Index

a
adipocytes 19
advanced-PRF (A-PRF) 16, 35
A-PRF+ versus 22–24
based on LSCC 36
cell behavior in response to 25–27
L-PRF versus 22–24
advanced PRF plus (A-PRF+)
versus A-PRF 22–24
based on LSCC 37
cell behavior in response to 25–26
clinical insights of 41–42
aesthetic procedures 223
allografts 2, 4, 63, 169–170
alloplasts 63, 68, 130, 169–170
American Society of Plastic Surgery 216
angiogenic factors, platelets 3, 16
anti-coagulants. See inhibitors of wound healing
A-PRF. See advanced-PRF
A-PRF+. See advanced PRF plus
augmentation techniques 229
autogenous bone 63
autografts 68, 130, 169–170
b
Bio-Gide® 104
biomaterials in cell-based tissue engineering 33
endothelial cells and in GBR 166
guided bone regeneration and 33
guided tissue regeneration and 33
mesenchymal cells and tissue engineering and 2
Bio-Oss® 104
biotensegrity 118–120
blood components 16
growth factors in 19–20
EGF 20
IGFs 20
PDGFs 19–20
TGF-β 19
VEGF 20
BMP-2. See bone morphogenetic protein 2
BMPs. See bone morphogenetic proteins
bone grafting materials classification of 66
during GBR 169–170
PRF for periodontal regeneration 129–130
for sinus floor elevation 100–103
for regeneration of periodontal intrabony defects 170
scanning electron microscopy of 67
bone morphogenetic protein 2 (BMP-2) 41
bone morphogenetic proteins (BMPs) 3, 19, 47–48
bone quality, primary stability in 151–152
bone regeneration (GBR) 258
Botox 221
bovine thrombin 4
brow ptosis 221
buccal gap 146–147
cadherins 218
Caldwell-Luc approach, bone height in posterior atrophic maxilla 87
canine model 73
CBCT. See cone-beam computed tomography
cell-cell junctions 218
chondrocytes 19
clot, PRF 34
cone-beam computed tomography (CBCT) 62–63
cytokines 3, 7, 16
within PRF 7–8
Platelet Rich Fibrin in Regenerative Dentistry: Biological Background and Clinical Indications, First Edition.
Edited by Richard J. Miron and Joseph Choukroun.
© 2017 John Wiley & Sons Ltd. Published 2017 by John Wiley & Sons Ltd.
demineralized freeze-dried bone allograft (DFDBA) 130
dental procedures 252
dentistry (regenerative), PRF in 47–48
bone grafting materials, classification of 66–67
extraction socket management 48–49
guided bone regeneration 51
other aspects and medicine 54
periodontal regeneration 50
sinus elevations procedures 48–51
soft-tissue root coverage 49–53
soft tissues around implants, regeneration of 50–51
dermal filler injections 222
derma rollers 228
desmosomes 218
DFDBA. See demineralized freeze-dried bone allograft
differentiation factor-5, growth and 3
DNA damage 215
e
ECM. See extra cellular matrix
EGF. See epidermal growth factor
EMD. See enamel matrix derivative
enamel matrix derivative (EMD) 3, 50, 116, 130
endothelial cells 16
epidermal growth factor (EGF) 6, 20
extra cellular matrix (ECM) 16, 18

f
facial aesthetics and rejuvenation 216
acupuncture 216
conventional therapies 220–221
esthetic appearance 217
features of 217
overview 222–226
facial enhancement procedure 221
FASTP. See fibrin-assisted soft tissue promotion
FDBA. See freeze-dried bone allograft
FGF-2. See fibroblast growth factor 2
fibrin 18, 48
platelet rich plasma and 3
three-dimensional network 18–19
fibrin-assisted soft tissue promotion (FASTP) 117–118
biotensegrity 118–120
surgical technique 120
incision 120
root decontamination 120–121
root preparation 120
suturing 121–123
volume packing 121
volume 120
fibrinogen 18
fibrin scaffold 5–6, 34–35, 39
fibroblast growth factor 2 (FGF-2) 19
fibro-conduction 116
foreign body reaction 2
freeze-dried bone allograft (FDBA) 130
freeze/fresh-frozen bone 130
furcation defect repair, PRF for 127–128, 134–135

g
GBR. See guided bone regeneration
growth factors in blood 19–20
for membranes, plasma-rich proteins as 167–169
platelets 4–5, 16
release of
i-PRF versus PRP 24–25
L-PRF versus A-PRF versus A-PRF 22–24
PRP versus PRF 20–22
GTR. See guided tissue regeneration
guided bone regeneration (GBR) 33, 159–160
biomaterials in 161
bone-grafting materials during 169–170
future research 177–179
new bone formation during 170
non-resorbable PTFE membranes and 161–166
options of 161
overview of 160–161
PRF 173–177
as barrier membrane in 171–172
with bone-grafting materials in 172–173
surgical approaches using PRF with 170–171
synthetic resorbable membranes and 167
titanium mesh and 166–167
guided tissue regeneration (GTR) 33, 159–160
barrier membranes for 129
membranes for 163–165
principle of 129

h
hemorrhage 92
hemostasis phase, of wound healing 2, 16
**IGFs.** See insulin growth factors

**inflammation phase, of wound healing** 2, 16

**infraorbital artery (IOA)** 83–84

**inhibitors of wound healing** 4

**injectable PRF (i-PRF)** 251

**cell behavior in response to** 26, 28

**clinical insights of** 41–42

**LSCC based development of** 37–40

**for pain management** 42

**PRP versus A-PRF** 24–25

**for skin rejuvenation** 42

**insulin growth factors (IGFs)** 6, 20

**interbony defect repair, PRF for** 127–128, 134–135

**IOA. See infraorbital artery**

**i-PRF. See injectable PRF**

**laser therapy** 222

**lateral nasal artery** 83

**“laugh lines”** 230

**less-invasive therapies** 216

**leukocyte-platelet rich fibrin (L-PRF)** 5, 16

**versus A-PRF** 22–24

**versus A-PRF+** 22–24

**cell behavior in response to** 25, 27

**leukocytes** 5, 16, 18, 34, 39

**in immune defense** 18

**in regeneration process** 39–41

**in wound healing** 18

**lip augmentation procedure** 226, 230

**lips** 221

**liquid injectable-PRF (i-PRF)** 224

**derma pen** 228

**derma roller** 227–228

**low-speed centrifugation concept (LSCC)** 1, 16, 18

**A-PRF based on development of i-PRF** 37–40

**for preparation of solid PRF** 34–38

**L-PRF. See leukocyte-platelet rich fibrin**

**LSCC. See low-speed centrifugation concept**

**maturation phase, of wound healing** 2, 16

**maxillary sinus** 83

**maxillary sinus floor elevation (MSFE)** 81

**anatomical considerations** 82

**embryologic development** 82–83

**lining membrane** 84–85

**maxillary sinus dimension** 83

**sinus septa** 86

**vascularization** 83–85

**biological principles** 86–87

**clinical outcomes** 88–89

**complications, surgical and post-surgical** 89–90

**acute/chronic infections** 90–92

**hemorrhage** 92

**implant migration** 92

**Schneiderian membrane perforation** 89–91

**via lateral wall approach** 87

**PRF, procedures with** 99–100

**for closure of lateral maxillary access window** 104–105

**future outlook** 105–111

**for repair of Schneiderian membranes** 103–104

**as sole grafting material** 100–103

**surgical techniques** 87–89

**mesenchymal stem cells (MSCs)** 19

**mesotherapy treatment** 231

**micropores** 18

**MSCs. See mesenchymal stem cells**

**MSFE. See maxillary sinus floor elevation**

**muco-gingival recessions treatment, PRF for** 115–117

**FASTP, surgical technique** 120–123

**fibro promotion** 117–118

**biotensegrity** 118–120

**volume** 120

**plastic periodontal procedures** 117

**muscle paresis** 221

**muscle weakness** 221

**nasolabial folds** 227, 229

**neocollagenesis** 228

**neurotransmitter**

**acetylcholine** 221

**neutrophil granulocytes** 40–41

**non-resorbable PTFE membranes** 161–166

**osseodensification** 152

**osseointegration** 149–151

**osteoblasts** 19

**osteonecrosis** 252–253

**osteotomy bone condensation** 152

**osteotomy site**

**PRF in, use of** 152–154

**under-preparation of** 152
Index

PDGFs. See platelet-derived growth factors
PDO threads 231
peri-implant defects, PRF treatment of 146–147
periodontal disease 128
periodontal plastic surgery, in dentistry 115, 117
periodontal regeneration, PRF for 127–128
barrier membranes, role of 129
biologic agents/growth factors 130–131
bone-grafting materials, role of 129–130
future research 135–137
periodontium 127–128
plasma-rich proteins, for growth factors of membranes 167–169
platelet-derived growth factors (PDGFs) 3, 6, 8, 19–20, 34, 39, 48, 237
platelet-rich fibrin (PRF) 1, 4–5, 34, 215, 237
advantages of 18
versus A-PRF 36
autologous biological agent for periodontal regeneration 131
cartilage regeneration 241–242
cell activity 238
components of 16, 18 types in 7
chronic leg ulcers 240–241
clinical studies evaluation 239–240
clot 34
components of 5–8
cytokines within 7–8
degradation properties 257–258
development of 5–8
effects on furcation defect regeneration 135
on intrabony defect regeneration 118, 132
on root coverage of gingival recessions 119
first case treated with 8, 9–11
for extraction sockets management 59–60, 70
bone grafting materials, classification of 66–67
collagen barrier membrane, SEM analysis of 68
dimensional changes 60–65
future research on 74–75, 77
implant placement into fresh extraction sockets 66, 68
infections, prevention from 71–75
postoperative pain, prevention from 71–76
ridge preservation techniques 63–66, 68–69, 71–72
socket grafting techniques 63–66, 68–69, 71–72
future research 251
GBR with 159–179.
See also guided bone regeneration (GBR)
leukocytes 5, 16, 18
ligaments and tendons 242
low centrifugation forces and 16, 34–38
L-PRF versus A-PRF 22–24
Lyell syndrome treated with 8–10
matrices 18, 41
MSFE procedures with 99–100
for closure of lateral maxillary access window 104–105
future outlook 105–111
for repair of Schneiderian membranes 103–104
as sole grafting material 100–103
natural fibrin matrix and its biological properties in 7
orthopedic medicine 242–243
and osseointegration 149–151
osteinduction 258
in osteotomy preparation 152–154
peri-implant defects, treatment of 146–147
for periodontal regeneration 127–128
barrier membranes, role of 129
biologic agents/growth factors 130–131
bone-grafting materials, role of 129–130
future research 135–137
on periosteum behavior 8
porcine ischemic wound treatment 239
and primary stability in poor bone quality 151–152
versus PRP 7
for growth factor release 20–22
in regenerative dentistry 47–48
extraction socket management 48–49
guided bone regeneration 51
other aspects and medicine 54
periodontal regeneration 50
regeneration of soft tissues around implants 50–51
sinus elevations procedures 48–51
soft-tissue root coverage 49–50, 52–53
in regenerative medicine 8, 9–11
for repair of furcation defect 127–128, 134–135
for repair of intrabony defect 127–128, 131–134
scaffolds 18, 251
skin regeneration 243
and soft-tissue healing at implants 147–149, 238
speeds 251
therapy for temporomandibular joint disorders 253
for treatment of muco-gingival recessions 115–117
FASTP, surgical technique 120–123
fibro promotion 117–120
plastic periodontal procedures 117
use for periodontal regeneration 256
pulp regeneration 6, 253
stem cells 256
variants 16
platelet rich growth factor (PRGF) 1, 16
platelet rich plasma (PRP) 1, 4, 34, 116, 215, 222, 253
cell behavior in response to 26, 28
development of 5–8
drawbacks of 4
and fibrin 3
goal of 4
i-PRF versus 24–25
versus PRF 7
for growth factor release 20–22
platelets 16
angiogenic factors 3, 16
average life span of 130
concentrates 1–2
first-generation 16
history of 4–5 (See also Platelet rich fibrin (PRF))
second-generation 1–11
growth factors 4–5, 16
in regeneration process 39–41
supraphysiological doses of 15
polytetrafluoroethylene (PTFE) membranes 160
posterior superior alveolar artery (PSAA) 83–84
PRF. See platelet rich fibrin (PRF)
PRF. See platelet rich growth factor
proliferation phase, of wound healing 2, 16
PRP. See platelet rich plasma PSAA. See posterior superior alveolar artery
RCF. See relevant centrifugation force
regenerative dentistry, PRF in 47–48
extraction socket management 48–49
guided bone regeneration 51
other aspects and medicine 54
periodontal regeneration 50
sinus elevations procedures 48–51
soft-tissue root coverage 49–50, 52–53
soft tissues around implants, regeneration of 50–51
relevant centrifugation force (RCF) 33–34, 39
S
Schneiderian membrane perforation 85, 89–91
repair of 103–104, 252
Sharpey’s fibers 128
sinus septa 86
skin, layers of 218
“smile lines” 230
soft-tissue healing at implants, PRF and 147–149
sought-after facial enhancement procedure 221
stem cells, in wound healing 19
stratum basale 218
stratum granulosum 218
stratum lucidum 218
stratus corneum 218
synthetic resorbable membranes 167
temporomandibular joint (TMJ) dysfunction 42
TGF-beta. See transforming growth factor beta
TGF-β1. See transforming growth factor beta-1
three-dimensional fibrin matrix network 18–19
tissue engineering biomaterials and 2
suitable factors for 22
titanium mesh 166–167
TMJ-osteoarthritis 253
tooth extraction sockets, PRF for future research on 74–75, 77
management 59–60
Index

tooth extraction sockets, PRF for (Continued)

bone grafting materials, classification of
66–67

collagen barrier membrane, SEM analysis of 68

implant placement into fresh extraction sockets 66, 68

post-extraction dimensional changes 60–65

ridge preservation techniques 63–66

socket grafting techniques 63–66

utilization canine model 73 human study 73–76

postoperative infections, prevention from 71–75, 74–76

postoperative pain, prevention from 71–75, 74–76

ridge preservation 68–69, 71–72

socket grafting 68–69, 71–72

transforming growth factor beta (TGF-beta) 6, 8, 19, 24, 39, 237

V

“Vampire Facelift” procedure 229

vascular endothelial growth factor (VEGF) 6, 8, 19–20, 39, 99, 257

VEGF. See vascular endothelial growth factor

Vestibular Incision Subperiosteal Technique Access (VISTA) 120

VISTA. See Vestibular Incision Subperiosteal Technique Access

W

wound healing 1–4

angiogenic factors in 3

barrier membranes for 2

bone-grafting materials for 2

EGF in 20

growth factors, roles in 2–3

IGFs in 20

inhibitors of 4

leucocytes in 16, 18 in mid- to late 1990s 3–4

MSCs in 19

PDGFs in 19–20 phases of

hemostasis 2, 16

inflammation 2, 16–17

maturation 2, 16

proliferation 2, 16–17

remodeling 16–17

stem cells in 19

TGF-β1 in 19

VEGF in 20

X

xenografts 2, 4, 63, 130, 169–170