



ISA Scientific, Inc.TM

1075 Skyler Drive, Draper, Utah 84020 United States of America



Responsible Phytocannabinoid Therapies

United States — Israel — China — Canada

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Mission Statement



Cannabis Plants

Improve health and the quality of life with non-smoked, non-psychoactive therapies based on *Cannabis* plant chemistry

Phytocannabinoids



Trichomes, stalked structures mostly on leaves & flowers, where phytocannabinoids are made

- **Major Phytocannabinoids**

- Cannabidiol, Tetrahydrocannabinol (THC), Cannabigerol, Cannabichromene, Cannabinol, Tetrahydrocannabivarin

- **More than 2,000 Published Scientific Works Indicate Profound Therapeutic Potential**

- Potential for treating pain, sugar metabolism, heart health, immune system function, cancer control, epilepsy & more

- **Resemble Endocannabinoids Made in the Body**

- Interact with particular receptors in the brain, organs, connective tissues, glands and immune cells involved in a variety of physiological processes

Barriers to Acceptance & Use As a Human Therapy

- **Smoking Is Presently the Chief Delivery Method**
 - Unsafe, same toxins as in tobacco
 - Imprecise & unreliable dosing
 - Most people, especially those with respiratory disorders, cannot, should not & will not smoke
- **Nearly All Existing Cannabinoid Products Are Psychoactive**
 - Enjoyable to some, problematic to many
 - Abuse liability, especially youth
 - Limits therapeutic utility
 - Detracts from work, driving, school, sports
- **Poor Bioavailability When Taken by Mouth**
 - Only 6% to the bloodstream

Essential Unmet Need



**Non-Smoked & Efficient Phytocannabinoid
Therapies Devoid of Psychoactive Effects**

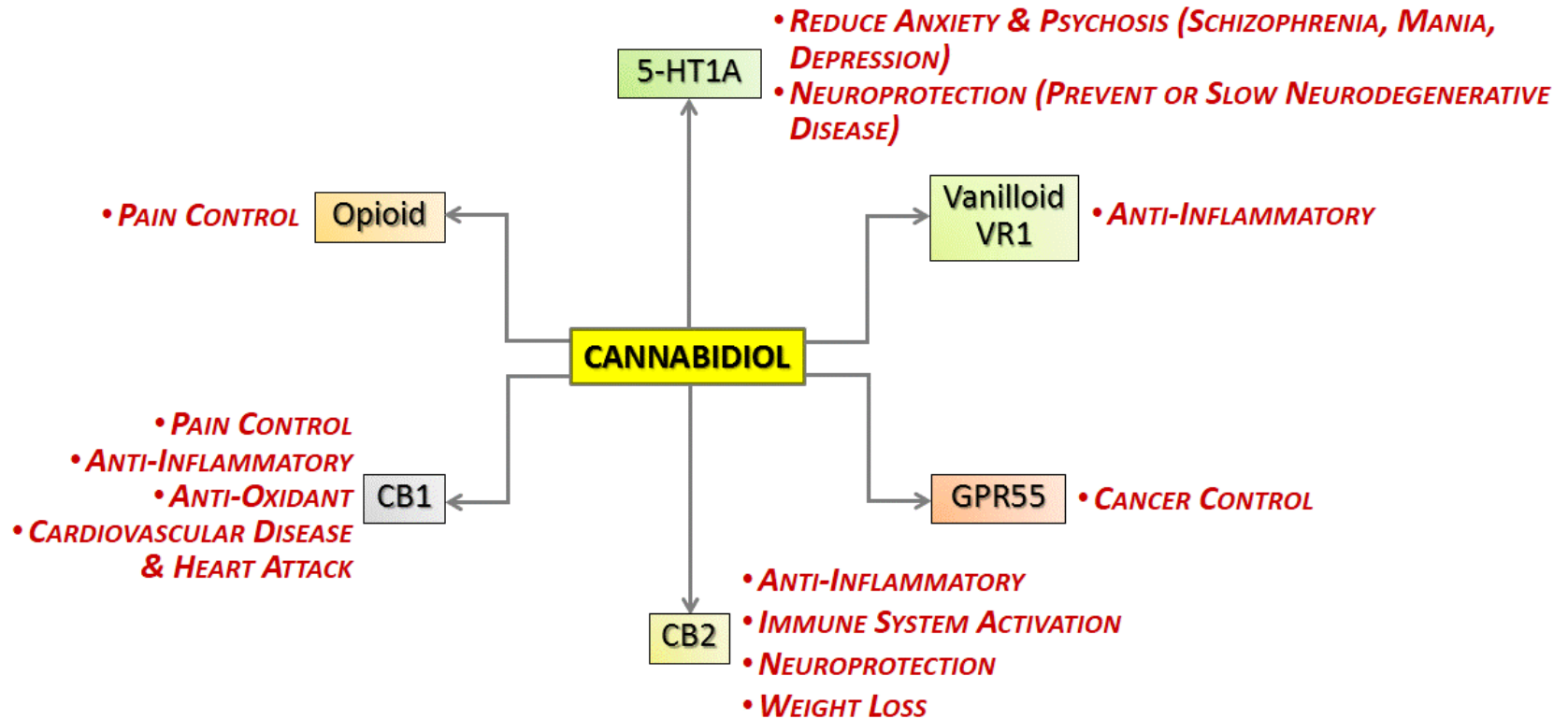
Cannabidiol (CBD)



CBD-Containing Hemp Plant
in Yunnan Province, China

- **Non-Psychoactive**
- **Huge Therapeutic Potential**
 - See Slide 7
- **Notably Abundant in Hemp**
 - A plant normally grown for its fiber, nutritious seeds & edible oil
- **Desirable Safety Profile**
 - Chronic use and higher doses well tolerated
- **Powerful Neuroprotective Antioxidant**
 - Suppresses the chemokine production responsible for inflammation

How CBD Works



- **Interacts with Structures in Living Cells Called Receptors**
- **Turning a particular receptor on or off yields specific effects**
 - Activates or de-activates biological processes

CBD Therapeutic Potential

Chronic Pain

- Provide relief when other treatments cannot

Diabetes

- May stabilize and even reverse diabetes

Heart Attacks

- May prevent or limit heart damage

Atherosclerosis

- May limit or remove arterial plaques

Inflammatory Bowel Disease

- Relieve Crohn's disease & ulcerative colitis

Cancer

- Inhibit or kill cancer cells

Epilepsy

- Reduce or eliminate seizures

Mental Disorders

- PTSD, anxiety, depression, schizophrenia

- **ISA Scientific Owns or Has Rights to Patents & Patents Pending for Conditions Shown in Bold Black Type**

- **ISA Scientific Is Limiting Initial Research Work to Chronic Pain & Diabetes**
 - Current therapies are inadequate
 - Huge unmet need for alternatives

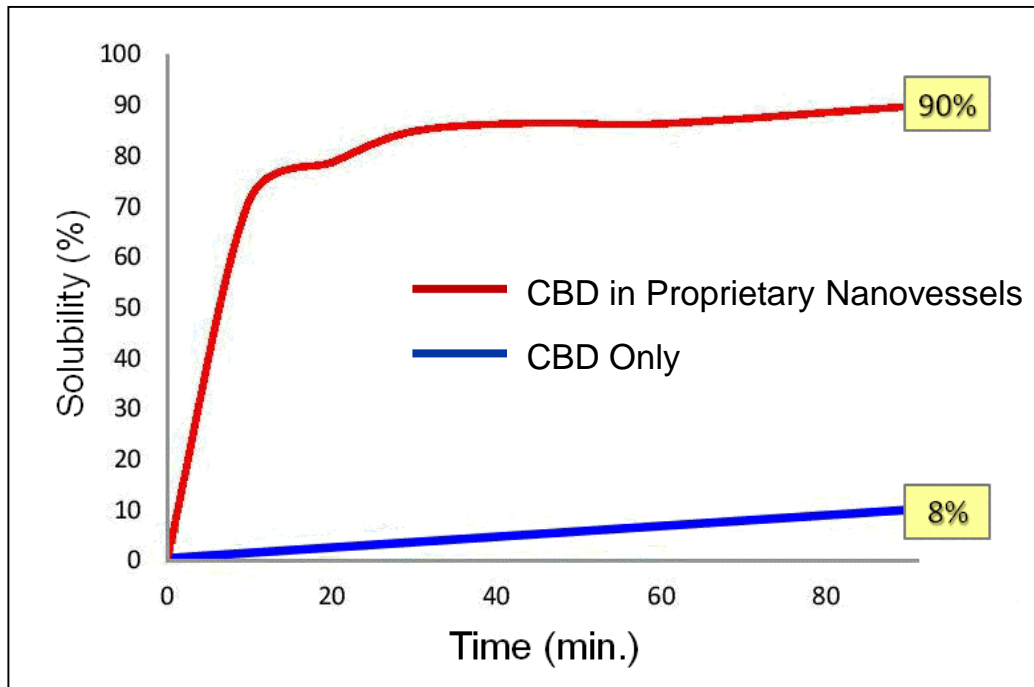
CBD Bioavailability Uniquely Enhanced



Woody, Older Hemp Plants
Guangxi Province, China.

Major Breakthrough & Industry First

Cannabidiol (CBD) Solubility – Intestinal Fluid¹



ISA Scientific

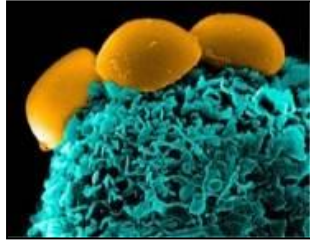
Everyone Else

¹Data on file

• Oral Bioavailability Is Greatly Increased with ISA Scientific's Proprietary Nanotechnology

- By 500% or more
- Rapid time-to-effect anticipated
 - Minutes, not hours like others
- Patented & entering into human trials (see Slide 16)

CBD as a Human Therapy



Nanovessels on the
Surface of a Cell

- **Non-Smoked, Consistent Oral Dosing**
 - ***For the First Time***
 - Patented GRAS¹ nanotechnology (nanovessels)
¹GRAS= Generally-Recognized-As-Safe; deemed safe in foods by the USFDA
 - Proprietary way to inhibit degradation by liver enzymes
 - **Elevated oral potency – uniquely overcomes the poor transit of cannabinoids into the bloodstream**
- **Formulations with Higher Efficacy**
 - Potential of boosting CBD therapeutic utility with other plant-derived substances
- **Legal & Physician Acceptability**
 - CBD is safe – with neither psychoactivity nor potential for abuse or addiction

Initial Attention: CBD for Treating Diabetes & Pain



Sand Rat, *Psammomys obesus*,
the Type 2 Diabetes Model
Used by ISA Scientific

Great & Growing Unmet Need: Diabetes

• Increasing at Extraordinary Rates

- 382 million patients globally, 552 million by 2030
 - \$376 billion in medical costs in 2010, \$490 billion by 2030
- 26 million US patients
 - 10% of all American healthcare costs
- Epidemic in China, more than 114 million patients
 - Economic burden of diabetes a debilitating clinical and public health challenge
 - 300 million pre-diabetics
 - Treatment costs \$46 billion in 2011
 - Treatment consumes more than half of China's annual health budget

• Insulin Therapy Is Problematic

- Huge problems with insulin distribution & storage in China
- Consequent need for more suitable therapies
- There is a serious potential for disease arrest & reversal with CBD

Great & Growing Unmet Need: Chronic Pain

- **Chronic Pain Widespread**

- 1.5 billion people worldwide
 - \$70 billion spent on pain killers in 2012
- 100 million Americans
 - \$35 billion spent on pain killers in 2012

- **Prescription Opioids – Overused & Tragic**

- Fewer than 1 in 10 patients benefit
- Abuse & dependency a growing problem
 - Greater medical costs & longer hospital stays
- About 16,000 US “prescription” deaths in 2012

- **Chronic Pain a Huge Unresolved Problem**

- ***Massive demand for worthwhile alternatives***

Israel & ISA Scientific



Tel Aviv
Skyline

- **R&D at the Hebrew University**

- Ground zero for key cannabinoid discoveries like THC, CBD & the endocannabinoid receptor system
- Key cannabinoid researchers recruited & involved

- **Forward-Looking Medical *Cannabis* Policies**

- Directed by the Israel Ministry of Health
- Progressive stance on human clinical work

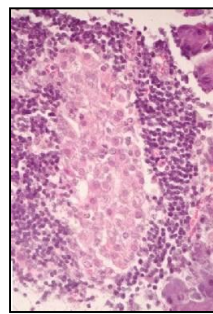
- **Key Patents Acquired**

- Therapeutic use & formulation

- **Production**

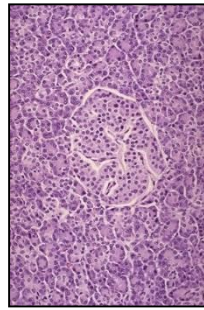
- Plant production, CBD extraction & nanotechnology manufacture in place

CBD & Diabetes – Ongoing R&D



Diabetic

CBD
➔



Healthy

Stimulate or Repair Insulin-Producing
Cells of the Pancreas

- **Potential to Stabilize or Reverse Type 1 (Juvenile) & Type 2 (Lifestyle) Disease – *For the First Time***

- Type 1 medicinal potential initially verified
 - Results published in a critiqued scientific journal
- Type 2 testing in process at Hebrew University

- **ISA Scientific Owns IP**

Human Clinical Trials: CBD in ISA Scientific's Nanovessels



- **Tel Aviv Sourasky Medical Center**
- **Institutional Review Board Approval**
 - Strict adherence to high ethical and academic standards in the conduct of human research
- **Comparing CBD in ISA's Nanovessels with CBD Alone**
- **Looking at Dosing, Safety and Tolerability Before Clinical Work on Specific Health Conditions**
 - Pharmacokinetics — how CBD is absorbed, distributed, metabolized and eliminated by the body
 - Pharmacodynamics — the biochemical and physiological effects of CBD on the body

Chronic Pain – Human Clinical Trials

- Arranged at Renowned Israeli Hospitals

CBD & Diabetic Neuropathic Pain



Rambam Hospital, Haifa



Elon Eisenberg, MD

CBD & Cancer Pain

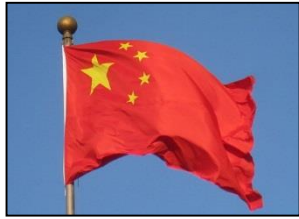


Shaare Zedek Hospital,
Jerusalem



Nathan Cherny, MD

China & ISA Scientific



Hemp in
Yunnan Province, China

- **Exclusively Partnered with China's Only Licensed Hemp Grower**
 - Plans include building a dedicated factory for extracting & refining CBD — **first in the world**
- **China Government Interested in CBD Therapies**
 - To help resolve its diabetes nightmare
 - Largest diabetic patient population in the world, 114 million patients
- **ISA Scientific Experienced in China Medical, Regulatory, Governmental & Business Matters**
 - Developing “cannabinoid” physician education courses in consort with the China government

Canada & ISA Scientific



Hemp Field
Alberta, Canada

- **Legalized Medical Cannabis Use Nationwide**
- **Hemp in Abundance**
 - 55,000 acres planted in 2012 – second only to China
 - But currently cannot be used as a CBD source
- **Canadian Medical Association (CMA)**
 - Does not condone extant cannabinoid use
 - Smoking
 - Unnecessary psychoactivity
 - **CMA supportive of the ISA Scientific approach**
- **Unique Health Canada Licensing in Process**
 - Permission being sought to extract CBD from Canadian hemp, laboratory studies & human use
 - **First approval of this sort in Canada**

Key Personnel

The skills & experience – intellectual, technical & operational – needed to go from concept through product release & sales

Key Personnel

- **Mark J. Rosenfeld, M.S., Ph.D. – CEO, Science**

- Founder & Chief Science Officer, Serocin Research & Technology
- Founder & Chief Science Officer, Impact Diagnostics
- Chief Science Officer, DxNA
- Advisor, China Health Ministry
- US Delegate, Joint United Nations FAO/IAEA Committee on Transboundary Diseases
- Visiting Scholar, Peking University
- 1 IPO & 1 acquisition

- **Perry G. Fine, M.D. – Medical Director**

- Board Certified: Anesthesiology, Pain Medicine, Hospice and Palliative Medicine
- President Emeritus, American Academy of Pain Medicine
- Professor of Anesthesiology, University of Utah
- Member, FDA Advisory Board – Opioids
- 2 companies through IPO

- **Giora Meyuhas, M.B.A. – Israel Director**

- Israel Economic Minister to North America
- President & CEO, Gadot Petrochemicals Industries
- Director, Baran Group Ltd.
- Director, First International Bank Israel Ltd
- Multiple companies through IPO, acquisition & merger

Key Personnel

- **Ruth Gallily, Ph.D. – *Cannabis* Pharmacology**
 - Principal Investigator, ISA Scientific Cannabidiol & Diabetes Studies
 - Professor, Hebrew University - Lautenberg Center of General and Tumor Immunology
 - Pioneer in therapeutic CBD use
- **Susan Alpert, M.D., Ph.D. – Regulatory & Clinical**
 - Director, USFDA Office of Device Evaluation
 - Senior Vice President – Global Regulatory Affairs, Medtronic
 - Vice President – Regulatory Sciences, C.R. Baird, Inc.
 - Executive Committee, Clinical Trials Transformation Initiative
 - Past Chair & Fellow, Regulatory Affairs Professional Society
 - Board of Advisors, Medical Technology Leadership Forum
- **Kyle Yang, M.B.A. – China Director**
 - North American Representative, China Continuing Medical Education
 - General Director, Beijing Transpacific IP Technology Development (with Paul Allen -- Microsoft)
 - First student from People's Republic of China to attend Harvard

Key Personnel

- **Anthony R. Torres, M.D. – Biological Extraction & Purification**
 - Director, Biomedical Laboratory, Center for Persons with Disabilities, Utah State University
 - Research Associate, National Cancer Institute, National Institute of Health
 - Assistant Professor, Yale University
- **Harold (Hal) Gutterman, M.B.A. – Chief Financial Officer**
 - Founder & Chief Operating Officer, F Cubed
 - Founder & Senior Vice President, Intelligent Optical Systems
 - Senior Consultant (Business Development), Honeywell International
 - Director of Operations, Raphael Advanced Defense Systems
- **Lee Hollaar, Ph.D. – Intellectual Property Strategy**
 - Visiting Scholar, US Court of Appeals for the Federal Circuit
 - Multiple amicus (friend of the court) briefs, US Supreme Court
 - Fellow, Intellectual Property Unit, Judiciary Committee, US Senate
 - Registered Patent Agent

Intellectual Property (IP) Estate



• Critical IP Protection in Place

- Patents & patents pending
- Efficient, non-smoked cannabinoid delivery
 - Nanotechnology to greatly increase oral & oro-buccal cannabinoid bioavailability
 - Methods to inhibit cannabinoid degradation in the liver
 - Both using substances deemed safe by USFDA
- Cannabinoids for specific diseases or conditions
 - Diabetes, atherosclerosis, heart attacks, inflammatory bowel disease, liver cirrhosis, hepatic encephalopathy

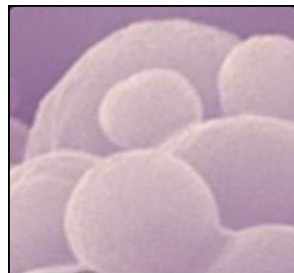
• Further In-House IP Creation & Licensing Ongoing

ISA Scientific Advantage

- **Oral Bioavailability Dramatically Enhanced**
 - Efficient, non-smoked & consistently-dosed cannabinoid products – *for the first time*
- **Chronic Pain Demands Products that Work**
 - CBD alleviates pain, even when other therapies do not
 - World's *first* non-psychoactive, non-smoked & effective oral cannabinoid pain therapeutic
- **Diabetes Needs New, Effective Therapies**
 - Disease oftentimes inadequately controlled
 - CBD seems to uniquely stimulates the pancreatic beta-cells that make insulin
- **Solid IP Portfolio**
 - Exclusive ownership of key IP for formulation & therapies
- **Personnel**
 - The skills and experience needed for success

ISA Scientific Advantage

- **Evidence-Based Laboratory and Human Clinical Studies**
 - Conspicuously deficient within the cannabinoid industry
 - At accredited universities and major medical centers
 - Credibility & demand from published studies
- **Cannabinoid Stability or Storability**
 - **Cannabinoids unstable once extracted from plants**
 - Breakdown at room temperature and when exposed to air
 - Less than label claims in many products
 - Even none in some
 - **Potency retained in ISA Scientific's nanovessels**
 - Prolonged shelf life without refrigeration



Filled
Nanovessels

ISA Scientific Advantage

- **Continuing Medical Education (CME)**

- Essential for educating physicians about the medicinal possibilities of cannabinoids
- Being developed by ISA Scientific
 - Medscape, largest online CME provider
 - China government CME (largest medical market in the world)
- Recruit physicians to the ISA Scientific perspective

Vision



ISA Scientific R&D Center
Hebrew University
Jerusalem, Israel



China Joint Venture Office
Yunnan Industrial Hemp
Kunming, China

- To be the most innovative, recognized & responsible name in cannabinoid health products
- To gain a large worldwide customer base through creativity, proficiency, integrity, education, teamwork & the desire to deliver great value for investment



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Helping to Heal the World

帮助世界