

50. ANIMAL AND PLANT CELLS AND CELL PARTS: CHEMICAL COMPOSITION

Chemical Constituent: DNA = deoxyribonucleic acid; RNA = ribonucleic acid. For additional information, consult reference 7.

Cell or Cell Part		Chemical Constituent	Value	Reference
Man				
1	Bone marrow, whole cell	DNA phosphorus	0.87 pg/cell	13
2		RNA phosphorus	0.69 pg/cell	13
3	Brain, whole cell	DNA phosphorus	0.68 pg/cell	5
4		RNA phosphorus	2.63 pg/cell	5
5	Kidney, whole cell	DNA phosphorus	0.83 pg/cell	14
6		RNA phosphorus	1.10 pg/cell	14
7	Leukocyte, whole cell	DNA phosphorus	0.73 pg/cell	13
8		RNA phosphorus	0.25 pg/cell	13
9	Liver, whole cell	Nitrogen, total	75.3 pg/cell	14
10		DNA phosphorus	1.0 pg/cell	14
11		RNA phosphorus	2.48 pg/cell	14
12		nucleus	Protein, acidic	35-51%
13		other, "residual"	4.7-7.5%	15
14		Nucleoprotein	42-59%	15
15	Sperm	DNA phosphorus	0.31 pg/sperm	14
16		RNA phosphorus	0.24 pg/sperm	14

continued

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	Cell or Cell Part	Chemical Constituent	Value	Reference
17	Spleen, whole cell	DNA phosphorus	0.77 pg/g fresh tissue	11
18		RNA phosphorus	0.36 pg/g fresh tissue	11
Cattle				
19	Heart, nucleus	Lipid, total	26.0% dry wt	38
20		Phospholipid	15.7% dry wt	38
21		Fatty acid	6.5% dry wt	38
22		Cholesterol	3.6% dry wt	38
23		DNA	30.0% dry wt	4
24	Liver, whole cell	DNA phosphorus	0.34 mg/g fresh tissue	11
25		RNA phosphorus	0.70 mg/g fresh tissue	11
26	nucleus	Nucleic acid, total	27.5-30.7% dry wt	29
27		DNA	6.4 pg/nucleus	6,40
28	ribosome ^{1/}	RNA	0.9-1.9% dry wt	29
29		RNA	40%	32
30	Pancreas, whole cell	DNA phosphorus	0.22 mg/g fresh tissue	11
31		RNA phosphorus	1.77 mg/g fresh tissue	11
32	nucleus	DNA	6.6 pg/nucleus	6,40
33	Sperm, whole cell	DNA	2.82-3.40 pg/cell	6,31
34	head	Protein, acidic "lipo-"	19.6% dry wt	10
35		basic	28.7% dry wt	10
36		Nucleic acid, total	48.0% dry wt	10
37		DNA	3.3 pg/head	6,40
38	Spleen, nucleus	Nucleic acid, total	32.6-33.6% dry wt	29
39		DNA	6.8 pg/nucleus	6,40
40		RNA	0.7-1.1% dry wt	29
41	Thymus, whole cell ^{1/}	DNA phosphorus	2.24-2.50 mg/g fresh tissue	11
42		RNA phosphorus	0.80-1.00 mg/g fresh tissue	11
43	nucleus	Protein, acidic	14.0% total N	30
44		basic	35.0% total N	30
45		Nucleic acid, total	31.0% total N	30
46		DNA	6.4 pg/nucleus	6,40
Dog				
47	Liver, whole cell	Lipid, total	17.2% dry wt	44
48		Phospholipid	9.2% dry wt	44
49		Fat, neutral	6.9% dry wt	44
50		Cholesterol	1.07% dry wt	44
51		nucleus	Lipid, total	16.5% dry wt
52	Phospholipid		10.7% dry wt	44
53	Fatty acid		4.6% dry wt	44
54	Cholesterol		1.2% dry wt	44
55	DNA		5.3 pg/nucleus	42
56	Sperm, head	Protein, acidic "lipo-"	17.0% dry wt	10
57		basic	25.0% dry wt	10
58		Nucleic acid, total	55.3% dry wt	10
Guinea Pig				
59	Liver, whole cell	Protein, total	15.0% dry wt	26
60		DNA phosphorus	0.42 mg/g fresh tissue	34
61		RNA phosphorus	0.97 mg/g fresh tissue	34
62	microsome	Lipid, total	40.0-51.0% dry wt of fraction ^{2/}	8,27
63		Phospholipid	58% total lipids; 28.0-29.0% dry wt of fraction ^{2/}	8,27
64		Nitrogen, total	9.15% dry wt of fraction ^{2/}	8

^{1/} Calif. ^{2/} Small granule fraction obtained by differential centrifugation of liver cytoplasm extract.

continued

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Cell or Cell Part	Chemical Constituent	Value	Reference	
65	mitochondrion	Lipid, total	25.0% dry wt of fraction ^{3/}	8
66		Phospholipid	16.0% dry wt of fraction ^{3/}	8
67		Nitrogen, total	10.0-12.0% dry wt of fraction ^{3/}	8
Mouse				
68	Liver, whole cell	Phospholipid	30.1 mg/g fresh tissue	3
69		Protein, total	126.3 mg/g fresh tissue	3
70		DNA	2.85 mg/g fresh tissue	3
71		DNA phosphorus	0.232 mg/g fresh tissue	25
72		RNA	9.0 mg/g fresh tissue	3
73		RNA phosphorus	0.927 mg/g fresh tissue	25
74	nucleus	Phospholipid	3.4%	3
75		Nucleoprotein	66.0%	3
76		DNA	27.0%	3
77		RNA	3.4%	3
78	microsome	Lipid, total	35.1% dry wt of fraction ^{2/}	2,26
79		Phospholipid	62.7% total lipid	2,26
80		Fat, neutral	22.8% total lipid	26
81		Cholesterol ^{4/}	14.5% total lipid	26
82		Nitrogen, total	23.1%; 10.3% dry wt of fraction ^{2/}	2,35
83		DNA	14.2% total nucleic acid ^{5/}	36
84		RNA	52.4% total nucleic acid; 9.1% dry wt of fraction ^{2/}	2,36
85	mitochondrion	Lipid, total	27.4% dry wt of fraction ^{3/}	2
86		Phospholipid	56.6% total lipid	2
87		Fat, neutral	30.8% total lipid	2
88		Cholesterol ^{4/}	12.6% total lipid	2
89		Nitrogen, total	23.5%; 12.1% dry wt of fraction ^{3/}	2,35
90		DNA	5.6% total nucleic acid ^{5/}	36
91		RNA	16.8% total nucleic acid; 3.7% dry wt of fraction ^{3/}	2,36
Rat				
92	Bone marrow, whole cell	DNA phosphorus	1.53 mg/g fresh tissue	39
93		RNA phosphorus	0.87 mg/g fresh tissue	39
94	nucleus	DNA	6.90 pg/nucleus	39
95	Heart, whole cell	DNA phosphorus	0.306 mg/g fresh tissue	39
96		RNA phosphorus	0.314 mg/g fresh tissue	39
97	nucleus	DNA	6.46 pg/nucleus	39
98	Kidney, whole cell	DNA phosphorus	0.267 mg/g fresh tissue	39
99		RNA phosphorus	0.657 mg/g fresh tissue	39
100	nucleus	DNA	6.72 pg/nucleus	39
101	Liver, whole cell	Lipid, total	15.2% dry wt	44
102		Phospholipid	8.3% dry wt	44
103		Fat, neutral	4.1% dry wt	44
104		Cholesterol	2.4% dry wt	44
105		Protein, total	129.0 mg/g fresh tissue	33
106		DNA	1.92 mg/g fresh tissue	33
107		DNA phosphorus	0.21-0.25 mg/g fresh tissue	11
108		RNA	5.88 mg/g fresh tissue	33
109		RNA phosphorus	0.77-1.10 mg/g fresh tissue	11

^{2/} Small granule fraction obtained by differential centrifugation of liver cytoplasm extract. ^{3/} Large granule fraction obtained by differential centrifugation of liver cytoplasm

extract. ^{4/} Unsaponifiable. ^{5/} Contamination with nuclear material cannot be excluded.

continued

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	Cell or Cell Part	Chemical Constituent	Value	Reference
110	nucleus	Lipid, total	3.2-10.0%; 10.5-18.1% dry wt	17,43,44
111		Nucleoprotein	20.0 mg/g fresh tissue	33
112		Nucleic acid, total	11.4-27.5% dry wt	20,29
113		DNA	1.84 mg/g fresh tissue; 4.4-30.0% dry wt	20,33,43
114		RNA	0.64 mg/g fresh tissue; 2.9-7.6% dry wt	20,29,33
115	microsome	Lipid, total	40.0% dry wt of fraction ^{2/}	37
116		Nitrogen, total	18.0-20.0%	37
117		Protein, total	19.0-21.0 mg/g fresh tissue	33
118		RNA	50.0% total nucleic acid	37
119	mitochondrion	Lipid, total	25.0-30.0% dry wt of fraction ^{3/}	37
120		Phospholipid	66.0% total lipid	37
121		Nitrogen, total	23.0-38.6%	22,23,37
122		Protein, total	30.0-33.0%; 35.0-40.0 mg/g fresh tissue	33,37
123		DNA	11.7% total nucleic acid ^{5/}	23
124		RNA	19.0-46.0% total nucleic acid	22,23
125		RNA phosphorus	11.0 µg/mg N	37
126	Lung, whole cell	DNA phosphorus	0.921 mg/g fresh tissue	39
127		RNA phosphorus	0.520 mg/g fresh tissue	39
128	nucleus	DNA	6.71 pg/nucleus	39
129	Spleen, whole cell	DNA phosphorus	1.40 mg/g fresh tissue	39
130		RNA phosphorus	0.499 mg/g fresh tissue	39
131	nucleus	DNA	6.52 pg/nucleus	39
Rabbit				
132	Kidney, whole cell	DNA phosphorus	0.125 mg/g fresh tissue	28
133		RNA phosphorus	0.167 mg/g fresh tissue	28
134	nucleus	Nucleic acid, total	26.0% dry wt	29
135		RNA	1.2% dry wt	29
136	Liver, whole cell	DNA phosphorus	0.16-0.29 mg/g fresh tissue	11
137		RNA phosphorus	0.44-0.76 mg/g fresh tissue	11
138	nucleus	Nucleic acid, total	26.2% dry wt	29
139		RNA	2.0% dry wt	29
140	microsome	Lipid, total	43.4% dry wt of fraction ^{2/}	1
141		Phospholipid	31.2% dry wt of fraction ^{2/}	1
142		Nitrogen, total	9.0% dry wt of fraction ^{2/}	1
143		Nucleic acid phosphorus	80.0 µg/mg total N	1
144	mitochondrion	Lipid, total	29.6% dry wt of fraction ^{3/}	1
145		Phospholipid	17.5% dry wt of fraction ^{3/}	1
146		Nitrogen, total	10.5% dry wt of fraction ^{3/}	1
147		Nucleic acid phosphorus	70.0 µg/mg total N	1
148	reticulocyte, ribosome	RNA	50%	16
Fowl				
149	Erythrocyte, nucleus	Protein, acidic	33-40%	24
150		Nucleoprotein	50.0-60.0%	24
151		Nucleic acid, total	33.9-38.1% dry wt	29
152		DNA	45.0%; 2.34-2.49 pg/nucleus	12,19,31
153		RNA	0.7-2.5% dry wt	29
154	Liver, whole cell	DNA phosphorus	0.31-0.41 mg/g fresh tissue	9
155		RNA phosphorus	0.76-0.84 mg/g fresh tissue	9

^{2/} Small granule fraction obtained by differential centrifugation of liver cytoplasm extract. ^{3/} Large granule fraction obtained by differential centrifugation of liver cytoplasm

extract. ^{5/} Contamination with nuclear material cannot be excluded.

continued

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	Cell or Cell Part	Chemical Constituent	Value	Reference
156	nucleus	Nucleic acid, total	29.4-31.2% dry wt	29
157		DNA	2.39-2.54 pg/nucleus	12,31
158		RNA	2.0-2.2% dry wt	29
159	Sperm, nucleus	DNA	1.26 pg/nucleus	31
160	Thymus, nucleus	Nucleic acid, total	32.0-36.3% dry wt	29
161		RNA	1.3-1.4% dry wt	29
Fishes				
162	Cod sperm, head	Nucleic acid, total	30.3% dry wt	29
163		RNA	0.3% dry wt	29
164	Herring sperm, head	Nucleic acid, total	38.8-59.0% dry wt	29
165		RNA	0-0.2% dry wt	29
166	Salmon sperm, head	Nucleic acid, total	60.8% dry wt	29
167		RNA	0.1% dry wt	29
Sea Urchin ^{6/}				
168	Ovum	DNA	0.01% dry wt; 28.0 pg/cell	21
169	Sperm	DNA	15.0% dry wt; 1.0 pg/cell	21
Bacteria				
170	<i>Bacillus anthracis</i>	Nitrogen, total	10.0% dry wt	41
171		Protein, total	58.1% dry wt	41
172		Nucleic acid, total	4.35% dry wt	41
173		DNA	1.15% dry wt	41
174		RNA	3.20% dry wt	41
175	<i>Escherichia coli</i>	Nitrogen, total	14.61% dry wt	41
176		Protein, total	78.5% dry wt	41
177		Nucleic acid, total	12.84% dry wt	41
178		DNA	3.72% dry wt	41
179		RNA	9.12% dry wt	41
180	<i>Salmonella typhosa</i>	Nitrogen, total	14.40% dry wt	41
181		Protein, total	76.8% dry wt	41
182		Nucleic acid, total	13.2% dry wt	41
183		DNA	4.40% dry wt	41
184		RNA	8.72% dry wt	41
185	<i>Staphylococcus</i> strain 72	Nitrogen, total	13.95% dry wt	41
186		Protein, total	75.5% dry wt	41
187		Nucleoprotein, total	11.57% dry wt	41
188		DNA	2.82% dry wt	41
189		RNA	8.75% dry wt	41

^{6/} *Paracentrotus lividus*.

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50. ANIMAL AND PLANT CELLS AND CELL PARTS: CHEMICAL COMPOSITION

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