## UBIQUINONE AND OTHER TERPENOID-QUINONE BIOSYNTHESIS 2-Methyl-6-solanyl-1,4-benzoquinol **▶**©⁵Plastoquinol-9 olanesyl-PP 4-Hydroxyphenyl-pyruvate 4-Hydroxyphenyllactate K18606 Terpenoid backbone biosynthesis Homogentisate δ-Tocopherol β-Tocopherol Phytyl-PP 2,3-Dimethyl-5-phytylquinol α-Tocopherol (Vitamin E) 2-Methyl-6-phytylquinol y-Tocopherol Phenylpropanoid biosynthesis 6-Geranylgeranyl-2-methylbenzene-6-Geranylgeranyl-2,3-dimethylbenzeney-Tocotrienol 4-dio1.,4-diol **►**O⁵³α-Tocotrienol (Vitamin E) L-Tyrosine K00487 **▶**७4Coumarate trans-Geranylgeranyl-PR Cinnamate **F 4 5** 4 δ-Tocotrienol β-Tocotrienol Terpenoid backbone biosynthesis Phenylalanine, tyrosine and tryptophan biosynthesis UbiC MenF Chorismate Isochorismate K03181.. K01075 K01851.. 4-Coumaroyl-4-Hydroxy-benzoyl-CoA CoA MenD 2-Succinyl-5-enolpyruvyl-6-6-hydroxy-3-cyclohexene-1-carboxylate K11782 MgnA 4-Hydroxybenzoate 🔽 2.41.194 **\*** MenH 3.2.1.-4-Hydroxybenzoate-Polyprenyl-PP GPP (1R,6R)-2-Succinyl-6-hydroxy-2,4-cyclohexadienec. ₹2 3-[(1-Carboxy-vinyl)oxy]benzoate O-glucoside Terpenoid backbone -{>**-O**biosynthesis 1-carboxylate K13565 MenC K18285 MqnE 3-Polyprenyl-4-hydroxybenzoate Geranyl-2-Succinylbenzoate hydroxybenzoate ან-Amino-6-deoxy-UbiD UbiX futalosine VIenE. Spirodilactone Geranyl-hydroquinone 3-Polyprenyl- 🔻 4,5-dihydroxybenzoate 🍑 2-Polyprenyl-phenol K18286 ▲2-Succinylbenzoyl-CoA 1.1413116 K18800 Coq3 Dihydro-shikonofuran 3"-Hydroxy-geranyl-hydroquinone MenB $^{\circ}$ Futalosine K18284 2-Polyprenyl-6-hydroxyphenol a,4-Dihydroxy-2-naphthoyl-CoA 3-Polyprenyl-4-hydroxy: 5-methoxybenzoate K11783 MqnB Ö <sup>4</sup>Dihydro-echinofuran ODeoxyshikonin UbiG 2-Polyprenyl-6-methoxyphenol 1,4-Dihydroxy-2-naphthoate ► Dehypoxanthine-futalosine Terpenoid backbone biosynthesis 💇 Shikonin K06126 MqnC Octaprenyl-PP ,—-©€1 — — -Phytyl-PP 150027 2-Polyprenyl-6-methoxy-1,4-bénzoquinone Cyclic dehypo-xanthinefutalosine MenA MenA K06127 2-Phytyl-1,4-naphthoquinone <sub>:s</sub>2-Demethylmenaquinone MqnD 2-Polyprenyl-3-methyl-6-methoxy-1,4-benzoquinone UbiE MenG MenG **▼**Phylloquinone K06134 K03184 -**⊵-**X.。Menaquinone 1,4-Dihydroxy-6-naphthoate 2-Polyprenyl-3-methyl-5-hydroxy-6-methoxy-1,4-benzoquinone Vitamin K cycle ်**တို** Menaquinol K05357 Phylloquinof 💇 Ubiquinone-n Complement and coagulation cascades യ Phylloquinone epoxide Menaquinone Oxidative phosphorylation epoxide 00130 5/13/15 (c) Kanehisa Laboratories