Cannabis and Pharmacological Applications of Cannaboids

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Background

➢ *Cannabis* is a genus of flowering plants that includes three different species, *Cannabis sativa*, *Cannabis indica* and *Cannabis ruderalis*.

➢Cannabis is a plant that is thought to have been used by humans for over 10,000 years.

➢ Centuries-old Chinese documents describe using cannabis for clothing production, food, and as an agent to communicate with spirits.

➢ Today, marijuana is the most frequently used illicit drug, and the illicit drug that new users are most likely to try.

➢ Certain cannabis plants can be used for making rope or clothing; however, the species *Cannabis sativa* is the plant most often used for its hallucinogenic properties.

➢ The main psychoactive alkaloid contained in marijuana is Δ9-tetrahydrocannabinol (*THC*).

Cannaboids and cannaboid receptors

Cannabinoids : are a class of diverse chemical compounds that act on cannabinoid receptors on cells that repress neurotransmitter release in the brain.

-Two types of cannaboid receptors :

1- Cannabinoid receptor type 1

- CB_1 receptors appear to be responsible for the euphoric and anticonvulsive effects of cannabis.

- brain\ basal ganglia, limbic system and cerebellum.

- effects due to CB1 – THC interaction include: physical relaxation, hyperphagia (increased appetite), increased heart rate, euphoria, decreased muscle coordination, conjunctivitis, and minor pain control .

2- Cannabinoid receptor type 2

-CB2 receptors appear to be responsible for the Immune suppressant effects, induction of apoptosis and Microglial migration.

- Immune system (Spleen) , PNS tissues, digestive system tissues and microglia.

Cannaboid Ligands

Endo-cannaboids

- Anandamide
- Arachidonoylglycerol

Phyto-cannaboids

- Tetrahydrocannabinol
- cannabidiol (CBD)
- cannabinol (CBN)

Synthetic cannaboids

- Dronabinol
- Nabilone
- Rimonabant (SR141716
- JWH-018
- JWH-073
- CP-55940
- Dimethylheptylpyran
- HU-210
- HU-331
- SR144528
- WIN 55,212-2,
- JWH-133
- Levonantradol
- AM-2201

Cannaboid Agents

Drug's name \ code:

Sativex®

THC and CBD (cannabidiol).

Cannaboidergic activity:

Agonist

Pharmacological properties:

Treatment of neuropathic pain and spasticity in patients with Multiple Sclerosis (MS); Analgesic treatment in adult patients with advanced cancer who experience moderate to severe pain.

Approving status:

Most of world countries except USA.

Cannaboid Agents

Drug's name \ code:
Dronabinol / Marinol ®
Synthetic Delta-9 THC.
Cannaboidergic activity:
Agonist
Pharmacological properties:
Treatment of nausea and vomiting for patients in cancer treatment; appetite stimulant for AIDS patients; analgesic to ease neuropathic pain in multiple sclerosis patients.
Approving status:
Denmark and USA.

Cannaboid Agents

Drug's name \ code:
Nabilone / Cesamet ®
Synthetic Delta-9 THC.
Cannaboidergic activity:
Agonist
Pharmacological properties:
Treatment of nausea and vomiting in patients undergoing cancer treatment.
Approving status:
USA, UK, Canada, Australia and Mexico.

Cannaboid Agents

Drug's name \ code:
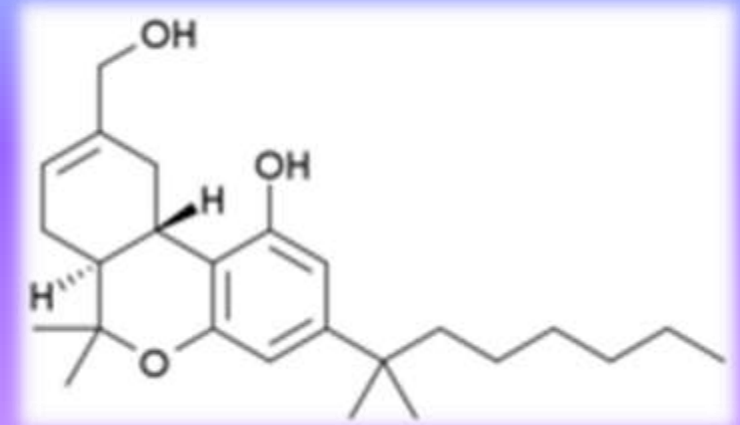Dexanabinol ®
Synthetic Cannaboid.
Cannaboidergic activity:
NMDA antagonist
Pharmacological properties:
Anticonvulsant and Neuroprotective
Approving status:
Empirical.

Cannaboid Agents

Drug's name \ code:
CT-3 (ajulemic acid)
Synthetic, more potent analog of THC metabolite THC-11-oic acid.
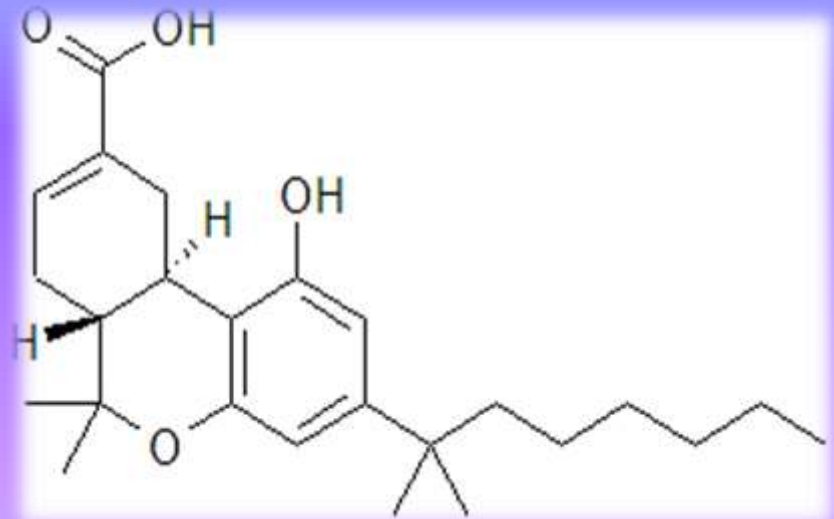**Cannaboidergic activity:**
NMDA antagonist
Pharmacological properties:
Treatment of spasticity and neuropathic pain in MS patients; anti-inflammatory properties may help relieve pain from arthritis
Approving status:
Empirical.

Cannaboid Agents

Drug's name \ code:
Cannabinor (PRS-211,375) .
Synthetic cannaboid.
Cannaboidergic activity:
Synthetic CB2 selective agonist.
Pharmacological properties:
Anti-inflammatory; treatment of chronic pain .
Approving status:
Empirical.

Cannaboid Agents

Drug's name \ code:
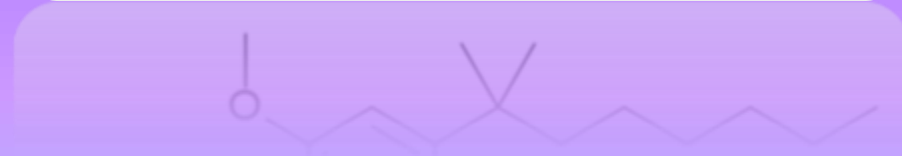HU 308.
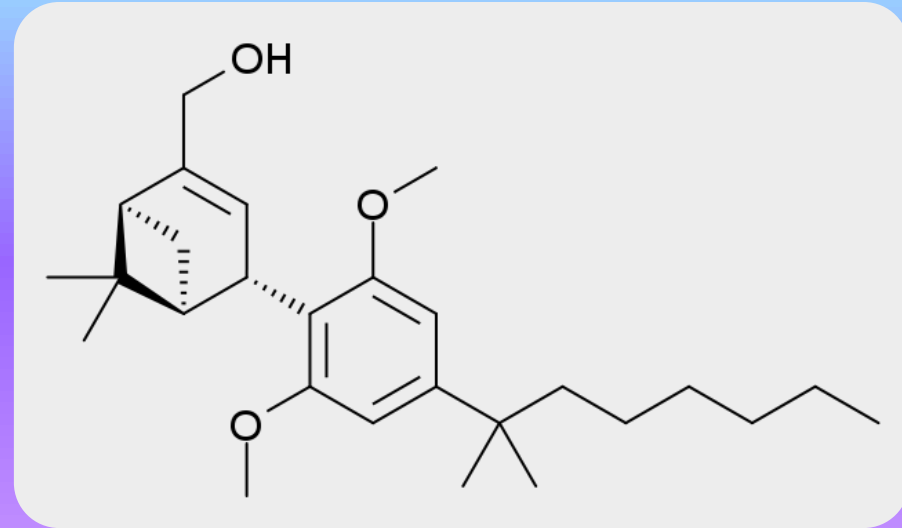Synthetic cannaboid.
Cannaboidergic activity:
Synthetic CB2 selective agonist.
Pharmacological properties:
Anti-inflammatory; Antihypertensive.
Approving status:
Empirical.

Cannaboid Agents

Drug's name \ code:
HU 331.
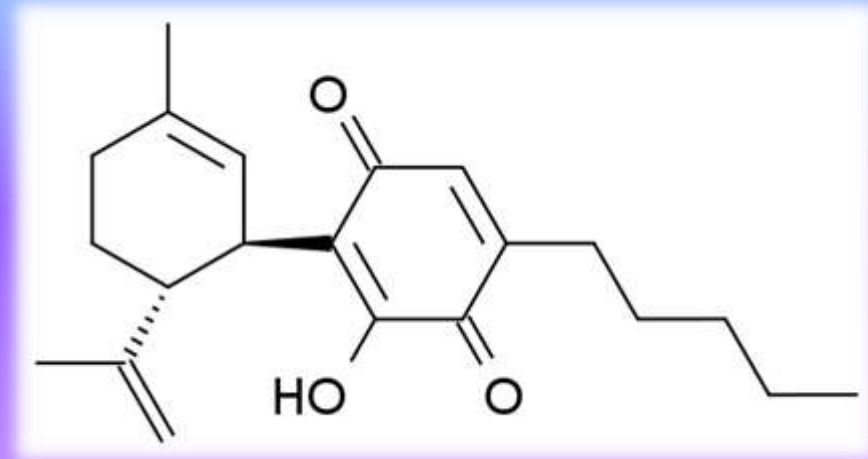Synthetic cannabidol.
Cannaboidergic activity:
Neuro – cannaboid receptor agonist.
Pharmacological properties:
Treatment of memory, weight loss, appetite, neurodegeneration, tumor surveillance, analgesia, and inflammation.
Approving status:
Empirical.

Cannaboid Agents

Drug's name \ code:
Rimonabant / Acomplia®.
Synthetic.

Cannaboidergic activity:
Inverse agonist for the cannabinoid receptor CB1.

Pharmacological properties:
Anti-obesity (appetite reducer).

Approving status:
Not approved.

Cannaboid Agents

Drug's name \ code:
Taranabant / MK-0364.
Synthetic.
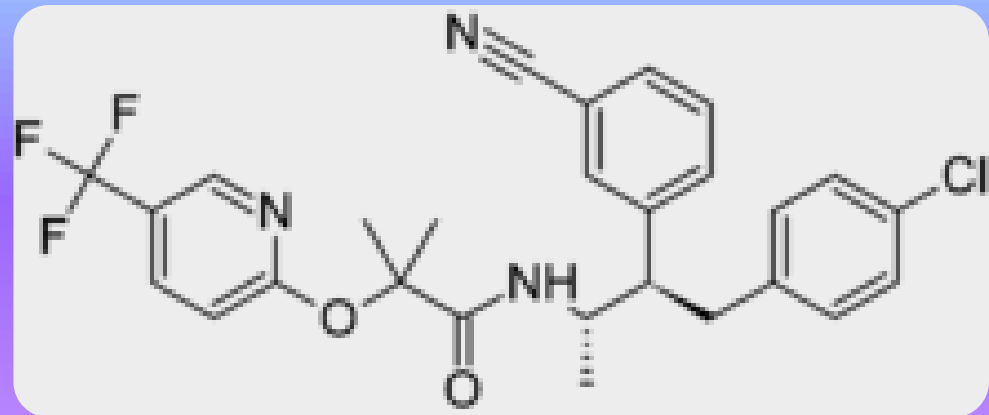**Cannaboidergic activity:**
Inverse agonist for the cannabinoid receptor CB1.
Pharmacological properties:
Anti-obesity (appetite reducer).
Approving status:
Not approved.

Future Researches on cannaboids

❖Possible role as neuro- protective agent against neurodegenrative diseases.

❖possible role as chemotherapeutic agent specially brain tumors.

❖possible role as anti- HIV agent.

❖possible role as anti-obesity agent.

❖possible role to understand dependence mechanisms.

Thanks