

Index

A

- Allopurinol, 117
- Ang II-dependent hypertension
 - apocynin, 63
 - blood pressure elevation, 62
 - endothelial dysfunction, 62
 - Nox4, 63
 - Nox signalling, mediators of, 63–64
 - reduced NO bioavailability, 62
 - vascular superoxide production, 62
- Angiotensin II type 1 receptors (AT1R), 81, 83
- Antioxidants, 35
- Apocynin, 63, 64
- Apolipoprotein MORTality RiSk study (AMORIS), 116
- Aspirin Versus Ascorbic acid plus Aspirin in Stroke (AVASAS) Study, 121
- Atherosclerosis
 - KYN, 52
 - KYNA, 52
 - LO-5, 52
 - NOXs, 51
 - oxidative damage, 51, 52
 - plaque formation, 51
 - P-selectin and chemotactic factors, 51
 - QA, 52
- Atherosclerotic renovascular disease (ARVD)
 - antioxidants, 35
 - causes, 19
 - late phase, 20
 - prevalence, 19
 - PTRA, 36–37
 - RAAS inhibitors, 36

stem cells, 37–38

unilateral renal artery stenosis vs. arterial hypertension, 19

Autoregulation, 101

B

- Barthel Index (DeltaBI), 118
- Bergman, 20
- Brain, 80–82
- Braun-Menendez, E., 20

C

- Cardiovascular drugs, 83–84
- CD40 ligand (CD40L), 71
- Central sympathetic outflow reduction, 83–84
- Cerebrovascular reactivity (CVR), 117
- Chemokine (C-X-C motif) receptor 2 (CXCR2), 49
- Chemokine (C-X-C motif) receptor 4 (CXCR4), 49
- Chemoregulation, 100–101
- Chronic kidney disease (CKD)
 - ADAMTS-1, 50
 - cd74, 49
 - CXCR2, 49
 - CXCR4, 49
 - ERK and p38 pathways, 49
 - Heme oxygenase-1 (HO-1), 50
 - HIF-1 α and downstream mediators, 49
 - inflammatory and proliferative pathways, 49
 - inflammatory changes, 49

- Chronic kidney disease (CKD) (*cont.*)
 local and systemic inflammatory shifts, 49
 MIF, 49
 oxidative damage, 48
 platelet-derived growth factor, 50
 TGF- β /Smad3, upregulation of, 50
 tumor necrosis factor- α , 48
 VEGF-A, 50
- Copper-zinc superoxide dismutase
 (CuZnSOD), 67
- D**
- Diabetes, 23
- E**
- Edaravone
 clinical outcomes, 118
 clinical trials, 118, 120
 DeltaBI, 118
 DeltaFIM-M, 118
 formulation and dosing regimen, 119
 intravenous thrombolysis, 119
 mRS, 118
 neuroprotective effects, 118
 randomised controlled trials, 118
 vs. rtPA, 119
- Endocardial cushion formation, 5–6
- Endocardium, 5
- Endothelial dysfunction, 94
- Endothelial function
 arachidonic acid metabolism, 98
 cGMP, 96
 EDHF, 99
 end-organ damage, 94
 low grade inflammation, 98
 NO, 96
 Nox-2 dependent effects, 96
 Nox isoforms, 92, 96
 oxidative stress, 96–98
 pericyte-dependent changes, 96
 Rho kinase, 98
 signaling mechanism, 99
 signaling molecules, 95
 TRPV4 channels, 99
 vascular muscle, 94
- Endothelial nitric oxide synthase (eNOS), 8, 92
- Endothelial-to-mesenchymal transformation
 (EMT), 7
- Endothelium-derived hyperpolarizing factors
 (EDHF), 99
- Epicatechin, 64
- Experimental hypertension
 Ang II-dependent hypertension
 apocynin, 63
 blood pressure elevation, 62
 endothelial dysfunction, 62
 Nox4, 63
 Nox signalling, mediators of, 63–64
 reduced NO bioavailability, 62
 vascular superoxide production, 62
 in brain, 65–66
 mineralocorticoid-dependent
 hypertension, 64
 SHR, 62, 64–65
- Extracellular matrix remodeling, 11–12
- Extracellular signal-regulated kinases (ERK), 49
- Extracellular superoxide dismutase (ECSOD),
 68–69
- F**
- Functional Independence Measure-Motor
 (DeltaFIM-M), 118
- G**
- Glomerular function, 28
- Glutathione peroxidases (GPxs), 69–70
- Goldblatt, H., 19, 20
- GPx-1 deficiency (GPx-1^{-/-}), 70
- H**
- Heart valve development
 endocardial cushion formation, 5–6
 function, 2–3
 remodeling, 6
 ROS signaling pathways
 eNOS, 8
 extracellular matrix remodeling, 11–12
 Tgf β signaling, 8–9
 VEGF signaling, 9–10
 VIC activation, 11
 Wnt/ β -catenin signaling, 9
 structure, 3–4
- Hemodialysis vascular access failure, 47–48
- I**
- Inducible NOS (iNOS), 81
- Intrarenal mechanisms, 31
- Intratubular macrophages, 26
- Irvine, 20
- Ischemic nephropathy, 28
- Ischemia-reperfusion (I/R) injury (IRI), 24–25
- Ischemia/reperfusion (I/R) model, 22
- Ischemic stroke
 allopurinol, 117

- antioxidant nutrients
 - NA-1, 123
 - Tirilazad, 123
 - vitamin C, 121
 - vitamin E, 121
 - causes, 114
 - de novo (ROS) generation, regulation of, 115
 - edaravone
 - clinical outcomes, 118
 - clinical trials, 118, 120
 - DeltaBI, 118
 - DeltaFIM-M, 118
 - formulation and dosing regimen, 119
 - intravenous thrombolysis, 119
 - mRS, 118
 - neuroprotective effects, 118
 - randomised controlled trials, 118
 - vs. rtPA, 119
 - free radicals, 114
 - morbidity and mortality, 114
 - NADPH oxidases, 123
 - neutralising enzymes, 115
 - NVU, 123–124
 - NXY-059, 120
 - pathophysiological mechanisms, 114
 - physiological parameters, 124
 - ROS scavenger molecules, 115
 - statins, 122
 - transient models, 115
 - uric acid
 - astroglia, 116
 - cerebral and myocardial ischemia, 116
 - clinical outcome, 116
 - hyperuricemia, 116
 - preclinical studies, 117
 - univariate analysis, 116
- Isoprostanes, 94
- J**
- Johnson, R.J., 30
- K**
- Kontos, H.A., 101
- Kynurenine (KYN), 52
- M**
- Manganese SOD (MnSOD), 67–68
- Mesenchymal stem cells (MSC), 37–38
- Metabolites kynurenic acid (KYNA), 52
- Microvascular architecture, 29–30
- Migration inhibitory factor (MIF), 49
- Mineralocorticoid-dependent hypertension, 64
- N**
- NA-1, 123
- National Institutes of Health Stroke Scale (NIHSS), 117
- Neurovascular unit (NVU), 123–124
- Nicotinamide adenine dinucleotide (phosphate) oxidases (NOX), 51
- Nitric oxide synthase (NOS), 81
- O**
- Oxidative stress
 - antioxidant enzymes, blood pressure and vascular function
 - CuZnSOD, 67
 - ECSOD, 68–69
 - GPxs, 69–70
 - MnSOD, 67–68
 - atherosclerosis (*see* Atherosclerosis)
 - cardiac valve development (*see* Heart valve development)
 - CD40L, 71
 - CKD (*see* Chronic kidney disease (CKD))
 - clinical evidence, 71
 - definition, 20
 - hemodialysis vascular access failure, 47–48
 - immune cells, 70
 - Nox isoforms, blood pressure and vascular dysfunction, 62–66
 - adventitial fibroblasts, 61
 - baseline blood pressure, 61–62
 - endothelial cells, 61
 - experimental hypertension (*see* Experimental hypertension)
 - multisubunit complex, 61
 - vascular smooth muscle cells, 61

P

p38 pathways, 49

p22phox gene -930 (A/G) polymorphism, 72

Percutaneous transluminal renal angioplasty (PTRA), 36–37

Peroxisome proliferator-activated receptor- γ (PPAR γ), 102, 103

Peroxynitrite, 93, 94

Polymorphonuclear Neutrophils (PMN), 28

Proinflammatory effects, 23

Q

Quinolinic acid (QA), 52

R

Reactive oxygen species (ROS)
 in ARVD
 antioxidants, 35
 PTRA, 36–37
 RAAS inhibitors, 36
 stem cells, 37–38
 AT1R activation, 84
 on blood pressure, 34
 central sympathetic outflow reduction,
 83–84
 chronic vasodilator, loss of, 91
 endocardial cushion formation
 eNOS, 8
 Tgfb signaling, 8–9
 VEGF signaling, 9–10
 Wnt/ β -catenin signaling, 9
 heart valve remodeling
 extracellular matrix remodeling, 11–12
 VIC activation, 11
 high salt intake and, 82
 molecular properties and functional
 impact, 90
 non-stenotic kidney
 glomerular function, 32
 microvascular architecture, 33–34
 renal fibrosis, 33
 tubular function, 31–32
 vascular function, 30–31
 obesity-induced hypertensive rats, 82–83
 peroxynitrite, 91
 production in brain, 80–82
 sources, cerebral circulation
 autoregulation, 101
 chemoregulation, 100–101
 COX, 91
 endothelial function (*see* Endothelial
 function)
 eNOS, 92
 mitochondria, 91
 myogenic responses, 101
 NADPH oxidases, 91
 neurovascular coupling, 100
 Nox isoforms, 92
 PPAR γ , 102, 103
 renin-angiotensin system, 103
 SOD, 102
 TZDs, 103
 vascular tone, 92–94
 stenotic kidney
 comorbidities, 23–24
 GFR, 28
 inflammation, 22–23
 IRI, 24–25
 microvascular architecture, 29–30
 RAAS activation, 20–22

 renal fibrosis, 29
 tubular integrity, 26–28
 vascular function, 25–26
 stroke-prone spontaneously hypertensive
 rats, 80
 superoxide, 90
 Red-wine polyphenols, 64
 Renal artery stenosis, 25
 Renovascular hypertension, 26
 ROS. *See* Reactive oxygen species (ROS)
 Rostral ventrolateral medulla (RVLM)
 central sympathetic outflow reduction,
 83–84
 high salt intake and, 82
 obesity-induced hypertensive rats, 82–83
 ROS production in brain, 80–82
 stroke-prone spontaneously hypertensive
 rats, 80
 sympathetic activation, 84

S

Skeggs, L.T., 20
 Statins, 122
 Stroke prone SHR (SHRSP), 64
 Stroke Therapy Industry Roundtable (STAIR),
 125
 Superoxide-mediated contraction, 93
 Systemic pressor effect, 20

T

Tigerstedt, 20
 Tirilazad, 123
 Transient receptor potential vanilloid 4
 (TRPV4), 99
 Tumor necrosis factor- α (TNF- α), 48

V

Vascular dialysis injury, 47
 Vascular endothelial growth factor (VEGF)
 signaling, 9–10
 Vascular function, 25–26
 Vasodilator effects, 93
 Vitamin C, 121
 Vitamin E, 121

W

Wistar-Kyoto (WKY) rats, 80
 Wnt/ β -catenin signaling, 9

Z

Ziakka, S., 37