Index

Note: Page numbers of article titles are in boldface type.

A

A Study to Evaluate the Effect of Rosuvastatin on Intravascular Ultrasound- Derived Coronary Atheroma Burden (ASTEROID), 18

ABO gene, in myocardial infarction, 76

ACCORD-LIPID (Action to Control Cardiovascular Risk in Diabetes-Lipid) study, 48

ADAMTS7 gene, in cardiovascular disease, 72, 77, 117

Adrenergic pathway, genetic defects in, as myocardial infarction risk factor, 73

Advanced glycation end products, 57–60

Age factors, in cardiovascular disease, 87–91

Aggrastat to Zocor trial, 16–17

AIM-HIGH (Atherothrombosis Intervention in Metabolic Syndrome with Low HDL/High Triglycerides: Impact on Global Health Outcomes) study, 20, 33, 48–49

Air Force/Texas Coronary Atherosclerosis Prevention Study

on apolipoproteins, 7–8

on statins, 16

Alcohol intake, hypertriglyceridemia and, 44–46

ALERT (Assessment of Lescol in Renal Transplantation) study, 129

AMORIS (Apolipoprotein Proteins Related Mortality Risk) study, 7

Ancetrapib, for HDL increasing, 34

Anorexia nervosa, in strict diets, 147

APO genes

in blood lipid levels, 124–126

in LDL-cholesterol lowering, 129

in pediatric patients, 145

Apolipoprotein B, as biomarker, 7–8

Apolipoprotein Proteins Related Mortality Risk (AMORIS) study, 7

ARBITER 6-HALTS (Arterial Biology for the Investigation of the Treatment Effects of Reducing Cholesterol 6–HDL and LDL Treatment Strategies) study, 21

ARIC (Atherosclerosis Risk in Communities Study), 8–9

Arterial Biology for the Investigation of the Treatment Effects of Reducing Cholesterol 6–HDL and LDL Treatment Strategies (ARBITER 6-HALTS) study, 21

Assessment of Lescol in Renal Transplantation (ALERT) study, 129

ASTEROID (A Study to Evaluate the Effect of Rosuvastatin on Intravascular Ultrasound- Derived Coronary Atheroma Burden), 18

Atherosclerosis

endothelial progenitor cells in, 93–102

in diabetes mellitus, 57–65

in pediatric patients, 141–143

LDL cholesterol in, 14

risk factors for, myocardial infarction risk factors and, 68, 70–71

Atherosclerosis Risk in Communities Study (ARIC), 8–9
Atherothrombosis Intervention in Metabolic Syndrome with Low HDL/High Triglycerides: Impact on Global Health Outcomes (AIM-HIGH) study, 20, 33, 48–49

Atorvastatin
- adverse effects of, 132–133
- clinical outcomes of, 16
- LDL-cholesterol lowering by, 128–129
- plaque changes due to, 18–19

B

Bile sequestrants, outcomes of, 19–20

Biomarkers, 1–11
- calibration of, 2
- discrimination by, 2–3
- examples of, 6–9
- history of, 1–2
- net reclassification improvement, 3–5
- risk stratification techniques using, 5–6
- versus DNA analysis, 118

C

Calcification, of coronary arteries, screening for, 103–112

Calibration, of biomarkers, 2

CAP (Cholesterol and Pharmacogenetics) trial, 128

Carbamylation, in diabetes mellitus, 60–63

CARDioGRAM (Coronary Artery Disease Genome-wide Replication and Meta Analysis), 115–116

Cardiovascular disease
- age factors in, 87–91
- endothelial progenitor cells aging in, 93–102
- genetic factors in. See Genetic factors; Genomics.
- HDL cholesterol in, 27–37, 146
- imaging for, 103–112
- kidney disease and, 57–65
- LDL cholesterol in. See Low-density cholesterol.
- pediatric, 141–154
- serum biomarkers for, 1–11, 118
- statins for. See Statin(s).
- triglycerides in, 39–55

Cardiovascular Health Study, of troponin, 9

CARE (Cholesterol and Recurrent Events) Trial, 16, 128

Catecholamines, as myocardial infarction risk factor, 73

CDKN2 genes, in myocardial infarction, 76

CELSR2 gene, in myocardial infarction, 74

Cerivastatin, adverse effects of, 132

Cholesterol. See also High-density lipoproteins; Low-density cholesterol.
- biology of, 13–14
- transport of, HDL in, 30–32

Cholesterol and Pharmacogenetics (CAP) trial, 128

Cholesterol and Recurrent Events (CARE) Trial, 16, 128
Cholesteryl ester transfer protein inhibitors, for HDL increasing, 33–34
Chromosome 1p13 variants, 117
Chromosome 9p21 variants, 114–115, 118
Clopidogrel, pharmacogenomics of, 117
Coagulation, genetic defects in, as myocardial infarction risk factor, 73
Coronary Artery Disease Genome-wide Replication and Meta Analysis
    (CARDioGRAM), 115–116
Coronary Drug Project
    on hypertriglyceridemia, 48
    on niacin, 20
Coumadin, pharmacogenomics of, 117
Counseling, genetic, on myocardial infarction risk, 81–83
C-reactive protein, as biomarker, 6–7
CSCL12 gene, in myocardial infarction, 77

D
Dalcetrapib, for HDL increasing, 34
Dallas Heart Study, of troponin, 9
Diabetes mellitus
    atherosclerosis in, 57–65
    carbamylation in, 60–63
    glycation in, 57–60
    hypertriglyceridemia in, 48
    in statin therapy, 22–23, 148
Diet
    as myocardial infarction risk factor, 71–72
    for hypertriglyceridemia, 44–46
    for pediatric patients, 146–147
    LCL cholesterol and, 15
DISC (Dietary Intervention Study in Children), 146–147
Discrimination, of biomarkers, 2–3

E
Early Identification of Subclinical Atherosclerosis by Noninvasive Imaging
    Research (EISNER) trial, 107–108
Effectiveness of Additional Reductions in Cholesterol and Homocysteine
    (SEARCH), 131
EISNER (Early Identification of Subclinical Atherosclerosis by Noninvasive
    Imaging Research) trial, 107–108
Endothelial progenitor cells, in atherogenesis, 93–102
ENHANCE (Ezetimibe and Simvastatin in Hypercholesterolemia Enhances
    Atherosclerosis Regression) trial, 21
Environmental factors, familial, in myocardial infarction, 71–72
Estrogen, atherogenesis and, 94–98
Evacetrapib, for HDL increasing, 34
EXCEL (Expanded Clinical Evaluation of Lovastatin) study, 127–128
Exercise
    for hypertriglyceridemia, 44–46
    insufficient, as myocardial infarction risk factor, 72
Expanded Clinical Evaluation of Lovastatin (EXCEL) study, 127–128
Ezetimibe
  for hypertriglyceridemia, 47
  outcomes of, 21
Ezetimibe and Simvastatin in Hypercholesterolemia Enhances Atherosclerosis Regression (ENHANCE) trial, 21

F
Familial hyperlipidemia, 145
Familial hypertriglyceridemia, 40
Fenofibrate Intervention in Event Lowering in Diabetes (FIELD) study, 48
Fibrates
  for HDL increasing, 32–33
  for hypertriglyceridemia, 45, 47–48
  for pediatric patients, 148
FIELD (Fenofibrate Intervention in Event Lowering in Diabetes) study, 48
Fluvastatin, adverse effects of, 132
Forcetrapib, for HDL increasing, 34
Framingham Heart Study, 1–2, 5
  on HDL cholesterol, 27–29
  on LDL cholesterol, 14
  screening based in, 104

G
GALNT2 gene, in blood lipid levels, 126–127
Gender issues, in atherosclerosis, 93–102
Gender-related imprinting, in myocardial infarction risk, 69
Genetic factors. See also Genomics.
  in hypertriglyceridemia, 40
  in myocardial infarction, 67–86
    atherosclerosis risk factors and, 68, 70–71
    familial environmental factors with, 71–72
    genetic counseling in, 81–83
    many genes involved in, 72
    monogenic, 80
    next-generation sequencing in, 80
    novel candidate genes in, 72–80
    personal risk stratification in, 80–81
    positive family history, 69, 71
  in statin therapy, 123–139
Genomics, of cardiovascular disease, 113–122
  complex, 114
    first risk factor discovered in, 114–115
    for pharmacotherapy, 117–119
    HapMap project for, 114
    later discoveries in, 115–117
    monogenic, 114
    risk variants in, 118–119
      single nucleotide polymorphisms in, 114–117
Glycation, in diabetes mellitus, 57–60
H
HapMap project, 114
Heart Protection Study, on statins, 16, 130
Heart Protection Study2-Treatment of HDL to Reduce the Incidence of Vascular Events, 33, 49
Helsinki Heart Study, 43
High-density lipoproteins, 27–37
agents increasing, 32–34
antiatherogenic properties of, 30–32
classification of, 30
low, in pediatric patients, 146
structure of, 30
HMGCR gene, in LDL-cholesterol lowering, 129–130
HNF1A gene, in myocardial infarction, 77
Hyperlipidemia, familial, 145
Hypertriglyceridemia, 39–55
causes of, 40
coronary artery disease risk in, 42–44
definition of, 39–40
genetic factors in, 40
in pediatric patients, 145–146
in women, 49
laboratory tests for, 41–42
pathophysiology of, 42
prevalence of, 39–40
treatment of, 44–49
versus normal triglyceride metabolism, 40
Hypoalphalipoproteinemia, in pediatric patients, 146

I
IDEAL (Incremental Decrease in End Points through Aggressive Lipid Lowering (IDEAL) trial, 43
Imaging, for cardiovascular disease risk detection, 103–112
Imprinting, in myocardial infarction risk, 69
IMPROVE-IT (Reduction of Outcomes: Vytorin Efficacy International Trial), 21
Incremental Decrease in End Points through Aggressive Lipid Lowering (IDEAL) trial, 17, 43
Infections, as myocardial infarction risk factor, 72
Inflammation pathway, genetic defects in, as myocardial infarction risk factor, 73
INTERHEART study, 88–90

J
JUPITER (Justification for the Use of Statins in Prevention: An Intervention Trial Evaluating Rosuvastatin), 130–131

K
Kidney disease, atherosclerosis in, 57–65
KIF6 gene, 130
LDL cholesterol. See Low-density cholesterol.

LDLR gene, in myocardial infarction, 78

Lifestyle modifications
  for hypertriglyceridemia, 44–46
  for pediatric patients, 146–147

LIPID (Long-Term Intervention with Pravastatin in Ischemic Disease), 128

Lipid hypothesis, 14

Lipid Research Clinics Coronary Primary Prevention Trial (LRC-CPPT), 13

Lipoprotein(s). See also High-density lipoproteins; Low-density cholesterol.
  metabolism of, 40
  very low-density, 14

Long-Term Intervention with Pravastatin in Ischemic Disease (LIPID) study, 128

Lovastatin
  adverse effects of, 132
  clinical outcomes of, 16
  compliance with, 127–128

Low-density cholesterol, 13–26
  biology of, 13–15
  evolutionary aspects of, 14–15
  genetic factors affecting, 124–127
  lowering of, 15–24
    combination therapy for, 19–21
    genetic factors in, 128–130
    outcomes of, 15–17
    plaque-imaging studies of, 17–19
    safety of, 21–24
  oxidized, 14
  pathophysiology of, 14

LPA genes, in myocardial infarction, 75

Malignancy, in statin therapy, 23

Measuring Effects on Intima-Media Thickness: An Evaluation of Rosuvastatin (METEOR) trial, 18

MEF2A gene, in myocardial infarction, 80

Menopause, endothelial cell function after, 93–102

METEOR (Measuring Effects on Intima-Media Thickness: An Evaluation of Rosuvastatin) trial, 18

MIA3 gene, in myocardial infarction, 74

MIAT gene, in myocardial infarction, 78

Monogenic disorders, 80, 114

MRAS gene, in myocardial infarction, 75

MTHFD1L gene, in myocardial infarction, 76

Myocardial infarction, genetic factors in, 67–86

Myopathy, in statin therapy, 22, 131–134

National Cholesterol Education Program Adult treatment Program III guidelines, 2

Net reclassification improvement, of biomarkers, 3–5
Next-generation sequencing, for myocardial infarction-related genes, 80
Niacin
   for HDL increasing, 33
   for hypertriglyceridemia, 47–49
   outcomes of, 20

O

OATP1B1 peptide, in LDL-cholesterol lowering, 130
Omega fatty acids, for hypertriglyceridemia, 47

P

PACC (Prospective Army Coronary Calcium Project), 107
Pathobiological Determinants of Atherosclerosis in Youth (PDAY) study, 142
PCSK9 gene, in myocardial infarction, 74
PDAY (Pathobiological Determinants of Atherosclerosis in Youth) study, 142
PEACE (Prevention of Events With Angiotensin Country Enzyme) trial, 8–9
Pediatric patients, lipid disorders in, 141–154
   clinical presentation of, 145–146
   controversy about, 148–149
   lifestyle modifications for, 146–147
   literature gaps concerning, 149–150
   pharmacotherapy for, 147–148
   prevalence of, 141
   screening for, 143–144
   significance of, 141–142
   testing for, 144–145
   tracking to adulthood, 143
PHACTR1 gene, in myocardial infarction, 75
Physicians Health Study, C-reactive protein in, 6
Pravastatin
   adverse effects of, 132–133
   clinical outcomes of, 15–16
   for HDL increasing, 27
   for LDL-cholesterol lowering, 128–129
   for pediatric patients, 142–143
Pravastatin Inflammation/CRP Evaluation (PRINCE) study, 128
Pravastatin or Atorvastatin Evaluation and Infection Therapy–Thrombolysis in Myocardial Infarction 22 trial (PROVE-IT), 16, 43
Prevention of Events With Angiotensin Country Enzyme (PEACE) trial, 8–9
PRINCE (Pravastatin Inflammation/CRP Evaluation) study, 128
Prospective Army Coronary Calcium Project (PACC), 107
PROSPER (Prospective Study of Pravastatin in the Elderly at Risk) study, 27, 129–130
PROVE-IT (Pravastatin or Atorvastatin Evaluation and Infection Therapy–Thrombolysis in Myocardial Infarction 22) trial, 43
PSRC1 gene, in myocardial infarction, 74

R

Receiver operating characteristic curve, for biomarkers, 2–3
Reduction of Outcomes: Vytorin Efficacy International Trial (IMPROVE-IT), 21
Relative risk, of myocardial infarction, 69
REVERSAL (Reversing Atherosclerosis with Aggressive Lipid Lowering) trial, 17–18
Rhabdomyolysis, in statin therapy, 22, 131–134
Risk factors, for cardiovascular disease
   age, 87–91
   biomarkers and, 1–11
   communication to patient, 89
   diabetes mellitus as, 57–65
   elevated LDL cholesterol as, 13–26
   genetic. See Genetic factors; Genomics.
   hypertriglyceridemia as, 39–55
   imaging detection for, 103–112
   in pediatric patients, 141–154
   low HDL cholesterol as, 27–37
   relative versus absolute, 89
   scores for, 88
Rosuvastatin
   adverse effects of, 132
   for clinical event reduction, 130–131
   for hypertriglyceridemia, 45
   plaque changes due to, 18–19
Salt consumption, as myocardial infarction risk factor, 71–72
SATURN (Study of Coronary Atheroma by Intravascular Ultrasound: Effect of Rosuvastatin versus Atorvastatin), 19
Scandinavian Simvastatin Study (4S), 15
Screening
   of pediatric patients, 143–144, 148–149
   with imaging, 103–112
SEARCH (Effectiveness of Additional Reductions in Cholesterol and Homocysteine), 131
Serum biomarkers. See Biomarkers.
SHARP (Study of Heart and Renal Protection) trial, 21
SH2B3 gene, in myocardial infarction, 77
Simvastatin
   adverse effects of, 132–133
   clinical outcomes of, 15, 16
   outcomes of, 21
   plaque changes due to, 18
   response to, 128
Single nucleotide polymorphisms
   in cardiovascular disease, 114–117
   in LDL cholesterol, 124–127
SLC22A3 gene, in myocardial infarction, 75
SLCO1B1 gene
   in LDL-cholesterol lowering, 130
   in statin adverse effects, 131–134
SMAD3 gene, in myocardial infarction, 78
Smoking
   as myocardial infarction risk factor, 72
   cessation of, for hypertriglyceridemia, 44–46

SORT1 gene
   in blood lipid levels, 127
   in myocardial infarction, 74

Special Turku Coronary Risk Factor Intervention Project (STRIP), 146–147

Stanols, for pediatric patients, 148

Statin(s)
   adverse events from, 131–134
   clinical trials of, 15–21
   compliance with, 127–128
   for HDL increasing, 32
   for hypertriglyceridemia, 45–46, 48
   for pediatric patients, 142–143, 147–148
   genetic factors related to, 123–139
      blood lipid levels and, 124–127
      in adverse effects, 131–134
      in clinical event reduction, 130–131
      in LDL-cholesterol reduction, 128–130
      in response, 127–128
      in combination therapy, 19–20
      pharmacogenomics of, 117–118
      plaque burden and, 17–19
      pleiotropic properties of, 130
      safety of, 21–24

STRENGTH (Statin Response Examined by Genetic Haplotype Markers) study, 129, 133

STRIP (Special Turku Coronary Risk Factor Intervention Project), 146–147

Stromal cell-derived factor-1, in endothelial cells, 97–98

Study of Coronary Atheroma by Intracoronary Ultrasound: Effect of Rosuvastatin versus Atorvastatin (SATURN), 19

Study of Heart and Renal Protection (SHARP) trial, 21

T

TNT (Treating to New Targets) trial, 16–17, 43–44, 128–129

Transaminitis, in statin therapy, 22

Treating to New Targets (TNT) trial, 16–17, 43–44, 128–129

Triglycerides
   elevated. See Hypertriglyceridemia.
   fasting, 49
   laboratory tests for, 41–42
   metabolism of, 40
   pathologic effects of, 42

Troponin I, as biomarker, 8–9

U

Ultrasonography, for plaque, 17–19
Vascular endothelial growth factor, in endothelial cells, 96–97

W
Warfarin, pharmacogenomics of, 117
WDR12 gene, in myocardial infarction, 75
Weight loss, for hypertriglyceridemia, 44–46
West of Scotland Coronary Prevention Study (WOSCOPS), 15–16, 130–131
Women, atherosclerosis in, 93–102