## UBIQUINONE AND OTHER TERPENOID-QUINONE BIOSYNTHESIS 2-Methyl-6-solanyl-1,4-benzoquinol K12502... **▶**©⁵Plastoquinol-9 🎔 Solanesyl-PP 4-Hydroxy-4-Hydroxyphenylphenyllactate pyrúvate Terpenoid backbone K18606 biosvnthesis Homogentisate δ-Tocopherol β-Tocopherol K09834 °♥ Phytyl-PP K00815... K12502.. α-Tocopherol (Vitamin E) 2-Methyl-6-phytylquinol 2,3-Dimethyl-5-phytylquinol y-Tocopherol Phenylpropanoid biosynthesis 6-Geranylgeranyl-2-methylbenzene-6-Geranylgeranyl-2,3-dimethylbenzeney-Tocotrienol 4-dio1.,4-diol **⊭⊙**™α-Tocotrienol (Vitamin E) L-Tyrosine K12502.. K00487 **▶**७4Coumarate trans-Geranylgeranyl-PF\*\* Cinnamate K09834 **F 4 5** 4 β-Tocotrienol δ-Tocotrienol Terpenoid backbone biosynthesis Phenylalanine, tyrosine and tryptophan biosynthesis UbiC MenF Chorismate Isochorismate K03181.. K01075 K01851.. 4-Coumaroyl-4-Hydroxy-benzoyl-CoA CoA K02551 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 (1R,6R)-2-Succinyl-6-hydroxy-2,4-cyclohexadiene-1-carboxylate GPP c. ₹2 3-[(1-Carboxy-vinyl)oxy]benzoate O-glucoside Terpenoid backbone **-(>-O**biosynthesis K13565 MenC K18285 MqnE 3-Polyprenyl-4-hydroxybenzoate c 😽 Geranyl-2-Succinylbenzoate hydroxybenzoate ან-Amino-6-deoxy-] WiD WiX futalosine K01911.. VIenE Spirodilactone Geranyl-3-Polyprenyl- 🔻 4,5-dihydroxybenzoate 🍑 hydroquinone 2-Polyprenyl-phenol K18286 ¥2-Succinylbenzoyl-CoA 1.1413116 K18800 Coq3 3"-Hydroxy-geranyl-hydroquinone K01661 MenB shikonofuran $^{\circ}$ 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 🗘 Deoxyshikonin UbiG 2-Polyprenyl-6-methoxyphenol 1,4-Dihydroxy-2-naphthoate ► Dehypoxanthine-futalosine Terpenoid backbone biosynthesis **O**°Shikonin K06126 K03185 MqnC Octaprenyl-PP ,—-©€1 — — -Phytyl-PP 2-Polyprenyl-6-methoxy-1,4-bénzoquinone Cyclic dehypo-xanthinefutalosine K02548 MenA MenA c**₹**,2-Demethyl-2-Phytyl-1,4-naphthoquinone menaquinone MqnD 2-Polyprenyl-3-methyl-6-methoxy-1,4-benzoquinone UbiE MenG MenG **▼**Phylloquinone K06134 K03184 1,4-Dihydroxy-6-naphthoate 2-Polyprenyl-3-methyl-5-hydroxy-6-methoxy-1,4-benzoquinone K00355... K00355... Vitamin K cycle ်**ဲု**Menaquinol K05357 K05357 Phylloquinof \$\P^3\$ K10106 K10106 Ubiquinone-n Complement and coagulation cascades യ Phylloquinone epoxide Menaquinone Oxidative phosphorylation epoxide 00130 5/13/15 (c) Kanehisa Laboratories