

# Index

- abortifacient, 239
- abortion, 66, 235, 236
  - delayed and HCG immunization, 212
- acrosin, 110, 181
  - antibodies, 113
- acrosome
  - antigens, 106, 110, 112
  - enzymes, 110
  - gamete recognition, 11
  - staining, 125, 131
  - zona binding, 175
- ACTH; *see* adrenocorticotrophic hormone
- actinomycin D, 127
- Addisonian adrenal disease, 134
- adjuvants, 166, 167; *see also* Freund's
- adrenocorticotrophic hormone (ACTH), 133
- allantois, 7
- allograft
  - conceptus analogy, 33–40
  - definition, 34
- alloincompatibility, intracellular in
  - invertebrates, 5
- alopecia, 134
- amenorrhoea, 134, 165
- AMP, cyclic, 153, 154
- anaemia
  - autoimmune haemolytic, 51
  - pernicious, 134
- angiotensin II, 85
- antibody; *see also* immunoglobulins
  - anti-neutrophil, 54
  - anti-sperm, 112, 113, 117, 120
    - clinical significance and sex, 128–31
    - detection, 122–7
    - fertility correlation, 124
    - and genital pathology, 131
    - head, 125–31
    - immunofluorescence, 124, 125
    - WHO collaborative programme, 122
  - blocking, 51, 52
  - enhancing, 17
  - haemagglutinating, 17
- HCG, 174–85, 217–24
  - kinetics of response, 223, 224
  - peptide, reaction, 207
- LHRH and reproductive function, 143–67
  - local, reproductive tract, 118, 119
  - ovarian, 179
  - production and steroids, 45
  - smooth muscle, 113
- antigenic disparity, mother–fetus, 21
- antigens; *see also* HLA
  - aspermatogenic, 106
  - blood group, 36, 38, 89, 114
  - conceptus, pre-implantation, 13, 14
  - detection technique, 37
  - fetal, 84
    - expression of, 15
  - histocompatibility; *see* HLA
  - ova, 188–92
  - ovarian, 188–94
  - paternal, fetal expression, 53
  - platelet, 54
  - polymorphism in invertebrates, 5, 6
  - pregnancy-associated, 69–72
  - rhesus, 54
  - semen, 111–15
  - sperm, 105–11, 114
    - brain shared, 115
    - differentiation, 114, 115
  - t-locus, 114, 115
  - TA1 and 2, 40
  - teratoma F–9, 115
  - transplantation, 115
  - trophoblastic, 37
  - zona, 173–97
- antiluteolysin, 72
- antilymphocyte serum, 44
- antisera; *see also* antibodies
  - conformational, 145
  - sequential, 145
- $\alpha_1$ -antitrypsin, 93
- aortic hyperplasia, 85
- arcuate nucleus lesions, 160, 162
- aspermatogenesis, 108
- ataxia telangiectasia, 134
- atherosis in pre-eclampsia, 85, 95
- auto-immunity, 50, 121–35
  - reproductive tract, pathogenesis, 106, 119–21
- baboons, 204–14, 222

- bacteria, antigen modification, 113
- blastocyst  
 recovery of, 239  
 surface immunogens, 13, 14
- blood group system, 122  
 incompatibilities, 49, 53  
 and infertility, 113
- blood transfusion, 47, 84
- Bordetella pertussis*, 146
- bursa of Fabricius, 8
- Callithrix jacchus*, 65, 234  
 HCG *beta*-subunit immunization, 233
- Candida albicans*, 45  
 pregnancy infections, 46
- candidiasis, mucocutaneous, 134
- carbodi-imide, 144
- carcinoma; *see also* tumours  
 prostrate, 107
- Cebus albifrons*, 65
- cell fusion, 12
- cell-mediated immunity  
 assessment to male antigens, 126
- cerebral haemorrhage, 83
- ceruloplasmin, 93
- cervix, immunological activity, 117
- chemotaxis, 11
- alpha*-chlorohydrin, 107
- chorionic gonadotrophin (HCG), 153, 165  
*alpha*-subunit, 64, 219, 229, 230  
 antibody-peptide specificity, 207–11  
 antiserum, 208  
*beta*-subunit 64, 204, 205, 217–24, 229  
 amino-acid sequence, 205, 217, 218  
 antiserum, 204–13  
 clinical trials, 222–4  
 conjugation, 221, 229  
 C-terminal antigen, 205, 217  
 cross-reactivity, 204, 205, 208, 221, 229, 231  
 detection in monkeys, 65  
 in equidae, 67, 68  
 immunization  
 and breeding history, 236  
 effects in marmosets, 233–9  
 and fertility, 213, 214, 234, 235  
 fetal fluid antibodies, 237, 238  
 milk antibodies, 237, 238  
 reversibility, 235  
 clearance of IgG, 211  
 ectopic synthesis, 224, 232, 233  
 female tolerance, 203, 221  
 hapten coupling, 203  
 and immune response, 19, 41, 43  
 immunization and gestation disruption, 204, 211, 212, 214  
 immunobiology, 229–41  
 in non-human primates, 64–7  
 peptide length and vaccine, 205, 206, 209  
 specificity, 208, 209  
 and uterine weights, 210  
 pregnancy diagnosis, 63  
 preimplantation detection, 66, 67  
 species range, 68  
 synthetic anti-pregnancy vaccines, 203–15, 220
- chorionic membranes, 85
- clotting system activation in pre-eclampsia, 83, 95
- CMI; *see* immunity, cell-mediated
- coitus, immune response after, 9
- complement, 35, 53, 117, 128  
 levels and menstrual cycle, 118  
 in pre-eclampsia, 91–3  
 in pre-eclamptic sera, 93
- concanavalin A, 44
- zona receptors, 175
- conceptus; *see also* fetus  
 allograft analogy, 33–40  
 antigenic immaturity, 13, 14  
 immunization by, 47  
 immunocompetence, development of, 20, 21
- contraception  
 HCG *beta*-subunit vaccination, 222  
 HCG synthetic, 203, 214  
 immunological, 108, 135, 173  
 LHRH antagonists, 157  
 LHRH inhibitors, 165  
 zona antigens, 196, 197
- corals, graft rejection, 6
- corpus luteum, 4, 231  
 maintenance of, 66, 72  
 progesterone secretion, 72  
 in reptiles, 7
- corticosteroids, 19, 44, 132, 133
- cortisone, 41, 44, 45  
 levels in pregnancy, 44
- Cowper's gland, 120
- cumulus oophorus, 12, 174, 176
- cytotoxicity, cell-mediated in annelids, 6
- cytotrophoblast  
 HLA antigens on, 39  
 proliferation, 85
- diabetes mellitus, 134
- diagnosis of early pregnancy, 63–75  
 accuracy, 73, 74  
 false positives, 74  
 sheep, 71  
 substances used, 63
- diazsulphanilic acid, 108
- dithiothiostol, 112
- DNA  
 egg-induced synthesis, 12  
 sperm, 125

- early pregnancy factor, 41, 44, 75  
 and E-rosettes, 44  
 preimplantation diagnosis, 63, 64  
 time of appearance, 69
- ectoplacental cone, 15
- embryonic mortality, 109
- endocrine disorders and autoimmune disease, 134
- endometrium giant cells, 68
- epididymis, 120, 121
- Epiperipatus trinidadensis*  
 oviduct development, 4, 5
- equine endometrial cups, 19
- Fallopian tubes, 117  
 fluid antibodies, 118
- fertility  
 after anti-sperm antibody test, 128, 129  
 in rat and immunization type, 190  
 regulation; *see* contraception
- fertilization  
 gamete recognition, 10–12  
 sea urchin, 11  
 vaccine inhibiting, 173  
 zona immunization, 182
- fertilizin, 11
- alpha*-fetoprotein  
 effects on lymphocytes, 19  
 levels in pregnancy, 42, 43  
 pregnancy immunosuppression, 41–3  
 in primates, 70  
 and T-cell reactivity, 42, 43
- fetuin, 19
- fetus  
 immune competence, 20  
 and maternal HLA antibodies, 52, 53  
 – mother relationship, 3–22  
 antigenic disparity, 21  
 barriers, 13, 18  
 post-implantation separation, 14, 15  
 tissue rejection, 14
- fibrinoid barrier, 14, 15
- flagellin, 206, 213
- follicle stimulating hormone (FSH), 143, 221, 230  
 effect of LHRH antibody, 148–51, 157  
 and ovariectomy, 158
- follicular fluid and local immunity, 119
- Freund's adjuvant, 106, 119, 144, 146, 166, 203, 213
- FSH; *see* follicle stimulating hormone
- gelatin, 123
- genes, Ir, 50
- genital tract  
 male autoimmunization, 119–21, 131  
 occult lesions, 131, 132  
 pathology, 131
- gill placentation, 7
- giraffe, 68
- beta*-globulin, 122
- alpha*<sub>1</sub>-acid glycoprotein, 93
- alpha*<sub>2</sub>-glycoprotein  
 pregnancy-associated and  
 immunosuppression, 41, 43, 44  
 SPT, 70
- beta*<sub>1</sub>-glycoprotein, 19  
 pregnancy-specific, 41
- glyoxylase, 35
- gonadal dysgenesis, 45
- Gorilla gorilla gorilla*, 65, 67
- grafts  
 reaction in invertebrates, 6  
 rejection and phylogeny, 9  
 survival and hormones, 19
- growth hormone, 221
- haemagglutination inhibition assays, 64  
 HCG, 65, 66  
 PMSG, 67  
 pregnancy-associated antigen in sheep, 70, 71
- haemolytic disease, 47
- Hashimoto's thyroiditis, 134
- HCG; *see* chorionic gonadotrophin
- HeLa cells, 233
- Hemimerus talpoides*  
 pseudoplacenta, 4
- histocompatibility loci  
 fetal expression, 15  
 and graft rejection, 36  
 major, 35, 36; *see also* HLA  
 minor, 36; *see also* blood group  
 polymorphism in invertebrates, 5, 6
- HLA antibodies and pre-eclampsia, 88
- HLA antigens, 122; *see also* microglobulin  
 A and B, proposed structure, 34  
 antibody development, maternal, 52  
 antigen sharing in pre-eclampsia, 87  
 –A on sperm, 114, 115  
 DR<sub>w</sub>, 36, 88  
 proposed structure, 35
- extracellular, 34
- homozygosity and pre-eclampsia, 88  
 and infertility, 113  
 linkage map, chromosome, 6, 35
- papain effects, 34, 35
- placental antibodies, 36
- pregnancy response in pre-eclampsia, 50  
 sperm, 114, 115  
 Y and sex determination, 115
- HLH; *see* luteinizing hormone
- hormones  
 inhibition by immunization, 150  
 protein in pregnancy, 19  
 sex and meat production, 166

- hormones (*continued*)  
 steroid in pregnancy, 18, 19, 45, 72–4  
 and immune system, 45  
 trophoblast produced, 18
- hyaluronidase, 110, 176  
 antibodies, 113
- hydatidiform mole, 66, 85, 86
- hydrops fetalis, 85, 86
- hyperplacentalosis, 86
- hypertension  
 chronic immune disorder, 94  
 familial, 94  
 lymphocyte transference of experimental, 94  
 placental damage, 85  
 pregnancy-induced; *see* pre-eclampsia
- hypoparathyroidism, 134
- hypothalamus, 143
- hysterotomy, 235, 236
- immune complex, 51, 86, 107  
 complement fixing and pre-eclampsia, 92, 93  
 and pre-eclampsia, 91, 95  
 in pregnancy, 91
- immune responses  
 and hormones, 18, 19, 90  
 invertebrate, 5, 6  
 phylogeny of, 9  
 post-coital, 9  
 vertebrate, 8, 9
- immunity, cell-mediated  
 cytotoxicity, 46–8  
 maternal, 46
- immunization; *see also* HCG, Zona  
 sperm antigens, response to 108, 109  
 and fertility, 108, 109
- immunocompetence  
 fetal, 20, 21  
 in pregnancy of thymectomized mice, 21
- immunofluorescence, 111–13, 124, 125, 180, 184, 185
- immunogens, 13, 15, 16  
 paternal, 17
- immunoglobulins  
 in agnatha, 6, 8, 9  
 F<sub>ab</sub> preparation, 125  
 IgA, 9, 45, 118  
 cervical, 117, 125  
 F<sub>c</sub> fragment stickiness, 127  
 follicular fluid concentration, 118, 119  
 secretory, composition, 117, 118  
 seminal plasma, 121  
 IgD, 9  
 IgE, 9  
 IgG, 9, 123, 125, 127  
 antigen receptors, 9  
 cervical, 117  
 clearance in baboon, 211  
 complexes, 92, 93  
 depressed in pre-eclampsia, 91  
 follicular fluid concentration, 118, 119  
 G<sub>1</sub> and G<sub>2</sub>, 20  
 HCG, peptide antibody, 209  
 immunosuppressive, maternal, 90  
 at implantation, 20  
 placental transfer, 49  
 seminal plasma, 121  
 sperm immobilization, 131
- IgM, 9, 91, 123, 125, 209  
 cytotoxic in blastocyst, 20  
 sperm immobilization, 131  
 phylogeny, 8, 9  
 placental transfer, 53  
 pregnancy response to G<sub>m</sub>, 46, 47  
 transfer after gestation, 20
- immunological privilege, 16
- immunological relationships, mother–fetus, 33–55
- immunosuppression, 36, 39, 117  
 agents, 40–2  
 antigen-specific, 48  
 HCG, 232  
 lymphocytes, 41, 69  
 non-specific in pregnancy, 17–19, 40–9, 69  
 therapy, 132, 133
- implantation, 12, 13  
 and anti-ovary antiserum, 183  
 cell fusion, 12  
 delayed, 14  
 LHRH inhibition, 164
- infertility  
 immunological factors in, 105–35  
 immunological investigations, 121–7  
 immunological tests  
 cell-mediated immunity, 126  
 cervical mucus, 125, 126  
 complement dependent sperm immobilization, 123, 124, 129–31  
 gelatin agglutination, 123, 130  
 immunofluorescence, 124, 125, 129  
 post-coital test, 127  
 results and fertility, 129, 130  
 seminal plasma antibody, 126  
 sperm microagglutination, 122, 123, 129, 130  
 sperm-mucus contact test, 127  
 sperm-mucus penetration test, 127  
 immunological, treatment of, 132, 133  
 male, 130–2  
 and sperm immunization, 108, 109  
 insemination, intra-uterine, 132, 133
- invertebrates immune system, 5, 6
- isolating mechanisms, 10
- kidney

- kidney (*continued*)  
 function in pre-eclampsia, 83  
 immune complex deposition, 91  
 lesion in pre-eclampsia, 50, 51  
 placental common antigens, 50, 86
- lactic dehydrogenase-X  
 isoantibodies in infertility, 113  
 non-specific, 110  
 sperm, 109, 110
- lactoferrin, 113
- lamina propria, 8, 9, 118
- leukocytes in annelids, 6
- Leydig cells, 155  
 effect of LHRH immunization, 153, 154  
 HCG bioassay, 219  
 HCG stimulation, 154
- LH; *see* luteinizing hormone
- LHRH; *see* luteinizing hormone-releasing hormone
- lupus erythematosus, disseminated, 92, 93
- luteinizing hormone (LH)  
*alpha*-subunit, 230  
 amino acid sequence, 205, 217, 218  
*beta*-subunit, 153, 205, 230  
 effect of anti-LHRH antibody, 148–51  
 and LHRH agonist, 163, 164  
 and ovariectomy, 158, 159, 163  
 /HCG bioassay, 66  
 HCG cross-reaction, 173, 204, 205, 208, 221  
 oestrogen variable effects, 156, 157  
 and pregnancy, 231  
 and prostaglandins, 160  
 surge, 157–60  
 causes, 160  
 and oestradiol benzoate, 159
- luteinizing hormone-releasing hormone (LHRH)  
 antibodies  
 generation, 144–6  
 and reproductive function, 143–67  
 site of action, 147, 148  
 antibody titre  
 and hormone levels, 151  
 progesterone in monkeys, 161  
 and testicular biopsy, 152  
 conjugation to carrier, 144, 145  
 effects on  
 FSH, 148, 149, 151, 157, 158, 160  
 LH, 148–51, 158–60, 163, 164  
 oestradiol, 162  
 testosterone, 148–51, 153–5  
 immunization  
 and hormone levels, 148–64  
 and LHRH agonist effects, 163, 164  
 and ovulation induction, 161  
 inhibition  
 implantation, 164  
*in vivo*, 146–8  
 in female, 156–65  
 in male, 148–56  
 and meat production, 166  
 practical applications, 165–7  
 long-term inhibition, 160–4  
 octapeptide precursor, 167  
 and ovulatory cycle, 157, 158  
 receptors, 164  
 structure, 143, 144  
 lymph nodes, peripheral, 9  
 lymphocytes  
 antigen recognition, 9  
 B, 8, 9, 206  
 breast milk, 20  
 fetal cord blood, antigens, 53  
 inhibitory factors, 41–5  
 maternal, response in pregnancy, 17, 90  
 peptide sensitization, 206  
 placental transfer, 20  
 suppressor in uterus, 17  
 T, 9, 206  
 and *alpha*-fetoprotein, 42, 43  
 and rejection, 34  
 suppressor, 41, 51
- Macaca arctoides*, 161  
*M. mulatta*, 65  
*M. speciosa*, 65
- alpha*<sub>2</sub>-macroglobulin, 19  
 pregnancy-associated, 70, 90
- macrophage, 116, 119, 120
- mare, pregnancy-associated antigen, 72
- marmoset; *see* *Callithrix*
- median eminence, 148
- membrane  
 egg and embryo protection, 7  
 menopause, premature, 134
- menstrual cycle and mucus  
 immunoglobulins, 118
- MHC; *see* histocompatibility, major
- beta*<sub>2</sub>-microglobulin (HLA light chain), 34, 37, 38  
 antigens on sperm, 114
- MIH; *see* histocompatibility, minor  
 milk  
 progesterone in cows, 73  
 transfer in, 20
- miscarriage and pre-eclampsia, 84
- mitogens, 42, 44
- mixed lymphocyte reaction (MLR), 41–3, 90
- monkeys  
 gestation length, 65  
 ovarian cycle, 65
- morula, cell function, 12
- mother  
 –fetus relationships, 3–22, 33–55

- antigenic, 87–9
- specific suppression of responses, 16–19
- mucus
  - antibodies in, 125, 126
  - cervical, 112, 117, 123
  - preparation of, 125, 126
  - sperm contact test, 127
  - sperm penetration, 127
- mumps, 135
- Mycobacterium butyricum*, 167
- neonatal purpura, 54
- neuraminidase, 15, 19
- neutropenia, 54
- occlusion therapy, 133
- oestradiol, 45
  - 17 beta, 157
  - levels and HCG antiserum, 211, 212
  - plasma levels and LHRH immunization, 162
- oestradiol benzoate
  - effect on LH levels and ovariectomy, 159
- oestriol, 90
- oestrogens, 45, 90, 231
  - effects on LH, 156, 157
  - and graft survival, 18
- oestrone levels and HCG antiserum, 211, 212
- oestrone sulphate, 63
  - pregnancy test, 74, 75
- Opsanus tau*
  - embryo invasion, 16
- oral contraceptives, 43, 45
- orchidectomy, 107
- orchitis
  - epididymo–, 131
  - experimental allergic, 106, 119
  - mumps, 120
- ova
  - antibodies to cumulus-free, 189–91, 193
- ovarian failure, autoimmune, 134, 135
- ovariectomy, 18, 157, 159, 163
- ovary
  - antibodies to, 179, 182, 188, 190, 192
  - antigen preparation, 188
  - gonadotrophin receptors, 134
- oviduct, fluid antibodies, 118
- oviparity, 3
- ovomuroid, 19
- ovulation and LHRH immunization, 161, 162
- Pan troglodytes*, 65, 67
- Papio anubis*, 65
- Papio cynocephalus*, 65
- parathyroid allograft rejection, 16
- peptides
  - HCG antisera action *in vivo*, 209–13
  - immunogenicity of synthetic HCG, 206, 207
  - specificity of HCG, 207–9
- pergonal, 208
- Peyer's patches, 8
- phagocytosis, sperm, 116, 119, 120, 131
- pheromones, 4
- phospholipid, bovine sperm, 109
- phytohaemagglutinin, 19, 42, 90
- pituitary gland, 133
  - effects of LHRH immunization, 153
  - gonadotrophic histochemistry, 153
  - HCG activity, 66, 208
  - primitive in tunicates, 3, 4
- placenta
  - allograft success, factors affecting, 22, 54
  - antigenic, 38, 85, 86
  - chorioallantoic types, 8
  - connective tissue, 86
  - eluate, immunosuppressive, 41
  - HLA antibody production, 38
  - hormones, 18
  - immunoabsorbant, 52, 53
  - immunosuppression, 17, 18
  - infarction, 85
  - ischaemia, 83, 85
  - mass and immunity, 21
    - and pre-eclampsia, 86
  - polysaccharide, 86
  - in pre-eclampsia, 50, 84–9
  - renal antigen cross-reaction, 86
  - uterine invasion, 8
  - vascular pathology in pre-eclampsia, 84, 85
  - yolk sac, first description, 6
- placental lactogen; *see*
  - somatotrophin
- placental transcortin, 41
- placentation
  - invertebrate, 4, 5
  - marsupial, 8
  - phylogeny, 3–8
  - pseudo–, 4
  - teleost, 7
  - vertebrate, 6–8
- platelet, 54
- PMSG; *see* pregnant mares serum
  - gonadotrophin
- poliomyelitis, 46
- polyspermy, barriers to, 177, 178
- Pongo pygmaeus*, 65, 67
- porifera graft reaction, 6
- pre-eclampsia, 49–52, 83–95
  - and complement system, 91–3
  - fetal survival and HLA homozygosity, 88
  - and immune complexes, 91
  - immune function, maternal, 89
  - incidence, 83
  - and pregnancy number, 50, 84

- Pre-eclampsia (*continued*)  
 inheritance, 49, 50, 89  
 placenta, 84–7  
   bed-vessels in, 50  
 proteinuric, 83  
 and suppressor T-cell function, 51, 52  
 symptoms, 49, 83
- pregnancy  
 –associated antigens  
   domestic animals, 70–2  
   non-human primates, 70  
 corpus luteum in, 231  
 diagnosis, immunological, 63–75  
 disruption by anti-HCG serum, 181  
 mother–fetus relationship and, 3–22  
 non-specific immunosuppression, 17–19,  
   40–9, 69  
 rates and infertility, 128, 129  
 stage and diagnosis, 63  
 test, non-human primates, 65  
   progesterone, 72–4  
   accuracy, 73  
 pregnant mares' serum gonadotrophin  
 (PMSG), 63, 67, 68, 75  
 serum levels, 67  
 subunits, 67  
 progesterone, 63, 64, 90, 122, 221, 231  
 and anti-HCG serum, 211, 212  
 immunosuppressant, 19, 41, 45  
 levels in pregnancy, 45  
 LHRH immunization, 161, 162  
 in marsupials, 18  
 and pregnancy diagnosis, 72–4  
   accuracy, 73, 74  
 in reptiles, 7  
 prolactin, 165, 221  
 prostaglandin E, 117  
   and LH release, 160  
 prostrate, 120, 121, 165  
   involution, 153  
 protamine, 125  
 proteins, pregnancy-associated, 19  
*Pygathrix nemaeus*, 65, 67
- radioimmunoassay, 64, 66  
 HCG, 66, 207, 208  
 LHRH, 145, 147  
   sensitivity, 157  
 oestrone sulphate, 75  
 PMSG, 67  
 progesterone, 72–4  
 radioreceptor assays, 67  
 Raji cell assay, 91  
 renin, uterine, 85  
 reverse transcriptase, 13  
 rhesus incompatibility, 16  
   pregnancy, response to, 46, 47  
   severity, reasons for, 49
- Ricinus communis*, 175  
 RNA, maternal messenger, 13  
 rosette inhibition test, 41, 44, 69  
*Saimiri sciureus*, 65  
*Salamandra atra*  
   cannibalism, 7  
 scaferrin, 113  
 semen  
   antigenic spectrum, 111–15  
   hypersensitivity, 110, 113  
   isoimmunization in female, 115–19  
   plasma  
     antibodies, 126  
     antigens, 110  
     glycoprotein, 117  
 seromucoid, 93  
 Sertoli cells, 119  
 serum  
   goat anti-human, 44  
   pregnancy immunosuppressive, 41  
 sheep  
   conceptus antisera raising, 71  
   pregnancy-associated antigen, 70, 71  
   purification, 71  
   progesterone pregnancy test, 74  
 sialomucin, 38  
 Soay ram sex hormones  
   effect of anti LHRH serum, 148, 149  
 somatomammotrophin (placental lactogen),  
   41, 64, 90  
   origin, 68  
   time of detection, 68  
 species evolution, 10  
 spermatogenesis suppression, 133  
 spermatozoa; *see also* acrosome  
 agglutination, 11, 111–13  
   gelatin, 123  
   head to head, 122, 123, 126  
   micro–, 122, 123, 129  
   tail to tail, 123, 126  
 alloantigens, 114, 115  
 autoantibody, head, 125, 131  
 autoimmunization, 106–8  
 behaviour and eggs, 10, 11  
 capacitation, 119  
   and zona binding, 174–6  
 cell-mediated immunity, 107  
 complement-dependent immobilization,  
   111–13  
 cytotoxicity to, 109, 119, 127  
 entry in sea urchin, 11  
 enzymes, 109, 110  
 guinea-pig antigen spectrum, 106, 107  
 histocompatibility antigens, 9, 114, 115  
 immobilization test, 123, 124  
   and fertility, 129  
 isoimmunization, 108–11  
   contraceptive effects, 108, 109

- spermatozoa (*continued*)  
 midpiece and neck, 112  
 non-motile in rabbit, 10  
 post-nuclear cap, 112  
 selection by female tract, 10  
 smooth muscle antibodies, 113  
 storage in bats, 10  
 tail, 112, 125  
 tail end-piece, 112, 125  
 transplantation antigen sensitization, 115  
 washing and insemination, 133  
 zona binding, 179, 186–95  
 assay, 186–93  
 spleen phylogeny, 9  
 staphylococcal protein A, 127  
 surinam toad, 7  
 syncytiotrophoblast, 38, 39  
 coated vesicles, 53
- testicular atrophy, 131  
 testicular infusion, hot water, 107  
 testicular trauma and orchitis, 119, 120  
 testis  
 biopsy, 152  
 HCG binding and LHRH immunization,  
 156  
 involution, 150, 153, 165  
 LH/HCG receptors, 155  
 weight and LHRH antibodies, 151  
 testosterone, 45, 66, 122, 133  
 effect of anti-LHRH antibody, 148–51, 153  
 HCG *beta*-subunit stimulated, 219  
 HCG response, 153–5  
 tetanus toxoid, 206, 207, 213  
 HCG linked, 173, 221  
 tetraploidy, human, 66  
 thrombocytopenia purpura, 134  
 thymus  
 ontogeny, 21  
 phylogeny, 8, 9  
 replacement, 134  
 thyroid stimulating hormone (TSH), 221  
*alpha*-subunit, 230  
*beta*-subunit, 220  
 thyrotoxicosis, 134  
 transplantation reactions  
 kidney, 36  
 immune injury, 85  
 recognition molecules, 12  
 triploidy, 85  
 trophoblast, 8, 47, 54, 74, 230  
 differentiation, 12  
 disease, 232, 233  
 HLA antigens, 36, 37, 86  
 immunogenicity, 13, 15  
 microvilli, 39  
 protection by blocking antibody, 51, 52  
 villus, antigens on, 38, 39  
 xenoantigens, 39  
 trophoblastin, 72  
 trypsin, 204  
 tumours, 165  
 HCG-secreting, 224, 233, 234  
 placental, 66  
 trophoblastic, 36, 38, 47, 232  
 Turner's syndrome, 134
- urine  
 post-menopausal, 208  
 pregnancy test, 66
- uterus, 85  
 immunological privilege, 16  
 response to spermatozoa, 9, 10  
 weight and HCG antiserum, 210
- vaccine, 184  
 anti-pregnancy and synthetic HCG,  
 203–15  
 HCG *beta*-subunit, 217–24  
 clinical trials, 222–4  
 HCG peptide selection, 205, 206  
 LHRH, 167  
 spermatozoal, 109  
 vagina, immunological inactivity, 117  
 vaginal infections, 116  
 vasculitis, 93  
 vasectomy, 107  
 immunological concomitants, 120, 121, 125  
 patchy orchitis, 120  
 reversal, persistent antibodies, 121
- virus disease  
 oncornavirus, 90  
 in pregnancy, 46  
 response, 90
- vitelline membranes, 7  
 vitiligo, 134  
 viviparity, 3  
 and altitude, 7  
 in invertebrates, 4
- Wampole UCG test, 71
- yolk test, 7, 8
- zebra, 68  
 zona pellucida, 7, 11, 14  
 active immunization, 183–96  
 antibodies to, 135, 179  
 and conception in rat, 194–6  
 and fertilization, 179  
 titre and sperm binding, 187–96  
 blastocyst protection, 14  
 -free eggs, hamster, 11  
 function, 175–9  
 post-fertilization, 178



- zona pellucida, function (*continued*)
  - and trypsin, 178
  - immunization against, 173–97
  - immunoprecipitation and sperm binding,
    - 180, 181, 184, 185
    - cross-reactivity, 183, 184
    - in vitro* activity, 179–82
    - in vivo* activity, 182–96
  - passive immunization, 182–183
  - spermatozoa binding, 174–81, 186–96
    - assay, 186–93
    - spermatozoa receptors, 11, 179, 184
    - structure, 174, 175
  - zona reaction, 177