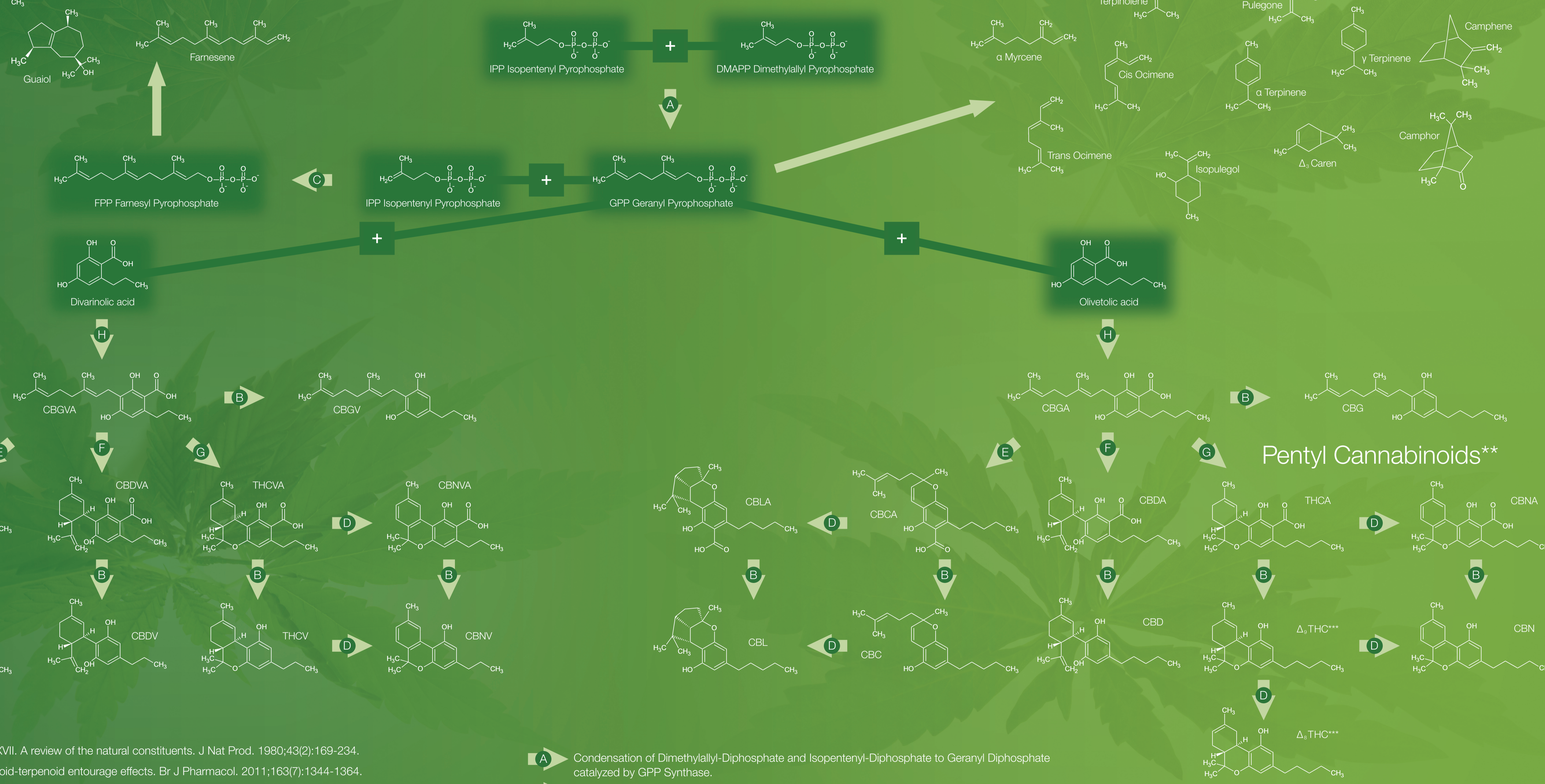
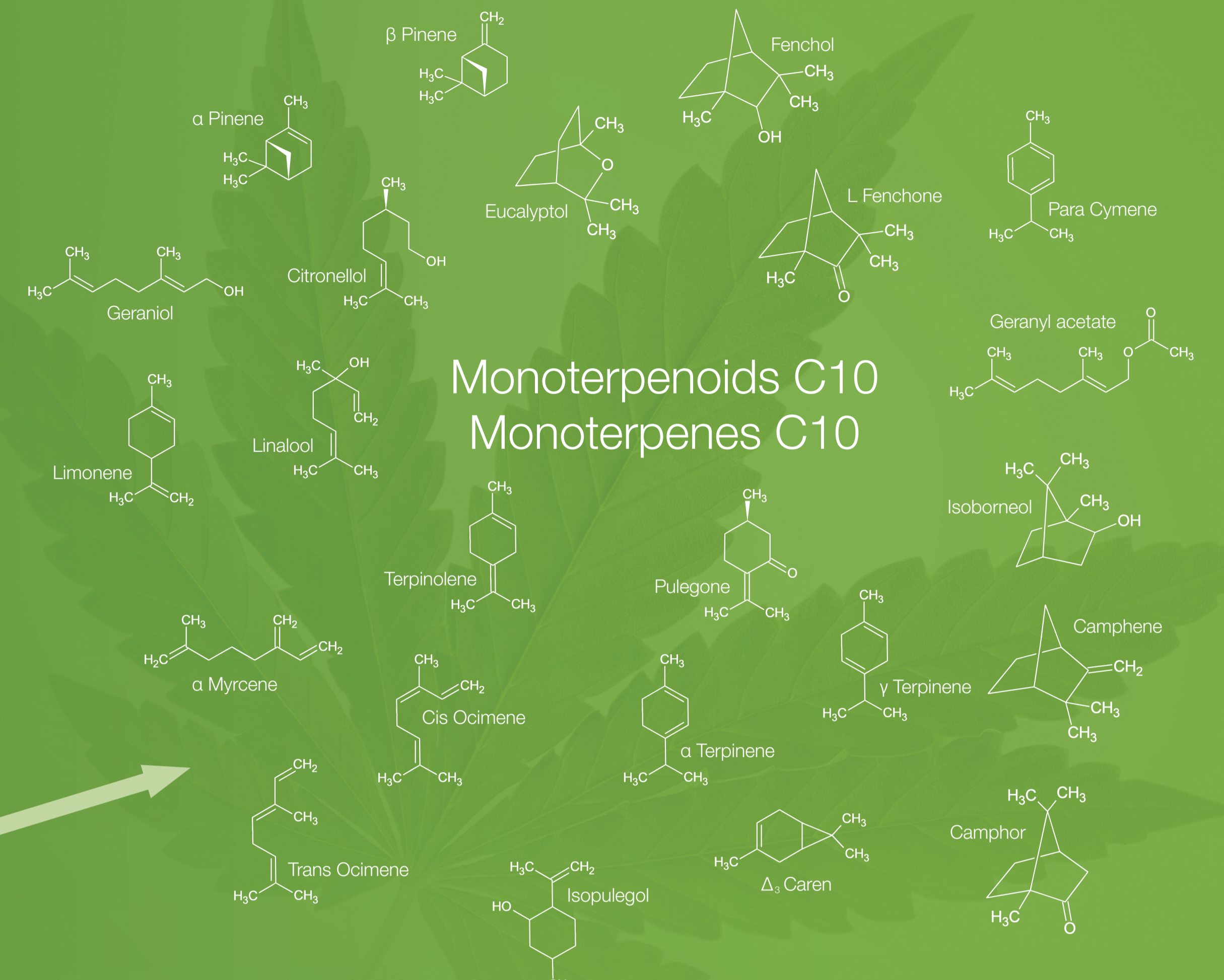
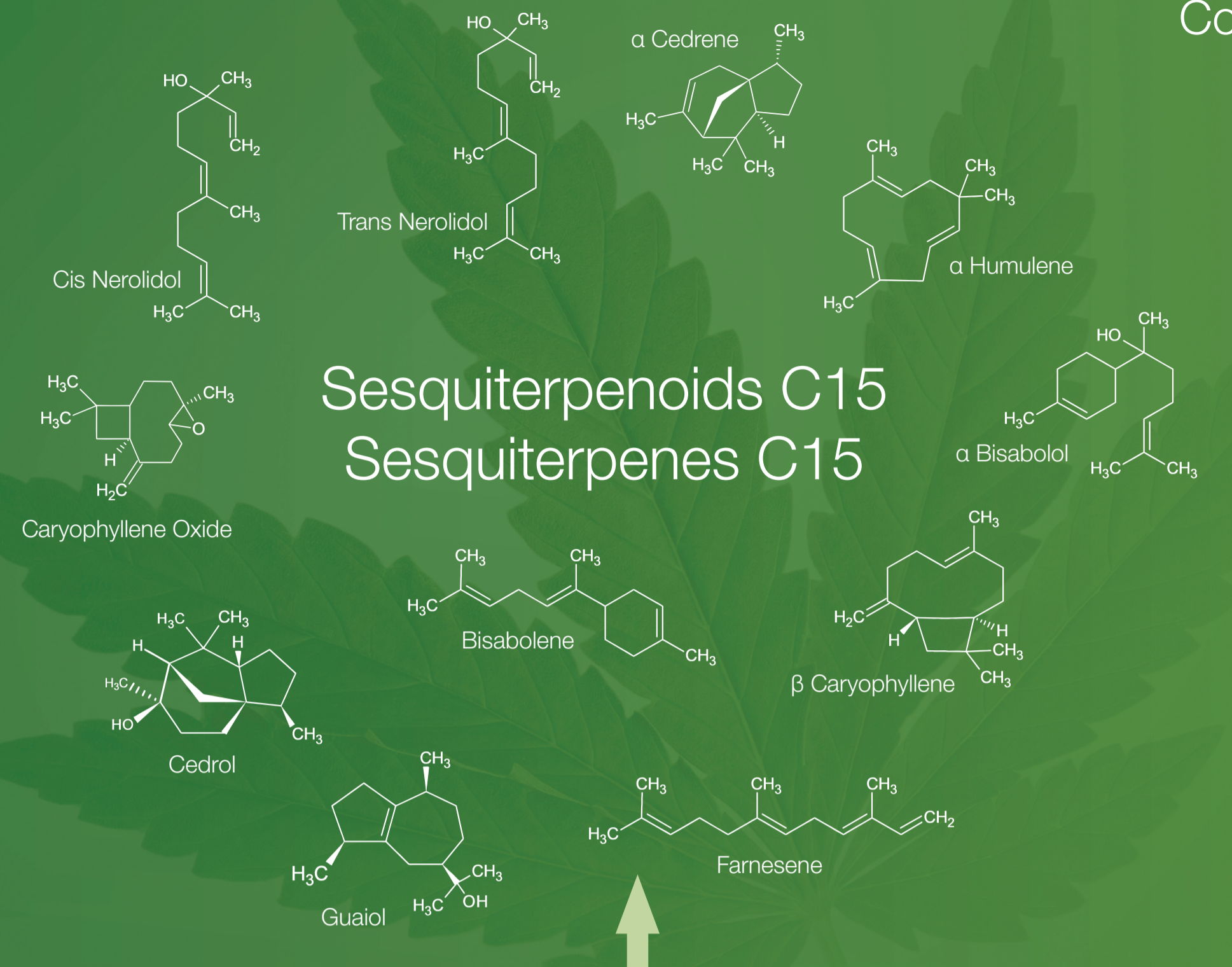


Biosynthetic Pathways of Cannabinoids

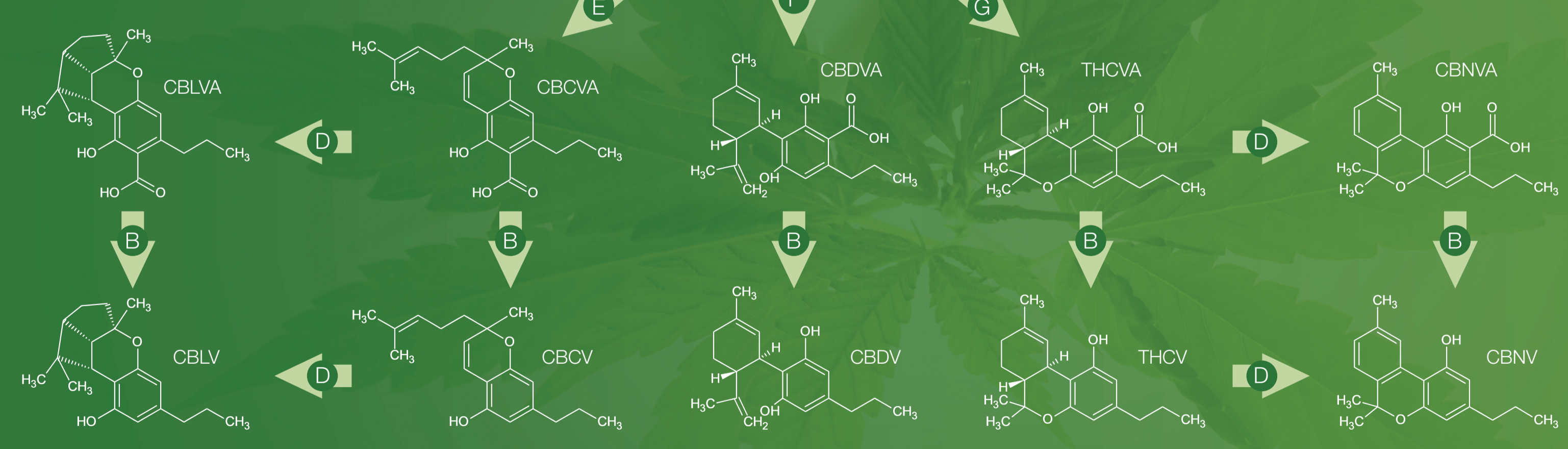
Compilation by Tanja Reither, Institut für Hanfanalytik

CBDV Cannabidivarin
 CBDVA Cannabidivarinic Acid
 CBGV Cannabigerovarin
 CBGVA Cannabigerovarinic Acid
 THCV Tetrahydrocannabivarin
 THCVA Tetrahydrocannabivarinic Acid
 CBCV Cannabichromevarin
 CBCVA Cannabichromevarinic Acid
 CBNV Cannabivarin
 CBNVA Cannabivarinic Acid
 CBLV Cannabicyclovarin
 CBLVA Cannabicyclovarinic Acid

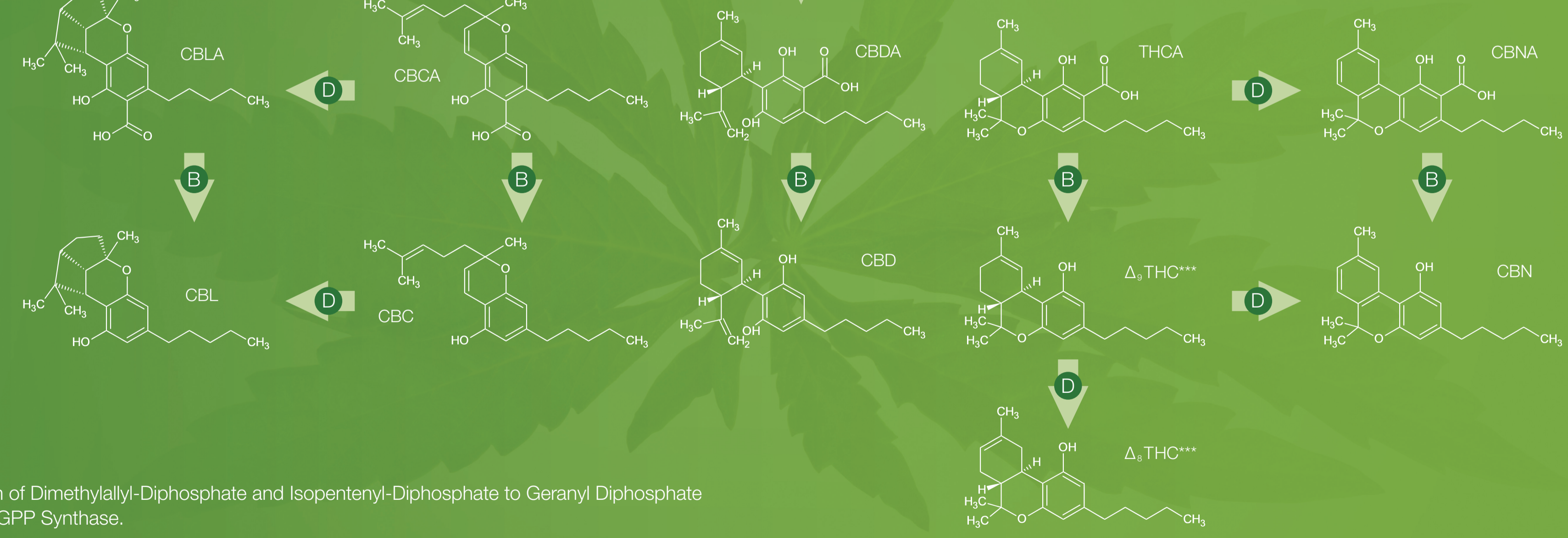
CBD Cannabidiol
 CBDA Cannabidiolic Acid
 CBG Cannabigerol
 CBGA Cannabigerolic Acid
 D9-THC delta 9 Tetrahydrocannabinol
 D8-THC delta 8 Tetrahydrocannabinol
 THCA Tetrahydrocannabinolic Acid
 CBC Cannabichromene
 CBCA Cannabichromenic Acid
 CBN Cannabinol
 CBNA Cannabinolic Acid
 CBL Cannabicyclol
 CBLA Cannabicyclolic Acid



Propyl Cannabinoids*



Pentyl Cannabinoids**



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- A** Condensation of Dimethylallyl-Diphosphate and Isopentenyl-Diphosphate to Geranyl Diphosphate catalyzed by GPP Synthase.
 - B** Decarboxylation, a chemical reaction that removes a carboxyl group (R-COOH) group and releases a CO₂ molecule with the addition of energy (heat, light, etc.).
 - C** Reaction between Geranylpyrophosphate and Isopentenyl Pyrophosphate, catalyzed by FDP Synthase to Farnesyl : Pyrophosphate.
 - D** Oxidative degradation by heat, light, acidic environment, etc.
 - E** Cyclic oxidation catalyzed by CBCA Synthase
 - F** Stereoselective oxidative cyclization of the monoterpene moiety in CBGA/CBGVA by CBDA Synthase
 - G** Oxidative cyclization of the monoterpene moiety of CBGA/CBGVA by THCA Synthase
 - H** Reaction between GPP and either Olivetolic Acid (C5) or Divarinolic Acid (C3) catalyzed by Geranylpyrophosphate : Olivetolate Geranyltransferase
- *Cannabinoids with Propyl (C3) - side chain
 **Cannabinoids with Pentyl (C5) - side chain
 ***Delta # refers to the double bond position
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