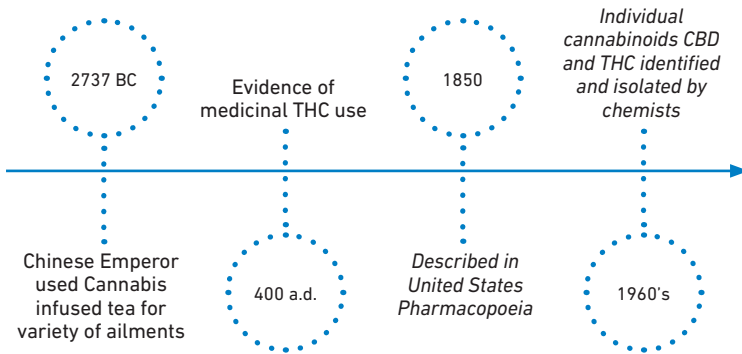


WHY FORMULATE CANNABINOIDS WITH LIPID EXCIPIENTS?

From experience to evidence-based medicine

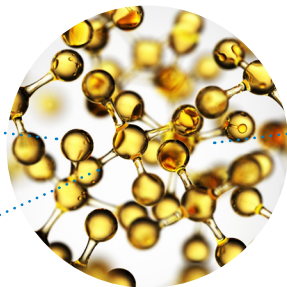


Approved for medicinal use in 28 states in USA
2018 FDA approved Epidiolex
Approval of medicinal CBD - THC medicines in several European countries (Sativex)

What excipients to use?

Lipophilic compounds are soluble in lipids i.e. lipid excipients

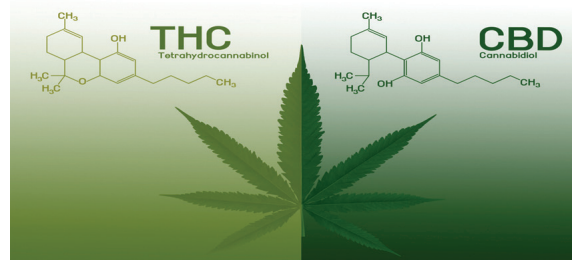
Excipients made with plant oils and fatty acids were specifically designed to solubilize lipophilic actives



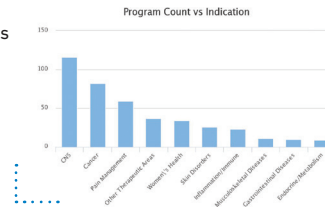
Oils, fatty acid esters and waxes

The compounds

THC = psycho-active compound CBD = non psycho-active compound

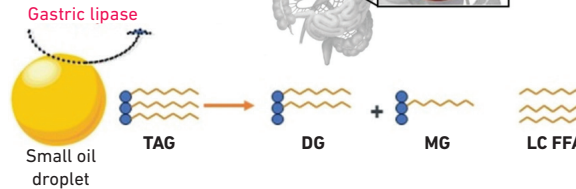


Similar molecular structure
Different physiological effects



How lipid digestion helps absorption

Begins with **gastric lipase** in the stomach



LCFA in Maisine CC, Geloil SC, soybean oil prevent drug precipitation after **lipolysis** and maintain drug available for absorption.

What can formulation do for THC & CBD?

Cannabinoids are grease balls...

CBD & THC lipophilic: LogP >5
Low aqueous solubility

Sensitive to degradation & oxidation

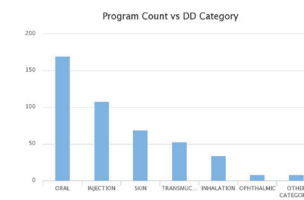
Systemic absorption = highly metabolised in liver (short half life)

Formulation can: increase solubility, increase bioavailability, reducing first pass metabolism, mitigate physico-chemical instability

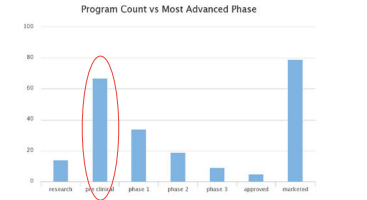
Preferred administration routes for medicinal cannabinoids

Oral	Mucosal (buccal, nasal)	Topical	Rectal
Oily solutions, drops, capsules	Sprays	Creams, Emulgels, Balms	For pediatric/geriatric patients
Maisine® CC Geloil® SC Labrasol® ALF	Transcutol® P Lauroglycol FCC Capryol PGMC	Transcutol® P Labrasol® P Capryol™ PGMC Labrafil® M 1944 CS Gelot® 64	Suppocire® Grades for powder, resin, liquid API Excellent drug dispersion, tolerability and physicochemical stability
Oily vehicles and SEDDS	Alcohol free solvent, Solubilizers, permeation enhancers	Solubilizers, emulsifiers, co-emulsifiers, oily phases, permeation enhancers	

Cannabinoids and drug delivery category



Cannabinoids and drug development stage



Market info from PHARMA.CIRCLE