

Osnove kemije prirodnih organskih spojeva

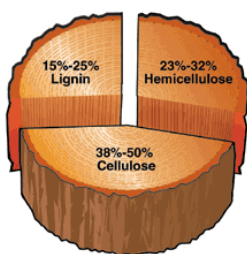
6. Polifenoli

Polifenoli. Strukturni tipovi. Nalaženje u prirodi. Izolacija i određivanje strukture. Biosinteza. Laboratorijska sinteza.

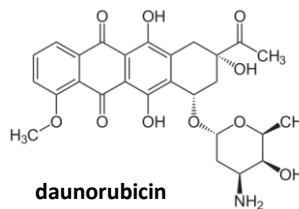
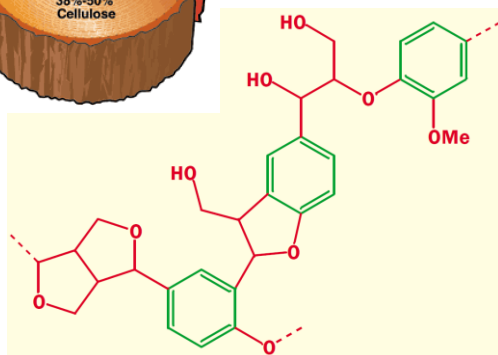
doc. dr. sc. Đani Škalamera

1

Aromatski spojevi u prirodi



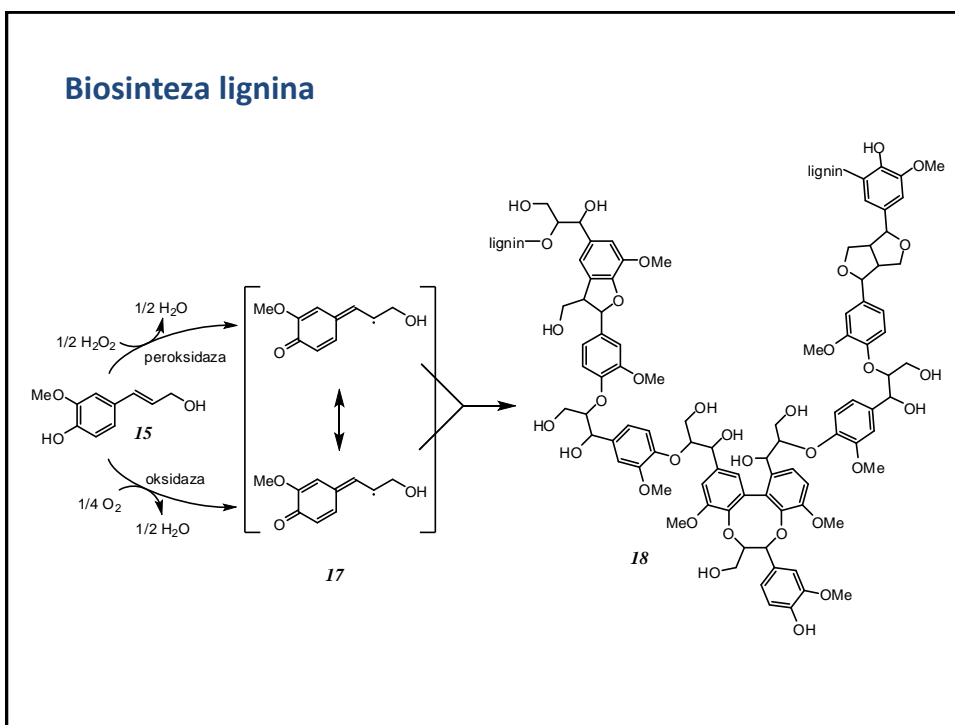
Dio strukture lignina



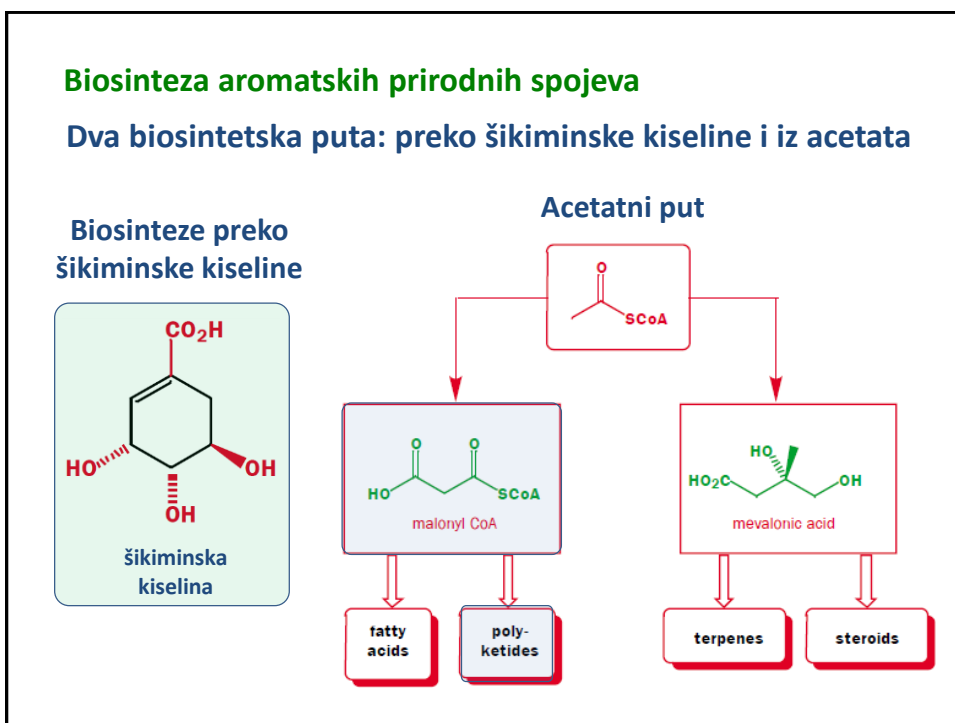
Iz *Streptomyces peucetius*



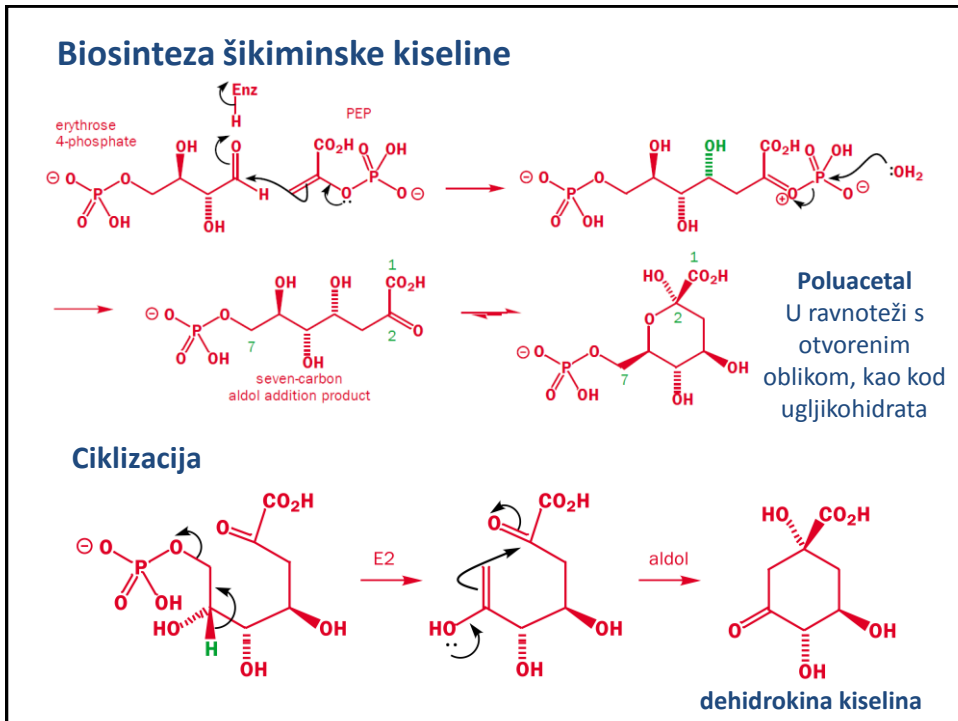
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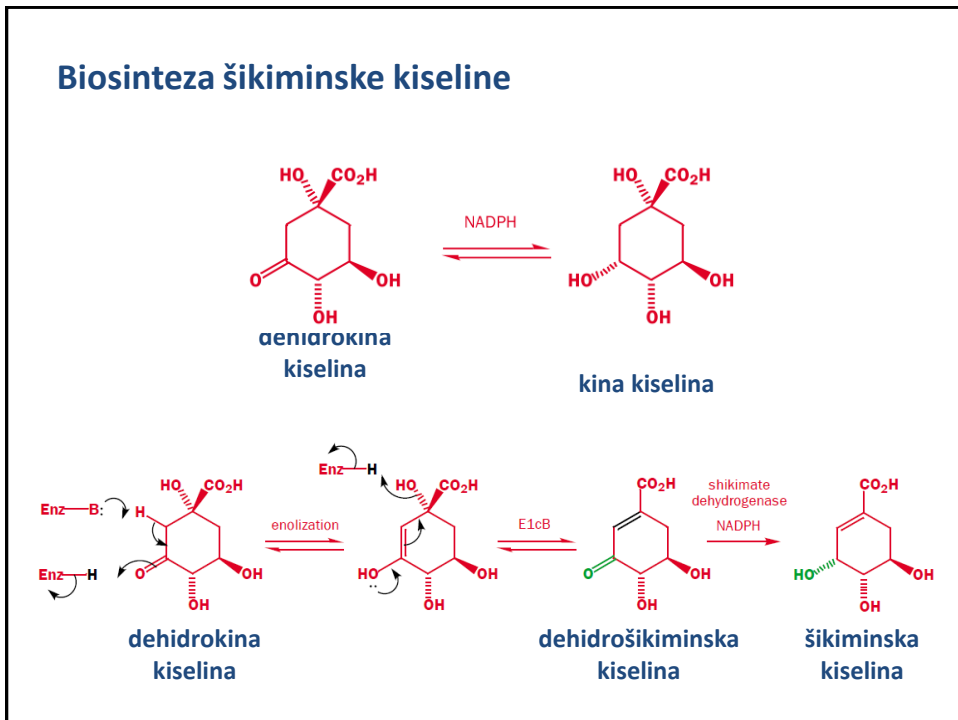
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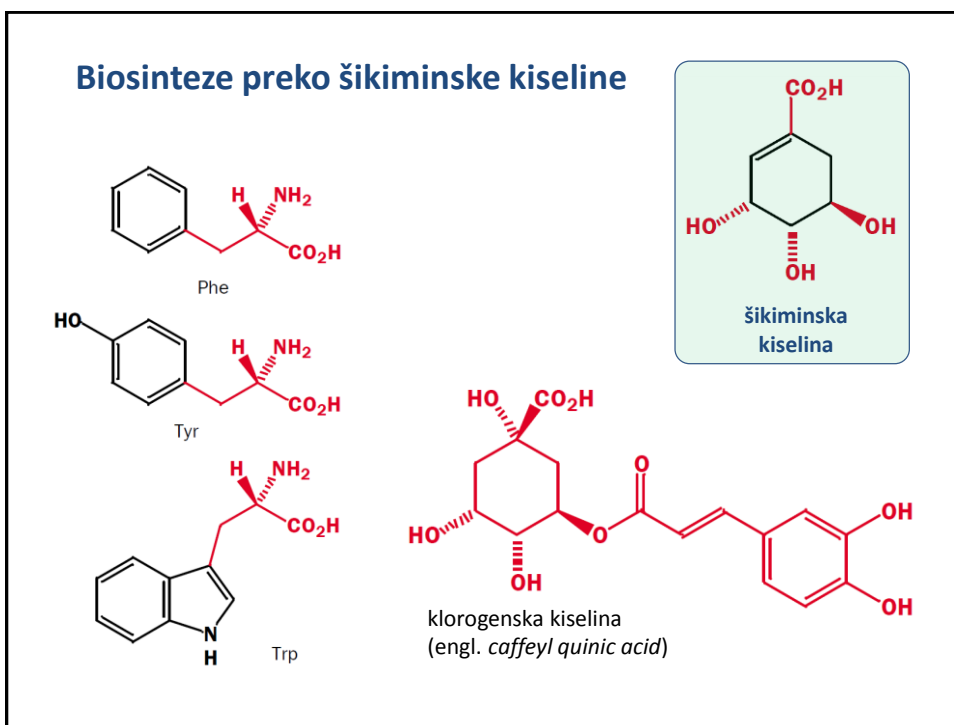
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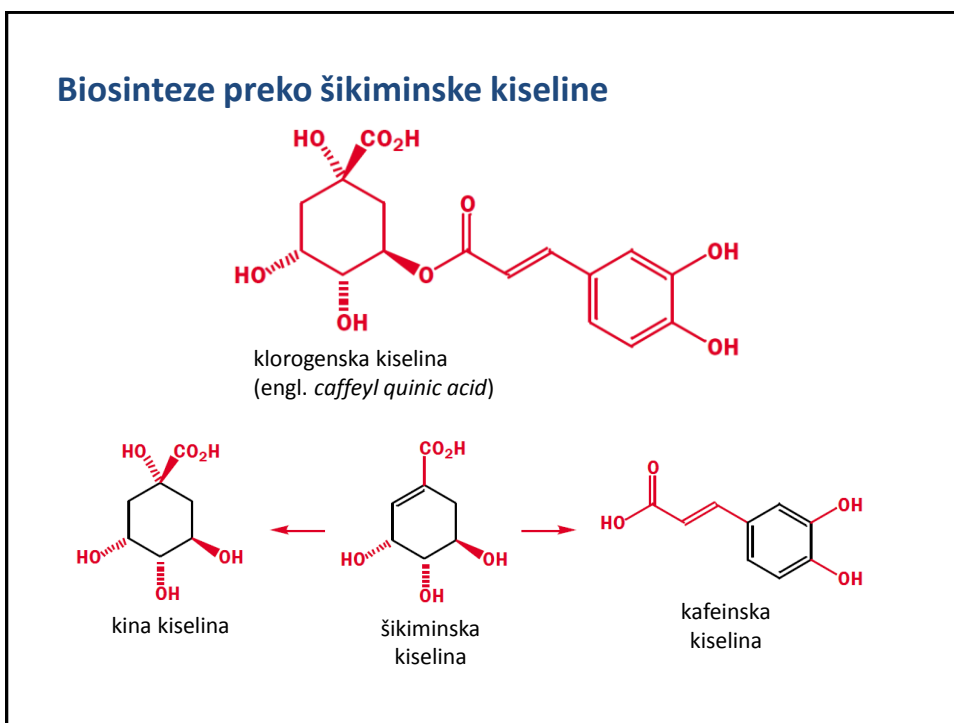
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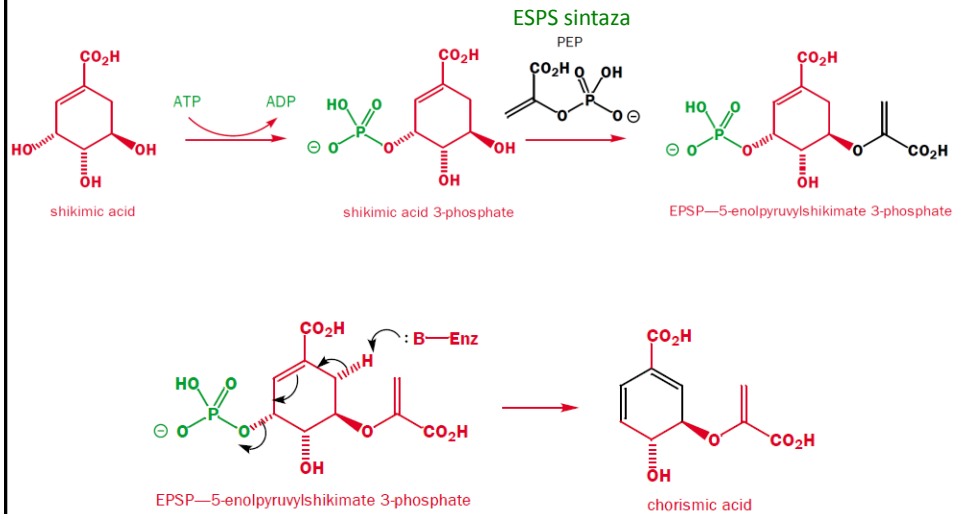


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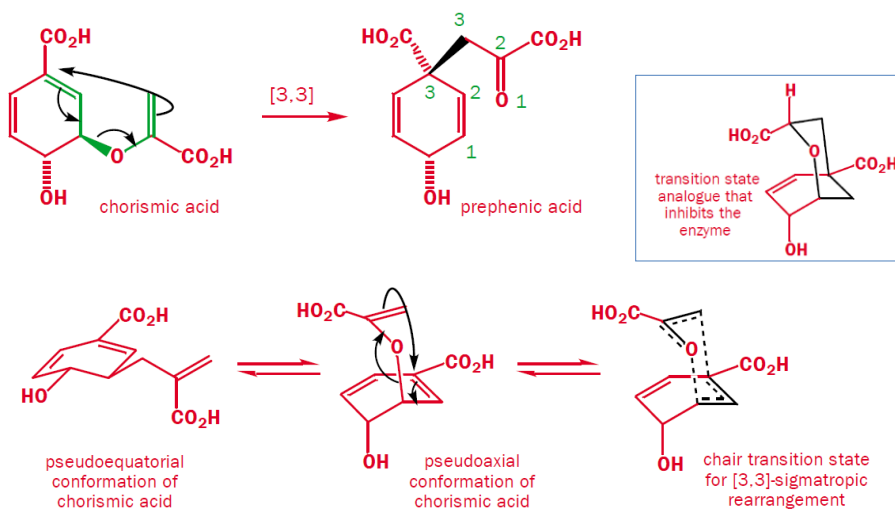
Biosinteza fenilalanina i tirozina



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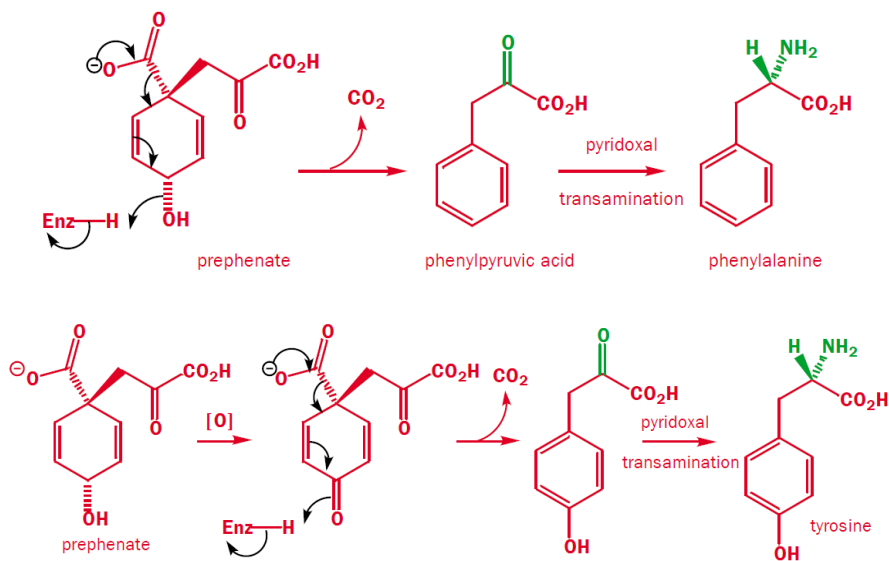
Biosinteza fenilalanina i tirozina

Sigmatropno pregrađivanje



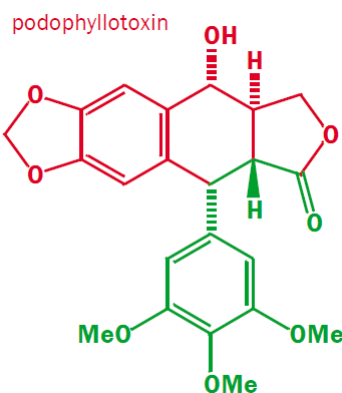
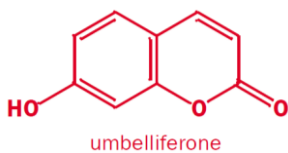
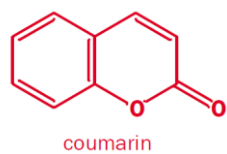
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Biosinteza fenilalanina i tirozina



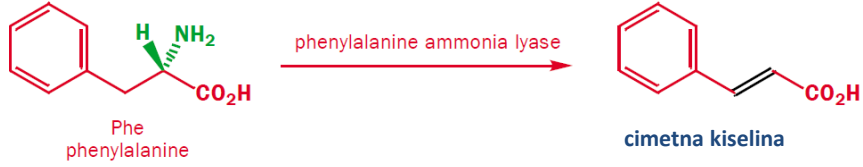
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Ostali spojevi nastali šikimatnim putem

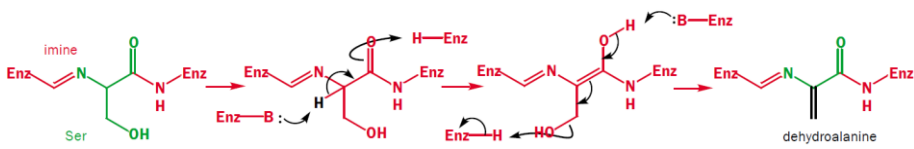


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Alkeni nastali eliminacijom amonijaka



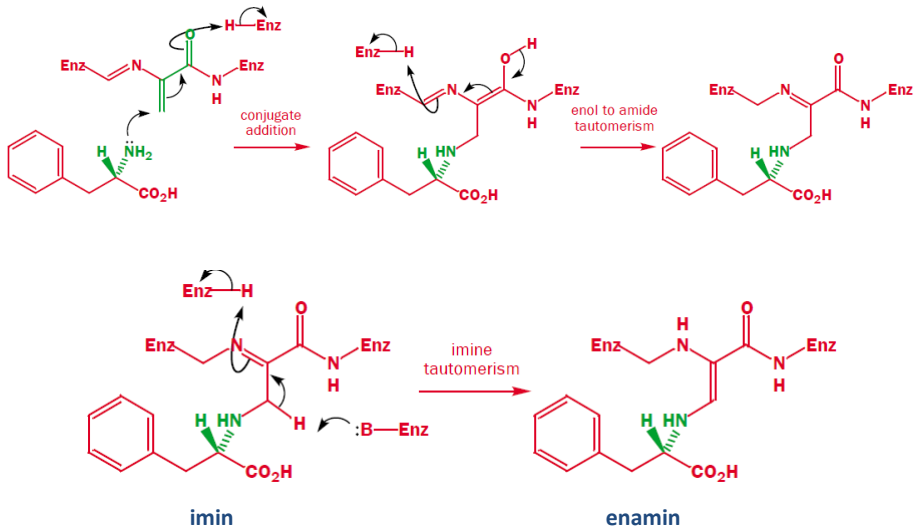
Mehanizam reakcije



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Alkeni nastali eliminacijom amonijaka

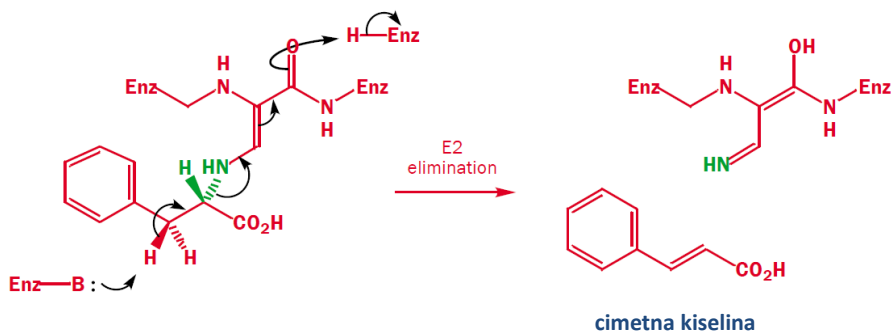
Mehanizam reakcije



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Alkeni nastali eliminacijom amonijaka

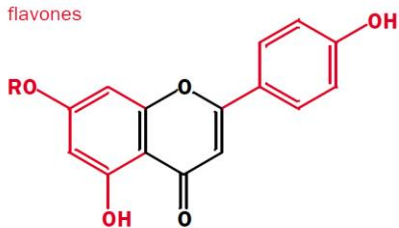
Mehanizam reakcije



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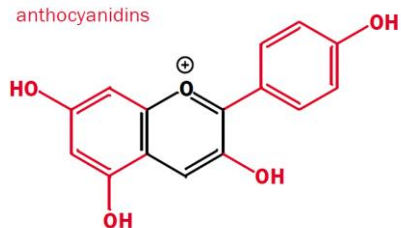
Flavononidi i antocijani

flavones



R = H; naringenin, R = glucose; naringin
—a bitter substance from grapefruit peel

anthocyanidins

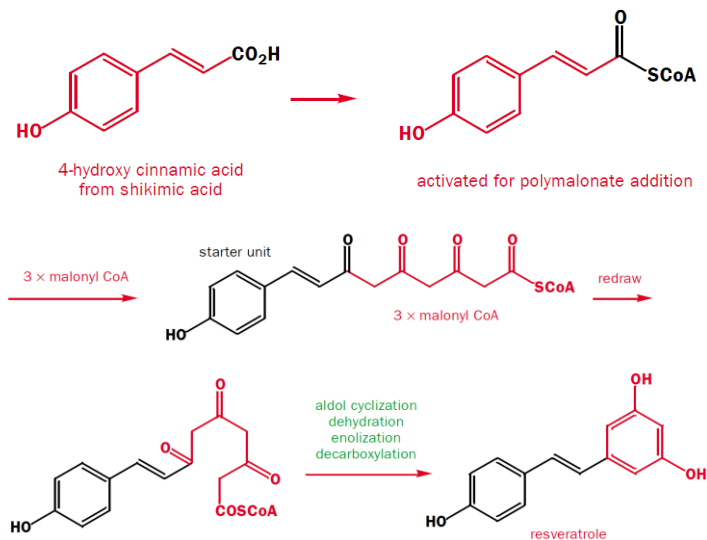


pelargonidin, pigment of raspberries,
geraniums, and red grape skins

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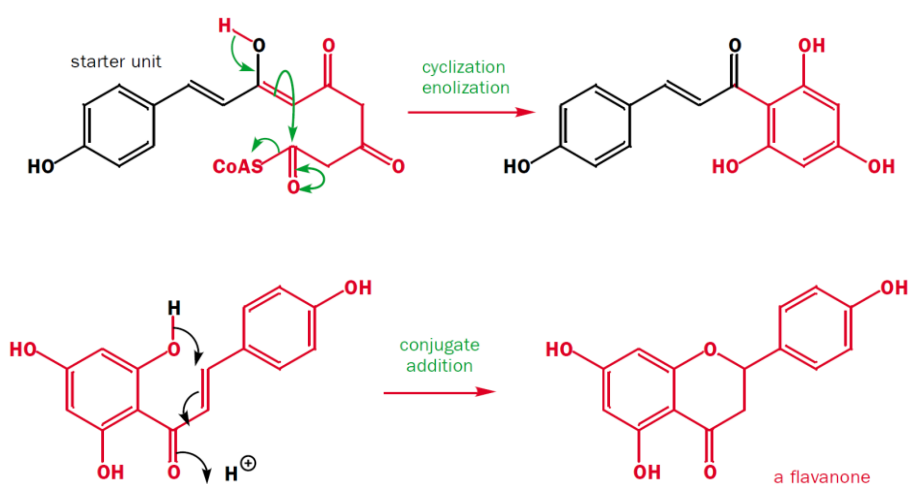
Biosinteze flavononida i antocijana

Acetatni put biosinteze



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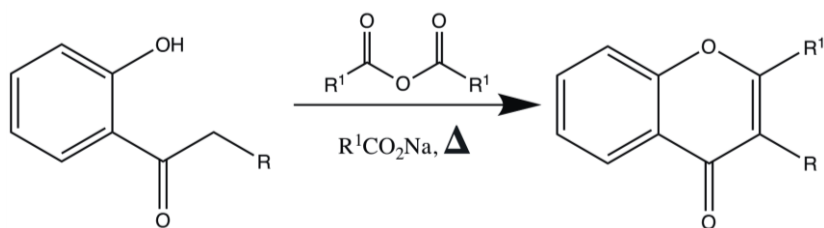
Biosinteze flavononida i antocijana



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Kemijske sinteze flavononida i antocijana

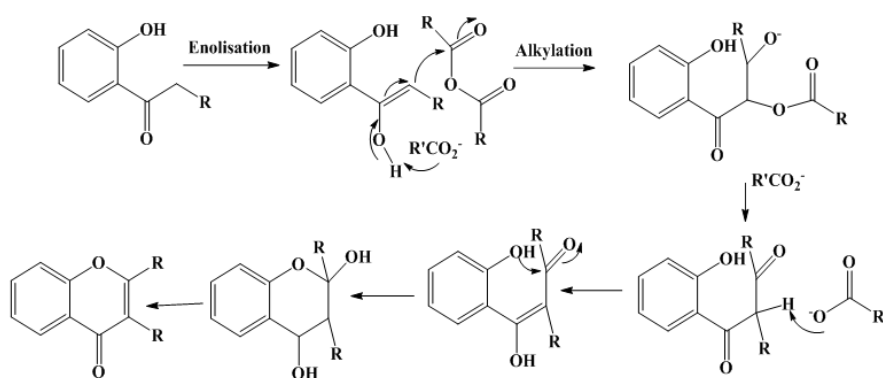
Robinsonova sinteza



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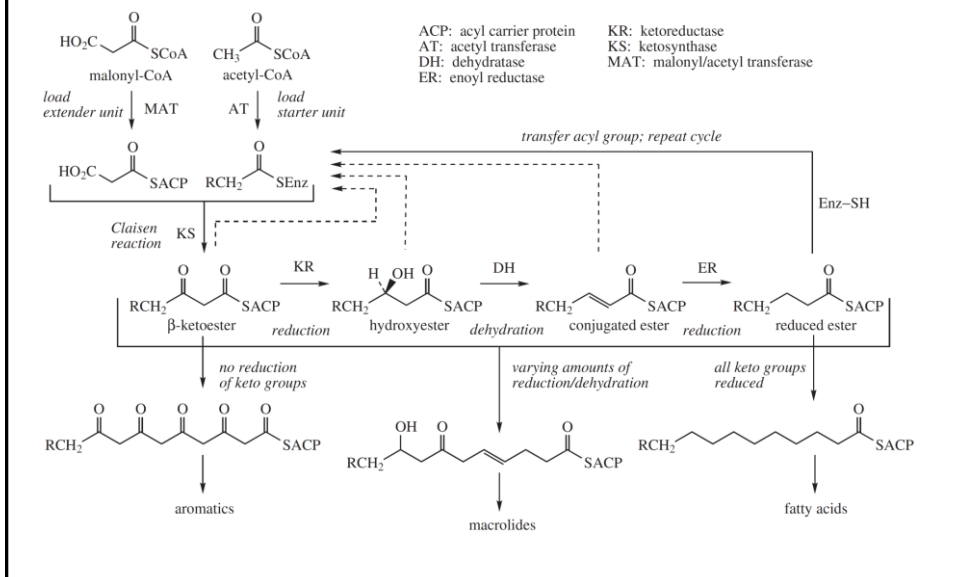
Kemijske sinteze flavononida i antocijana

Robinsonova sinteza - mehanizam



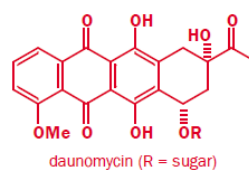
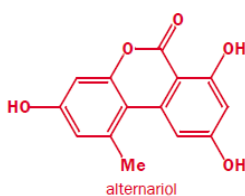
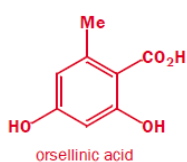
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Biosinteze preko acetata - poliketidi

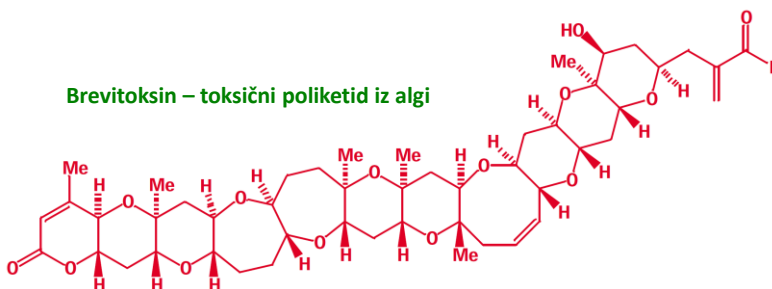


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Biosinteze preko acetata - poliketidi

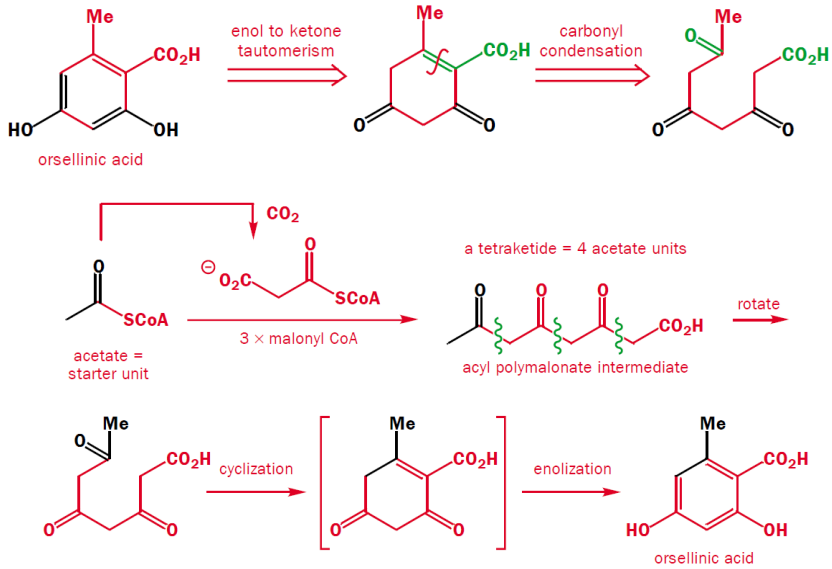


Brevitoksin – toksični poliketid iz algi



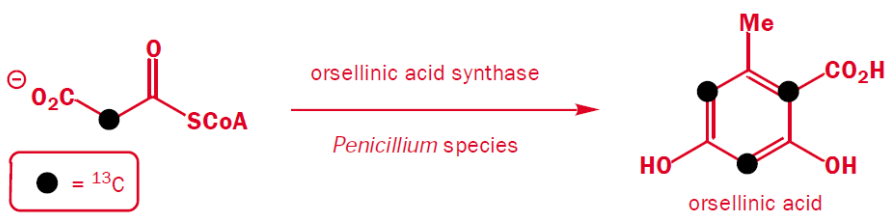
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Biosinteze preko acetata - poliketidi

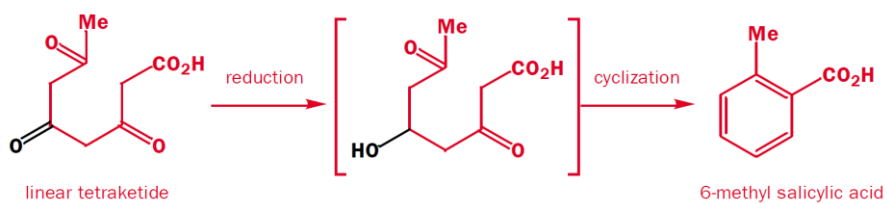


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Biosinteze preko acetata - poliketidi

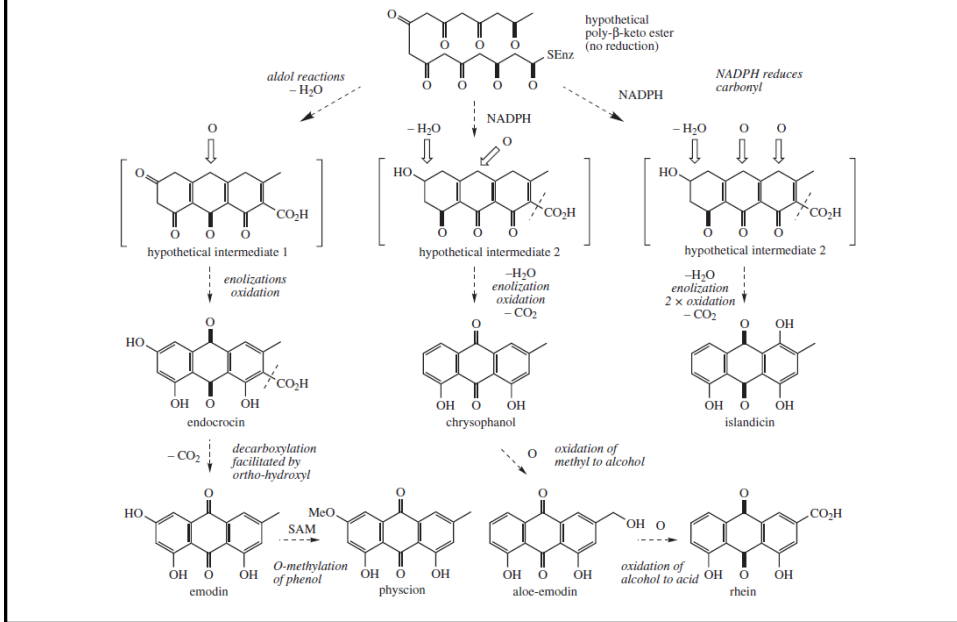


Preko istog međuprodukta mogu nastati i drugi spojevi:



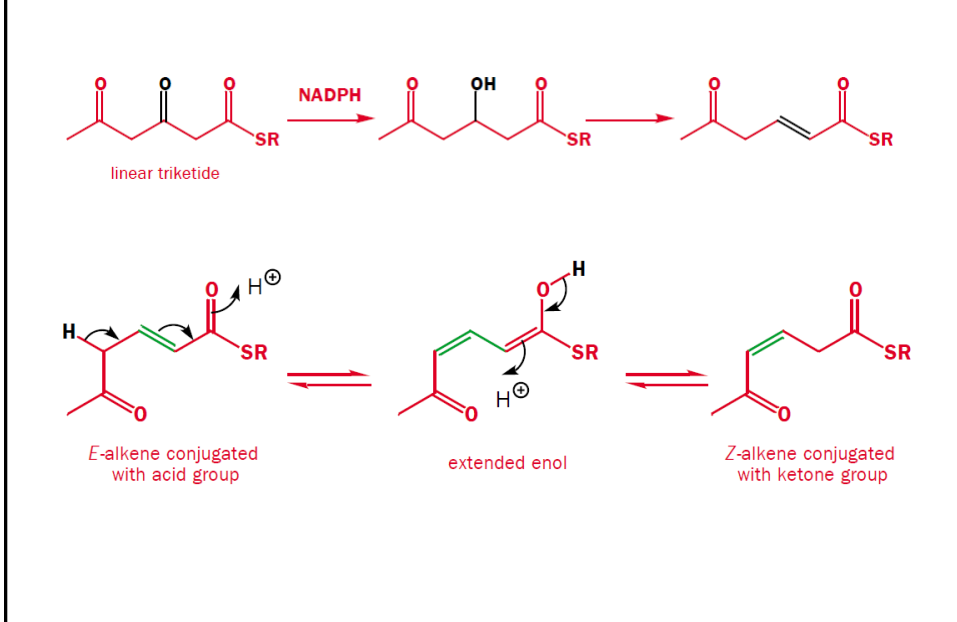
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Biosinteze preko acetata - poliketidi



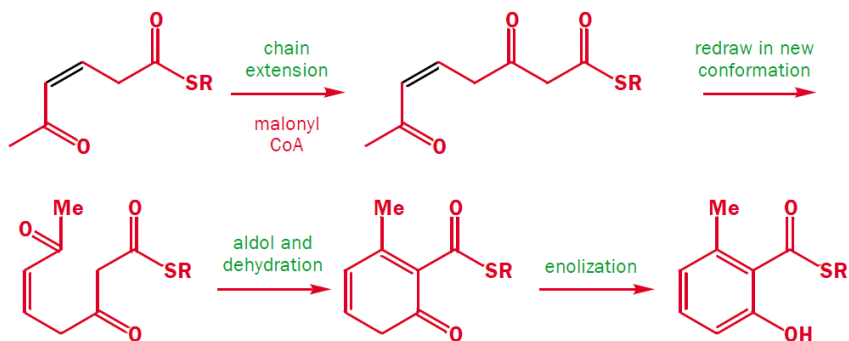
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Biosinteze preko acetata - poliketidi



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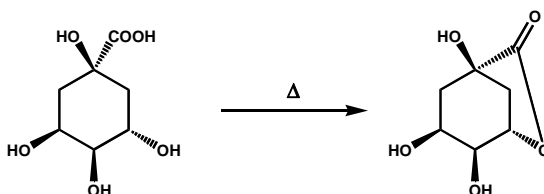
Biosinteze preko acetata - poliketidi



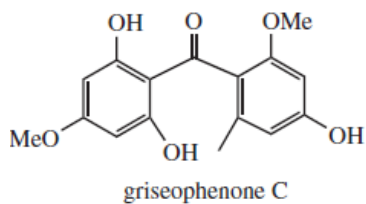
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ZADACI

1.) Kina kiselina zagrijavanjem vrlo lako prelazi u lakton. Objasnite to na temelju njezine strukture (nacrtajte konformacije stolca te molekule).



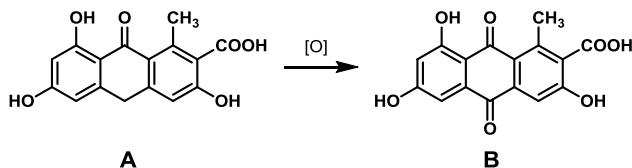
2.) Griseofenon C, međuprodukt u biosintezi griseofulvina, kojeg proizvodi gljivica *Penicillium griseofulvum*, poliketidni je spoj koji nastaje acetatnim putem. Prikažite ravni poli- β -keto lanac čijom ciklizacijom nastaje ovaj spoj. (Metilne skupine su na kisik dodane u zadnjem stupnju iz S-adenozilmetionina)



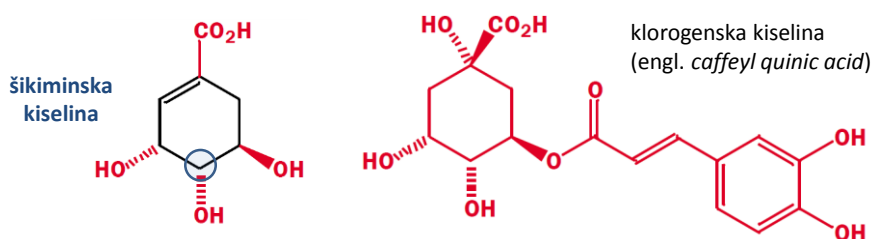
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ZADACI

3.) Antrakinon **B** nastaje iz antrona **A** reakcijom oksidacije. Prikažite ravni poli- β -ketonski lanac iz kojeg nastaje spoj **A**.



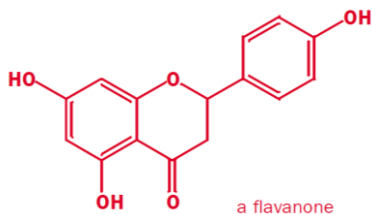
4.) Označite gdje će se naći radioaktivni biljag ako je biosinteza započeta iz šikiminske kiseline označene na C-atomu kako je prikazano:



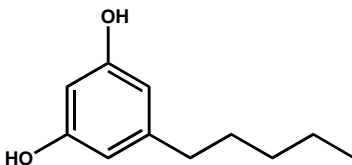
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DOMAĆA ZADAĆA

1.) Biosinteza flavonoida koristi oba puta sinteze aromatskog prstena. Tako jedan prsten nastaje acetatnim putem, a drugi šikimatnim. Prikažite korake u biosintezi flavona.



2.) Predložite biosintezu olivetola. Poli- β -ketonski lanac iz kojeg kreće biosinteza mora sadržavati i $-C(O)SCoA$ skupinu na početku lanca. (Mala pomoć: u sintezi dolazi do reakcije dekarboksilacije, tj. gubitka $COOH$ skupine kao CO_2)



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