

# Index

- A**
- Activin receptor-like kinase (ALK), preeclampsia dysfunction, 129
  - AF. *See* Amniotic fluid
  - ALK. *See* Activin receptor-like kinase
  - Amniotic fluid (AF)
    - cell-free fetal RNA, 342–343
    - overview, 341–342
    - transcriptomics
      - cell-free versus cellular RNA comparison, 353–355
      - Down syndrome, 348–349
      - Edwards syndrome, 348–350
      - fetal therapy applications, 352–355
      - maternal obesity, 352
      - placenta-specific gene expression, 347
      - prospects, 355
      - RNA extraction, 343, 345
      - second trimester euploid fetus studies, 347–350
      - table of studies, 344–345
      - tissue-specific gene expression, 354
      - Turner syndrome, 350–361
      - twin–twin transfusion syndrome, 343, 345–346, 349, 351–352
  - AMPK, salivary transcriptomics in neonates, 395
  - Angiotensin, preeclampsia role, 258
  - Argonaute
    - knockout effects on ovarian development, 3, 6
    - microRNA processing, 2
  - ART. *See* Assisted reproductive technology
  - Assisted reproductive technology (ART)
    - epigenetics
      - differences in children by type of conception, 84–85
      - DNA methylation, 81–84
      - environmental influences, 79–80
      - placenta studies, 84–86
      - plasticity, 81
      - prospects for study, 85–88
    - microRNA utilization, 14–15
    - overview of in vitro fertilization, 77–79
    - recurrent pregnancy loss and genetic testing
      - preimplantation genetic diagnosis, 225–226
      - preimplantation genetic screening, 225–226
      - biopsy
        - blastomere, 227–228
        - overview, 226–227
        - polar body, 227
        - trophoectoderm, 228–229
- B**
- Bacterial vaginosis (BV), vaginal microbiome, 163, 167
  - Birth. *See* Parturition
  - Bisphenoyl A (BPA), *HOX* gene expression response, 58–59
  - Blood group. *See* Fetal blood group
  - BPA. *See* Bisphenoyl A
  - BRCA*, newborn screening for mutations, 363
  - BV. *See* Bacterial vaginosis
- C**
- Cell-free fetal DNA (cffDNA)
    - fetal blood group typing. *See* Fetal blood group
    - fetal single-gene disorder detection. *See* Whole exome sequencing; Whole genome sequencing
    - noninvasive prenatal testing. *See* Noninvasive prenatal testing
    - parturition timing role, 201
  - cffDNA. *See* Cell-free fetal DNA
  - CHARGE syndrome, 331
  - Chromosomal microarray analysis (CMA), prenatal genetic diagnosis, 325–326
  - CL. *See* Corpus luteum
  - CMA. *See* Chromosomal microarray analysis
  - Corin
    - amniotic fluid, 341–342
    - placentation defects in preeclampsia, 259
  - Corpus luteum (CL)
    - microRNA expression and function, 10–11
    - progesterone synthesis, 237–239
  - COX-2. *See* Cyclooxygenase-2
  - Cyclooxygenase-2 (COX-2)
    - late gestational changes, 190
    - progesterone effects, 184
- D**
- DC. *See* Dendritic cell
  - Dendritic cell (DC), uterus and immune tolerance, 95–96

## Index

- Dicer  
knockout effects on ovarian development, 3, 6, 11  
microRNA processing, 2
- DNA methylation. *See* Epigenetics; Placenta
- Down syndrome (DS), amniotic fluid transcriptomics, 348–349
- DREAM assay, 83
- Drosha, microRNA processing, 2
- DS. *See* Down syndrome
- E**
- Edwards syndrome, amniotic fluid transcriptomics, 348–350
- EGF. *See* Epidermal growth factor
- EMX2*, 56, 60
- Endoglin, preeclampsia role, 253, 257, 260
- Endometriosis, *HOX* genes in pathogenesis, 59–61
- Endometrium  
fibroids. *See* Leiomyoma  
immunological priming, 202, 204  
transcriptomics  
clinical applicability, 71–72  
next-generation sequencing, 72  
overview, 69–70  
prospects for study, 72–73  
receptivity studies, 69, 71  
window of implantation, 67–69, 71–73
- Endoplasmic reticulum stress, preeclampsia role, 260
- Endothelial cell, placental extracellular vesicle interactions, 118–119
- Epidermal growth factor (EGF), extravillous trophoblast cell invasion regulation, 99
- Epigenetics  
assisted reproductive technology studies  
differences in children by type of conception, 84–85  
DNA methylation, 81–84  
environmental influences, 79–80  
placenta studies, 84–86  
plasticity, 81  
prospects for study, 86–88  
cell-free fetal DNA, 300  
cytosine methylation, 40–41  
maternal obesity  
DNA methylation, 275–276, 282  
histone code variations, 276  
microRNA variations, 276–277, 283  
overview, 275  
molecular carriers, 40  
overview, 39–40  
placental methylome. *See* Placenta  
preterm birth studies, 208  
sperm intergenerational transfer  
environmental effects, 47–48  
model systems, 45  
nutrition effects, 45–46  
odorant training, 46–47  
stress effects, 46  
toxin effects, 46
- Estrogen, *HOX* gene expression regulation, 58–59
- Extravillous trophoblast cell. *See* Trophoblast
- F**
- Factor V Leiden (FVL), recurrent pregnancy loss gene defects, 224
- FAS-L, recurrent pregnancy loss gene defects, 223
- Fetal blood group  
hemolytic disease of the fetus and newborn, 315–316  
typing  
cell-free fetal DNA, 316  
next-generation sequencing  
polymerase chain reaction primers, 320–321  
principles, 316–317  
prospects, 321–322  
reporting, 320–321  
statistical analysis, 318–321  
technical aspects, 317–318  
overview, 316
- Fetal growth restriction (FGR)  
placental methylome findings, 149–150  
placental microRNA findings, 129–130
- FGR. *See* Fetal growth restriction
- Fibroid. *See* Leiomyoma
- Fibronectin, placental extracellular vesicle cargo, 115
- FIGLA*, microRNA regulation, 13
- FLT. *See* Fms-like tyrosine kinase
- Fms-like tyrosine kinase (FLT), preeclampsia  
biomarker utilization, 260–263  
role, 253–255, 257, 260, 264
- Follicle-stimulating hormone (FSH), receptor variants  
in preterm birth, 245–246
- FSH. *See* Follicle-stimulating hormone
- FVL. *See* Factor V Leiden
- G**
- Gut microbiome. *See* Microbiome
- H**
- hCG. *See* Human chorionic gonadotropin
- HELLP syndrome, 264
- HELLP assay, 83
- Heme oxygenase-1 (HO-1), preeclampsia  
role, 259  
therapeutic targeting, 263–264
- Hemolytic disease of the fetus and newborn. *See* Fetal blood group
- HLA-G, recurrent pregnancy loss gene defects, 223

HMP. *See* Human Microbiome Project  
HO-1. *See* Heme oxygenase-1  
*HOX* genes  
    *Drosophila* development role, 54  
    female reproductive tract  
        development role, 55–56  
        estrogen and progesterone in expression  
            regulation, 58–59  
    infertility pathogenesis  
        endometriosis, 59–61  
        hydrosalpinx, 82–63  
        leiomyoma, 62  
        polycystic ovarian syndrome, 61–62  
        reproductive function, 56–57  
    functional overview, 53  
    *HOXD* sperm chromatin cluster, 26–27  
    vertebrate axial development role, 54–55  
Human chorionic gonadotropin (hCG), extravillous  
    trophoblast cell invasion regulation, 99  
Human Microbiome Project (HMP), 157–158  
Hydrosalpinx, *HOX* genes in pathogenesis, 82–63

**I**

IDO. *See* Indoleamine 2,3-dioxygenase  
IGF-1. *See* Insulin-like growth factor-1  
Immune tolerance, pregnancy and uterine cells  
    dendritic cells, 95–96  
    macrophages, 94–95  
    natural killer cells, 93–94  
    T cells, 95  
Indoleamine 2,3-dioxygenase (IDO), fetal immune  
    response prevention, 205  
Insulin-like growth factor-1 (IGF-1), receptor as  
    susceptibility gene for preterm birth, 247  
Intrauterine growth restriction. *See* Fetal growth  
    restriction  
In vitro fertilization. *See* Assisted reproductive  
    technology

**K**

*KEL*, fetal blood group typing, 317, 319–323

**L**

Leiomyoma, *HOX* genes in pathogenesis, 62  
Leukemia inhibitory factor (LIF), recurrent pregnancy  
    loss gene defects, 223  
LH. *See* Luteinizing hormone  
LIF. *See* Leukemia inhibitory factor  
Lipopolysaccharide (LPS), preterm birth induction,  
    208–209  
LPS. *See* Lipopolysaccharide  
Luteinizing hormone (LH), microRNA expression  
    effects in antral follicles, 8–10

**M**

Macrophage  
    placental extracellular vesicle interactions, 117–118  
    uterus and immune tolerance, 94–95  
Massively parallel sequencing. *See* Next-generation  
    sequencing  
Maternal obesity. *See* Obesity  
Matrix metalloproteinases (MMPs), extravillous  
    trophoblast cell invasion, 97–98  
MED1, microRNA regulation of expression, 131  
MER, repetitive elements and invasive placenta, 244  
Metagenomics. *See* Microbiome  
Methoxychlor (MXC), *HOX* gene expression  
    response, 58  
Microbiome  
    clinical significance in reproduction, 173  
    gut microbiome in pregnancy, 168  
    Human Microbiome Project, 157–158  
    infant colonization  
        cesarean versus vaginal delivery, 169  
        first microbial species, 170  
        probiotic studies, 169  
    maternal obesity studies, 278  
    metagenomics  
        omics data integration, 162  
        perinatal health studies, 159–160  
        16S-based metagenomics, 160–161  
        whole genome shotgun-based metagenomics,  
            161–162  
    placental microbiome, 171–173  
    vaginal microbiome  
        community state types, 163–164, 167–168  
        next-generation sequencing, 163–164  
        pregnancy, 164–168  
MicroRNA  
    biogenesis, 1–2, 125–126  
    corpus luteum expression and function, 10–11  
    maternal obesity and epigenetic variations,  
        276–277, 283  
    myometrial quiescence maintenance in pregnancy  
        overview, 185–186  
        miR-200 family and targets, 186–188  
        downregulation of cyclooxygenase-2 regulators,  
            190–191  
    nomenclature, 2  
    oocyte expression and function, 11–13  
    ovarian development  
        antral follicles, 8–10  
        follicular development, 5–7  
        overview, 2–5  
        tissue expression, 8  
    ovarian disease studies  
        assisted reproductive technology utilization,  
            14–15  
        early reproductive senescence, 13–14

## Index

- MicroRNA (*Continued*)  
ovarian cancer, 13  
polycystic ovarian syndrome, 14  
sperm, 30, 32, 44–45  
Miscarriage, placental methylome findings, 149–150  
MKP-1, progesterone effects, 184  
MMPs. *See* Matrix metalloproteinases  
mTORC1, premature decidual senescence in mice, 208  
Müllerian duct, *HOX* genes in development, 55  
MXC. *See* Methoxychlor
- N**
- Natural killer (NK) cell  
spiral artery remodeling in pregnancy, 100–101,  
257–259  
uterus and immune tolerance, 93–94  
NBS. *See* Newborn screening  
Neutrophil, placental extracellular vesicle  
interactions, 118  
Newborn screening (NBS)  
historical perspective, 359, 361  
next-generation sequencing  
challenges for incorporation in routine practice,  
361–362  
ethics, 368–371  
gene selection, 360–361  
hearing loss, 363–364  
miscellaneous disease screening, 364–368  
monogenetic diseases in critically ill neonates.  
*See* Whole genome sequencing  
overview, 359–360  
phenylketonuria, 363  
prospects, 371  
secondary findings, 362–363  
Next-generation sequencing. *See* Fetal blood group;  
Microbiome; Newborn screening;  
Noninvasive prenatal testing; Whole  
exome sequencing; Whole genome  
sequencing  
NF- $\kappa$ B. *See* Nuclear factor- $\kappa$ B  
NIPT. *See* Noninvasive prenatal testing  
NK cell. *See* Natural killer cell  
Noninvasive prenatal testing (NIPT)  
cell-free fetal DNA  
historical perspective, 296–299  
overview, 295–296  
massively parallel sequencing of maternal plasma  
aneuploidy testing  
costs, 306–307  
failed test implications, 307  
false-positives, 304–306  
intellectual property issues, 308  
overview, 301, 304  
public health care implementation, 306–308  
stakeholder opinions and education, 307–308  
epigenetics, 300  
monogenetic disease detection  
overview, 301–303  
public health care implementation, 308–309  
overview, 299  
sizing of fetal DNA, 299–300  
transcriptomics, 300  
*NPHP4*, salivary transcriptomics in neonates, 395  
*NPY2R*, salivary transcriptomics in neonates, 395  
Nuclear factor- $\kappa$ B (NF- $\kappa$ B), progesterone inhibition  
of activation, 184
- O**
- Obesity  
epidemiology, 273  
maternal obesity  
definitions, 274–275  
epigenetic modifications  
DNA methylation, 275–276, 282  
histone code variations, 276  
microRNA variations, 276–277, 283  
overview, 275  
gut microbiome studies, 278  
mechanistic studies  
animal models, 278–279  
humans, 279–280  
metabolic programming  
animal models, 280–282  
epidemiological studies, 280  
human studies, 281–283  
neurodevelopment studies in offspring  
animal models, 283–285  
epidemiological studies, 283  
human studies, 285  
prospects for study, 286–287  
sex-specific effects  
cardiometabolic programming, 285–286  
neurodevelopmental programming, 286  
transcriptomics and RNA sequencing,  
277–278, 352  
metabolic imprinting, 274  
Oocyte  
microRNA expression and function, 11–13  
sperm penetration effects, 30–34  
Ovary, microRNA studies  
development  
antral follicles, 8–10  
follicular development, 5–7  
overview, 2–5  
tissue expression, 8  
disease studies  
assisted reproductive technology utilization, 14–15  
early reproductive senescence, 13–14  
ovarian cancer, 13  
polycystic ovarian syndrome, 14

- P**
- p53  
recurrent pregnancy loss gene defects, 223  
uterine knockout and preterm birth in mice, 208, 240
- Parturition. *See also* Preterm birth  
inflammatory response, 182  
progesterone functional decline at term, 191  
placental clock  
cell-free fetal DNA role, 201  
decidual prostaglandin synthesis suppression in pregnancy, 205–206  
models for nine-month clock, 198–201  
overview, 198  
prospects for study, 211  
supporting evidence for decidual clock, 201–203  
T cells, 202, 204–205  
selective pressures and adaptive evolution in human pregnancy and parturition, 245–246
- PBMC. *See* Peripheral blood mononuclear cell
- PBX2, 57
- PCOS. *See* Polycystic ovarian syndrome
- PDGF. *See* Platelet-derived growth factor
- Peripheral blood mononuclear cell (PBMC), placental  
extracellular vesicle interactions, 116–117
- Peroxisome proliferator-activated receptor- $\gamma$  (PPAR- $\gamma$ ),  
metabolic programming in maternal obesity, 282
- PGC. *See* Primordial germ cell
- PGD. *See* Preimplantation genetic diagnosis
- PGS. *See* Preimplantation genetic screening
- Phenylketonuria (PKU), newborn screening, 359, 363, 369
- PKU. *See* Phenylketonuria
- PLA2G4C, preterm birth variants, 246
- PLAC4, noninvasive prenatal testing, 296
- Placenta. *See also* Trophoblast  
DNA methylation  
characteristics  
gene promoter hypomethylation, 145  
global hypomethylation, 143  
monoallelic methylation and genomic imprinting, 145–146  
overview, 142–143  
partially methylated domains, 144  
retrotransposable element hypomethylation, 144  
X-chromosome promoter hypomethylation in females, 144–145  
environmental exposure effects, 150–151  
gestational age and changes, 147–149  
overview, 141–142  
pregnancy complication studies, 148–149  
villous tree structure and distribution, 146–147  
epigenetic studies of assisted reproductive technology effects, 84–86  
extracellular vesicles  
cargo  
immune regulatory proteins, 114  
lipids, 116  
nucleic acids, 115–116  
overview, 113  
vascular-reactive proteins, 115  
endothelial cell interactions, 118–119  
immune cell interactions  
monocytes/macrophages, 117–118  
neutrophils, 118  
peripheral blood mononuclear cells, 116–117  
T cells, 116  
nanovesicles, 112–113  
overview of types, 108  
preeclampsia effects, 113  
prospects for study, 119  
purification, 108–111  
syncytial nuclear aggregates, 108, 111–112  
trophoblast deportation, 113  
microbiome, 171–173  
microRNA  
circulating levels in pregnancy and biomarker use, 131–135  
expression, 126–129  
fetal growth restriction findings, 129–130  
preeclampsia dysfunction, 129  
prospects for study, 134  
viral infection studies, 130–131  
structure, 107–108  
timing of birth. *See* Parturition  
Placental growth factor (PLGF)  
placental extracellular vesicle cargo, 115  
preeclampsia  
biomarker utilization, 260–263  
role, 253–255  
Platelet-derived growth factor (PDGF), spiral artery remodeling in pregnancy, 100  
PLGF. *See* Placental growth factor  
PLXNA1, salivary transcriptomics in neonates, 395  
Polycystic ovarian syndrome (PCOS)  
HOX genes in pathogenesis, 61–62  
microRNA role, 14  
prenatal androgen exposure, 5  
PPAR- $\gamma$ . *See* Peroxisome proliferator-activated receptor- $\gamma$   
Preeclampsia  
angiogenic factors  
biomarker utilization, 260–263  
pathogenesis, 253–257  
therapeutic targeting, 263–264  
epidemiology, 253  
long term complications, 264–265  
placental extracellular vesicle effects, 113  
placental microRNA dysfunction, 129  
placentation defect mechanisms, 257–260  
prospects for study, 265–266

## Index

- Pregnancy loss. *See* Recurrent pregnancy loss
- Preimplantation genetic diagnosis (PGD), recurrent pregnancy loss and genetic testing
- biopsy
    - blastomere, 227–228
    - overview, 226–227
    - polar body, 227
    - trophoectoderm, 228–229
  - overview, 225–226
- Preimplantation genetic screening (PGS), recurrent pregnancy loss and genetic testing
- biopsy
    - blastomere, 227–228
    - overview, 226–227
    - polar body, 227
    - trophoectoderm, 228–229
  - overview, 225–226
- Preterm birth
- animal models
    - clinical relevance, 239–240
    - fetal membrane rupture comparative genomics, 243–244
    - overview, 236–237
  - progesterone
    - function evolution, 237
    - levels across different species, 240–241
    - luteal production, 237–239
    - repetitive elements and invasive placenta, 244
  - biological continuum, 210
  - definition, 235
  - epidemiology, 181–182
  - epigenetics, 208
  - follicle-stimulating hormone receptor variants, 245–246
  - genome-wide analysis, 246–247
  - heritability, 206–208
  - insulin-like growth factor-1 receptor as susceptibility gene, 247
  - myometrial quiescence maintenance in pregnancy. *See* MicroRNA
- Primordial germ cell (PGC), ovarian development, 2–4
- Progesterone
- PLA2G4C* variants, 246
  - progesterone evolutionary genomics
    - receptor
      - evolution, 240–241
      - genetic variation and function, 243
      - withdrawal mechanisms, 242–243
    - prostaglandin roles, 237, 240, 248
    - selective pressures and adaptive evolution in human pregnancy and parturition, 245–246
    - two-hit hypothesis and decidual dysregulation, 208–211
- Progesterone
- evolution of function, 237
  - levels across different species, 240–241
  - HOX* gene expression regulation, 58–59
  - myometrial quiescence maintenance in pregnancy
    - anti-inflammatory mechanisms, 183–184
    - functional decline in parturition, 190
    - overview, 182
    - prospects for study, 191–192
    - signaling, 183
    - ZEB1 induction, 184
- Prolactin, decidual expression, 244–245
- Prostaglandins
- preterm birth role, 237, 240, 248
  - decidual prostaglandin synthesis suppression in pregnancy, 205–206
- Protein C, recurrent pregnancy loss gene defects, 224
- ## R
- Recurrent pregnancy loss (RPL)
- assisted reproductive technology genetic testing
    - biopsy
      - blastomere, 227–228
      - overview, 226–227
      - polar body, 227
      - trophoectoderm, 228–229
    - preimplantation genetic diagnosis, 225–226
    - preimplantation genetic screening, 225–226
  - clinical evaluation of etiology, 217–218
  - definition, 217
  - fetal aneuploidy
    - overview, 218–220
    - product of conception genetic testing, 220–222, 229
  - parental genetic testing
    - immunologic gene defects, 223–224
    - musculoskeletal gene defects, 223
    - peripheral blood karyotyping, 221, 223, 228
    - thrombophilic gene defects, 224–225
  - prospects for study, 229–230
- RET*, newborn screening for mutations, 368
- RHCE*, fetal blood group typing, 316, 321
- RHD*, fetal blood group typing, 316
- RPL. *See* Recurrent pregnancy loss
- ## S
- Saliva
- biomarkers, 391–392
  - composition, 392
  - transcriptomics in neonates
    - applications, 394–395
    - collection, storage, and processing, 392–394
    - Normal Core Salivary Transcriptome, 394
    - prospects, 396–397
  - SERPINB5, noninvasive prenatal testing, 296

- SMGT. *See* Sperm-mediated gene transfer
- SMRGT. *See* Sperm-mediated reverse gene transfer
- Sperm
- DNA packaging, 21–27, 41–43
  - epigenetic intergenerational transfer
    - environmental effects, 47–48
    - model systems, 45
    - nutrition effects, 45–46
    - odorant training, 46–47
    - stress effects, 46
    - toxin effects, 46
  - microRNA, 30, 32, 44–45
  - oocyte penetration effects, 30–34
  - RNA features and functions, 27–30, 43–45
- Sperm-mediated gene transfer (SMGT), 31
- Sperm-mediated reverse gene transfer (SMRGT), 31–32
- Spiral artery
- placentation defects in preeclampsia, 257–259
  - remodeling in pregnancy, 100–101, 257–259
- Spontaneous abortion. *See* Recurrent pregnancy loss
- STAT5b, progesterone effects, 189
- Syncytial nuclear aggregate. *See* Placenta
- T**
- T cell
- endometrium, 202, 204, 209
  - placental extracellular vesicle interactions, 116
  - uterus and immune tolerance, 95
- TGF- $\beta$ . *See* Transforming growth factor- $\beta$
- Thyrotropin (TSH), preeclampsia levels, 264–265
- TLRs. *See* Toll-like receptors
- Toll-like receptors (TLRs), lipopolysaccharide-induced
- preterm birth role, 208–209, 211
- Transcriptomics. *See* Amniotic fluid; Endometrium; Obesity; Saliva
- Transforming growth factor- $\beta$  (TGF- $\beta$ )
- extravillous trophoblast cell invasion regulation, 99
  - preeclampsia role, 253, 356–357
- Trophoblast
- cell types, 96
  - extravillous trophoblast cell invasion
    - overview, 96–97
    - regulators
      - cytokines, 99–100
      - decidual cells, 97–99
      - growth factors, 100
      - hormones, 99
      - signaling, 100
    - placental extracellular vesicle deportation, 113
    - placentation defects in preeclampsia, 257
- TS. *See* Turner syndrome
- TSH. *See* Thyrotropin
- TTTS. *See* Twin–twin transfusion syndrome
- Turner syndrome (TS), amniotic fluid transcriptomics, 350–361
- Twin–twin transfusion syndrome (TTTS), amniotic fluid transcriptomics, 343, 345–346, 349, 351–352
- U**
- Uterus. *See* Endometrium; Placenta; Spiral artery; Trophoblast
- V**
- Vaginal microbiome. *See* Microbiome
- Vascular endothelial growth factor (VEGF)
- extravillous trophoblast cell invasion regulation, 99
  - placental extracellular vesicle cargo, 115
  - preeclampsia
    - role, 253–257
    - therapeutic targeting, 263–264
  - recurrent pregnancy loss gene defects, 223
  - spiral artery remodeling in pregnancy, 100
- VEGF. *See* Vascular endothelial growth factor
- W**
- WES. *See* Whole exome sequencing
- WGS. *See* Whole genome sequencing
- Whole exome sequencing (WES)
- fetal single-gene disorder detection
    - costs, 334
    - data reanalysis and reclassification, 336–337
    - examples, 331–332
    - expectations, 334
    - gene panels and targeted sequences, 328, 330–331
    - genetic counseling availability, 334
    - incidental finding management, 334–335
    - informed consent, 334
    - inherited disease considerations for extended family, 336
    - next-generation sequencing strategies, 326–328
    - noninvasive testing, 333
    - parental samples, 336
    - privacy and confidentiality, 336
    - prospects, 337
    - technical issues and challenges, 332–333
    - variants of uncertain significance, 335–336
  - Mendelian disease gene discovery and diagnosis, 328–330
- Whole genome sequencing (WGS)
- fetal single-gene disorder detection
    - costs, 334
    - data reanalysis and reclassification, 336–337
    - expectations, 334
    - gene panels and targeted sequences, 328, 330–331

## Index

- Whole genome sequencing (WGS) (*Continued*)  
  genetic counseling availability, 334  
  incidental finding management, 334–335  
  informed consent, 334  
  inherited disease considerations for extended family, 336  
  next-generation sequencing strategies, 326–328  
  noninvasive testing, 333  
  parental samples, 336  
  privacy and confidentiality, 336  
  prospects, 337  
  variants of uncertain significance, 335–336
- Mendelian disease gene discovery and diagnosis, 328–330
- monogenetic disease screening in critically ill neonates  
  application, 383  
  benefits, 378  
  diseases  
    impact and incidence, 377–378  
    types, 376–377  
  overview, 375–376  
  prospects, 382–386  
  technique, 379–382  
  variant classification scheme, 382
- Window of implantation. *See* Endometrium
- WNT3*, salivary transcriptomics in neonates, 395
- Z**
- ZEB1  
  miR-200 family effects, 188–190  
  progesterone induction, 184