

TABLE 3. Membrane proteins of mitochondria and chloroplasts

Protein ^a	Cell	Method of isolation	Molecular weight (native)	Composition	Molecular weight (subunits)	Amino acid composition	Refs.
<u>Mitochondria</u>							
Cytochrome c	many	acid extraction	12,000	1 heme	12,000	+ (sequence, 3-D structure)	79, 80
Cytochrome c ₁	beef heart	deoxycholate extraction	300,000	6 hemes	37,000-53,000	no	81
Cytochrome b	beef heart	deoxycholate, SDS extraction		1 heme	28,000	no	82
Nonheme iron (complex III)	beef heart	deoxycholate, succinylation		2 atoms Fe	30,000	no	83
Cytochrome oxidase	beef heart	cholate extraction, emulol dispersion	200,000 (2×100,000)	2 molecules sulfide 14% lipid 2 hemes 2 Cu ⁺	1×37,000 1×19,000 2×14,000 4×10,000	+	84, 85
Succinate dehydrogenase	beef heart	detergent, chaotropic agents	100,000	7-8 iron atoms 7-8 sulfide molecules	1×70,000 1×27,000	no	86
NADH-coenzyme α reductase	beef heart	detergent, chaotropic agents		1 FAD 4 Fe atoms 4 sulfide molecules 1 FMN	70,000 (also an iron sulfur protein)	no	87, 88
ATPase	beef liver	mechanical disintegration, buffer extraction	280,000 to 360,000		6×46,000 or 6×51,500 and 1 each: 7,500; 10,500; 12,500; 25,000	+	89-92
ATPase	rat liver	sonication	360,000 to 384,000		6×53,000 A ₃ B ₃ C 1×28,000 A = 62,000 1×12,500 B = 57,000 1× 8,000 C = 36,000	no	93, 94
Rutamycin-sensitive ATPase	yeast	triton X-100 extraction	520,000	10% phospholipid	9 subunits	no	95
12. Macropeptide	rat liver	triton X-100 extraction	180,000	no lipid	180,000	+	96
<u>Chloroplasts</u>							
Cytochrome f	spinach	butanol & Triton X-100	62,000	1 heme	2×30,000	no	97
Ferredoxin-NADP reductase	spinach	acetone fractionation	40,000	1 FAD		+	
Plastocyanin	spinach	acetone extract	21,000	some carbohydrate		+	99
Ferredoxin	spinach	acetone extract	12,000	2 copper atoms 2 iron atoms 2 sulfide molecules	12,000	+ (sequence)	100

^a see footnote to Table 2.

Footnote to table 2:

^a The numbers on the left-hand side indicate proteins discussed in the text.

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