Index

2D DIGE see two-dimensional difference gel electrophoresis

acetonitrile  6, 40–41
acetylation  47–48, 70, 72–73, 75
acetyltransferases  48–49
acute kidney injury (AKI)  158–59
affinity chromatography, immobilized metal ion  52, 55
affinity tag  35–37, 39, 56
isotope-coded  35
aging  48, 73, 86–87, 92–95, 175–78, 183, 185–86
cellular  175–76, 178
differential proteomics analysis of  10
functional cell  176
human  93
molecular mechanisms of aging-related protein variations  181–82, 185
replicative  182
aging-related proteome  175–76, 178, 180, 182, 184
AKI see acute kidney injury
albumin  27, 88, 101, 103–4, 107–8, 127, 146, 155, 157, 159, 162, 227, 255
albuminuria  161, 163
ALS see amyotrophic lateral sclerosis
Alzheimer's disease  21, 23–24, 86–87, 92–93, 95, 97–100, 106–7
amino acids  1, 19, 124, 131–32, 179, 207
amniotic fluid  244, 264
amyotrophic lateral sclerosis (ALS)  86–87, 279
antibodies  46, 48, 52, 77, 90, 224–25, 233, 235, 251
antioxidants  10, 212, 214
antiretroviral therapy, active  237, 278
aortic dissection  74
apolipoproteins  103–4, 107–8, 210, 235, 260, 262, 281
apoptosis  7–8, 93–94, 123, 201, 217, 231, 277, 279
ascorbate  50–51
asthma  25, 242, 259
ataxia telangiectasia mutated (ATM)  73
ATM see ataxia telangiectasia mutated
ATP-independent nucleosome assembly factors  71–72
bacterial Infection  239, 241, 243
BALF see bronchioalveolar lavage fluid
biological systems  276, 282
CSF  98
diagnostic  86, 134
exploration of  122, 146
novel  126, 135, 163
predictive  161, 165
protein  91
protein-based  22
serum 98, 130, 147, 159, 229, 231, 239, 246
urinary 156
biopharmaceuticals 22, 25–26
biotin moiety 39, 41
biotin switch method 50–51
birth, preterm 243–44, 266
body fluids 36, 87–88, 96, 101, 108, 151, 276
brain 10, 85–87, 94, 96, 100–9, 183, 185, 237, 248, 279
aged 95–96
aging 93
brain proteome 106
brain tissues 101, 183, 185, 249, 264
brainstem 10, 183
breast cancer 8, 22, 25
breast cancer cell lines 5, 7–8, 12
brine shrimp 246, 263
brine shrimp brains 247
bronchoalveolar lavage fluid (BALF) 147, 241, 264
C-reactive protein (CRP) 224, 240
calgranulins 241–44, 258–59
ovarian 76
cancer stem cells 25
differentiation of 25
CAPD see continuous ambulatory peritoneal dialysis
cardiovascular diseases 67–70, 73, 78
cardiomyopathy 71, 73, 78
cardiovascular proteomic analysis 67–68, 70, 72, 74, 76, 78
cardiovasculature 70, 72–73, 75, 79
CBB see Coomassie Brilliant Blue
CBB staining 179–81
cell culture 124, 131, 147
cell lines 12, 21, 24, 144, 157, 178, 191, 193, 196, 199
nocodazole-treated 196, 199
cells
breast cancer 6–9
cancer 8–9, 25, 52
nocodazole-treated 193, 196, 199
normal epithelial 7–9
reservoir 278
tumor 190, 193–94
central nervous system (CNS) 86, 248, 279
cerebellum 183–84
cerebrospinal fluid (CSF) 88, 96–101, 103–5, 107, 249–50, 264, 276, 279
CFS see chronic fatigue syndrome
Chaga’s disease 247–48
CHC see chronic hepatitis C
chemical analogs 49
chronic fatigue syndrome (CFS) 236–37
chronic hepatitis 7–8, 205–6, 209–10, 229, 234–35, 251
chronic hepatitis C (CHC) 8, 209–10, 234–35, 251, 255
chronic kidney disease (CKD) 158, 163–64
chronic liver disease (CLD) 122–23, 127, 234
chronic obstructive pulmonary disease (COPD) 240–42, 259, 264
chronic wasting disease (CWD) 249
CID see collision-induced dissociation
cirrhosis 121, 162, 205, 229, 233, 253
CJD see Creutzfeldt–Jakob disease
CKD see chronic kidney disease
Clara cell secretory protein 242
CLD see chronic liver disease
cleavable ICAT-labeled peptides 39–41
clinical proteomics 78, 88, 92, 124
CNS see central nervous system
cognitive decline 95–96
   age-related 95–96
cognitive impairment 96, 237, 280
collision-induced dissociation (CID) 37–39, 42, 57–58, 91, 190
continuous ambulatory peritoneal dialysis (CAPD) 164, 245
Coomassie Brilliant Blue (CBB) 179–80
COPD see chronic obstructive pulmonary disease
coronary artery disease 74
Creutzfeldt–Jakob disease (CJD) 23, 249, 263–64
CRP see C-reactive protein
CSF see cerebrospinal fluid
CSF proteome 106–7
CWD see chronic wasting disease

DCP see des-gamma-carboxy prothrombin
DDD see dense deposit disease
deacetylases 70, 72
dementia 92, 94, 99, 256
dense deposit disease (DDD) 163
Dent’s disease 159
des-gamma-carboxy prothrombin (DCP) 124, 128
deuterium 36–39
diabetes 160–61
diabetic nephropathy 130, 158, 160–61
differential protein expression analysis 101
disease progression 21–22, 98, 108, 122, 124, 240
diseases, parasitic 247–48

EBV see Epstein–Barr virus
ECD see electron capture dissociation
electron capture dissociation (ECD) 58
electron transfer dissociation (ETD) 58, 91
electrophoresis 3, 16–18, 20, 26–27, 101
two-dimensional 17
ELISA see enzyme-linked immunosorbent assay
enzyme-linked immunosorbent assay (ELISA) 26, 130, 164, 241, 247, 258–59, 262, 264
epigenetic regulation 67, 69–70, 72–73, 78
epithelial cells, nasal 242, 259
Epstein–Barr virus (EBV) 235, 264
ETD see electron transfer dissociation
eukaryotes 69–70

FASP see filter-aided sample preparation
FBS see fetal bovine serum
fetal bovine serum (FBS) 178
fibrosis 123, 210
filter-aided sample preparation (FASP) 154
fluorogenic derivatization 2, 5, 216
galectin-1 9, 163
gels 18–21, 27–28, 40, 89, 101–5, 126, 155, 177, 179–82
genome 71, 86, 206–7
genotype 208, 235
glomerular diseases 155, 161–62
glomeruli 151–52, 154
glycolytic enzymes 11, 95
glycoproteins 49, 127, 160
glycosylation 45, 47, 49, 56, 68, 124

HAMMOC see hydroxy acid-modified metal oxide chromatography

haptoglobin 76, 107–8, 147, 248–49, 262

HBV see hepatitis B virus

HBV-related HCC 230–32

HCC see hepatocellular carcinoma

HCP see host cell protein

HCV see hepatitis C virus

HCV-associated liver disease 7

HCV core protein 7, 205–8, 210, 213–16

HCV infection 7–8, 214, 229

HCV-related HCC (HCVHCC) 128–29, 231, 233–34

HCVHCC see HCV-related HCC

hepatic steatosis 209, 212

hepatitis B virus (HBV) 134, 229–31, 252, 264

hepatitis C virus (HCV) 7, 205–9, 212–15, 217–21, 223, 231

hepatocarcinogenesis 7, 14–15, 213–14, 217


hepcidin 162, 164, 250–51

high-performance liquid chromatography (HPLC) 2–3, 12, 39, 143

hippocampus 10, 94, 96, 183–85

histidine-rich glycoprotein (HRG) 281

histones 48, 58, 71–72, 79

HIV infection 275–82

quantitative proteomic analysis of 275–76, 278, 280, 282

proteomic research 276–77, 279

HMEC see human mammary epithelial cell

host cell protein (HCP) 26

HPLC see high-performance liquid chromatography

HPV see human papillomavirus

HRG see histidine-rich glycoprotein

human mammary epithelial cell (HMEC) 8–9

human papillomavirus (HPV) 238, 256, 264

hydroxy acid-modified metal oxide chromatography (HAMMOC) 54–55, 57

ICAT see isotope-coded affinity tag

ICAT-labeled peptides 36–38

ICAT reagents 36–39

cleavable 38–39

ICPL see isotope coded protein labeling

idiopathic pulmonary fibrosis (IPF) 143, 147

IMAC see immobilized metal affinity chromatography

IMAC resins 55


inactive cysticercosis 248–49

infectious diseases 205, 217, 223–24, 265–66

ingenuity pathway analysis (IPA) 192–94, 197, 199

insulin resistance 123, 210

intra-amniotic inflammation 243–45, 264
IPA see ingenuity pathway analysis
IPF see idiopathic pulmonary fibrosis
isotope-coded affinity tag (ICAT) 3, 35–40, 49, 91, 124, 130–31, 134, 278
isotope coded protein labeling (ICPL) 91
kidney diseases, chronic 158, 163
kidney injury, acute 158
KLFs see Kruppel-like factors
Kruppel-like factors (KLFs) 70–71
laser captured microdissection (LCM) 151–54
LCM see laser captured microdissection
lipoproteins 276
liquid chromatography 89, 91, 216, 232, 252–54, 264
liver 7, 13–14, 209–11, 213–16, 230, 248, 251
liver biopsy 123, 229
liver disease-related proteomics 121–22, 124, 126, 128, 130, 132, 134
chronic 122–23
quantitative proteomic techniques for 124–25, 127, 129, 131, 133
liver failure, acute 123, 135–36
liver fibrosis 126
lung 144, 146, 239–40
lung adenocarcinoma 144, 146–48
lung cancer 22, 143–45, 147–48
early detection of 144–46
lung disease 147
lysine acetylation 48
major urinary protein (MUP) 7, 14
MALDI see matrix-assisted laser desorption ionization
MAM see mitochondrial-associated membrane
MAPK see mitogen-activated protein kinase
MAPs see microtubule-associated proteins
matrix-assisted laser desorption ionization (MALDI) 41, 90–91, 225
memory 94–95
Michael addition 52, 56
microalbuminuria 161, 163
microtubule-associated proteins (MAPs) 199
mitochondria 11, 208, 210–17
mitochondrial-associated membrane (MAM) 217
mitogen-activated protein kinase 208, 215
mitogen-activated protein kinase (MAPK) 196–97, 208, 215
mitosis 199, 201
model for end-stage liver disease (MELD) 123, 135
MUP see major urinary protein
NAFLD see non-alcoholic fatty liver disease
NASH see non-alcoholic steatohepatitis
nasopharyngeal carcinoma (NPC) 235, 255
NBS see 2-nitrobenzenesulfenyl
NBS labeling method 132–33
nephropathy 160–61
neurodegenerative disorders 87, 94, 97, 99
neuronal loss 93–94, 96
neuroproteomics 86, 88, 97–100
neutrophil gelatinase-associated lipocalin (NGAL) 158–59
NGAL see neutrophil gelatinase-associated lipocalin
2-nitrobenzenesulfenyl (NBS) 124, 132–33
NMR see nuclear magnetic resonance
nocodazole 190–91, 193, 196, 199, 201
non-alcoholic fatty liver disease 121
non-alcoholic fatty liver disease (NAFLD) 121–23
non-alcoholic steatohepatitis (NASH) 123, 133
non-small cell lung cancer 146–47
NPC see nasopharyngeal carcinoma
nuclear magnetic resonance (NMR) 22, 159
obesity 210, 212
open reading frame (ORF) 206–7
oral squamous cell carcinomas (OSCC) 238, 256, 264
ORF see open reading frame
OSCC see oral squamous cell carcinomas
oxidative stress 95–96, 99,176, 212, 214, 216
oxidative stress overproduction 212, 214, 216
parasitic infections 245, 247
Parkinson’s disease 86–87, 92, 97, 99–100, 164
PCA see principal component analysis
peptide peaks 165, 250
peptide sequences 91, 192
peptides 1, 3, 6, 35–39, 48, 53, 91, 130–32, 134, 247, 277–78
neutrophil-activating 230
nonphosphorylated 55
phosphopeptides 53, 55–58, 190–93, 196, 200
phosphorylated 56
phosphoproteins 55, 57–58, 191–92, 195
phosphoproteome 52, 152, 193
phosphoproteomics of tumor cell lines 189–90, 192, 194, 196, 198, 200
phosphorylated peptides 58, 190, 192
phosphorylation 45, 47–48, 51, 68, 157, 189, 196, 199, 201
tyrosine 52
polyacrylamide gels 180
polypeptides 90–92, 177
polyprotein 206–7
post-mitotic cell aging 183
post-translational modifications (PTMs) 2, 18, 45–46, 48, 50, 52, 54, 56, 58, 67–68, 70–75, 96–97
preterm labour 243–44, 264
principal component analysis (PCA) 250, 264
prion disease 21, 23, 249
prohibitin 215–16
prostate cancer 22, 76
protein acetylation 48–49
protein activity 46–47, 51
protein aggregation 95
protein alterations, aging-related 175–76
protein chip 77, 128
protein complexes 28
protein diversity 97
protein expression 11–12, 23–24, 94, 126, 134, 145, 175
<table>
<thead>
<tr>
<th>Protein Function/Property</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Differential analysis of</td>
<td>122, 124, 126</td>
</tr>
<tr>
<td>Protein function</td>
<td>96</td>
</tr>
<tr>
<td>Protein glycosylation</td>
<td>49, 124, 124</td>
</tr>
<tr>
<td>Protein identification, mass-spectrometric</td>
<td>180</td>
</tr>
<tr>
<td>Protein interactions</td>
<td>47, 79, 217</td>
</tr>
<tr>
<td>Protein isolation</td>
<td>155–56, 215</td>
</tr>
<tr>
<td>Protein lysine acetylation</td>
<td>48</td>
</tr>
<tr>
<td>Protein markers</td>
<td>93, 97, 97</td>
</tr>
<tr>
<td>Protein phosphatase</td>
<td>94</td>
</tr>
<tr>
<td>Protein phosphorylation</td>
<td>48, 51–53, 55, 57, 189–90, 199, 201</td>
</tr>
<tr>
<td>Protein purification</td>
<td>74, 242, 242</td>
</tr>
<tr>
<td>Protein quantitation</td>
<td>35, 42, 124</td>
</tr>
<tr>
<td>Acetylated proteins</td>
<td>48–49</td>
</tr>
<tr>
<td>Age-related proteins</td>
<td>7, 10, 12</td>
</tr>
<tr>
<td>Altered proteins</td>
<td>10–12</td>
</tr>
<tr>
<td>Age-related proteins</td>
<td>10</td>
</tr>
<tr>
<td>Brain proteins</td>
<td>184</td>
</tr>
<tr>
<td>Calcium-binding proteins</td>
<td>153, 244</td>
</tr>
<tr>
<td>CD4-associating proteins</td>
<td>278</td>
</tr>
<tr>
<td>Cell proteins</td>
<td>28, 67, 181, 206</td>
</tr>
<tr>
<td>Co-expressed proteins</td>
<td>101, 103, 105</td>
</tr>
<tr>
<td>CSF proteins</td>
<td>98, 279</td>
</tr>
<tr>
<td>Cytoskeletal proteins</td>
<td>10, 157</td>
</tr>
<tr>
<td>Derivatized proteins</td>
<td>2–3, 5–6, 12</td>
</tr>
<tr>
<td>Differential analysis of</td>
<td>9, 14</td>
</tr>
<tr>
<td>Differential expression of</td>
<td>8, 276</td>
</tr>
<tr>
<td>Disease-related proteins</td>
<td>7, 97, 216</td>
</tr>
<tr>
<td>Envelope proteins</td>
<td>206–7</td>
</tr>
<tr>
<td>Extracellular proteins</td>
<td>69, 74–75, 77</td>
</tr>
<tr>
<td>Glomerular proteins</td>
<td>152, 154</td>
</tr>
<tr>
<td>Heat shock proteins</td>
<td>95, 157</td>
</tr>
<tr>
<td>High-molecular-weight</td>
<td>90, 159</td>
</tr>
<tr>
<td>Human proteins</td>
<td>57</td>
</tr>
<tr>
<td>Intracellular proteins</td>
<td>69, 71, 73</td>
</tr>
<tr>
<td>Mass spectrometric</td>
<td>Identification of</td>
</tr>
<tr>
<td>Membrane proteins</td>
<td>24, 28, 152, 156</td>
</tr>
<tr>
<td>Membrane-associating</td>
<td>277</td>
</tr>
<tr>
<td>Mitochondrial proteins</td>
<td>28, 158, 206, 215–16</td>
</tr>
<tr>
<td>Nitrosylated proteins</td>
<td>50</td>
</tr>
<tr>
<td>Non-structural proteins</td>
<td>207</td>
</tr>
<tr>
<td>Nuclear proteins</td>
<td>9</td>
</tr>
<tr>
<td>Phosphorylated proteins</td>
<td>27, 53</td>
</tr>
<tr>
<td>Regulatory proteins</td>
<td>94, 153</td>
</tr>
<tr>
<td>Ribosomal proteins</td>
<td>10, 53</td>
</tr>
<tr>
<td>Secreted proteins</td>
<td>256</td>
</tr>
<tr>
<td>Serum proteins</td>
<td>127, 131, 160, 237</td>
</tr>
<tr>
<td>Serum/plasma proteins</td>
<td>146</td>
</tr>
<tr>
<td>Signaling pathways</td>
<td>196–97</td>
</tr>
<tr>
<td>Skeletal muscle proteins</td>
<td>7, 11, 14</td>
</tr>
<tr>
<td>Structural proteins</td>
<td>207, 209</td>
</tr>
<tr>
<td>Surface proteins</td>
<td>28</td>
</tr>
<tr>
<td>Synaptic proteins</td>
<td>10</td>
</tr>
<tr>
<td>Ubiquitylated proteins</td>
<td>52–53</td>
</tr>
<tr>
<td>Urinary proteins</td>
<td>88, 155, 160</td>
</tr>
<tr>
<td>Proteomic analysis, urinary</td>
<td>160</td>
</tr>
<tr>
<td>Proteomic analysis of extracellular proteins</td>
<td>74–75, 77</td>
</tr>
<tr>
<td>Proteomic analysis of intracellular proteins</td>
<td>69, 71, 73</td>
</tr>
<tr>
<td>Proteomic approaches</td>
<td>69–70, 72–73, 85, 97–98, 206</td>
</tr>
<tr>
<td>Quantitative</td>
<td>97, 100, 124–25</td>
</tr>
<tr>
<td>Proteomics</td>
<td>Differential</td>
</tr>
<tr>
<td>Quantitative proteomics</td>
<td>98, 180, 276–77, 282</td>
</tr>
<tr>
<td>Redox</td>
<td>99</td>
</tr>
<tr>
<td>PTMs see post-translational modifications</td>
<td></td>
</tr>
<tr>
<td>Pulmonary alveolar proteinosis</td>
<td>143, 147–48</td>
</tr>
<tr>
<td>Reactive oxygen species (ROS)</td>
<td>7, 96, 212–14</td>
</tr>
<tr>
<td>Renal disease-related proteome</td>
<td>149–50, 152, 154, 156, 158, 160, 162, 164</td>
</tr>
</tbody>
</table>
renal diseases 149, 151, 153, 155
respiratory disease-related proteome 143–44, 146
respiratory disease syndrome 238
respiratory diseases 240–42, 264
retinoid X receptor (RXR) 208, 211
ROS see reactive oxygen species
RXR see retinoid X receptor
sarcoidosis 143, 147–48
SARS see severe acute respiratory syndrome
schizophrenia 21, 23, 98
scrapie 249–50, 264
SDS PAGE see sodium dodecyl sulfate polyacrylamide gel electrophoresis
SELDI see surface-enhanced laser desorption ionization
sepsis 240, 243, 251
serum alpha-fetoprotein 123, 229
serum hepcidin 251
serum proteomic analysis 131
serum tumor markers 124
severe acute respiratory syndrome (SARS) 224, 264
SILAC see stable isotope labeling by amino acids in cell culture
silver staining 106, 108, 126, 176, 180–81, 183
simple steatosis 123, 133–34
smear-negative pulmonary tuberculosis (SNPTB) 239–40
smear-positive pulmonary tuberculosis (SPPTB) 239
SNPTB see smear-negative pulmonary tuberculosis
sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS PAGE) 26, 28
SPPTB see smear-positive pulmonary tuberculosis
SREBP see sterol regulatory element-binding protein
stable isotope labeling by amino acids in cell culture (SILAC) 124, 130–31, 278
stem cells 24–25
sterol regulatory element-binding protein (SREBP) 211, 213
striatum 183–85
supernatants 6, 101–2, 179, 234, 237
synaptic morphology 94–95
telomere shortening 93, 176–77
TFA see trifluoroacetic acid
Thoroughbred horses 11–12, 16
transmissible spongiform encephalopathies (TSEs) 249–50, 263–64
trifluoroacetic acid (TFA) 6, 39, 41
triglycerides 210–11
trypsin 2, 36, 38, 40, 103, 181, 190
trypsin digestion 52–53
tryptophan 132
TSEs see transmissible spongiform encephalopathies
tuberculosis 224, 239
tumor cell lines 189–92, 194–96, 198–201
tumor tissue 144–46
two-dimensional difference gel electrophoresis (2D DIGE) 15–33, 89, 153, 158, 281
urinary exosomes 155–56, 159
urinary proteomics 165
urine proteins, cancer-related 146
urine proteomes 150, 156, 159–65
very-low-density lipoproteins (VLDL) 210

viral Infection 229, 231, 233, 235–37
VLDL see very-low-density lipoproteins
western blotting 242, 280–81
zinc-alpha-2-glycoprotein 107–8