









Gene	Protein	Key words
hemA	Glutamyl-tRNA reductase	gene:hema name:"glutamyl-trna reductase" NOT name:"probable multifunctional siroheme biosynthesis protein hema" AND reviewed:yes gene:hema name:"glutamyl-trna reductase" AND reviewed:no
hemL	Glutamate-1-semialdehyde 2,1-aminomutase	gene:heml name:"glutamate-1-semialdehyde 2,1-aminomutase" AND reviewed:yes gene:heml name:"glutamate-1-semialdehyde 2,1-aminomutase" NOT name:"multifunctional fusion protein" AND reviewed:no
gltX	Glutamate--tRNA ligase	gene:gltx (name:"glutamate--trna ligase" NOT name:"glutamylglutaminyl-trna synthetase") AND reviewed:yes gene:gltx (name:"glutamate--trna ligase" NOT name:"multifunctional fusion protein") AND reviewed:no
hemB	Delta-aminolevulinic acid dehydratase	gene:hemb name:"delta-aminolevulinic acid dehydratase" AND reviewed:yes gene:hemb name:"delta-aminolevulinic acid dehydratase" AND reviewed:no
hemC	Porphobilinogen deaminase	gene:hemc name:"porphobilinogen deaminase" AND reviewed:yes (gene:hemc NOT gene:hema) name:"porphobilinogen deaminase" AND reviewed:no
hemD	Uroporphyrinogen-III synthase	(gene:hemd NOT gene:uros) (name:"uroporphyrinogen-III synthase" NOT name:"porphyrin biosynthesis protein hemd") AND reviewed:yes (gene:hemd NOT gene:coba) name:"uroporphyrinogen-III synthase" AND reviewed:no
cysG	Siroheme synthase	gene:cysg name:"siroheme synthase" AND reviewed:yes (gene:cysg NOT gene:coba) NOT gene:cysf name:"siroheme synthase" AND reviewed:no
cobA	uroporphyrinogen-III c-methyltransferase	gene:coba NOT gene:cysg name:"uroporphyrinogen- III c-methyltransferase" AND reviewed:yes gene:coba name:"uroporphyrinogen- III c-methyltransferase" AND reviewed:no
cobB	Hydrogenobyrrinate a,c-diamide synthase	gene:cobb name:"hydrogenobyrrinate a,c-diamide synthase" AND reviewed:yes gene:cobb name:"hydrogenobyrrinate a,c-diamide synthase" AND reviewed:no
cobC-beta	Threonine-phosphate decarboxylase	gene:cobc name:"threonine-phosphate decarboxylase" AND reviewed:yes gene:cobc name:"threonine-phosphate decarboxylase" AND reviewed:no
cobC-ado	Adenosylcobalamin/alpha-ribazole phosphatase	gene:cobc name:"adenosylcobalamin alpha-ribazole phosphatase" AND reviewed:yes gene:cobc name:"adenosylcobalamin alpha-ribazole phosphatase" AND reviewed:no
cobD	Threonine-phosphate decarboxylase	gene:cobd name:"threonine-phosphate decarboxylase" AND reviewed:yes gene:cobd name:"threonine-phosphate decarboxylase" AND reviewed:no

cobF	Precorrin-6A synthase	gene:cobf name:"precorrin-6A synthase" AND reviewed:yes gene:cobf NOT gene:cbid name:"precorrin-6A synthase" AND reviewed:no
cobG	Precorrin-3B synthase	gene:cobg name:"precorrin-3B synthase" AND reviewed:yes gene:cobg name:"precorrin-3B synthase" AND reviewed:no
cobH	Precorrin-8X methylmutase	gene:cobh name:"precorrin-8X methylmutase" AND reviewed:yes gene:cobh (name:"precorrin-8X methylmutase" NOT name:"precorrin-8X methylmutase or isomerase") AND reviewed:no
cobI	Precorrin-2 C(20)-methyltransferase	(gene:cobi NOT gene:cobij) name:"precorrin-2 C(20) -methyltransferase" AND reviewed:yes (gene:cobi NOT gene:cbil) (name:"precorrin-2 C(20) -methyltransferase" NOT name:"cobalt- precorrin-2 C(20)-methyltransferase") AND reviewed:no
cobJ	Precorrin-3B C(17)-methyltransferase	gene:cobj name:"precorrin-3B C(17) -methyltransferase" AND reviewed:yes gene:cobj (name:"precorrin-3B C(17) -methyltransferase" NOT name:cobalt) AND reviewed:no
cobK	Precorrin-6A reductase	gene:cobk NOT gene:cbij name:"precorrin-6A reductase" AND reviewed:yes gene:cobk NOT gene:cbij (name:"precorrin-6A reductase" NOT name:'cobalt') AND reviewed:no
cobL	Precorrin-6Y C(5,15)-methyltransferase	gene:cobl name:"precorrin-6Y C(5,15)-methyltransferase" AND reviewed:yes gene:cobl name:"precorrin-6Y C(5,15)-methyltransferase" AND reviewed:no
cobM	Precorrin-4 C(11)-methyltransferase	gene:cobm name:"precorrin-4 C(11) -methyltransferase" AND reviewed:yes gene:cobm NOT gene:cbif name:"precorrin-4 C(11)-methyltransferase" AND reviewed:no
cobN	Aerobic cobaltochelataase subunit CobN	gene:cobn name:"aerobic cobaltochelataase subunit cobn" AND reviewed:yes gene:cobn name:"aerobic cobaltochelataase subunit cobn" AND reviewed:no
cobO	Corrinoid adenosyltransferase	gene:cobo name:"corrinoid adenosyltransferase" AND reviewed:yes gene:cobo (name:"corrinoid adenosyltransferase" NOT name:atp NOT name:"cob(I)alamin adenosyltransferase cobo") AND reviewed:no
cobP	Bifunctional adenosylcobalamin biosynthesis protein CobP	gene:cobp name:"bifunctional adenosylcobalamin biosynthesis protein cobp" AND reviewed:yes gene:cobp name:"bifunctional adenosylcobalamin biosynthesis protein" AND reviewed:no
cobQ	Cobyric acid synthase	gene:cobq name:"cobyric acid synthase" AND reviewed:yes gene:cobq (name:"cobyric acid synthase" NOT name:cobq) AND reviewed:no
cobR	Cob(II)yrinic acid a,c-diamide reductase	gene:cobr name:"cob(II)yrinic acid a,c-diamide reductase" AND reviewed:no

cobS-gdp	Aerobic cobaltochelatae subunit CobS	gene:cobs name:"aerobic cobaltochelatae subunit cobs" AND reviewed:yes gene:cobs name:"aerobic cobaltochelatae subunit cobs" NOT name:"atpase protein" AND reviewed:no
cobS-co	Adenosylcobinamide-GDP ribazoletransferase	gene:cobs name:"adenosylcobinamide-GDP ribazoletransferase" AND reviewed:yes (gene:cobs NOT gene:cobv) name:"adenosylcobinamide-GDP ribazoletransferase" NOT name:"multifunctional fusion protein" AND reviewed:no
cobT-co	Aerobic cobaltochelatae subunit CobT	gene:cobt name:"aerobic cobaltochelatae subunit cobt" AND reviewed:yes gene:cobt name:"aerobic cobaltochelatae subunit cobt" AND reviewed:no
cobT-alpha	Nicotinate-nucleotide--dimethylbenzimidazole phosphoribosyltransferase	gene:cobt name:"nicotinate-nucleotide--dimethylbenzimidazole phosphoribosyltransferase" AND reviewed:yes (gene:cobt NOT gene:blub) NOT gene:cobp NOT gene:cobu name:"nicotinate-nucleotide--dimethylbenzimidazole phosphoribosyltransferase" NOT name:"multifunctional fusion protein" AND reviewed:no
cobU-ade	Bifunctional adenosylcobalamin biosynthesis protein CobU	gene:cobu name:"bifunctional adenosylcobalamin biosynthesis protein cobu" AND reviewed:yes gene:cobu name:"bifunctional adenosylcobalamin biosynthesis protein cobu" AND reviewed:no
cobU-alpha	Nicotinate-nucleotide--dimethylbenzimidazole phosphoribosyltransferase	gene:cobu name:nicotinate-nucleotide--dimethylbenzimidazole phosphoribosyltransferase AND reviewed:yes gene:cobu name:"nicotinate-nucleotide--dimethylbenzimidazole phosphoribosyltransferase" AND reviewed:no
cobV	Adenosylcobinamide-GDP ribazoletransferase	gene:cobv NOT gene:cobs name:"adenosylcobinamide-GDP ribazoletransferase" AND reviewed:yes gene:cobv name:"adenosylcobinamide-GDP ribazoletransferase" AND reviewed:no
cobY	Adenosylcobinamide-phosphate guanylyltransferase	gene:coby name:"adenosylcobinamide-phosphate guanylyltransferase" AND reviewed:yes gene:coby NOT gene:cobu name:"adenosylcobinamide-phosphate guanylyltransferase" AND reviewed:no
pduX	L-threonine kinase	gene:pdux name:"L-threonine kinase" AND reviewed:yes gene:pdux name:"L-threonine kinase" AND reviewed:no
cbiA	Cobyrinate a,c-diamide synthase	gene:cbia name:"cobyrinate a,c-diamide synthase" AND reviewed:yes gene:cbia name:"cobyrinate a,c-diamide synthase" AND reviewed:no
cbiB	Cobalamin biosynthesis protein CbiB	gene:cbib name:"cobalamin biosynthesis protein cbib" AND reviewed:yes gene:cbib name:"cobalamin biosynthesis protein cbib" AND reviewed:no
cbiC	Cobalt-precorrin-8 methylmutase	gene:cbic name:"cobalt-precorrin-8 methylmutase" AND reviewed:yes gene:cbic name:"cobalt-precorrin-8 methylmutase" AND reviewed:no

cbiD	Cobalt-precorrin-5B C(1)-methyltransferase	gene:cbid name:"cobalt-precorrin-5B C(1) -methyltransferase" AND reviewed:yes gene:cbid NOT gene:yusv NOT gene:cobk NOT gene:cobh name:"cobalt-precorrin-5B C(1) -methyltransferase" NOT name:"multifunctional fusion protein" AND reviewed:no
cbiE	Cobalt-precorrin-7 C(5)-methyltransferase	gene:cbie name:"cobalt-precorrin-7 C(5) -methyltransferase" AND reviewed:yes gene:cbie name:"cobalt-precorrin-7 C(5) -methyltransferase" AND reviewed:no
cbiF	Cobalt-precorrin-4 C(11)-methyltransferase	gene:cbif name:"cobalt-precorrin-4 C(11) -methyltransferase" AND reviewed:yes gene:cbif name:"cobalt-precorrin-4 C(11) -methyltransferase" AND reviewed:no
cbiG	Cobalt-precorrin-5A hydrolase	gene:cbig name:"cobalt-precorrin-5A hydrolase" AND reviewed:yes gene:cbig name:"cobalt-precorrin-5A hydrolase" AND reviewed:no
cbiH	Cobalt-factor III C(17)-methyltransferase	gene:cbih name:"cobalt-factor III C(17)-methyltransferase" AND reviewed:yes gene:cbih NOT gene:cobj name:"cobalt-factor III C(17) -methyltransferase" AND reviewed:no
cbiJ	Cobalt-precorrin-6A reductase	gene:cbij name:"cobalt-precorrin-6A reductase" AND reviewed:yes gene:cbij name:"cobalt-precorrin-6A reductase" AND reviewed:no
cbiK	Sirohydrochlorin cobaltochelataase	gene:cbik name:"sirohydrochlorin cobaltochelataase" AND reviewed:yes gene:cbik name:"sirohydrochlorin cobaltochelataase" AND reviewed:no
cbiL	Cobalt-precorrin-2 C(20)-methyltransferase	gene:cbil name:"cobalt-precorrin-2 C(20) -methyltransferase" AND reviewed:yes gene:cbil name:"cobalt-precorrin-2 C(20) -methyltransferase" AND reviewed:no
cbiP	Cobyric acid synthase	gene:cbip NOT gene:cobq name:"cobyric acid synthase" AND reviewed:yes gene:cbip NOT gene:cbih name:"cobyric acid synthase" NOT name:"cobyric acid synthase cbip" AND reviewed:no
cbiT	Cobalt-precorrin-6B C(15)-methyltransferase	gene:cbit name:"cobalt-precorrin-6B C(15) -methyltransferase" AND reviewed:yes gene:cbit name:"cobalt-precorrin-6B C(15) -methyltransferase" AND reviewed:no
cbiX	Sirohydrochlorin cobaltochelataase	gene:cbix name:"sirohydrochlorin cobaltochelataase" AND reviewed:yes gene:cbix name:"sirohydrochlorin cobaltochelataase" AND reviewed:no
cbiZ	Adenosylcobinamide amidohydrolase	gene:cbiz name:"adenosylcobinamide amidohydrolase" AND reviewed:yes gene:cbiz name:"adenosylcobinamide amidohydrolase" AND reviewed:no

btuB	Vitamin B ₁₂ transporter BtuB	gene:btub name:"vitamin B ₁₂ transporter btub" AND reviewed:yes gene:btub name:"vitamin B ₁₂ transporter btub" NOT name:"tonb-dependent receptor" AND reviewed:no
btuC	Vitamin B ₁₂ import system permease protein BtuC	gene:btuc (name:"vitamin B ₁₂ import system permease protein btuc" OR name:"cobalamin import system permease protein btuc") AND reviewed:yes gene:btuc (name:"vitamin B ₁₂ import system permease protein btuc" OR name:"cobalamin import system permease protein btuc") AND reviewed:no
btuD	Vitamin B ₁₂ import ATP-binding protein BtuD;	gene:btud (name:"vitamin B ₁₂ import ATP-binding protein btud" OR name:"cobalamin import ATP-binding protein btud") AND reviewed:yes gene:btud (name:"vitamin B ₁₂ import ATP-binding protein btud" OR name:"cobalamin import ATP-binding protein btud") NOT name:"aaa atpase" AND reviewed:no
btuF	Vitamin B ₁₂ -binding protein	gene:btuf name:"vitamin B ₁₂ -binding protein" NOT name:"cobalamin-binding protein" AND reviewed:yes gene:btuf name:"vitamin B ₁₂ -binding protein" NOT name:"iron abc transporter substrate-binding protein" AND reviewed:no
btuR	Cob(I)alamin adenosyltransferase	gene:btur NOT gene:coba name:"cob(I)alamin adenosyltransferase" AND reviewed:no
eutT	Ethanolamine utilization cobalamin adenosyltransferase	gene:eutt name:"ethanolamine utilization cobalamin adenosyltransferase" AND reviewed:yes gene:eutt name:"ethanolamine utilization cobalamin adenosyltransferase" AND reviewed:no
pduO	Corrinoid adenosyltransferase	gene:pduo name:"corrinoid adenosyltransferase"
pduS	Cob(II)alamin reductase	gene:pduS name:"cob(II)alamin reductase"
fre	NAD(P)H-flavin reductase	gene:fre name:"NAD(P)H-flavin reductase" AND reviewed:yes gene:fre name:"NAD(P)H-flavin reductase" AND reviewed:no
ubiB	Aquacobalamin reductase	gene:ubib name:"aquacobalamin reductase" AND reviewed:yes gene:ubib name:"aquacobalamin reductase" AND reviewed:no
bluB	5,6-dimethylbenzimidazole synthase	gene:blub name:"5,6-dimethylbenzimidazole synthase" AND reviewed:yes gene:blub name:"5,6-dimethylbenzimidazole synthase" AND reviewed:no