, anti-IgG, 675–676
sexual transmission
hepatitis C virus, 708
HIV infection, 713
S gene, hepatitis B virus, 700
shape
stored platelets, 617, 619, 620
stored red cells, 371, 378
sheep, transfusions from, 411
sheep antibodies, 136
sheep red blood cells (SRBC), immune responses, 86–87
shigatoxin, p binding, 148
Shigella shigae, A and B antigens, 129
shock, 24, 25
C1 esterase inhibitor, 857
from contaminated transfusions, 736
interstitial fluid, 31
lung injury, 45
transfusion reactions, 462
vitamin K, 824
shortages of blood, 3
sialic acid deficiency, 222–223, 283
sialic acid residues, MNS system and, 224
sialidase-susceptible antigens, 263
sialosylparagloboside, P system antibodies and, 150
sickle cell disease
alloimmunization, 79, 80–81
autoimmune haemolyis, 482
delayed haemolytic transfusion reactions, 479, 485
exchange transfusion, 394–395, 765–766
Fy(a– b– 3–) phenotype, 220
Fy(a– b–) phenotype, 219
haemoglobin-based oxygen carriers, 830
hypertensive encephalopathy, 388
Lutheran glycoprotein, 230
pregnancy, 395–396, 765
red cells
deglycerolized, 382–383, 470
survival, 366, 412
selecting donor blood, 331
thrombospandin, 182
sickle cell haemolytic transfusion reaction syndrome, 472
Sid antigen, 240, 241
siderophilic microorganisms, 806
SIGN-R1 (lectin), complement binding, 99
silent infants (SCI), sickle cell disease, 765–766
silent (occult) HBV infection, 700, 702, 703
silica, colloidal, 289
simian foamy virus, 728
skin
flora, 733
GCSF side effects, 776
hypersensitivity, plasma transfusions, 672–673
TA-GvHD, 667
skin grafts, tolerance, 85
SIT3 antigen, 237
SPI antigen, 237
SPL phenotype, 237
SLC4A1 gene, Diego system, hereditary spherocytosis, 230–231
slide tests, agglutination tests, 312
SMIM1 gene, 239
Snaggs (serum normal agglutinators), 591
snails, lectins, 134
SNO hypothesis, 371–372
sodium, stored red cells, 372, 374
sodium azide, 134, 261, 306
sodium bicarbonate, red cell storage, 373
sodium chromate, red cell labelling, 360–361, 362, 874
sodium dodecyl sulphate see SDS-PAGE
sodium ferric gluconate, 805
soft tissues, haemorrhage into, 472
solid organ transplantation
ABO incompatibility, 135
alloimmunization, 81
deferral of blood donors, 5
fetal D grouping and, 513
frequency of anti-D, 79, 194–195
HLA system, 561–564
immune response to lymphocytes (passenger lymphocyte syndrome), 194–195, 486–488
removal of antibodies, 781–782
solid-phase techniques
blood grouping, 303, 324–325
platelet antibodies, 586–587
Solidscreen II, 325
soluble antigens, 55
soluble HLA class I antigens, 557
solvent/detergent-treated antithrombin concentrates, 862
solvent/detergent-treated plasma, 641
transfusion-associated acute lung injury and, 665
viruses, 641, 846
South-East Asia. haemolytic transfusion reactions, Lewis system, 145
South-East Asian ovalocytosis, 243
species differences, complement, 103
specific gravity
haemoglobin testing, 9
red cell suspensions, 874
specific inhibition, antibodies, 338–339
Spectra cell separators, 770, 771
spectrin, 56
spectrophotometers, blood grouping, 325
spectroscopy
methaemalbumin, 489
urine, 489
spherocytosis, see also hereditary spherocytosis
delayed haemolytic transfusion reactions, 481
spiculation, red cells, 92
spin-tube antiglobulin tests, 321, 330
splanchnic vasoconstriction, 26
spleen
granulocyte colony stimulating factor side
effects, 776

immune responses, 76
platelet pool, 614
red cell destruction, 86, 415, 425

splenectomy
autoimmune haemolytic anaemia with
warm autoantibodies, 277
cytomegalovirus infection, 722
delayed haemolytic transfusion reactions, 480

platelet transfusion and, 583, 613–614
for post-transfusion purpura, 672
on red cells, 359–360, 425
glycophorin B

splanchnic vasoconstriction, 26
spleen

splanchnic vasoconstriction, 26
spleen
granulocyte colony stimulating factor side
effects, 776

immune responses, 76
platelet pool, 614
red cell destruction, 86, 415, 425

splenectomy
autoimmune haemolytic anaemia with
warm autoantibodies, 277
cytomegalovirus infection, 722
delayed haemolytic transfusion reactions, 480

platelet transfusion and, 583, 613–614
for post-transfusion purpura, 672
on red cells, 359–360, 425

splanchnic vasoconstriction, 26
spleen

splanchnic vasoconstriction, 26
spleen
granulocyte colony stimulating factor side
effects, 776

immune responses, 76
platelet pool, 614
red cell destruction, 86, 415, 425

splenectomy
autoimmune haemolytic anaemia with
warm autoantibodies, 277
cytomegalovirus infection, 722
delayed haemolytic transfusion reactions, 480

platelet transfusion and, 583, 613–614
for post-transfusion purpura, 672
on red cells, 359–360, 425

splanchnic vasoconstriction, 26
spleen
Index

929
tetany, donors, 13
tetrameric band 3, 55
tetraspanins, 238
thalassaemia, 393
anti-Sc3 antibody, 233
autoimmune haemolysis, 483
donor blood selection, 331
glucose-6-phosphate dehydrogenase
deficiency, 6
haemosiderosis, 684, 685–686
hypertensive encephalopathy, 388
I and I antigens, 151–152
immunological tolerance, 85
red cell antibodies, frequency, 80
trait, 6
transfused red cells, survival, 366
Th antigen, red cell polyagglutination
thawing
bacterial contamination, 733
human cells and tissue-based products,
887–888
red cells, 883
phosphate-buffered saline, 305
Th cells see helper T cells
therapeutic effectiveness, index of (ITE),
stored red cells, 383
thermal ranges
antibodies, red cell destruction, 419
cold autoagglutinins, 262
Thermus aquaticus polymerase, nucleic acid
testing, 699
thioester bonds, complement molecules, 99,
100, 102
thiol proteases, 307
thiol reagents, on red cells, 339
thrombin, 826–827, 863–864
thrombocytapheresis see plateletpheresis
thrombocytopenia, see also Glanzmann's
thrombocytopenia type I; neonatal
alloimmune thrombocytopenia bleeding
time, 614–615
DDAVP and, 817
dilution, 38, 39
granulocyte colony stimulating factor, 809
histological aspects, 611
hypoproliferative, 621–624
invasive procedures, 623–624
lysin analogues, 818
neonatal, 583–586
plasma exchange, 787
platelet lifespan, 614
plateletpheresis donors, 776
thrombopoietin for, 811–813
thrombocytopenic purpura see autoimmune
thrombocytopenic purpura; immune
thrombocytopenic purpura; thrombotic
thrombocytopenic purpura
thromboelastography, trauma, 40
thromboembolism see venous
thromboembolism
thrombomodulin, transfusion reactions, 466
thrombopoietin, 621, 809–813
thrombosis
aprotinin, 820
DDAVP, 817
heparin-induced thrombocytopenia, 590
hereditary antithrombin deficiency, 862
lysine analogues, 819–820
recombinant factor VIIa, 815
thrombocytosis, 789
thrombospondin, sickle cell disease, 182
thrombotic thrombocytopenic purpura,
640–641
plasma exchange, 779, 783–785
tick bites, exclusion of donors, 4
tick-borne rickettsial disease, 732–733
TIC (trauma-induced coagulopathy), 39–40
tin chloride, red cell volume estimation, 873
tissue adhesives, 827
tissue factor, recombinant factor VIIa
binding, 814
tissue necrosis factor (TNF), transfusion
reactions, 466, 476
tissues, A, B and H antigens, 128–129
titres
antibodies
anti-A and anti-B, 129
blood grouping, 325–326
anti-complement reagents, 319
serum volume vs. antiglobulin test, 320
Tp antigen, stomach carcinoma and, 60
Tk antigens, 282, 284
malignant disease, 286–287
red cell polyagglutination, 126, 285
T lymphocytes, see also specific types
Ia-Ia glycoprotein complex, 576
apheresis donors, 776–777
autoimmune haemolytic anaemia, 278
depletion, donor lymphocyte infusion, 638
engineering, for donor lymphocyte
infusions, 638–639
irradiation, prevention of TA-GvHD,
668–669
peripheral blood-derived progenitor cells
and, 632–633, 775
solid organ rejection, 562
Tn red cells
toxins on, 310
polyagglutination, 61, 282, 286–287, see
also anti-Tn antibody
toe temperature, 25
tolerance see immunological tolerance
tolmetin, 280
topical haemostatic agents, 825–827
topical lysine analogues, 818, 819, 820
total-dose infusion, intravenous iron, 805
total nucleated cell counts, cord blood
progenitor cell transplantation, 634
tourniquets, orthopaedic surgery, lysine
analogues, 818
vertical transmission see mother–infant transmission
very fresh whole blood, 396
very-low-birthweight infants, see also premature infants
erythropoietin, 392
veterans, exclusion as donors, 4
V genes, anti-D antibody, 187, 188
viability, see also survival platelets, 614, 619
stored red cells, 369–370, 371, see also non-viable red cells
estimation, 375–378
irradiation, 379
temperature on, 378–379
*Vicia cracca* agglutinins, 87
*Vicia cratica* lectin, red cell polyclagglutinability, 284t
*Vicia graminea*, anti-N lectin, 226
vimentin, crossreactivity of monoclonal
*Vicia cracca*
viscosity of blood
viscoelastic whole blood assays, trauma, 279
viruses, see also blood-borne viruses; specific viruses
ABH-active, 138
autologous blood, 802
biphasic haemolysins and, 266–267
donor lymphocyte infusion, 638
fibrin sealants, 827
fresh-frozen plasma, 639
HLA class I molecules and, 552
leucoreduction and, 579
methylene blue-treated plasma, 641
oncogenic, 686
screening, 696
solvent/detergent-treated plasma, 641, 846
vaccinations, 5
viscoelastic whole blood assays, trauma, 40
viscosity of blood
haemorrhage on, 27
rapid transfusion, 28
vital capacity, transfusion on, 385–386
vitamin K, 813, 821–824
vitamin K<sub>α</sub>, 640, 821–822
vitamin K<sub>β</sub>, 821–822
vitamin K epoxide reductase, 821
Vivaglobin®, 858
volume of donation, 2
fainting, 11
volume replacement, 26–34, 764–765, 779
Voluven, 34
von Willebrand disease, 854
von Willebrand factor, 854
ABO system and, 60, 126
DDAVP on, 815–816, 852
deficiency, oestrogens on, 825
hydroxyethyl starch on, 37
receptors, platelets, 620
VS antigen, 180
V wells, agglutination tests, 312
walking donors, 392, 396
warfarin
heparin-induced thrombocytopenia and, 90
reversal, 640, 821–825, 855
warm antibodies, 90
autoantibodies, 260, 268–278
delayed haemolytic transfusion reactions, 482–483
donor incompatibility, 336
drug-induced, 280
Rh system, 273–275, 341
specificity, 273–278
incomplete, 319
warm-antibody type autoimmune haemolytic anaemia, 75, 188, 270, 277–278
warm autohaemolysins, 273
warming of blood, 378, 678
washed red cells, 397–398, see also freshly-washed red cells
anaphylaxis, 673
glycerol removal, 883
hepatitis B virus, 703
paroxysmal nocturnal haemoglobinuria, 398, 471–472
salvaged, 803
washes
antiglobulin test, 318–319, 320–321
microplates, 323
WASP (gene product), 129
waterbaths, bacterial contamination, 733
water injection, 469
weak A and B variants, 122, 124
weak alleles, A group, 123–124
weak antibodies
clotting, 340
identification, 338
weak D antigens, 174, 175–179, 527, see also D phenotypes
auto-anti-D antibody and, 198
blood grouping, 329
immunogenicity of red cells, 191–192
weak Fyb expression, 218–219
weak HLA antibodies, 558–559
weak reactions, leukaemia, ABO system, 126
weighing of swabs, blood loss, 25
weight averages (m<sub>w</sub>), molecular weights, plasma alternatives, 34
weight (body)
blood volume estimation, 876
of donors, 2
fainting, 11
wells, blood grouping, 312, 324
WES’ antigen, 236
West African ethnicity, gene frequencies, 59
Western blotting
antibody identification, 341–342
HIV screening, 716, 717–718
infectious agents, 698
West Nile virus, 726–727
Wharton’s jelly, 289
‘white ball disease’, 788
whole blood
donation, 6–21
fresh, 396, 611, 612
*Treponema pallidum*, 731
*Yersinia enterocolitica*, 735
storage see storage of blood and components, whole blood transfusion, 29–30
Wiener, A., work on Rh system, 54
Wiener’s nomenclature, 168
window period
cytomegalovirus infection, 723
after hepatitis B, 701
HIV infection, 712, 718
Wiskott–Aldrich syndrome, 129, 624, 667
women
anti-HI antibody, 134
D immunization, 196
D-positive transfusion, 331
fainting, 11
frequency of donations, 6–7
haemoglobin levels for donation, 9
husband’s blood, 217
non-D immunization, 331
transfusion-associated acute lung injury and, 666
World Trade Center disaster, 17
wounds
assessment of blood loss, 24
blood transfusions on postoperative infections, 564–565
Wr antigens, 231
autoantibody specificity, 275
Wren, Christopher (1632–1723), 22
wristbands, 337
X chromosome
blood group genes, 58
pseudoautosomal region, 232
xenodiagnosis, *Trypanosoma cruzi*, 740
Xg system, 232–233
X-inactivation, 232
Xk gene, 216
Xs2 gene, 228
*Yersinia enterocolitica*
in fresh blood, 735
in red cell concentrates, 736
colour change, 737
Yk<sup>+</sup> antigen, 237
young platelets, 614
<table>
<thead>
<tr>
<th>Term</th>
<th>Page(s)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>young red cells see neocytes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yt antigens, 231–232, see also anti-Yt</td>
<td></td>
<td>antibodies</td>
</tr>
<tr>
<td>Yuk system (HPA-4 system), 575</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yus phenotype, 235</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zav system, 575</td>
<td></td>
<td></td>
</tr>
<tr>
<td>zeolite (mineral zeolite bandage), 826t</td>
<td></td>
<td></td>
</tr>
<tr>
<td>zidovudine, anaemia, recombinant erythropoetin, 807</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zw antigens see HPA-1 system</td>
<td></td>
<td></td>
</tr>
<tr>
<td>zygosity, RHD, 513</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZZAP (papain and DTT), removal of autoantibodies, 336, 341</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>