

# Cannabinoids and cancer



# 1. PALLIATIVE APPLICATIONS OF CANNABINOIDS IN CANCER

## ⊗ EFFECT

## POTENTIAL THERAPEUTIC APPLICATION



Inhibition of nausea and vomiting

**Chemotherapy-induced nausea and vomiting**  
(Marinol and Cesamet approved)

- Efficacy > D<sub>2</sub> antagonists (metoclopramide)
- Efficacy ≈/< 5-HT<sub>3</sub> antagonists (ondansetron)
- Efficacy vs. NK<sub>1</sub> antagonists? (aprepitant)



Stimulation of appetite and anabolism

**Weight loss, cachexia**

(Cesamet approved; phase III with Marinol)

- Efficacy < Progesterooids (megestrol)

Analgesia

**Pain**

(Sativex phase III/approved; phase III with Marinol)

- Efficacy ≈ Moderate opioids (codeine)



Inhibition of anxiety and depression

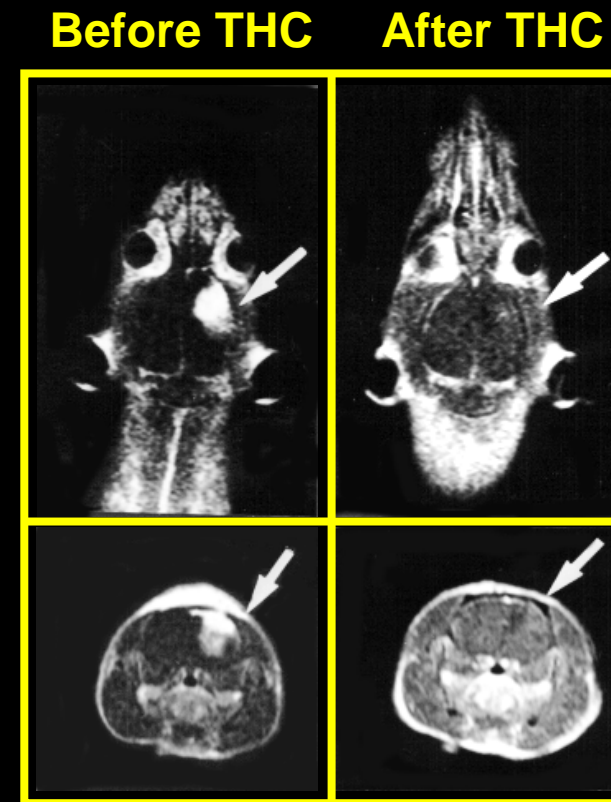
**Anxiety, depression**

(phase II with Marinol, Cesamet and Sativex)

## CONCLUSIONS (1)

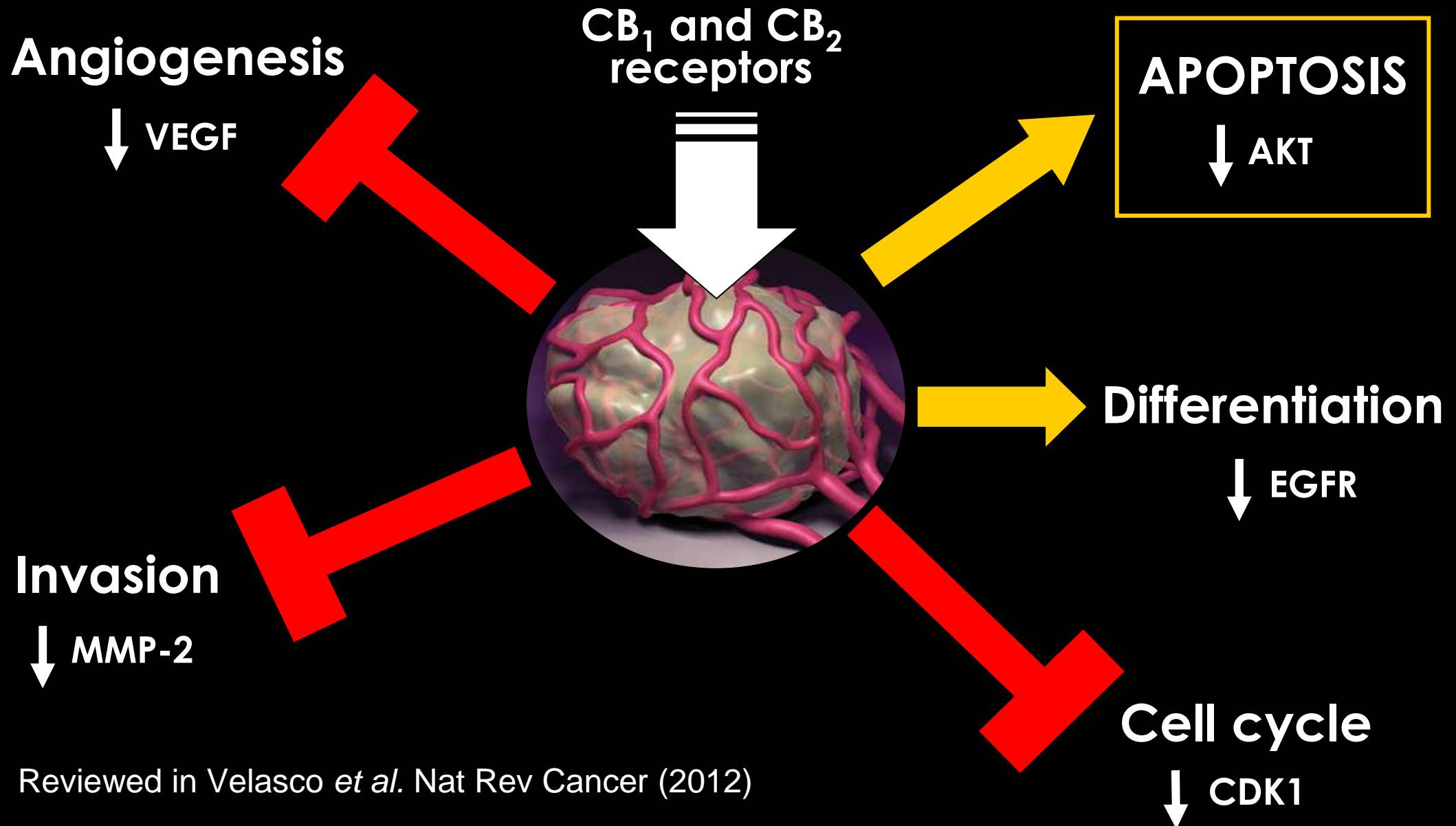
- ③ Cannabinoids are effective as palliative medicines in cancer patients
- ③ Some standard medicines are more effective than cannabinoids to palliate specific symptoms of cancer
- ③ However, cannabinoids can be useful
  - (a) in patients that do not tolerate well those medicines
  - (b) in patients that do not respond well to those medicines (alternative therapy)
  - (c) in patients that do not respond well to those medicines (combinational therapy)
  - (d) in patients with poor overall life quality (one medicine → several effects)

## 2. ANTI-TUMOUR EFFECT OF CANNABINOIDS IN CANCER?



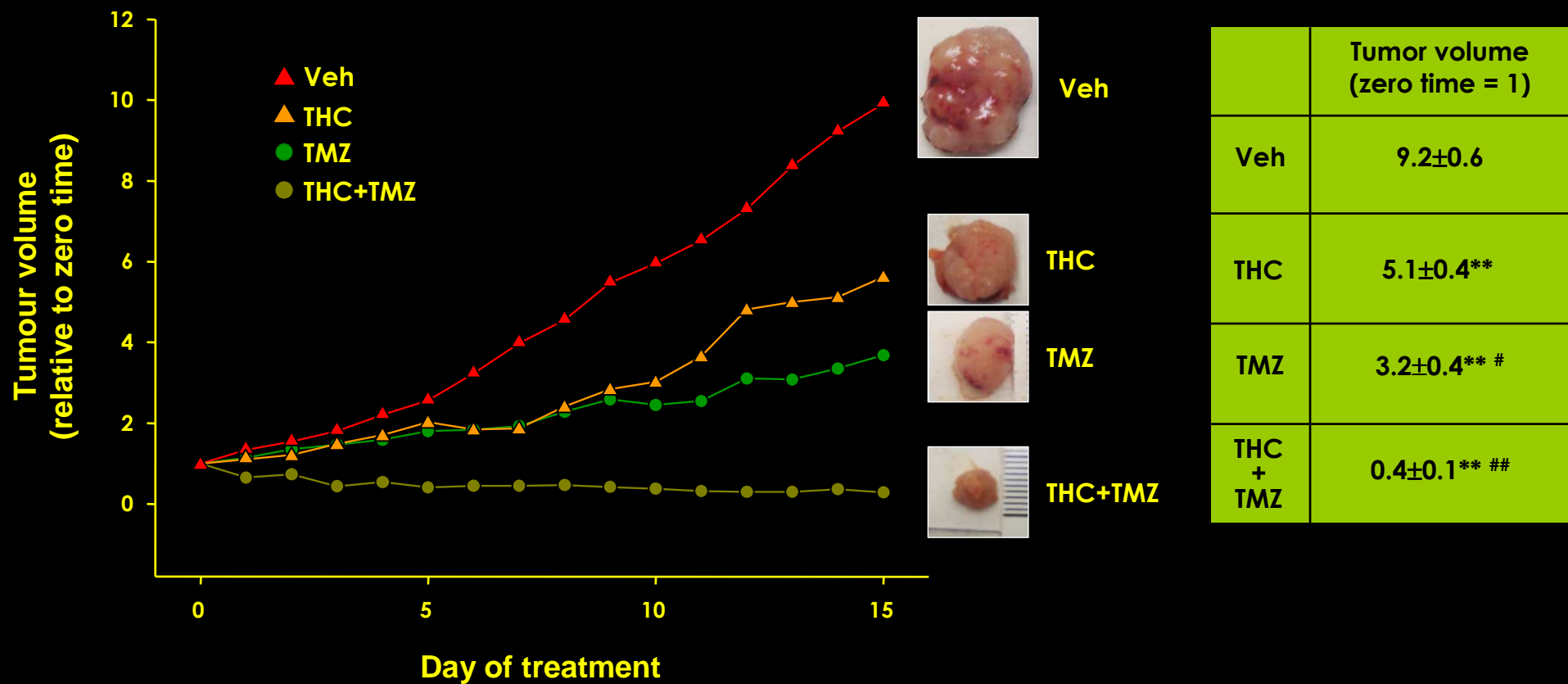
Galve-Roperh *et al.* Nat Med (2000)

# MECHANISMS OF PRECLINICAL ANTI-TUMOUR CANNABINOID ACTION



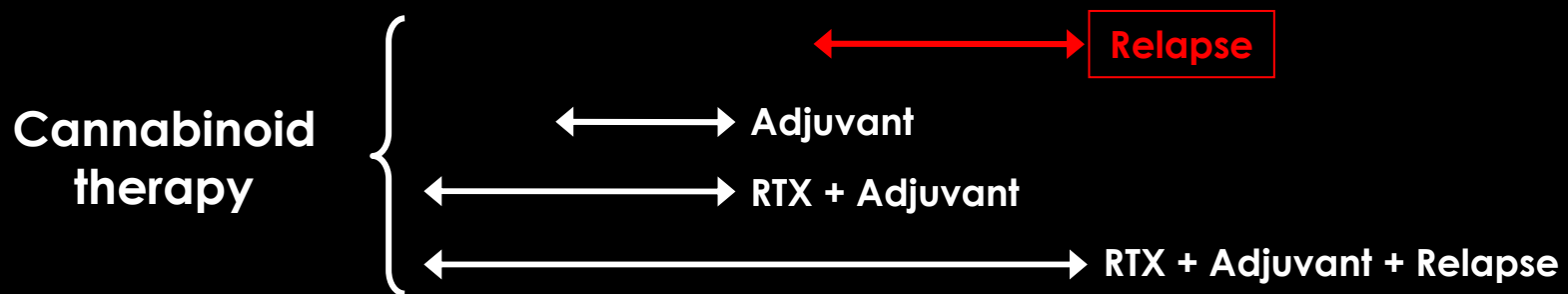
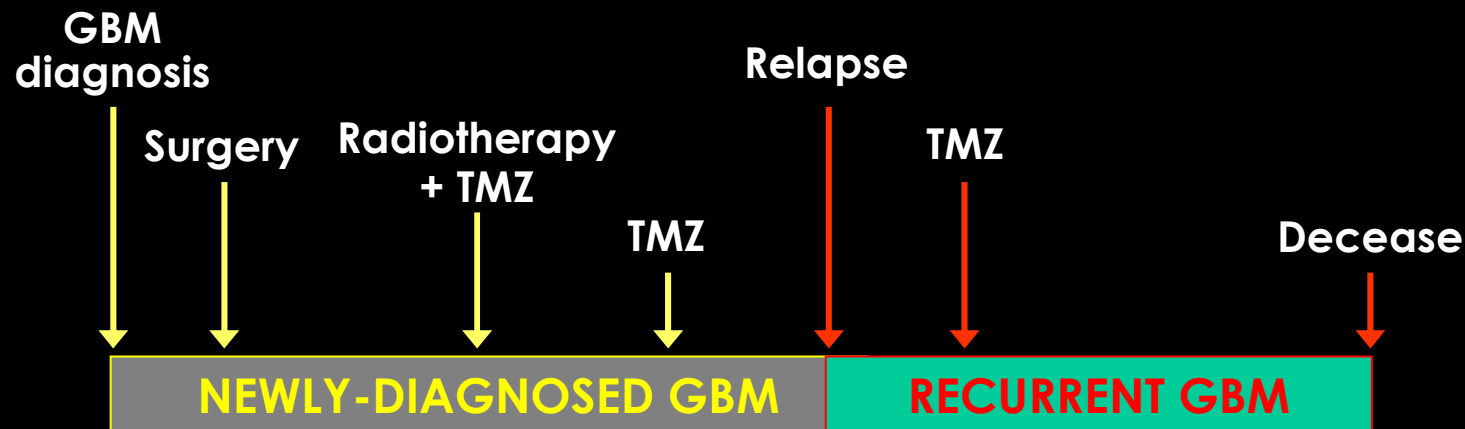
# PRECLINICAL ANTI-TUMOUR THERAPIES WITH CANNABINOIDS

## Glioma cells THC $\pm$ temozolomide treatment



Torres *et al.* Mol Cancer Ther (2011)

# CANNABINOID + TMZ THERAPY FOR GLIOMA PATIENTS?



*ClinicalTrials.gov*

A service of the U.S. National Institutes of Health

## A Safety Study of Sativex in Combination With Dose-intensive Temozolomide in Patients With Recurrent Glioblastoma

This study is currently recruiting participants.

Verified March 2014 by GW Pharmaceuticals Ltd.

Sponsor:  
GW Pharmaceuticals Ltd.

Information provided by (Responsible Party):  
GW Pharmaceuticals Ltd.

ClinicalTrials.gov Identifier:  
NCT01812503

First received: March 14, 2013  
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Last verified: March 2014  
[History of Changes](#)

## CONCLUSIONS (2)

- ③ Cancer is a very serious and heterogeneous disease, so fighting it therapeutically remains an extremely difficult challenge
- ③ PRECLINICAL EVIDENCE: Cannabinoids are efficacious drugs to treat at least some cancer models in laboratory animals –mice and rats
- ③ ANECDOTAL REPORTS: Although it is possible –and desirable- that cannabis preparations have exerted some anti-tumour activity in some particular cancer patients, the current anecdotal evidence is weak
- ③ CLINICAL EVIDENCE: It is necessary –and desirable- that exhaustive clinical studies are conducted to determine whether cannabinoids might be used, other than for their palliative effects, as anti-tumour drugs to treat cancer patients