MASSACHUSETTS GENERAL HOSPITAL
PSYCHIATRY ACADEMY

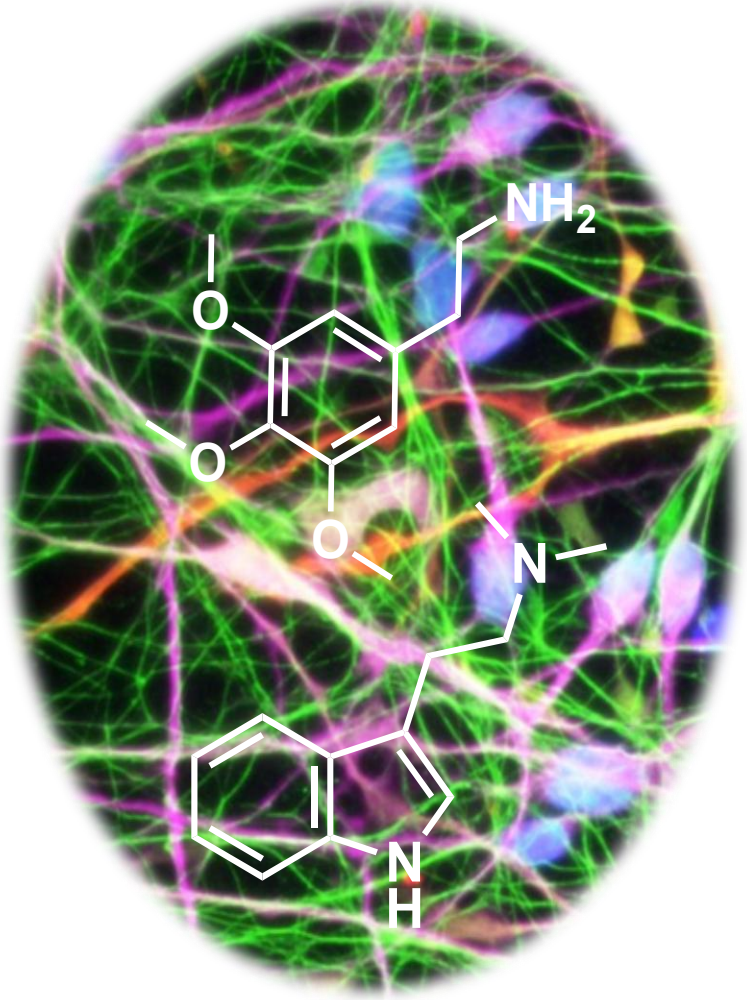
From Nature to Neuroscience:

Novel Plant-Derived Psychedelics & Modeling Human Brain Plasticity

Stephen J. Haggarty, PhD

Professor of Neurology, Harvard Medical School

Scientific Director, Neurobiology, Mass General Center for the Neuroscience of Psychedelics, Department of Psychiatry, Massachusetts General Hospital, Boston, MA



5th Annual Conference on Psychedelics & Psychedelic Medicine | November 14, 2025

Disclosures

Dr. Stephen Haggarty: My spouse/partner and I have the following relevant financial relationships with a commercial interest to disclose.

Company	Nature of Financial Relationship	Status Past 2 Years
Proximity Therapeutics	Equity, Consultant, Scientific Advisory Board	active
Sensorium Therapeutics	Equity, Consultant, Scientific Advisory Board	active
4M Therapeutics	Equity, Consultant, Scientific Advisory Board	active
Psy Therapeutics	Equity, Consultant, Scientific Advisory Board	active
Birdwood Therapeutics	Equity, Consultant, Scientific Advisory Board	active
Manhattan Neuroscience	Equity, Consultant, Scientific Advisory Board	active
Entheos Labs	Sponsored Research Support at MGH; Consultant, Scientific Advisory Board	active
Ilios Therapeutics	Consultant, Scientific Advisory Board	active
Biohaven Pharmaceuticals	Consultant	active
Alzheimers' Drug Discovery Foundation	Honorarium, Scientific Advisory Board	active
Fondazione Carpilo	Honorarium, Scientific Advisory Board	active
Lexicon Therapeutics	Sponsored Research Support at MGH	ended
Compass Pathways	Sponsored Research Support at MGH	ended
atai Life Sciences	Sponsored Research Support at MGH	ended
JW Pharmaceuticals	Sponsored Research Support at MGH	ended
Stealth Biotherapeutics	Sponsored Research Support at MGH	ended

Wide Spread Use of Psychoactive Plants in Modern Society

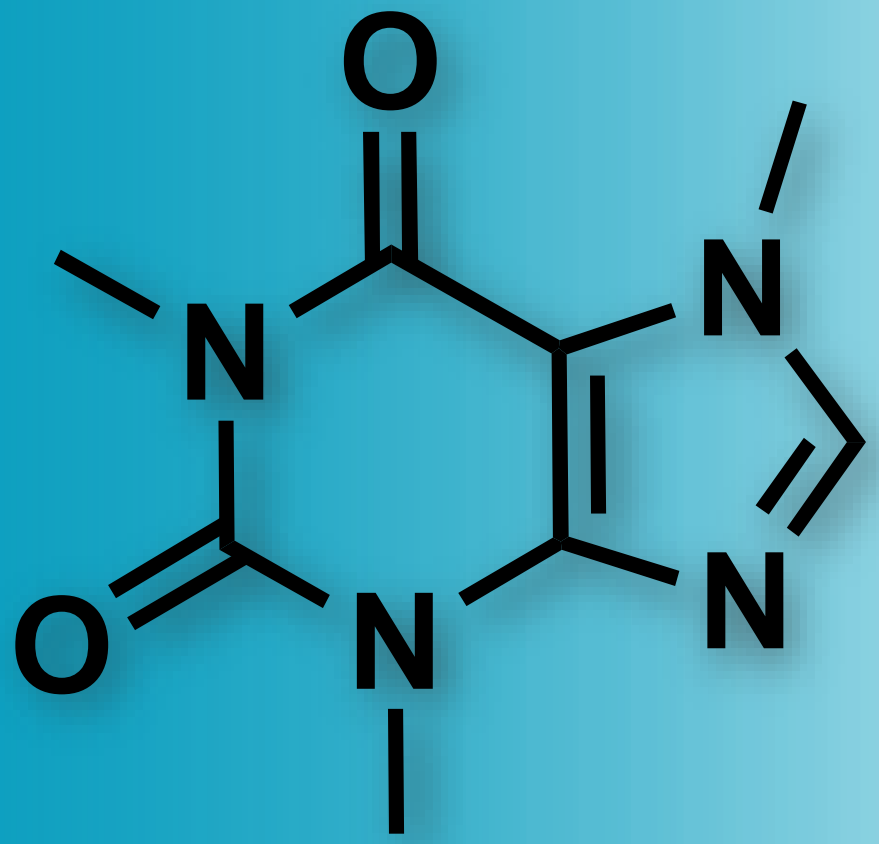
Coffee: ***Coffea arabica***

Black Tea: ***Camellia sinensis***

Mate: ***Ilex paraguariensis***

(Source: Köhler. *Medizinal Pflanzen*, 1897)

Wide Spread Use of Psychoactive Plants in Modern Society



Caffeine
(1,3,7-trimethylxanthine)

- Central Nervous System Stimulant
- Antagonist of Adenosine Receptors
- Belongs to Alkaloid Compound Class

Early Interest in Understanding Mechanisms of Human Brain Plasticity

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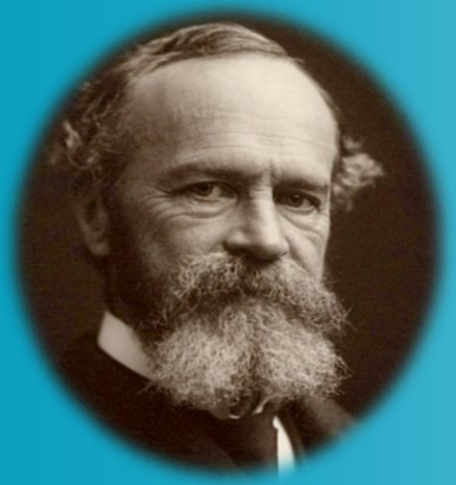

Dr. William James
Principles of Psychology (1890)

*"**Organic matter**, especially **nervous tissue**, seems endowed with a very extraordinary **degree of plasticity**……phenomena of **habit** in living beings are **due to the plasticity of the organic materials**…"*

Noetic Sense: "profound sense of knowledge & states of insight into depths of truth unplumbed by the discursive intellect" (***The Varieties of Religious Experience, 1902***)

Psychedelic Treatments: Imaging, Physiology & Clinical Studies Implicate Plasticity in Specific Brain Regions & Neurons

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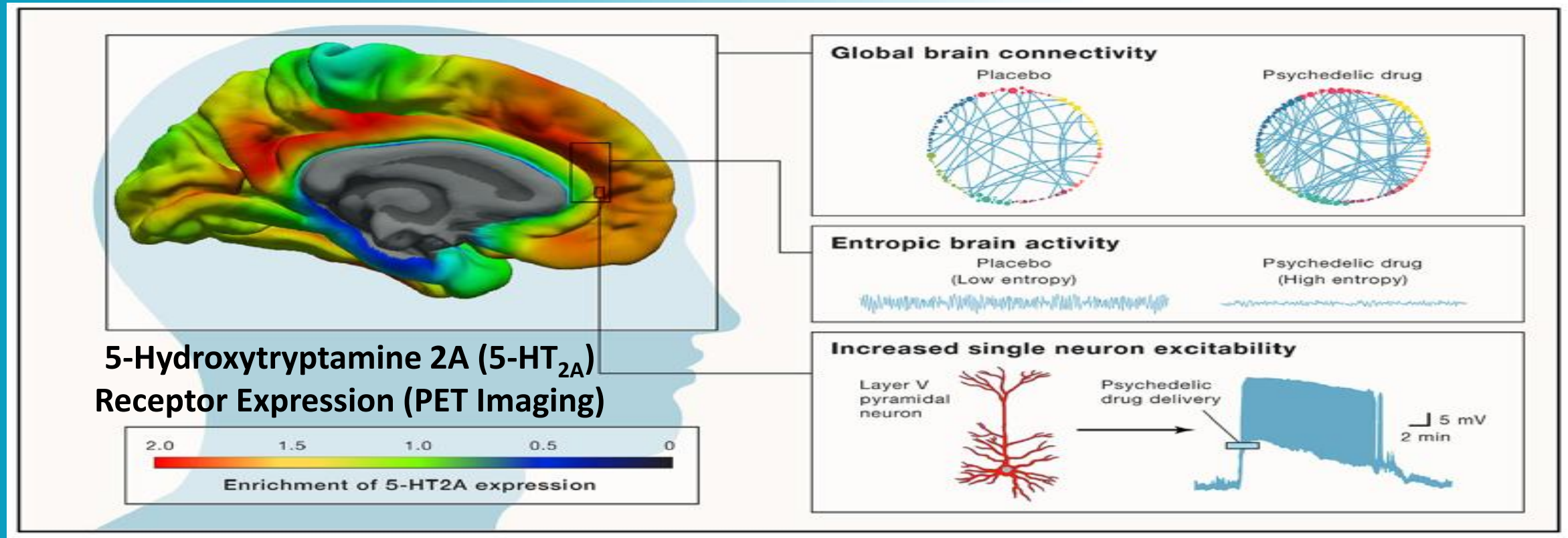
Scientific Challenges: Neuroplasticity Operates at a Wide Range of Size Scales & Times



(Adapted: David Nutt, David Erritzoe & Robin Carhart-Harris. Psychedelic Psychiatry's Brave New World. *Cell.* 2020)

Toward Optimizing the Precision of Psychedelic Use as Medicines

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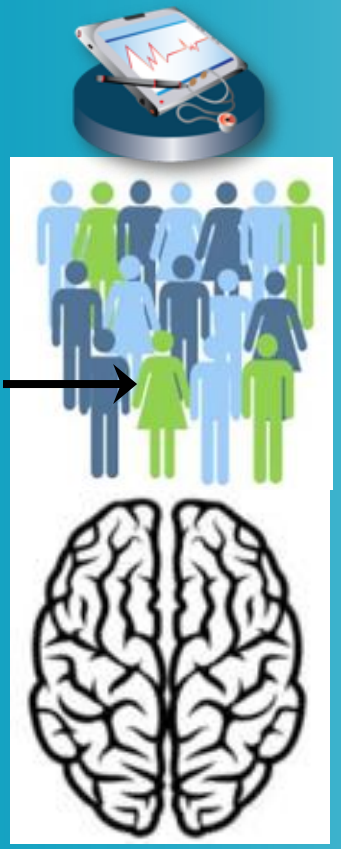
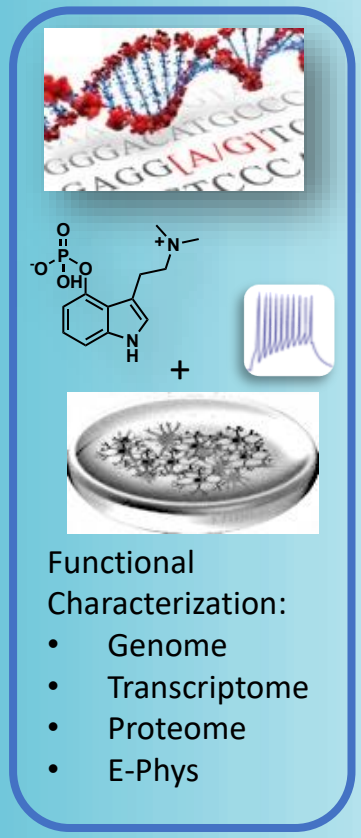
Goal: Right Drug—for the Right Patient—at the Right Time

PATIENT COHORT

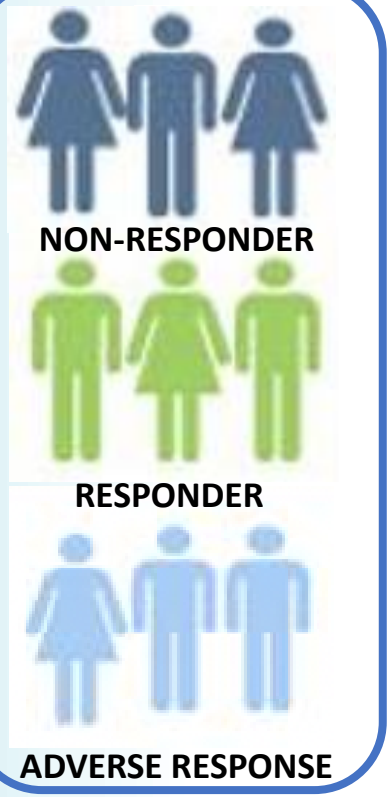
Patient:
Liz M.



Advanced Neuroimaging

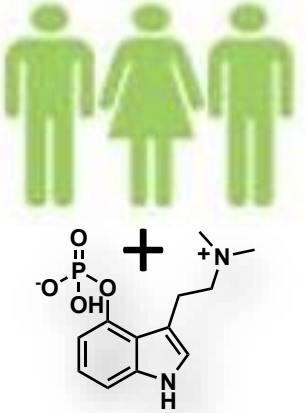


Functional Characterization:
- Genome
- Transcriptome
- Proteome
- E-Phys



PRECISION PSYCHEDELIC MEDICINE

COMPANION DIAGNOSTIC



[+ Next-Generation Psychedelic Agents]

Learning from the Fields of Ethnobotany & Ethnopharmacology

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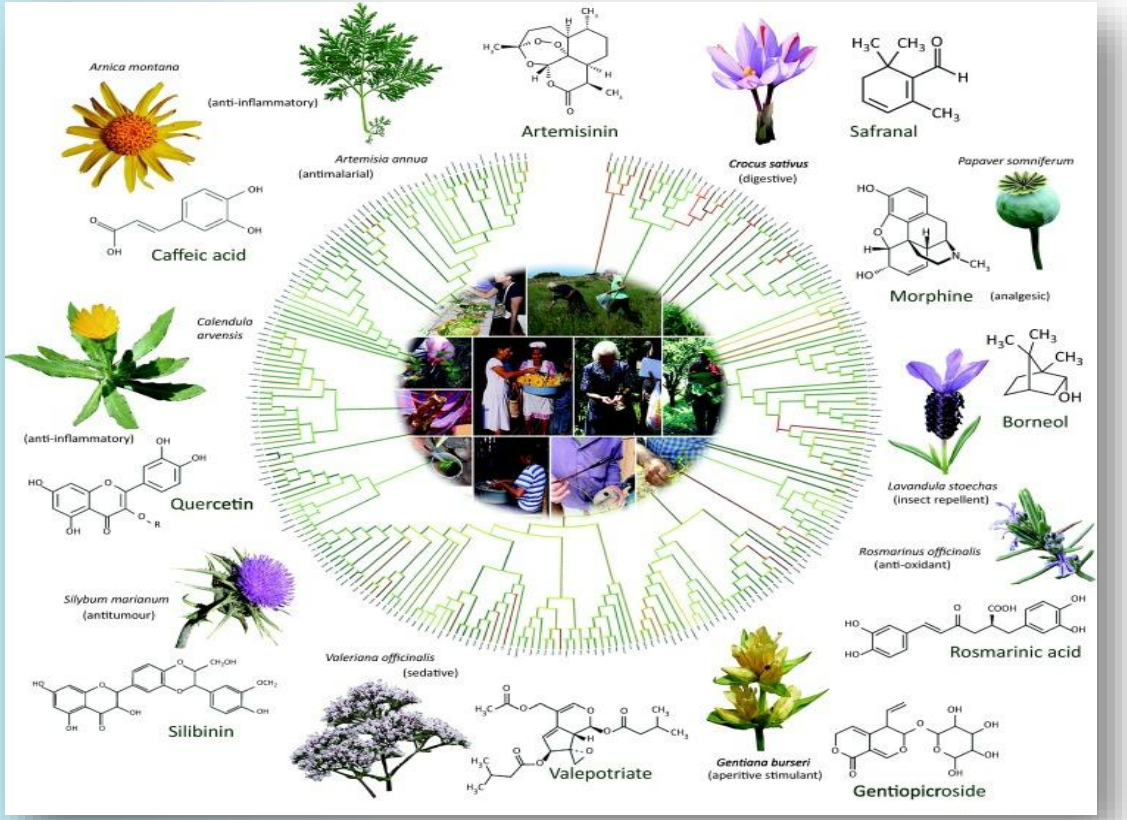
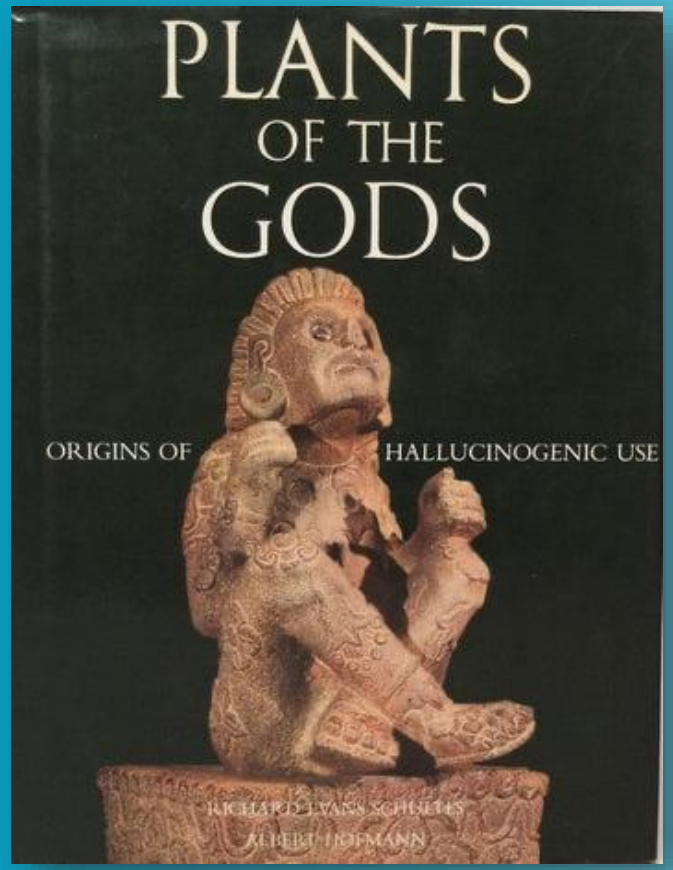
PIONEERING the FUTURE by LEARNING FROM the PAST

- **Ethnobotany** is derived from the terms "***ethnology***," the study of human culture & "***botany***, the study of plants."
- Ethnobotany is the scientific study of the **relationships that exist between people & plants**



Adapted: Garnatje, et al. Ethnobotany, Phylogeny, and 'Omics' for Human Health and Food Security. *Trends in Plant Science.* 2017.

Innumerable Discoveries & Teachings Serve as a Foundation & Inspiration for Psychedelic Research



Authors: Dr. Richard Evans Schultes & Dr. Albert Hofmann (Swiss chemist, LSD Pioneer)

"Can a thorough understanding of the use & chemical composition of these drugs not lead to the discovery of pharmaceutical tools for psychiatric treatment or experimentation?"

—*Dr. Richard Evans Schultes & Dr. Albert Hofmann*
Plants of the Gods (1979)

Dr. Richard Evan Schultes: Enduring Legacy of Scientific Discovery & Collaboration

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In 2025: Innumerable Discoveries & Teachings Serve as Inspiration for Psychedelic Research

[January 12, 1915–April 10, 2001]

- Considered **founder of modern ethnobotany field** – the study of Indigenous Peoples' uses of locally available plants in particular as medicines
- Came to **Harvard** as an undergraduate bound for Medical School
- Completed his AB (1937), AM (1938) & PhD (1941)
- Served at the **Harvard Botanical Museum**
  - 1941 to 1953: research associate (fieldwork)
  - 1958 to 1985: curator of Economic Botany
  - 1967 to 1985: executive director/director
- Served as **Harvard Professor**
  - Professor of biology at Harvard (1970); Mangelsdorf Professor of Natural Sciences (1973)
  - Edward C. Jeffrey Professor of Biology/Emeritus (1980/1985)
- **Trained & inspired a generation of interdisciplinary scientists & in doing so (un/knowingly) helped lay the foundation for psychedelic medicine.**

(Sources: Wade Davis. One River. 1996. https://news.harvard.edu/gazette/story/2001/04)

Origins of the Field of Psychedelic Medicine: *Pioneering Ethnobotanical Research & Legacy of Inter-Disciplinary Collaboration*

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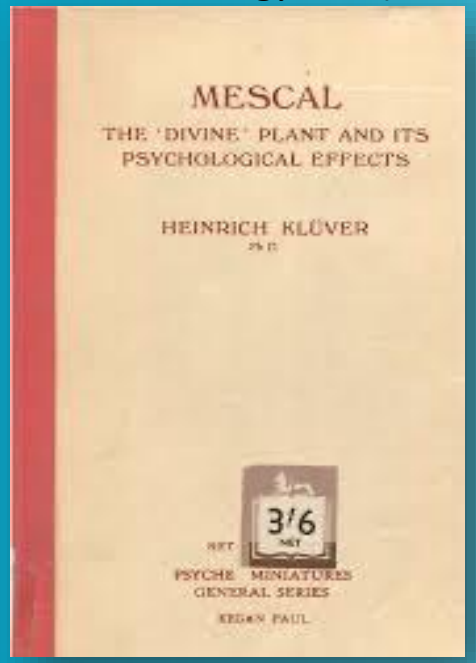
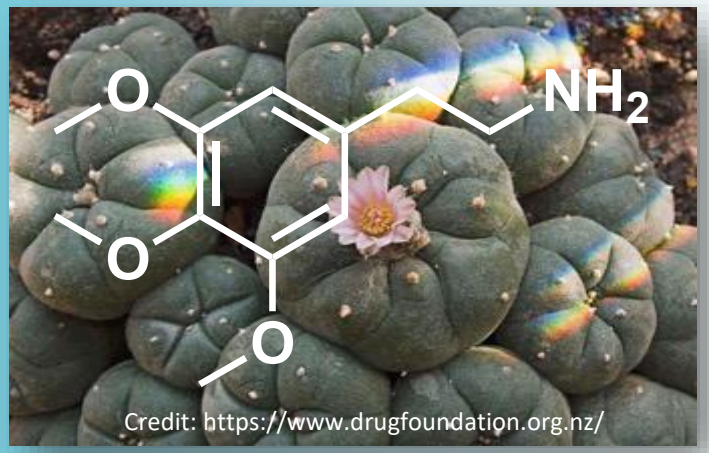
Read for Class Assignment:
Harvard Biology 104 (1936)



Author: German Psychiatrist Dr. Henrich Klüver (1928)

Peyote Cactus (***Lophophora williamsii***)



- Native Americans as part of **religious ceremonies for thousands of years**
- German scientist Dr. Karl Heffter (1897) identified **mescaline** as active principle
- **Mescaline synthesized** by Austrian chemist Dr. Ernst Späth (1919)

21-year old Schultes asked to write his **Harvard thesis** on peyote

---

Prof. Oakes Ames: Agreed only if studied use by **Kiowa People** of Oklahoma, USA

(Sources: Wade Davis. One River. 1996. https://www.arcgis.com/apps/MapJournal/; https://www.amazonteam.org/maps/schultes/en/)

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- Visited 15 tribes **taking peyote** 2-3 times/week
- Schultes learned value of **inter-disciplinary collaboration** (Shamans & Weston La Barre)
- **Lifelong friendships** with indigenous peoples
- Exposed Schultes to **experiences beyond contemporary science**
- **Published**: Peyote & Plants Used in the Peyote Ceremony (1937); The Appeal of Peyote (*Lophophora williamsii*) as a Medicine (1938)
- Defined **path to future career**

1936 Kiowa Territory, Oklahoma
21-year-old Richard E. Schultes (left)
Kiowa Shaman Belo Kozad (center)
Anthropologist Weston La Barre (right)

(Sources: Wade Davis. One River. 1996. https://www.arcgis.com/apps/MapJournal/; https://www.amazonteam.org/maps/schultes/en/)

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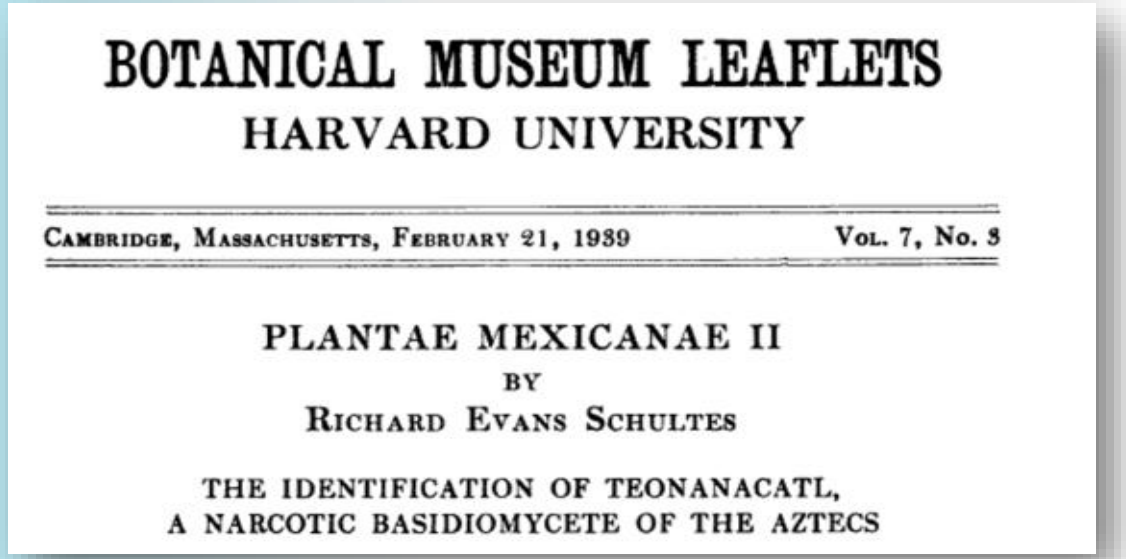
- While researching peyote…Schultes becomes **intrigued** by references to a scared mushroom known as ***teonanácatl*** or "flesh of the gods" used by Aztecs for divinatory purposes; **skeptical of claims** was a cactus (peyote) & not a mushroom
- 1938: 24-year old Schultes travelled to Mexico to investigate (**Harvard Master's Thesis**)
- 1939: Schultes & Austrian-born/Mexican **ethnobotanist Blas Pablo Reko** solved 300-year old botanical mystery



BOTANICAL MUSEUM LEAFLETS
HARVARD UNIVERSITY

CAMBRIDGE, MASSACHUSETTS, FEBRUARY 21, 1939 VOL. 7, NO. 3

PLANTAE MEXICANAE II
BY
RICHARD EVANS SCHULTES

THE IDENTIFICATION OF TEONANACATL,
A NARCOTIC BASIDIOMYCETE OF THE AZTECS

(Sources: *The Amazonian Travels of Richard Evans Schultes*, by Brian Hettler & Mark Plotkin. https://www.amazonteam.org/;
Wade Davis. One River. 1996. Rolf, Singer. Mycological investigations on Teonanacatl, the Mexican hallucinogenic mushroom. *Mycologia*. 195.)

Origins of the Field of Psychedelic Medicine: *Pioneering Ethnobotanical Research & Legacy of Inter-Disciplinary Collaboration*

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AMERICAN ANTHROPOLOGIST [N. S., 42, 1940

TEONANACATL: THE NARCOTIC MUSHROOM OF THE AZTECS[1]

By RICHARD EVANS SCHULTES

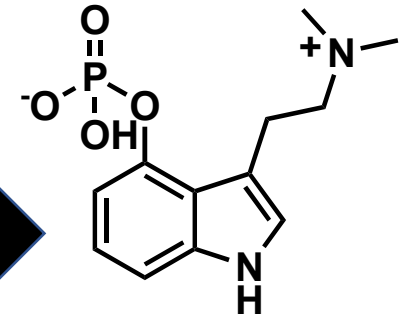
BECAUSE of the important roles which they played in ceremonial and in daily life, the narcotic plants of ancient Mexico are of especial interest to the anthropologist. Mexico possessed and still possesses many plant narcotics and intoxicants, of which a few are outstanding in their uses and are extremely interesting because of their great antiquity as well as because of the important bearing their use, distribution, and history may have on questions of a theoretical nature. Of these, the most notable are the *toleselo* or *coral-berry* (*Sophora secundiflora* (Ort.) Lag. ex DC.), *ololiuqui* or *piule* (*Rivea corymbosa* (L.) Hall. f.), *peyote* (*Lophophora Williamsii* (Lem.) Coult.), and *teonanacatl* (*Paneolus campanulatus* L. var. *sphinctrinus* (Fr.) Bresadola).

(Also: Reko BP. Teonanacatl, the Narcotic Mushroom. *American Anthrop.* 1940.)

- Original publications ignored for > 12 years
- World War II interrupted follow-up research
- 1952: amateur mycologist (G. Wasson) takes interest

➢ Teonanacatl now recognized as likely > 1 species also belonging to the genus *Psilocybe* spp.

Rogen Heim
(French Mycologist)



psilocybin

Albert Hofmann
(Swiss Chemist)

Origins of the Field of Psychedelic Medicine: *Pioneering Ethnobotanical Research & Legacy of Inter-Disciplinary Collaboration*

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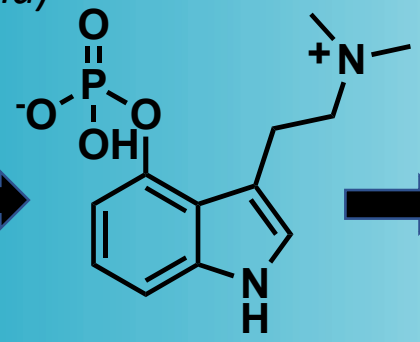
Mazatec Healers (M. Sabina)

Psilocybe Mushrooms



Psilocybin

Sainte-Anne Hospital (Paris)

Jean Delay, MD (1907–1987)

Gordon Wasson → Dr. Roger Heim (French Mycologist) → **Dr. Albert Hofmann** (Swiss Chemist)

- Mass production of fungal mycelia led Dr. Author Brack & Dr. Hans Kobel at Sandoz
- Isolated the **two active agents** (psilocybin & psilocin)
- Dr. Albert Hofmann & chemistry colleagues at Sandoz defined their **molecular structure** & completed **total synthesis**

Dr. Jean Delay (French Psychiatrist)

- Coined the word "**psychopharmacology**" & first trials with chlorpromazine (Thorazine) in 1952
- **First clinical trials** at (1958): psilocybin (10 mg) sublingually to 4 healthy controls + 14 patients with varied diagnoses
- Psilocybin caused "**hallucinations, dreamlike states, reliving of emotionally charged experiences & modifications of mood**"
- Manifestations **varied from subject to subject**

The NEW ENGLAND JOURNAL of MEDICINE

MEDICAL INTELLIGENCE ARCHIVE N Engl J Med 1960; 262:295-297

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Experimental Psychiatry. V — Psilocybine, a New Psychotogenic Drug

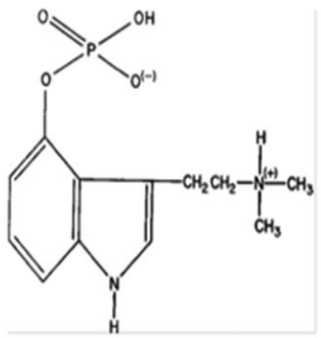
Max Rinkel, M.D.†, Charles R. Atwell, M.A.‡, Albert DiMascio, M.A.§, and Jonathan Brown, B.A.¶

† Senior research associate, **Massachusetts Mental Health Center**
‡ Instructor in psychology, **Harvard Medical School**; principal psychologist, **Massachusetts Mental Health Center**
§ Research associate, **Boston University** and **Massachusetts Mental Health Center**
¶ Graduate student, Psychology Department**, Northwestern University**, Evanston, Illinois

Psilocybin Has its First Medical Investigation In Boston

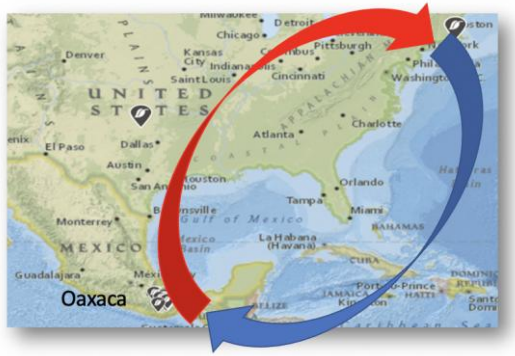
PSILOCYBINE (FIG. 1), THE phosphoric ester of 4-hydroxytryptamine, has been established by Hofmann et al.[1 2 3 4] as the active principle of the Mexican mushroom family *Psilocybe mexicana Heim*. The chemists emphasize the fact that this chemical is the only phosphorylated indole compound that is known to occur in nature and that it is remarkable in that it is an indole substituted at the fourth position.

Figure 1.



Chemical Structure of Psilocybine.

Footnote:
We are indebted to Dr. Harry C. Solomon, Massachusetts Commissioner of Mental Health, and **Dr. Jean Delay, professor of psychiatry, Paris, France, for suggesting this research and providing us with the chemical.**



Massachusetts Mental Health Center
(Boston Psychopathic Hospital)
74 Fenwood Road, Boston

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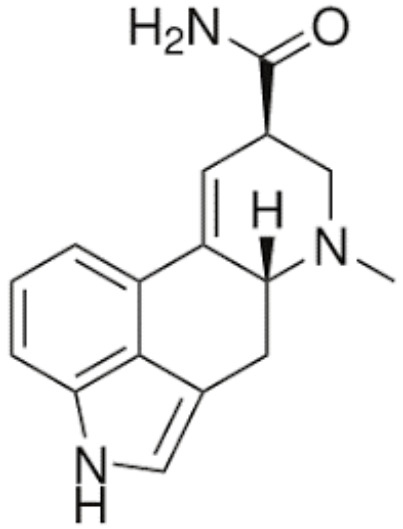
- Schultes next becomes **intrigued** by references to ***ololiuqui*** or "the vine of the serpent" used by the Aztecs for divination
- Schultes returned to Oaxaca in 1939 for more research leading to the identification of ***ololiuhqui*** as *Rivea corymbosa* (morning glory) *&* what becomes final chapter of **Harvard PhD Thesis**
- Seeds latter shown by Dr. Hofmann (1960) to contain *d*-lysergic acid amide (LSA)

1933: Starts Bound for Harvard Medical School Bound

1941: Becomes Harvard Doctor of Philosophy (Botany)

Seeds of *Rivea corymbosa*



d-lysergic acid amide
(ergine; ergoline alkaloid)

(Sources: *The Amazonian Travels of Richard Evans Schultes*, by Brian Hettler & Mark Plotkin; https://www.amazonteam.org/; Wade Davis. One River.)

Schultes' Legacy: 12 Years >24,000 Plants Collected > 300 "New" to Science

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.....But Many Known for 100-1000's of Years by Indigenous Cultures

The Amazonian Travels of Richard Evans Schultes

the Amazon Conservation Team

Introduction | I. Putumayo: Sacred Plants | II. WWII Rubber Mission | III. Apaporis: Workshop of the Gods | IV. Dance of the Spirits

the Amazon Conservation Team

The Amazonian Travels of Richard Evans Schultes

Richard Evans Schultes – ethnobotanist, taxonomist, writer and photographer – is regarded as one of the most important plant explorers of the 20th century. In December 1941, Schultes entered the Amazon rainforest on a mission to study how indigenous peoples used plants for medicinal, ritual and practical purposes. He went on to spend over a decade immersed in near-continuous fieldwork, collecting more than 24,000 species of plants including some 300 species new to science.

(Sources: https://www.amazonteam.org/maps/schultes/en/

Rich Legacy of Ethnobotanical Descriptions of Medicinal Plants/Fungi: Potential Keys to Improve Brain Health

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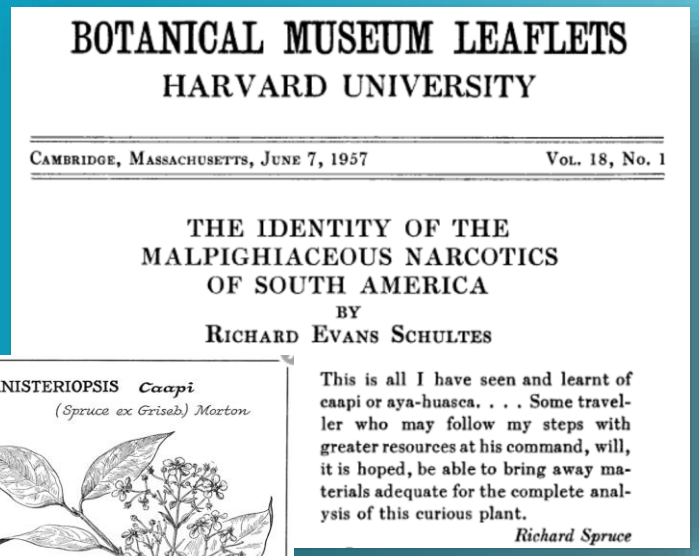

BOTANICAL MUSEUM LEAFLETS
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CAMBRIDGE, MASSACHUSETTS, JUNE 7, 1957 VOL. 18, No. 1

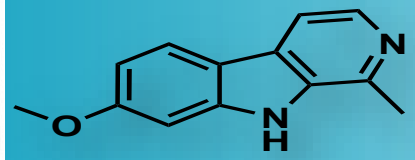
THE IDENTITY OF THE MALPIGHIACEOUS NARCOTICS OF SOUTH AMERICA

BY
RICHARD EVANS SCHULTES

BANISTERIOPSIS *Caapi*
(Spruce ex Griseb.) Morton

This is all I have seen and learnt of caapi or aya-huasca. . . . Some traveller who may follow my steps with greater resources at his command, will, it is hoped, be able to bring away materials adequate for the complete analysis of this curious plant.
Richard Spruce

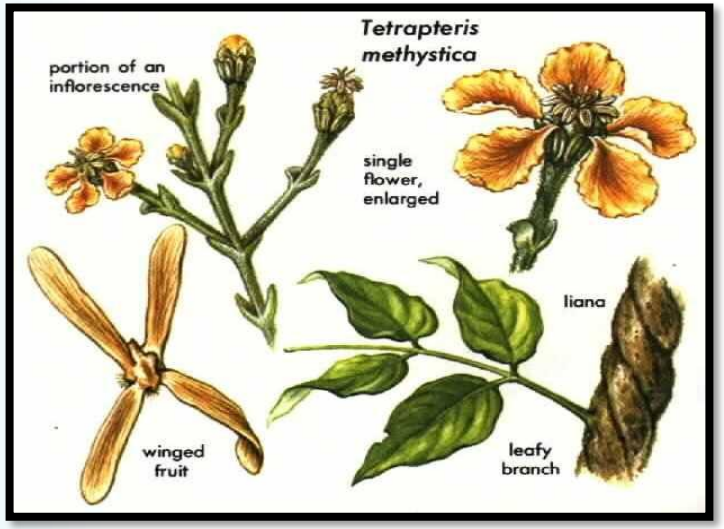
Rubiaceae: coffee family



harmine alkaloid

Tetrapterys styloptera **(syn. *Tetrapterys methystica*)**

Harvard Gray Herbarium Specimen



Schultes Golden Guide Illustration: Elmer W. Smith

"Specimens taken from a flowering vine, from the bark of which a cold water infusion was made **without the admixture of any other plants…nothing is known chemically of this kind of caapi…**with effects very like those induced by *Banisteriopsis*, **I can vouch from self-experimentation**."

(Sources: R.E. Schultes. *Hallucinogens.* 1976. R.E. Schultes & Albert Hofmann. *Plants of the Gods: Their Sacred, Healing, and Hallucinogenic Powers*. 1992; R.E. Schultes & Robert F. Raffauf. *The Healing Forest: Medicinal and Toxic Plants of the Northwest Amazonia*. 1990. W. Davis. *The Lost Amazon: The Pioneering Expeditions of Richard Evans Schultes*. 2016.)

A New Hallucinogen from Andean Colombia:

Iochroma fuchsioides

RICHARD E. SCHULTES*


(credit: Stan Shebs)

In February 1946, I made a botanical collection (*Schultes 3208*) in the Valley of Sibundoy to which was attached the following annotation: "Leaves crushed and taken in water by medicine-men as a narcotic." Another collection (*Schultes et Villarreal 7489*) made in Sibundoy in May 1946, likewise indicated use of the plant as an hallucinogen.

Richard E. Schultes. A New Hallucinogen the Andean Colombia. *Journal of Psychedelic Drugs.* vol. 9, no. 1, 1977, pp. 45–49.

Definitive Scientific Guides to the Nature of Psychoactive Plants & Fungi

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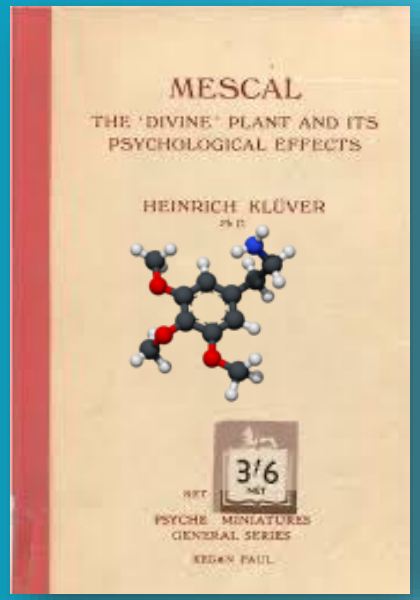
Collaborative Work by Dr. Schultes (Botanist) & Dr. Hofmann (Chemist)

Key Demonstration of Inter-Disciplinary Collaboration

Schultes: *Harvard Bio104 Class Term Paper (1936)*

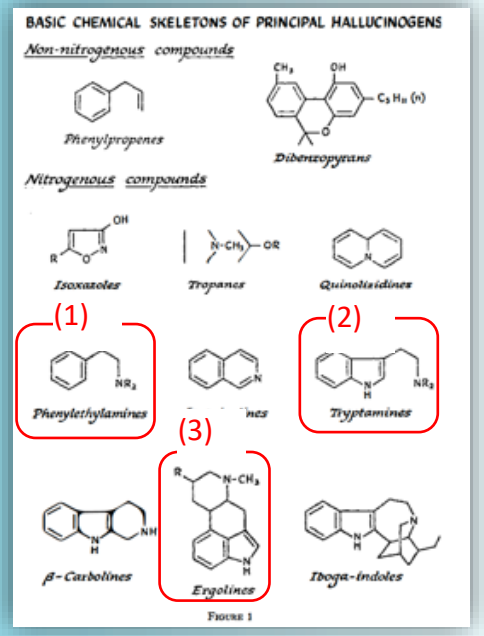


Dr. Henrich Klüver
German Psychiatrist (1928)

Ethnobotany of 3 Major Classes of Psychedelics

By Age 26

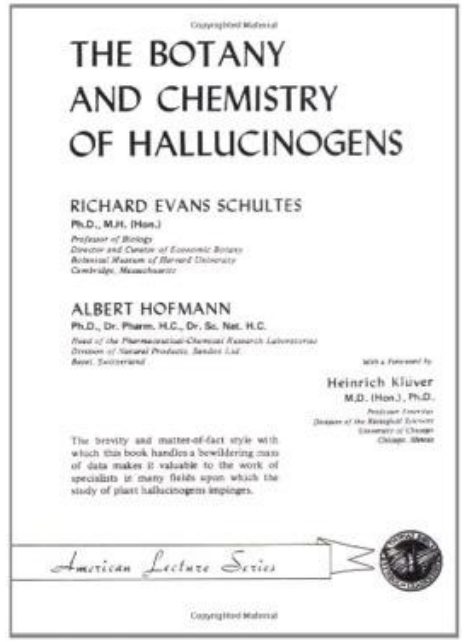
(1) Scared Cacti (Peyote)
(2) Teonanacatl (Psilocybe)
(3) Ololiqui (Morning Glory)



Dr. Richard E. Schultes, Annual Review Plant Physiology, 1970

By Age 58

1973 (464 pages)



Foreword By: **Dr. Henrich Kluver**, Psychiatrist/Professor Emeritus

MASSACHUSETTS GENERAL HOSPITAL
PSYCHIATRY ACADEMY

Future of Ethnopharmacology & Personalized Medicine for Psychiatric Disorders

Launch of the MGH Center for the Neuroscience of Psychedelics

MASSACHUSETTS GENERAL HOSPITAL
PSYCHIATRY ACADEMY

Official Launch: February 2021

MASSACHUSETTS GENERAL HOSPITAL
THE CENTER FOR THE NEUROSCIENCE OF PSYCHEDELICS IN PSYCHIATRY

MISSION: The Center seeks to understand how psychedelics enhance the brain's capacity for change, to optimize current treatments, to create new treatments for mental illness & to make the term "treatment resistant" obsolete.

The Harvard Gazette

HEALTH & MEDICINE June 10, 2021

New center seeks to understand any 'magic' in mushrooms

Research may help clear path for use of psychedelics in treating psychiatric patients

Director: Dr. Jerrold Rosenbaum, MGH's former psychiatrist-in-chief & Stanley Cobb Professor of Psychiatry at Harvard Medical School

Future: Toward Precision Psychiatric Medicines for Improved Therapy

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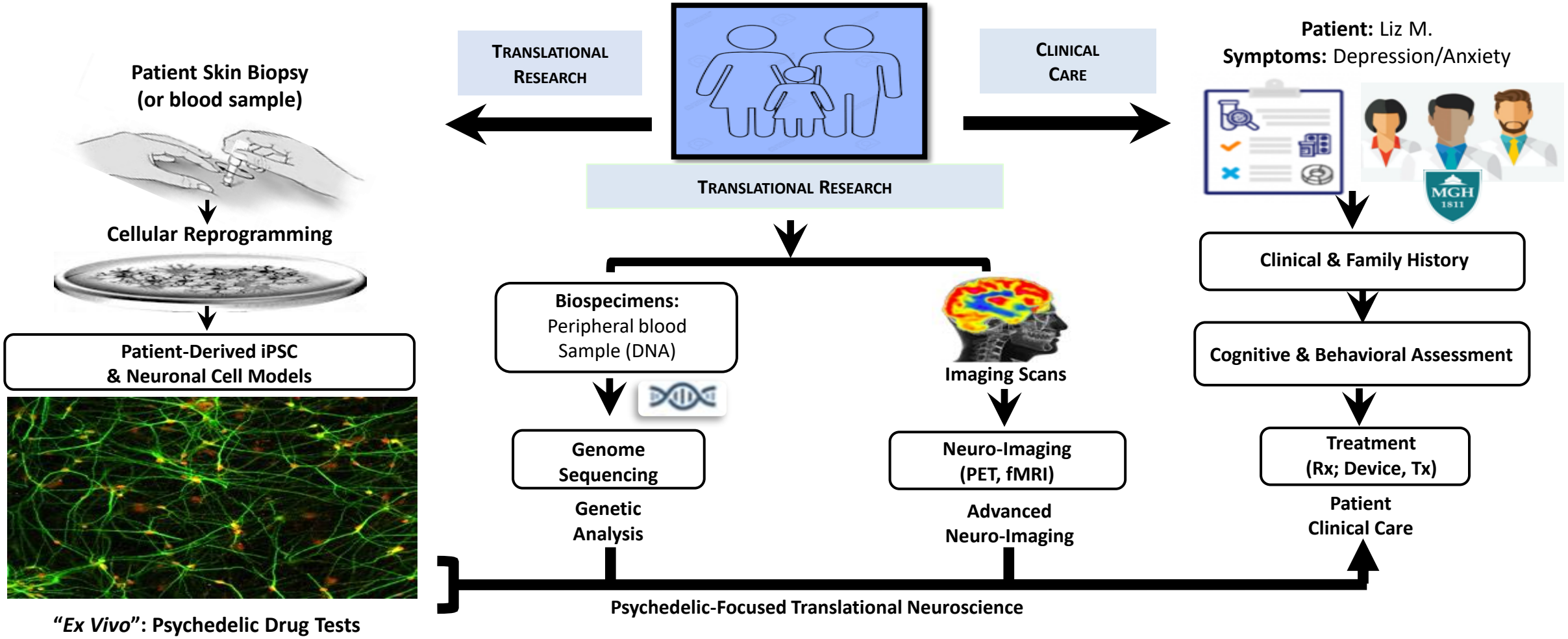

Rationale for Applying Human iPSC Models to Advance the Neurobiology of Brain Plasticity & Psychedelic Medicine

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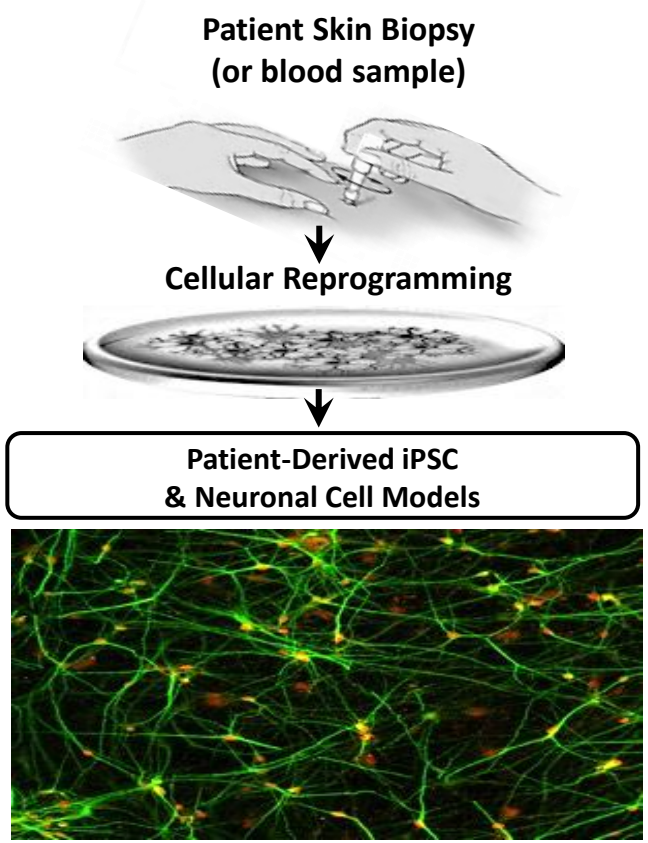

"*Ex Vivo*": Psychedelic Drug Tests

1. Study of **genetically accurate human** cell models that fully capture relevant genetic variation
2. Study of **different cell types** and hard to obtain cells *(e.g., glutamatergic neurons with functional synapses)*
3. Study of **developmental, maintenance,** & any **degenerative aspects** of disorders in multiple cells
4. Identification of **biomarkers** for treatment response
5. Provide human cell models for high-throughput **drug screens** to discover next-generation medicines

Goal: Develop Robust Functional Assays to Probe the Cellular Neurobiology & Mechanism of Diverse Psychedelic Agents

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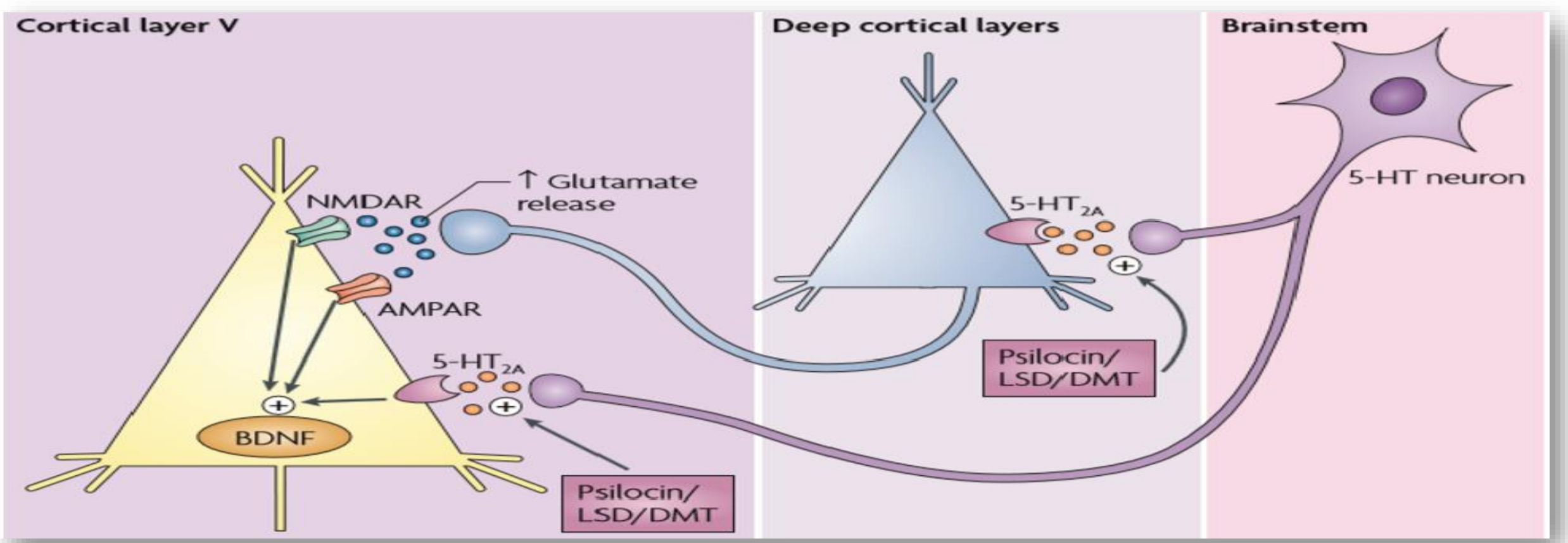

(Adapted: Vollenweider & Kometer. The Neurobiology of Psychedelic Drugs: Implications for the Treatment of Mood Disorders. *Nature Review Neurosci.* 2010.)

Opportunity to Grow Human Neural Networks From Patients in the Lab

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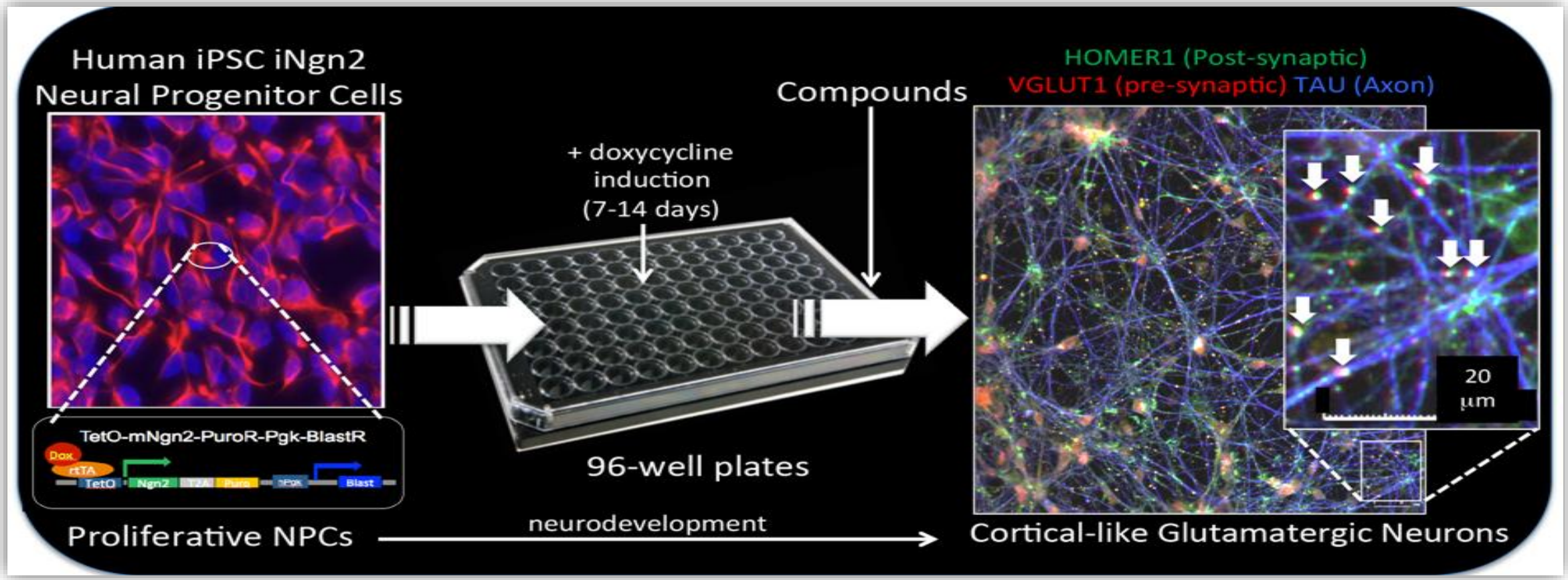

Cheng et al. Highly Expandable Human iPS Cell-Derived Neural Progenitor Cells (NPC) and Neurons for CNS Disease Modeling and High-Throughput Screening. *Current Protocol Human Genetics.* 2017.

Development of High-Content Imaging Assays of Neuroplasticity: Quantifying Changes in Human Axon/Dendrite Morphology

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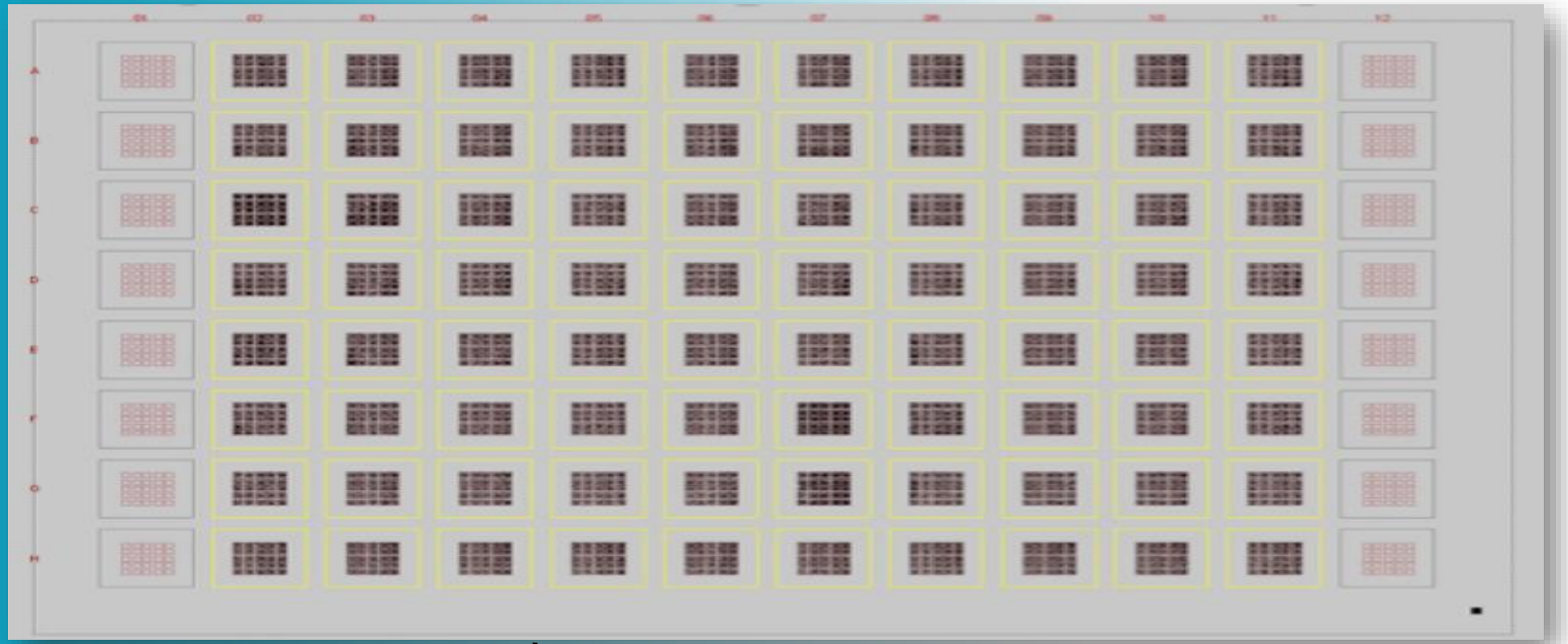

4 Color Imaging → FITC: PHF-1 DsRed: K9JA Cy5: β3-Tubulin UV: Hoechst 33342

Cheng et al. *Current Protocols in Human Genetics.* 2017.

Development of High-Content Imaging Assays of Neuroplasticity: Quantifying Changes in Human Axon/Dendrite Morphology

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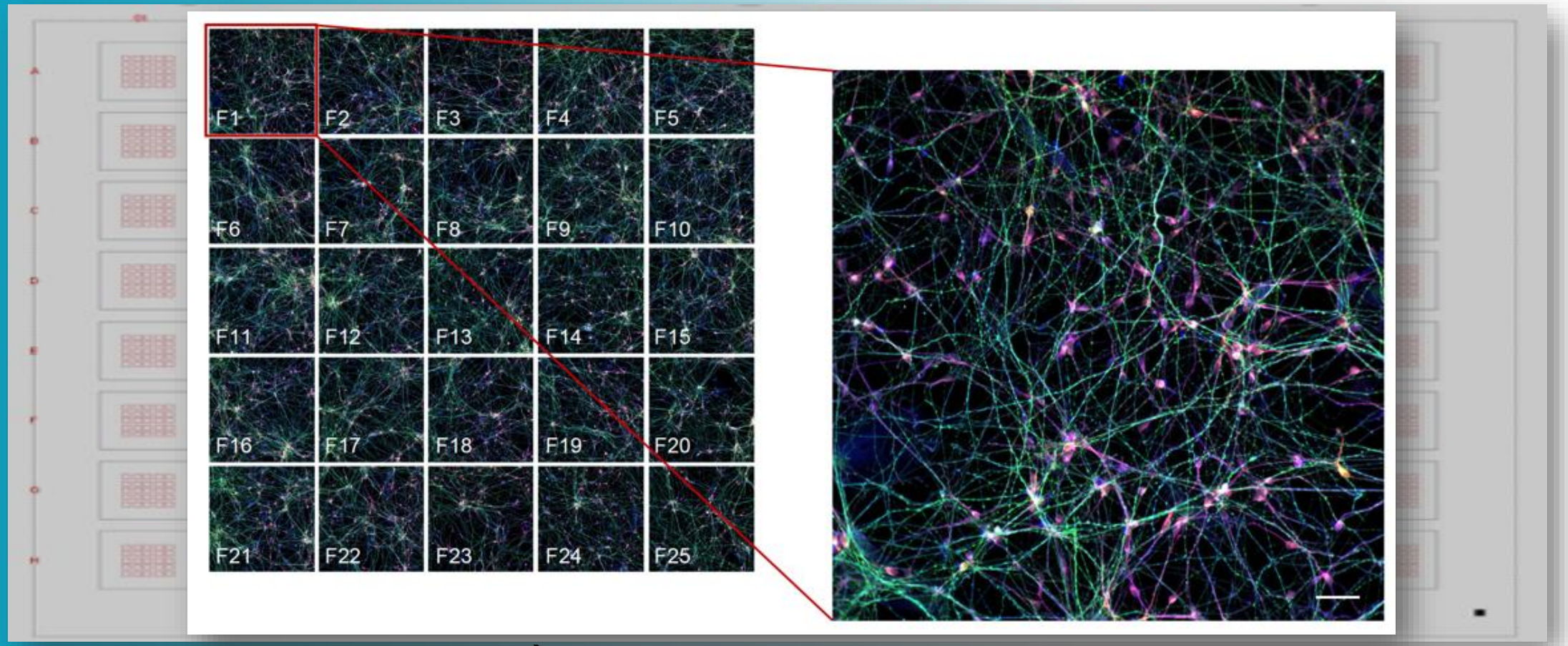

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Cheng et al. *Current Protocols in Human Genetics.* 2017.

Imaging Human Neurons & Quantifying Changes in Neuroplasticity

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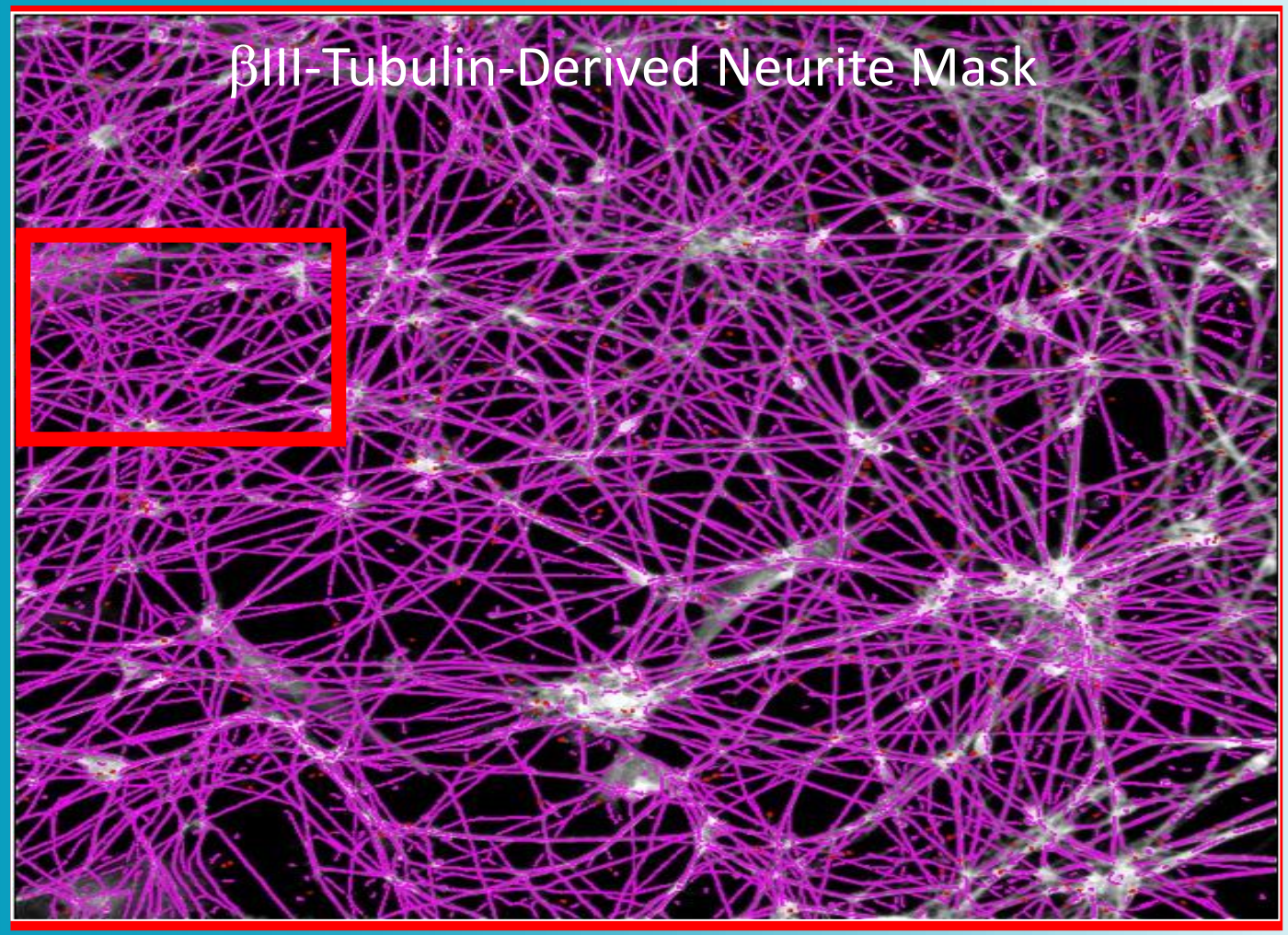
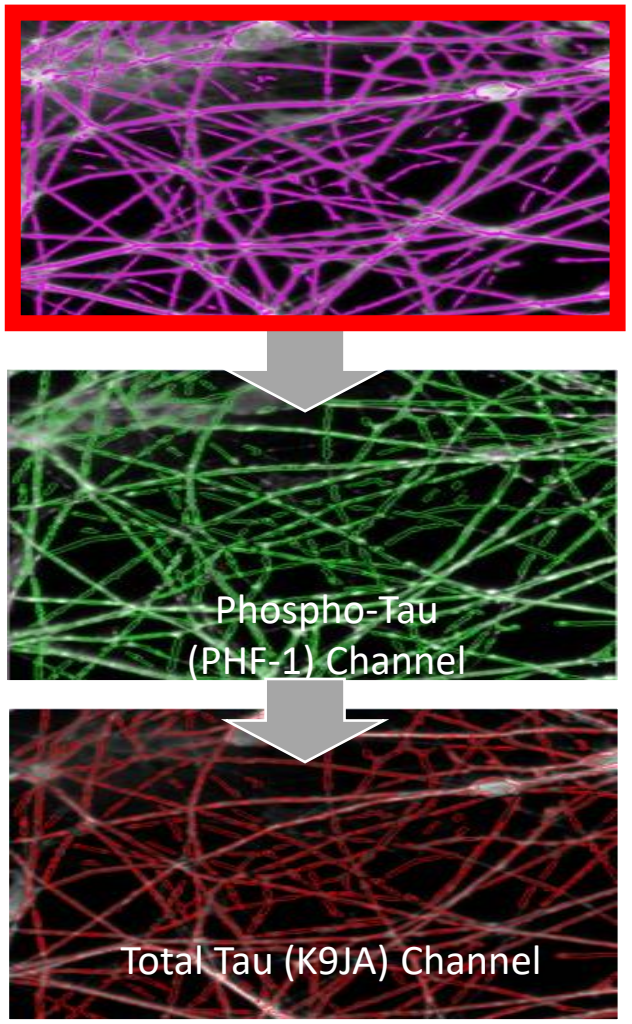


Automated Image Segmentation



Cheng et al. *Current Protocols in Human Genetics.* 2017.

Use of 3-Dimensional 'Mini-Brains' to Study Psychedelics & Neuroplasticity

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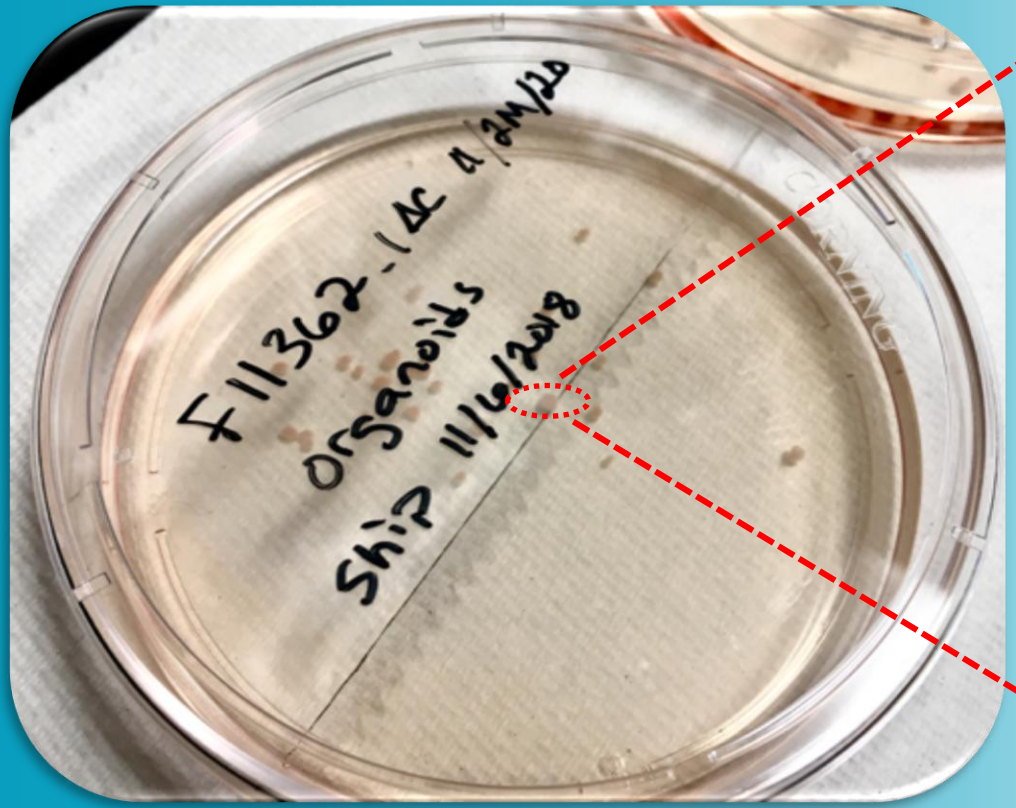
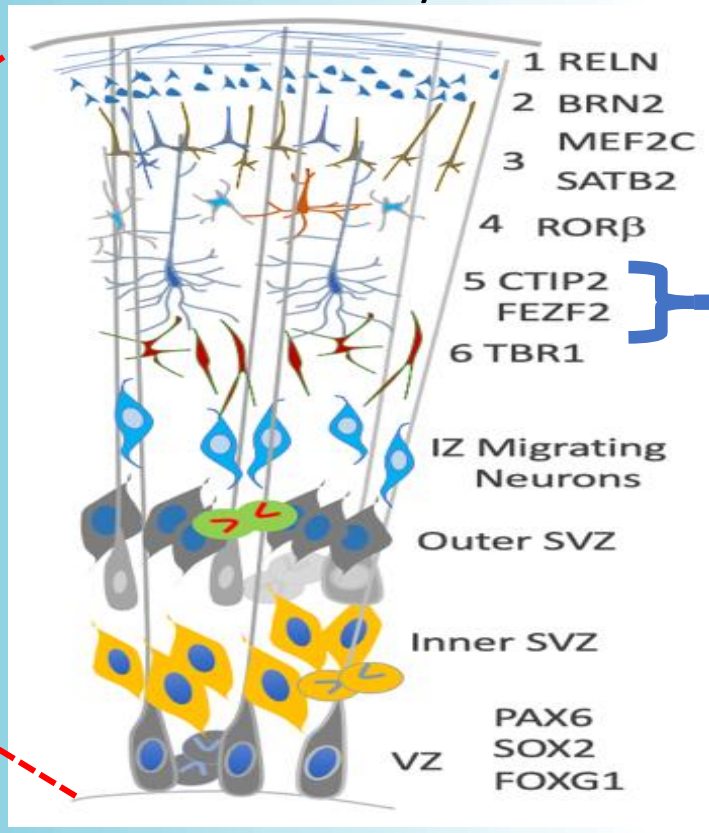
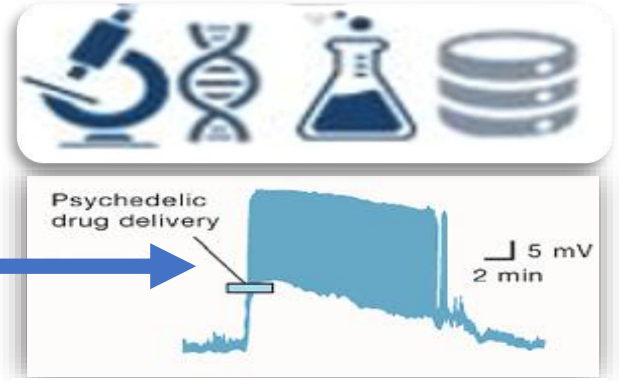
Human iPSC → Organoids



Cortical Layers





Ex Vivo 'Scans'
+/- Psychedelic Drug

- Neurogenesis
- Neuritogenesis
- Synaptogenesis

(Adapted: Sally Temple. NSCI)

Toward Discovering Next-Generation Medicines Targeting Neuroplasticity

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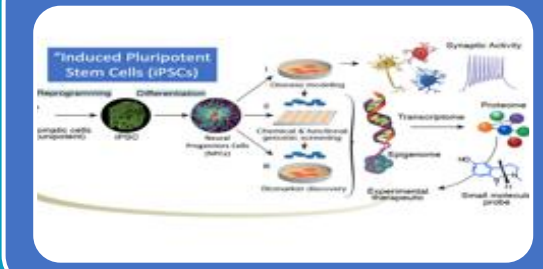
Step I: Source Understudied Psychedelic Plants & Fungi with Medicinal Potential Based on Human Use

(Collaborations with Traditional Knowledge Keepers, Ethnobotanists, Chemists, Psychiatrists/Neurologists)

Step 2: Create a Collection of Fractionated Extracts & Purified Compounds + Known Psychedelics

(e.g., mescaline, psilocybin, 5-MeO-DMT, salvinorin, mitragynine, ibogaine, MDMA, ketamine, novel)



Step 3: Use Patient Stem Cell Models to Generate Molecular & Cellular Signatures in Neurons/Mini-Brains

(Working with Psychiatry & Neurology Clinicians, Neuro-Imagers & Medicine Hunters)

PSYCHEDELOME PROJECT v1.0: Curation of a 'Living Library' of Diverse Psychoactive Plants

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PSYCHIATRY ACADEMY

"Garden-to-Lab"

None of the plants are Scheduled (i.e., not known to contain an agent covered in the Controlled Substance Act)

PSYCHEDELOME PROJECT v2.0: Revitalization of a MGH Rooftop Greenhouse to Create the MPL

MASSACHUSETTS GENERAL HOSPITAL
PSYCHIATRY ACADEMY

[Source: Google Earth View of Mass General Hospital/Boston]

PSYCHEDELOME PROJECT v2.0: Curation of a 'Living Library' of Diverse Psychoactive Plants

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PSYCHIATRY ACADEMY

MPL
Medicinal Plant Laboratory

Banisteriopsis caapi vine

None of the plants are Scheduled (i.e., not known to contain an agent covered in the Controlled Substance Act)

Toward Learning from Nature to Advance Novel Plant-Derived Medicines for Mental Health

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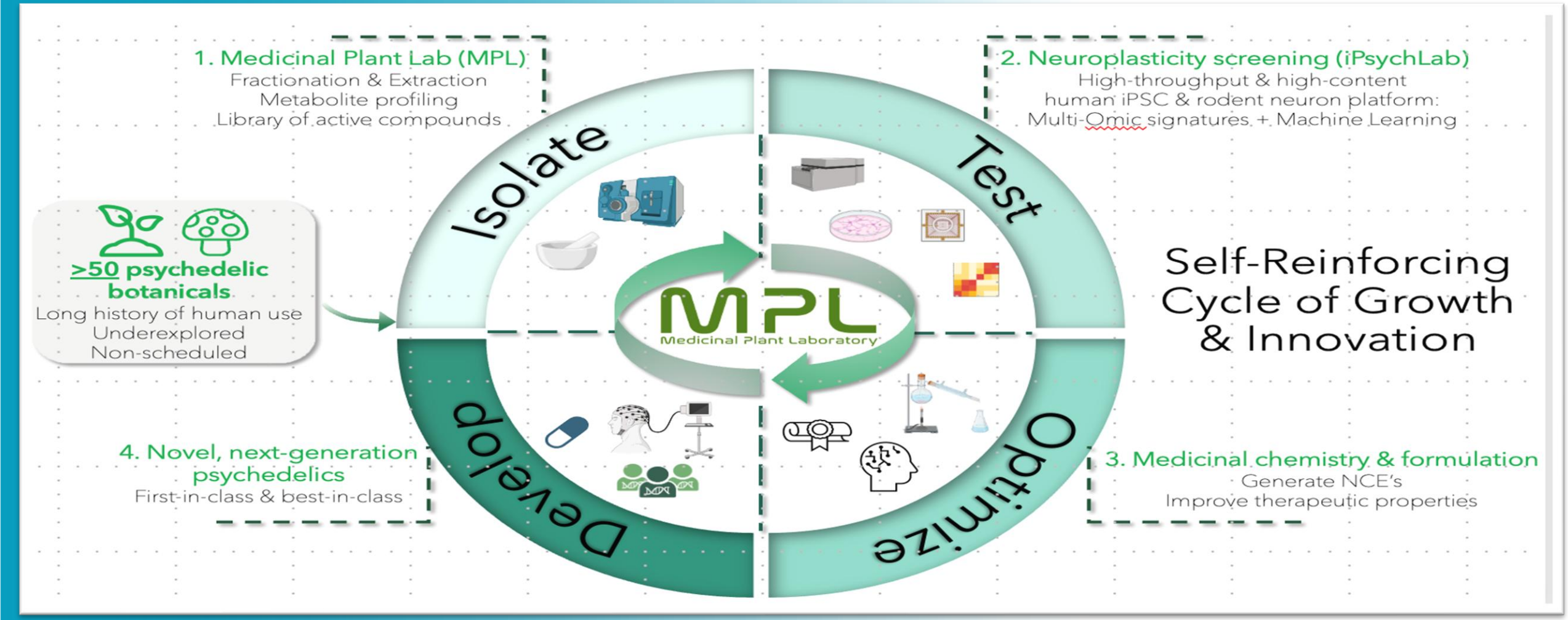
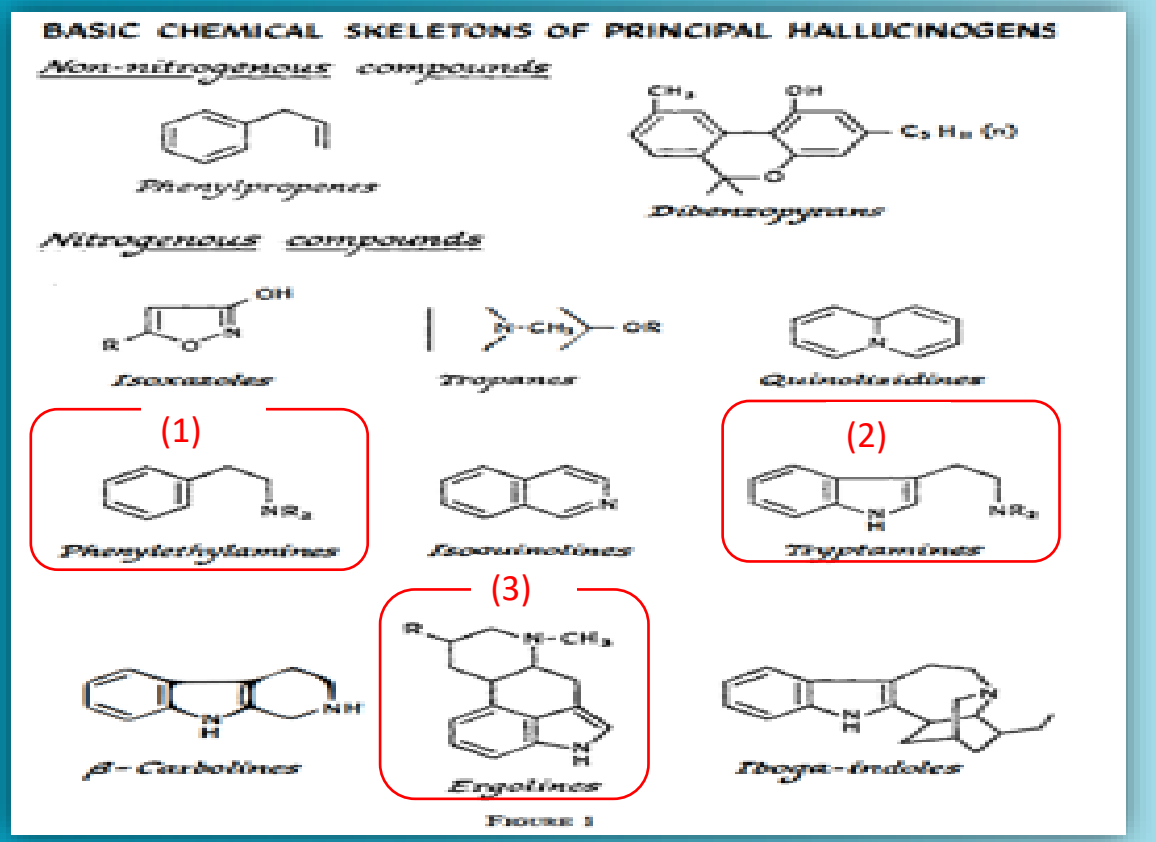


Natural Products As Leads for Drug Discovery & Innovation



Dr. Richard E. Schultes. *Annual Review Plant Physiology*. 1970.

Psychoactive Plants & Fungi
(1) Scared Cacti (Peyote)
(2) Teonanacatl (Psilocybe)
(3) Ololiqui (Morning Glory)

3 Major Classes of Psychedelics Under Clinical Investigation

New Targets & Chemotypes?

Natural Products As Leads for Drug Discovery & Innovation

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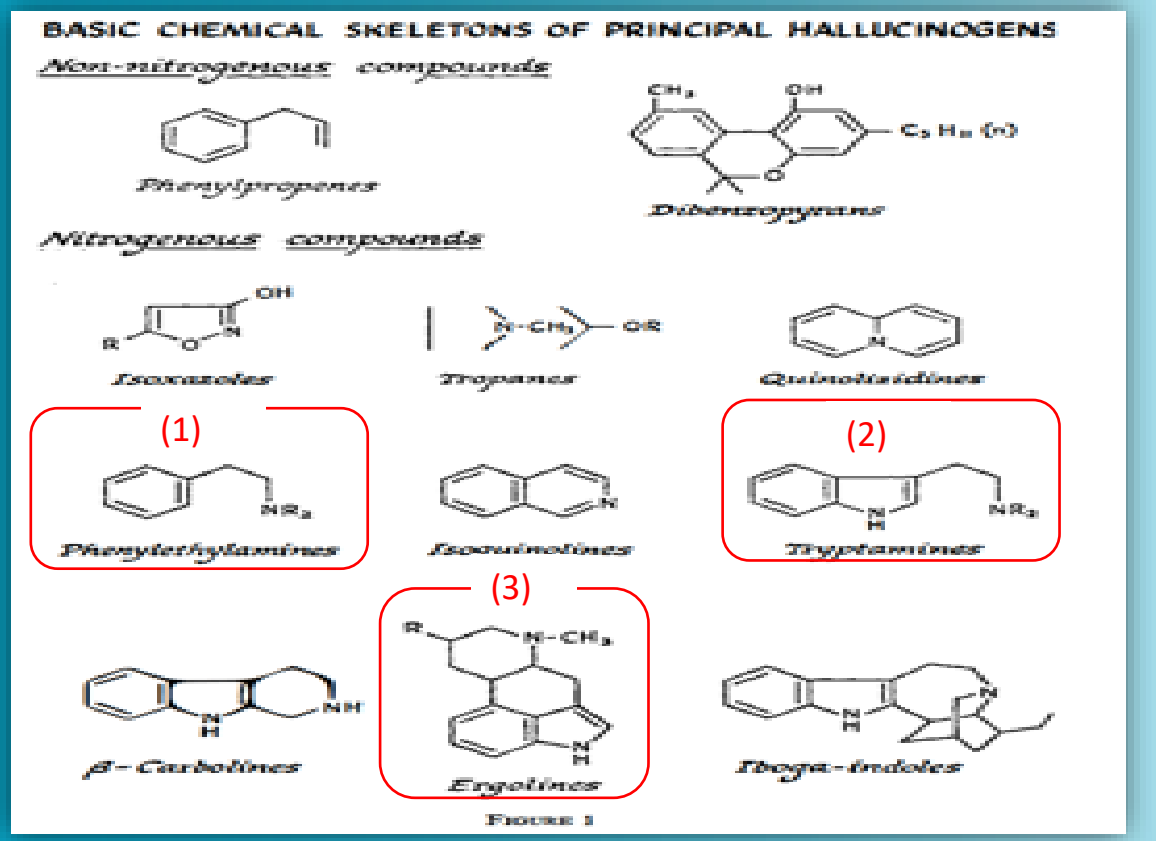

Dr. Richard E. Schultes. *Annual Review Plant Physiology*. 1970.

Growing the Future of Mental Health

Ethnobotany of the Future: Key Considerations & Implications

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1) Key for **collaboration with keepers of traditional knowledge** & **Indigenous Peoples** scholars to elevate their voices & contribution.

2) Continued importance of **maintaining biodiversity** & **conservation** efforts throughout the world.

3) Adherence to the ***United Nations' Convention on Biological Diversity*** & informed consent on the use of genetic resources, including the fundamental principles of **access** & **benefit-sharing**.

CENTER for the NEUROSCIENCE of PSYCHEDELICS

MPL Medicinal Plant Laboratory

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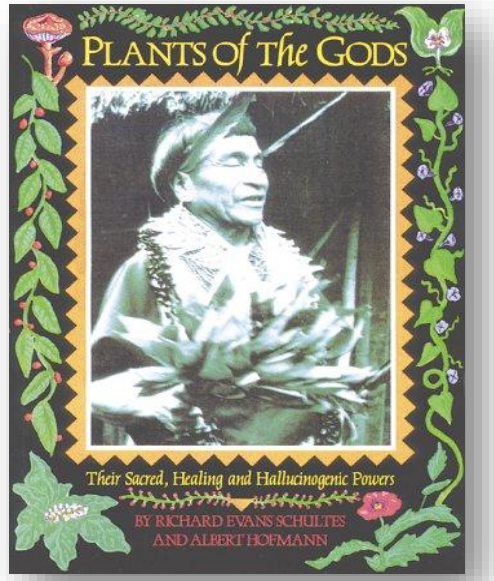
HARVARD MEDICAL SCHOOL

Acknowledgments

Chemical Neurobiology Lab Members & Collaborators (Past & Present)
Mass General Hospital, Departments of Psychiatry & Neurology
Harvard Medical School, Boston, Massachusetts
Psychedelic Ethnobotany/mycology & Ethnopharmacology
Communities, Traditional Knowledge Keepers, Psychiatrists, Therapists



Suggested Readings

1) Schultes, RE. *Teonanacatl: The Narcotic Mushroom of the Aztecs*. American Anthropologist, New Series, Vol. 42, No. 3, Part 1 (Jul.-Sep., 1940).
2) Schultes RE. The Botanical and Chemical Distribution of Hallucinogens. *Annual Review of Plant Physiology*. 1970. Vol. 21:571-598.
3) Public Lecture by Mark Plotkin, Amazon Conservation Team. *The Amazonian Travels of Richard Evans Schultes.* https://www.youtube.com/watch?v=vBqQ2SQuq68
4) Vollenweider FX & Kometer M. The neurobiology of psychedelic drugs: implications for the treatment of mood disorders. *Nature Review Neuroscience*. 2010;11:642-51.
5) Silva MC, Haggarty SJ. Human Pluripotent Stem Cell-Derived Models and Drug Screening in CNS Precision Medicine. *Ann N Y Acad Sci*. 2020;1471:18-56.