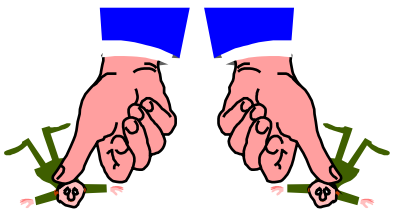
Separation of Optical Isomers (Enantiomers) by Chiral Chromatography

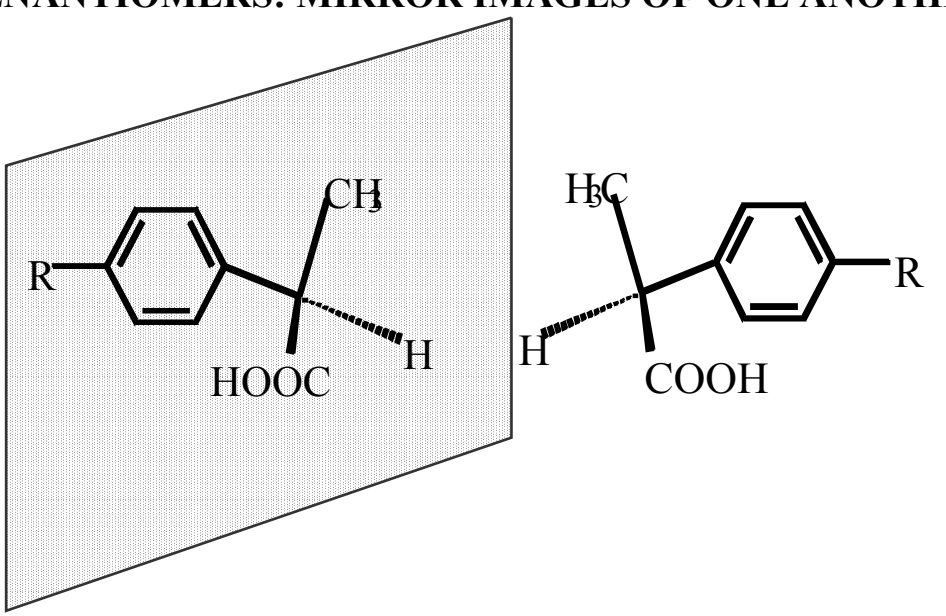


Dr. Shulamit Levin

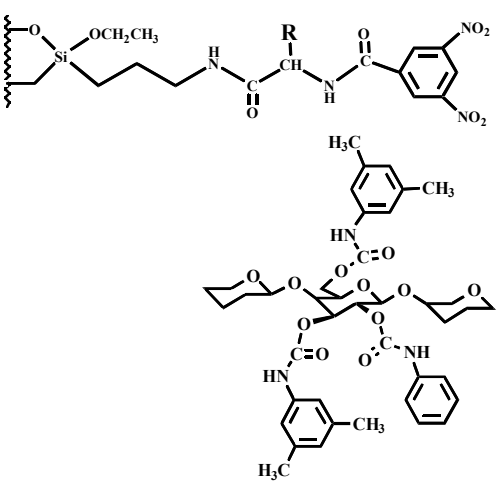
60 seconds on stereochemistry

Asymmetric	**Lacking an alternative axis of symmetry, existing as enantiomers**
Chiral, "handed"	**having the potential to exist as two nonsuperimposable mirror images**
Enantiomers (stereoisomers)	**Two nonsuperimposable compounds, mirror images of one another**
Diastereomers	**Optical isomers that are not mirror images on one another**
Enantioselectivity	**Selective preference of one enantiomer over the other**
Optical activity [(+) or (-)]	**Experimentally observed rotation of the plane of monochromatic plane polarized light**
R or S	**Absolute configuration about a dissymmetric center**
Racemate	**50:50 mixture of two enantiomers**

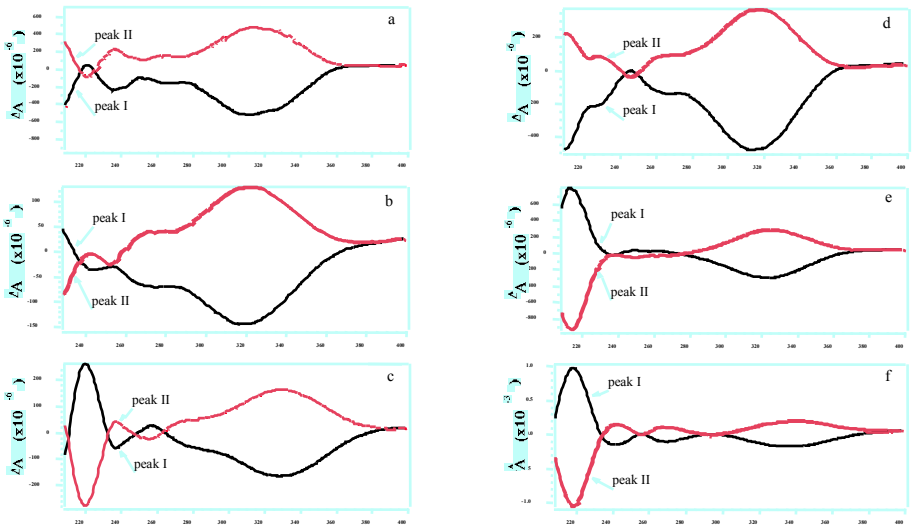
ENANTIOMERS: MIRROR IMAGES OF ONE ANOTHER



Chiral Molecules



Circular Dichroism SPECTRA



Stereospecificity in drug action

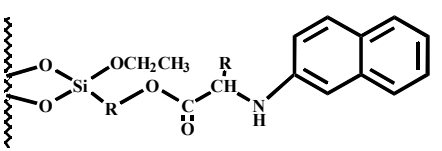
* binding to proteins
* transport through membranes
* receptor recognition
* metabolism
* clearance

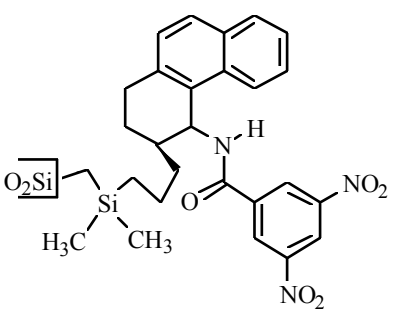
Chiral stationary phases:

* Ligand exchange
* π-Donnor π-acceptor (Pirkle)
* Chiral Host-guest (cyclodextrin)
* Immobilized proteins
* Immobilized polysaccharides

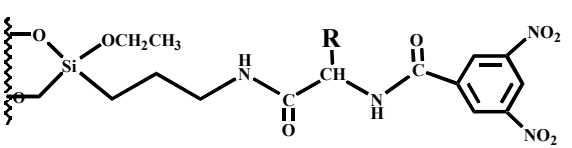
π - Donorπ - acceptor (Pirkle) Type

Napthyl amino acids

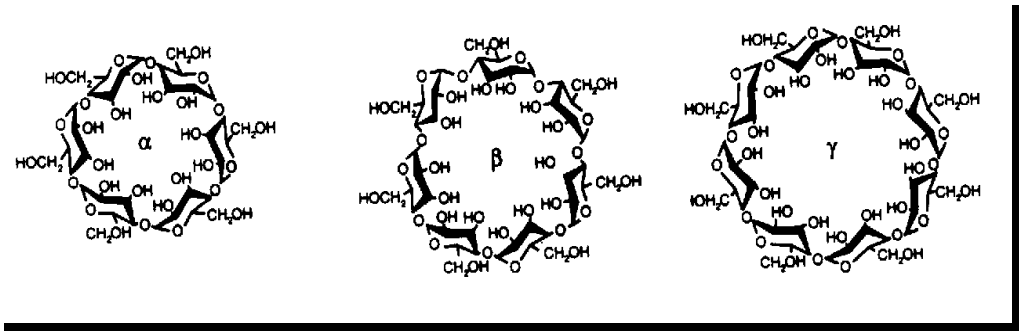




Dinitrobenzoyl amino acids

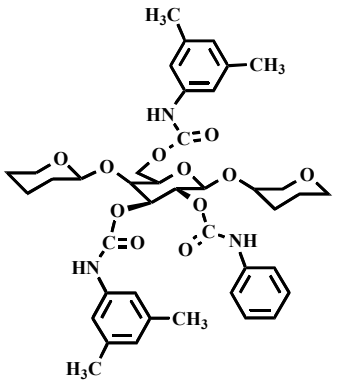


Chiral cavity by cyclodextrins

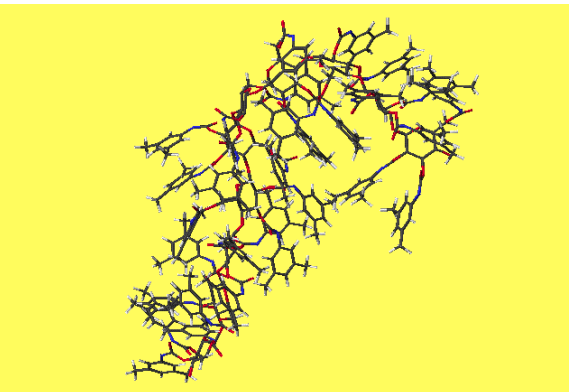


Immobilized polysaccharides:

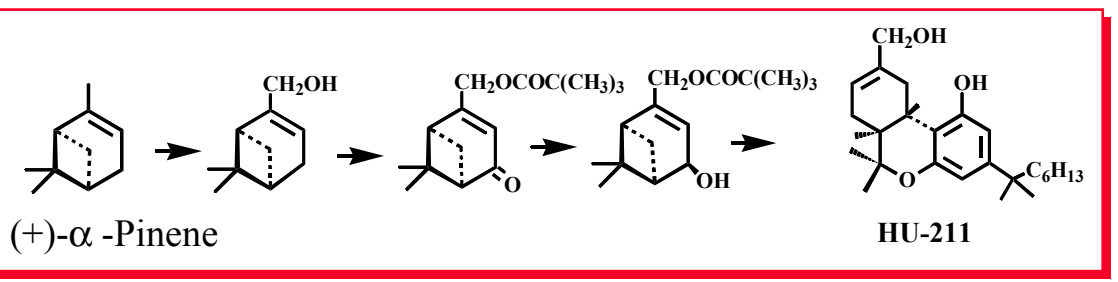
Amylose
or
Cellulose

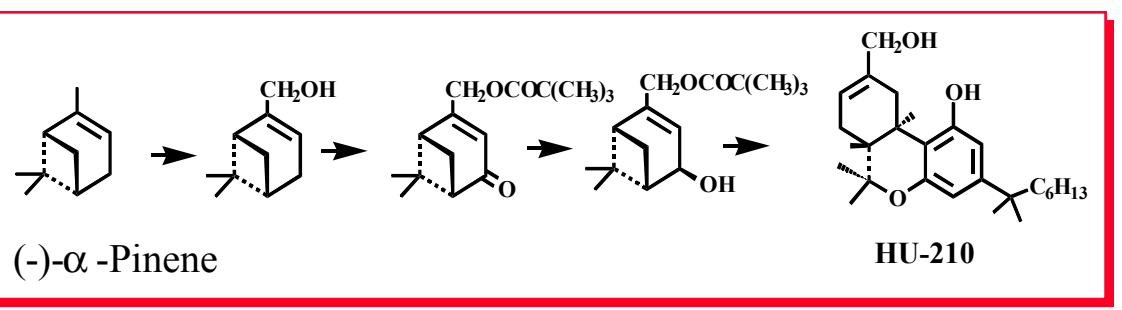


tribenzoate
tris phenylcarbamate
triacetate

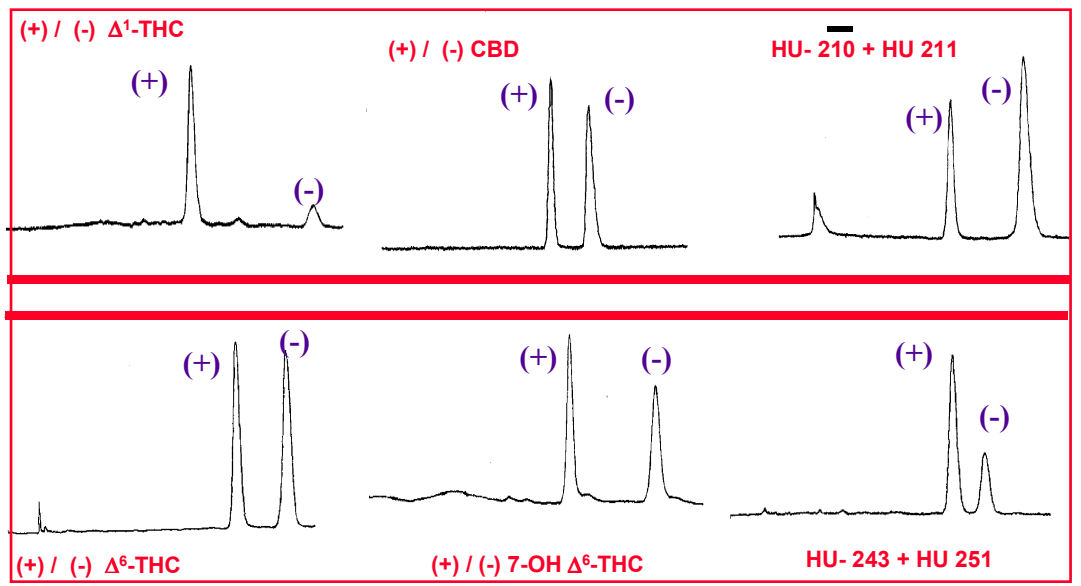


FROM TERPENOIDS TO CANNABINOIDS

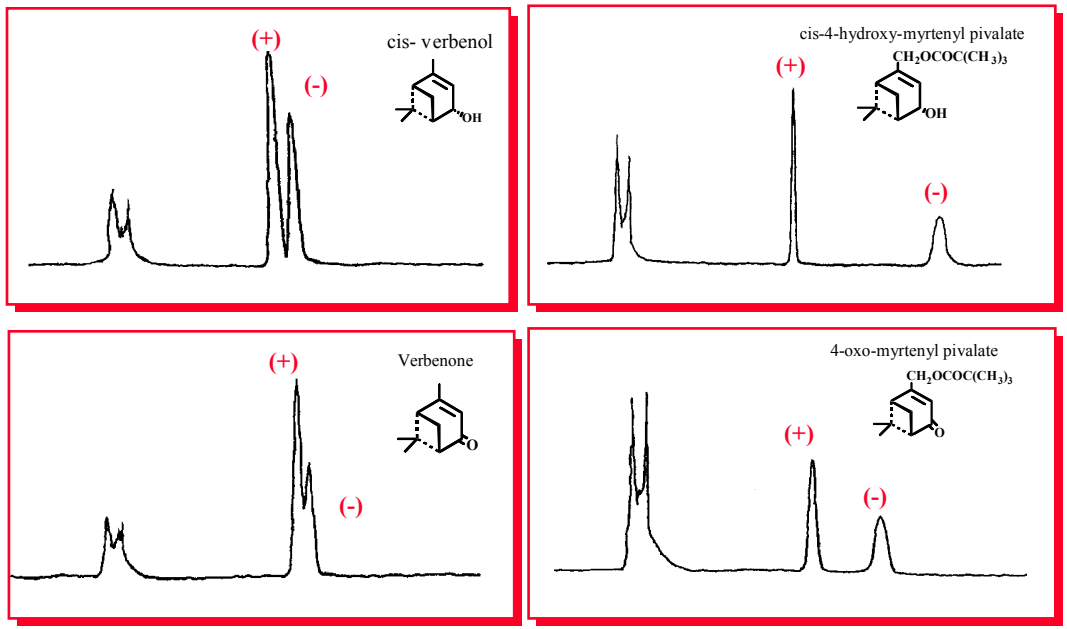




SEPARATION OF 6 ENANTIOMERIC PAIRS OF CANNABINOIDS

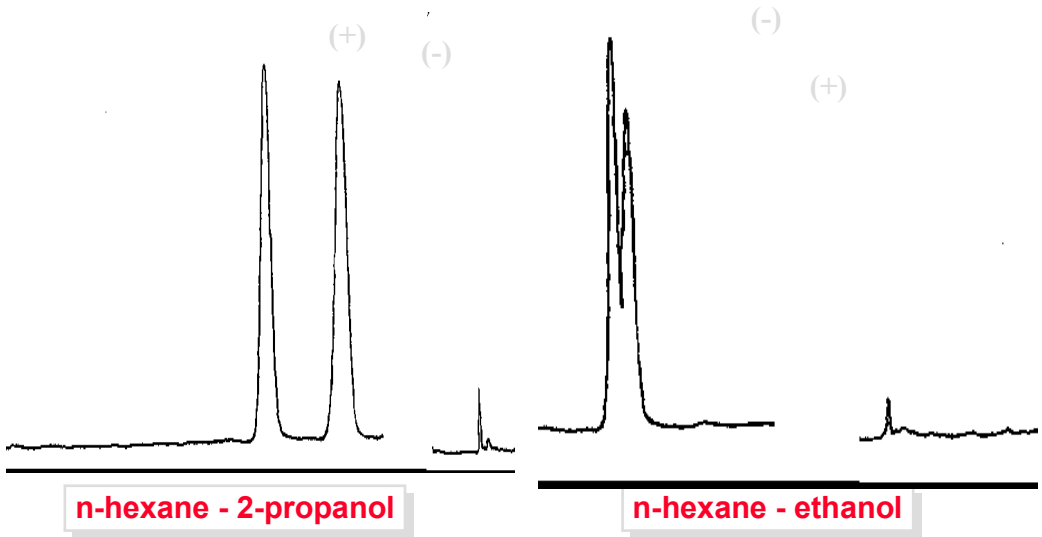


SEPARATION OF ENANTIOMERS OF TERPENOIDS

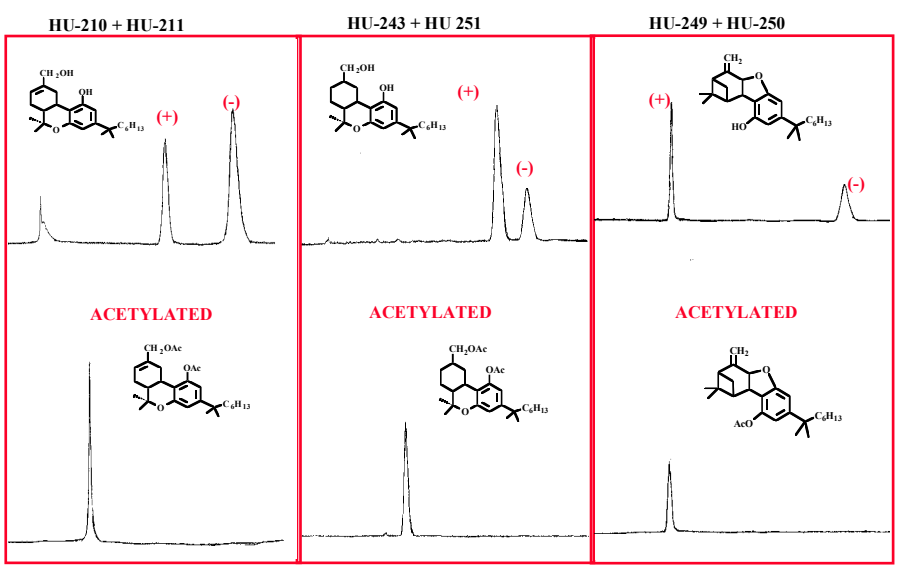


(+) and (-)- Δ^6-THC IN TWO SOLVENTS

REVERSAL OF ELUSION ORDER!



ACETYLATION OF THE -OH GROUP



ACETYLATION OF OH GROUPS ON CANNABIDIOLS