

Dual Diagnosis

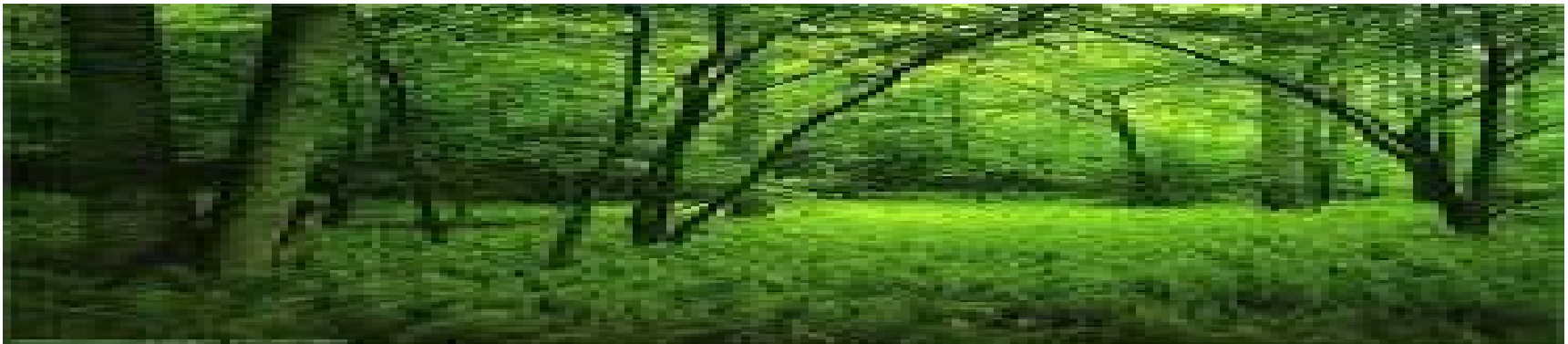


Dr. Terrance G. Lichtenwald
IADCP Presentation 9/1/2011

Seeing the Forest through the Trees

([idiomatic](#)) To discern an overall pattern from a mass of detail; to see the [big picture](#), or the broader, more general situation. Generally used in the negative.

*Smith is good at detail, but can't **see the forest for the trees**.*



Seeing the forest through the trees while it is on



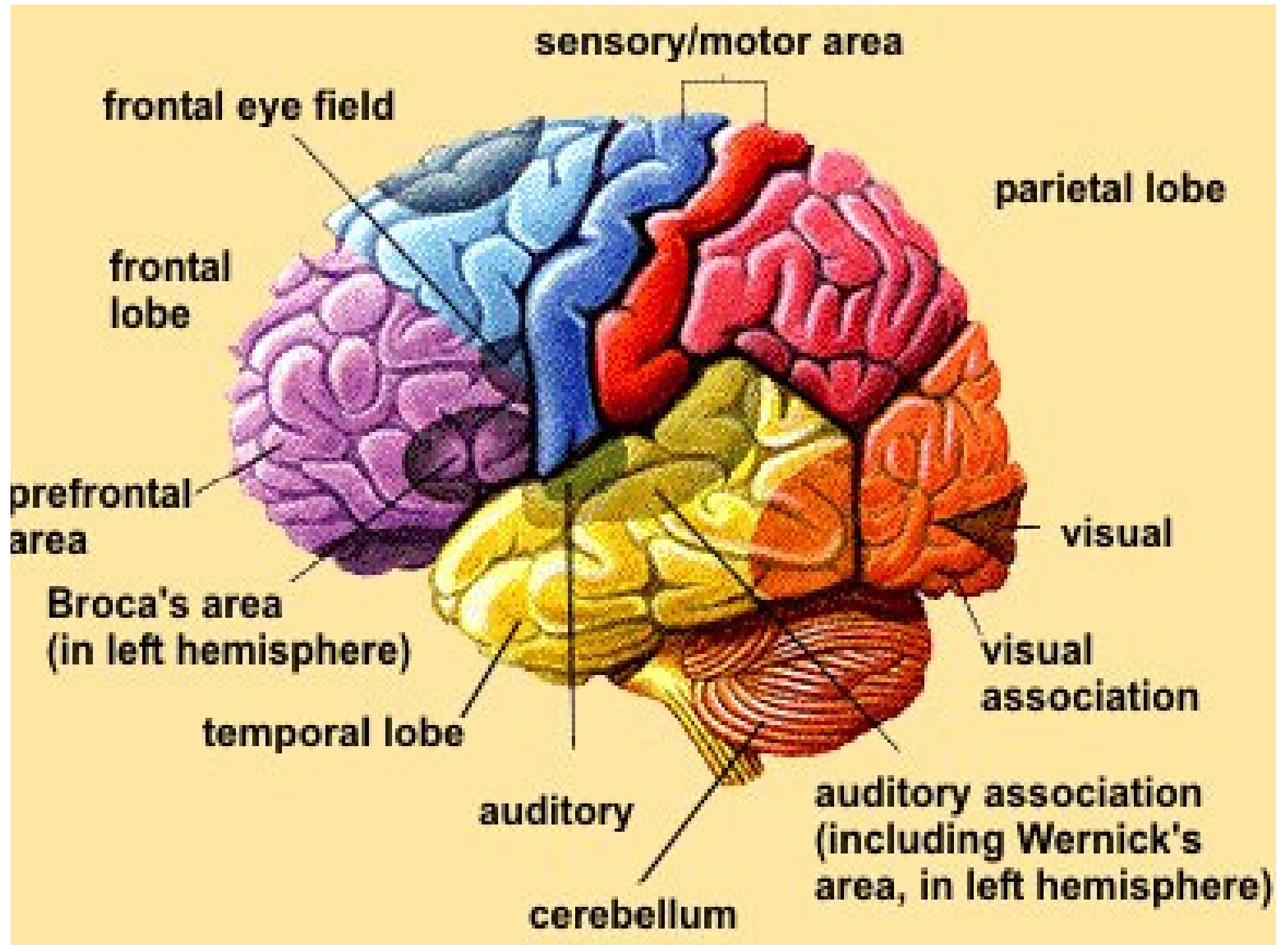
Two IADCP's at work



Psychopharmacology

- **Psychopharmacology** (from Greek ψυχή, *psūkhē*, "breath, life, soul"; φάρμακον, *pharmakon*, "drug"; and -λογία, *-logia*) is the study of drug-induced changes in **mood**, **sensation**, **thinking** and **behavior**.

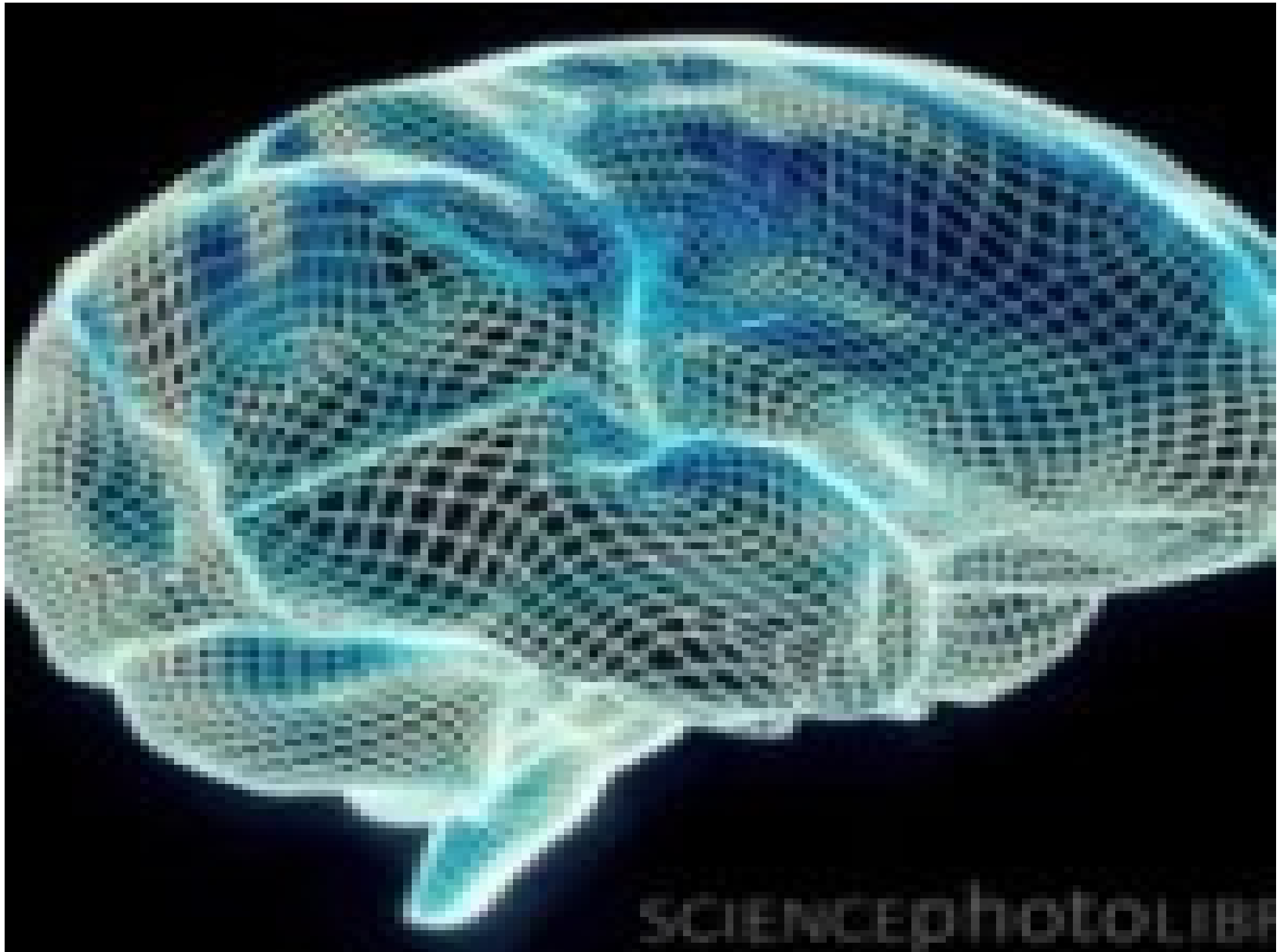


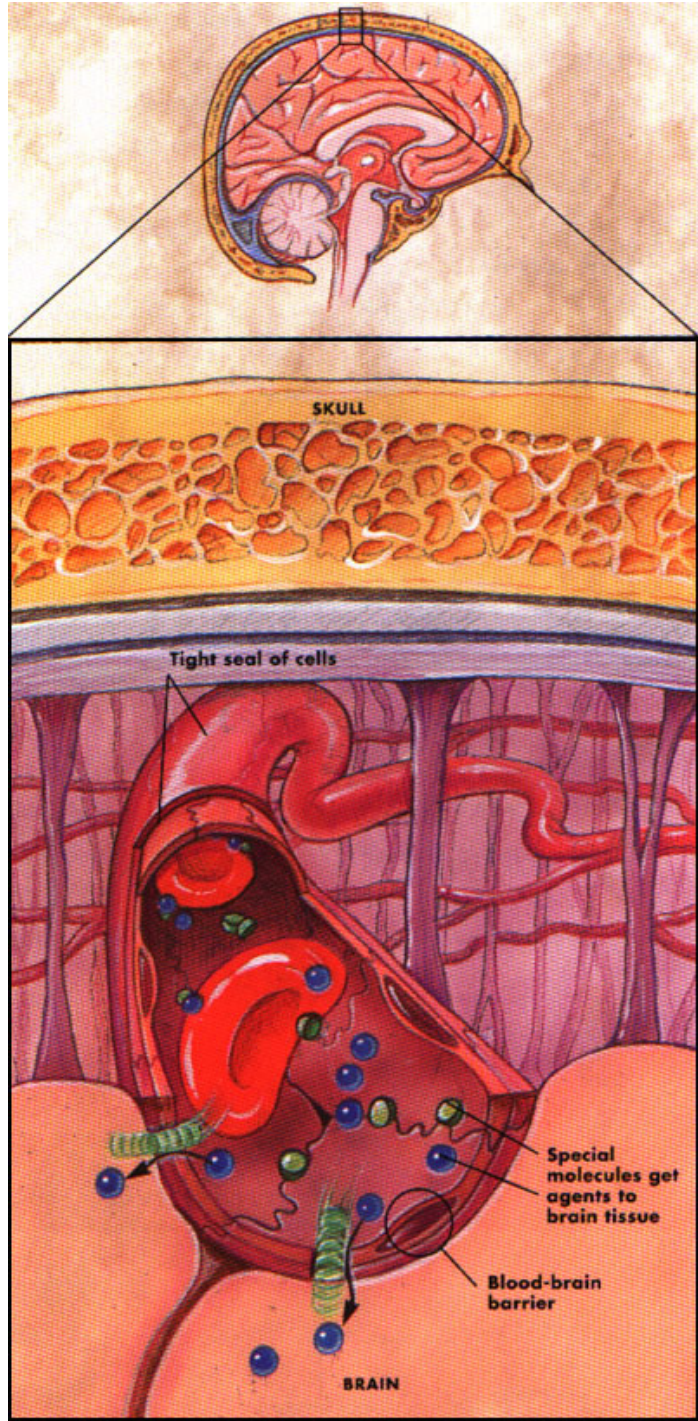


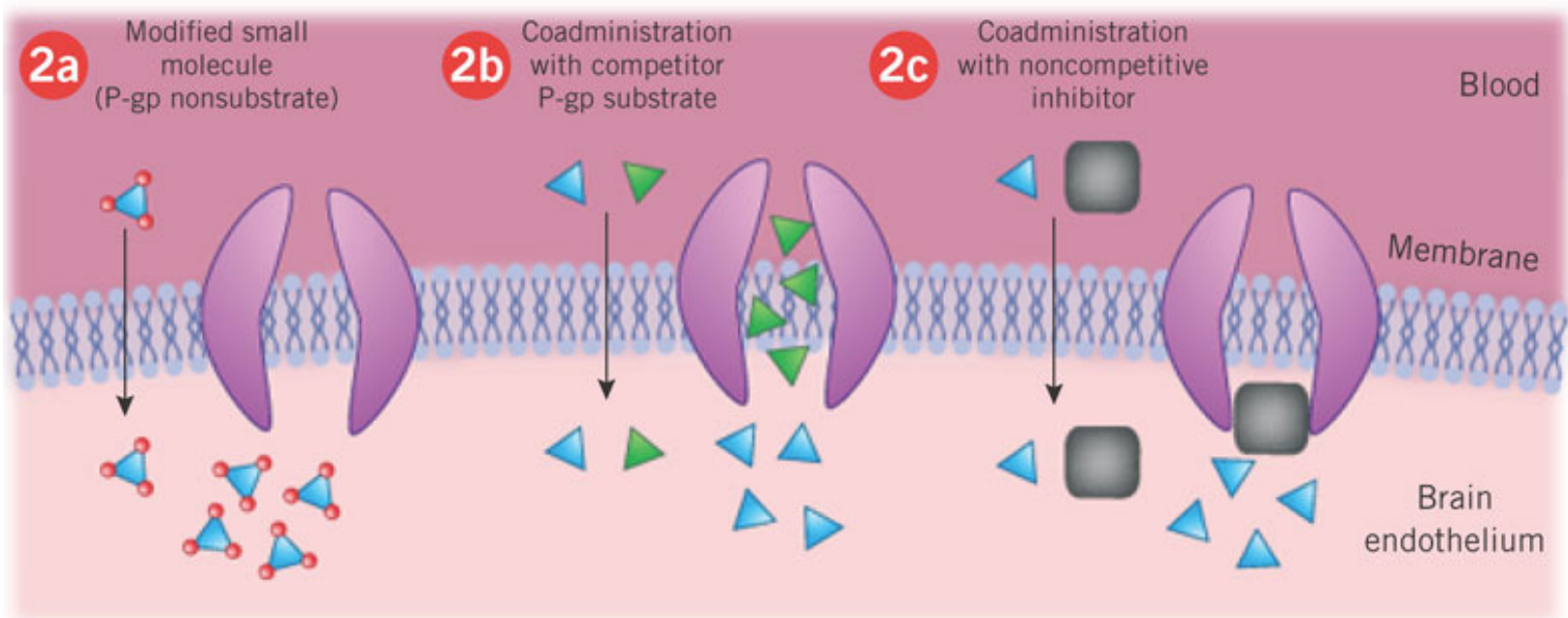
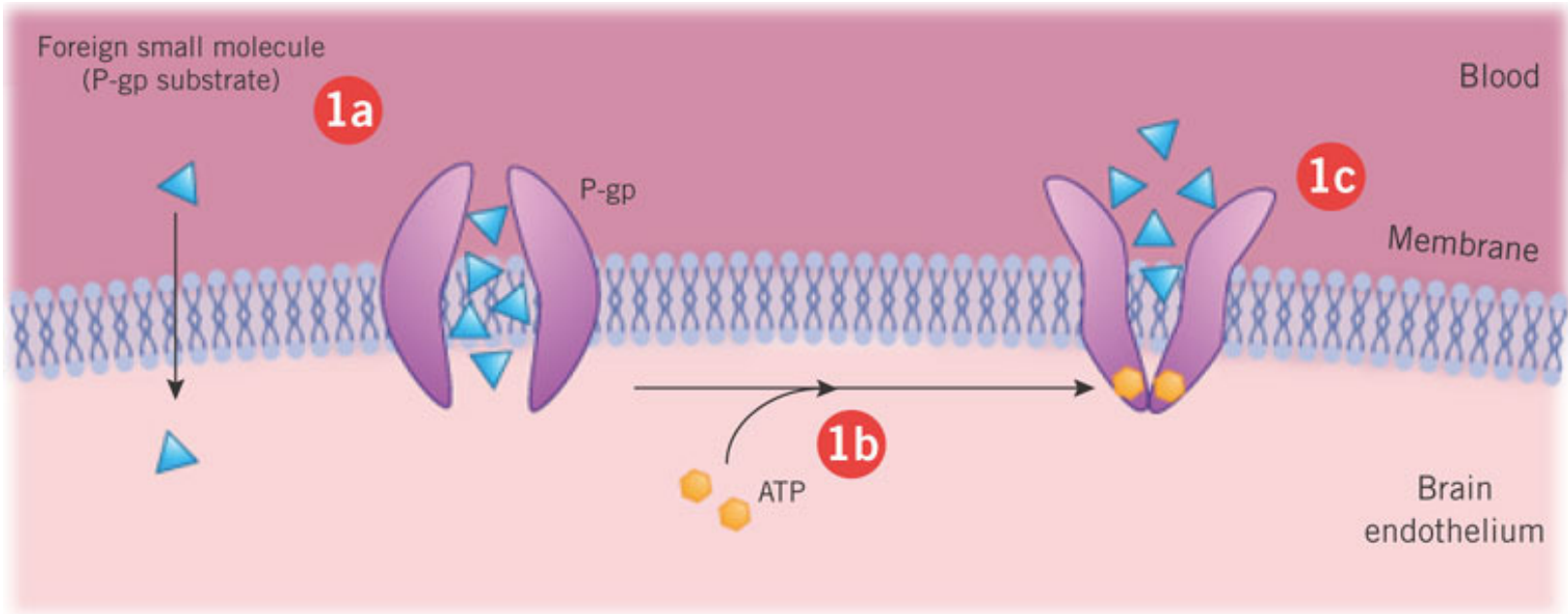
Blood Brain Barrier

In psychopharmacology, researchers are interested in any substance that crosses the blood-brain barrier and thus, has an effect on behavior, mood or cognition.









The blood-brain barrier (BBB) is an essential feature that protects the brain from potentially harmful substances in the blood.

The field of psychopharmacology studies a wide range of substances with various types of [psychoactive](#) properties. The professional and commercial fields of [pharmacology](#) and psychopharmacology do not mainly focus on [recreational drugs](#) (because street drugs have less predictable interactions and cannot be monitored in the same way), as the majority of studies are conducted for the development, study, and use of drugs for the modification of behavior and the alleviation of symptoms, particularly in the treatment of [mental disorders](#) ([psychiatric medication](#)). While studies are conducted on all psychoactives by both fields, psychopharmacology focuses primarily on the psychoactive and chemical interactions with the [brain](#).

Psychoactive drugs may originate from natural sources such as plants and animals, or from artificial sources such as chemical synthesis in the laboratory. These drugs interact with particular target sites or receptors found in the nervous system to induce widespread changes in physiological or psychological functions. The specific interaction between drugs and their receptors is referred to as "drug action", and the widespread changes in physiological or psychological function is referred to as "drug effect".

Only since the 1950s has the use of psychiatric drugs to restore [mental health](#), or at least limit aberrant behavior, been a part of medical therapeutics, when a number of new classes of pharmacological agents were discovered, notably [tranquillizers](#) (e.g., [chlorpromazine](#), [reserpine](#), and other milder agents) and [antidepressants](#) (including the highly effective group known as [tricyclic antidepressants](#)). Additionally, [psychedelic drugs](#) ([LSD](#) and [psilocybin](#)) and [empathogens](#) ([MDMA](#)) were popularized among many psychiatrists for a certain time as very helpful tools to assist [psychotherapy](#).

Lithium is widely used to allay the symptoms of affective disorders and especially to prevent recurrences of both the manic and the depressed episodes in manic-depressive individuals

The many commercially marketed [antipsychotic agents](#) (including [thiothixene](#), [chlorpromazine](#), [haloperidol](#), and [thioridazine](#)) all share the common property of blocking the [dopamine receptors](#) in the brain. ([Dopamine](#) acts to help transmit nerve impulses in the brain.)

Since scientists have found a direct relationship between dopamine blockage and reduction of schizophrenic symptoms, many believe that schizophrenia may be related to excess dopamine.^[3]

Dopamine hypothesis of schizophrenia

The **dopamine hypothesis** of schizophrenia or the dopamine hypothesis of psychosis is a theory that argues that the unusual behavior and experiences associated with schizophrenia (**sometimes extended to psychosis in general**) can be fully or largely explained by changes in dopamine function in the brain..

These drugs contrast sharply with the hypnotic and sedative drugs that formerly were in use and that clouded the patient's consciousness and impaired his/her motor and perceptual abilities. The antipsychotic drugs can allay the symptoms of anxiety and reduce agitation, delusions, and hallucinations, and the antidepressants lift spirits and quell suicidal impulses.

The heavy prescription use of drugs to reduce agitation and quell anxiety has led, however, to what many psychiatrists consider an overuse of such medications.^[4] An overdose of a tranquilizer may cause loss of muscular coordination and slowing of reflexes, and prolonged use can lead to [addiction](#)

Toxic side effects such as jaundice, psychoses, [dependency](#), or a reaction similar to [Parkinson's disease](#) may develop. The drugs may produce other minor symptoms (e.g., heart palpitations, rapid pulse, sweating) because of their action on the [autonomic nervous system](#).

Though particular drugs are prescribed for specific symptoms or syndromes, **they are usually not specific to the treatment of any single mental disorder.** Because of their ability to modify the behavior of even the most disturbed patients, the antipsychotic, antianxiety, and antidepressant agents have greatly affected the management of the hospitalized mentally ill, enabling hospital staff to devote more of their attention to therapeutic efforts and enabling many patients to lead relatively normal lives outside of the hospital. A somewhat controversial application of psychopharmacology is "cosmetic psychiatry"

How many neurotransmitters are there?

For the most part, neurons in the human brain communicate with one another by releasing chemical messengers called neurotransmitters. All neurotransmitter molecules undergo a similar cycle of use involving (1) synthesis and packaging into vesicles in the presynaptic cell; (2) release from the presynaptic cell and binding to receptors on one or more postsynaptic cells; and (3) rapid removal and/or degradation

How many neurotransmitters are there

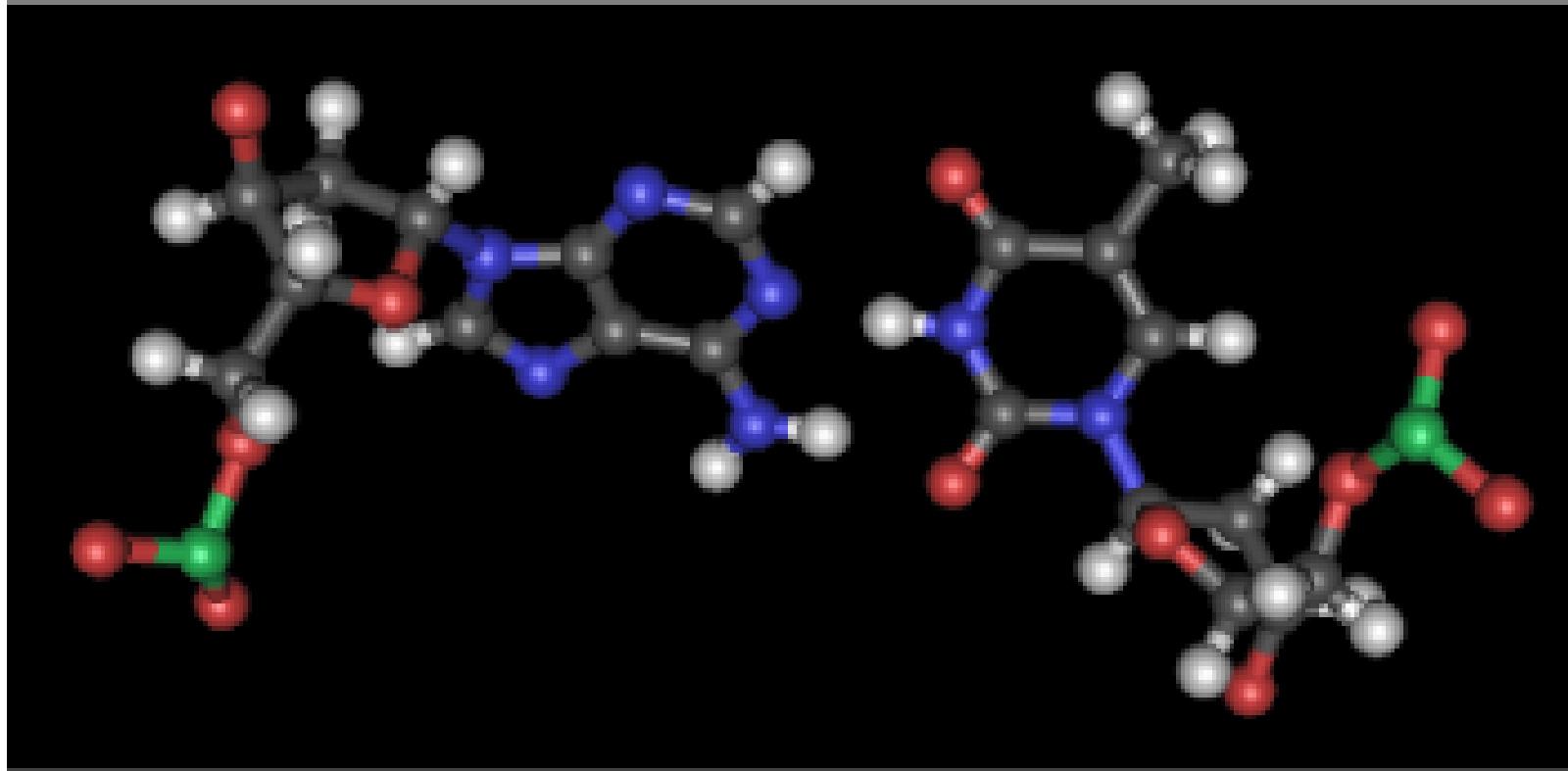
The total number of neurotransmitters is not known, but is well over 100. Despite this diversity, these agents can be classified into two broad categories: small-molecule neurotransmitters and neuropeptides

How many neurotransmitters are there

In general, small-molecule neurotransmitters mediate rapid synaptic actions, whereas neuropeptides tend to modulate slower, ongoing synaptic functions. Abnormalities of neurotransmitter function contribute to a wide range of neurological and psychiatric disorders. As a result, altering aspects of neurotransmitter release, binding, and reuptake or removal by pharmacological or other means is central to many therapeutic strategies.

Polydrug
Person





Human Genome Project

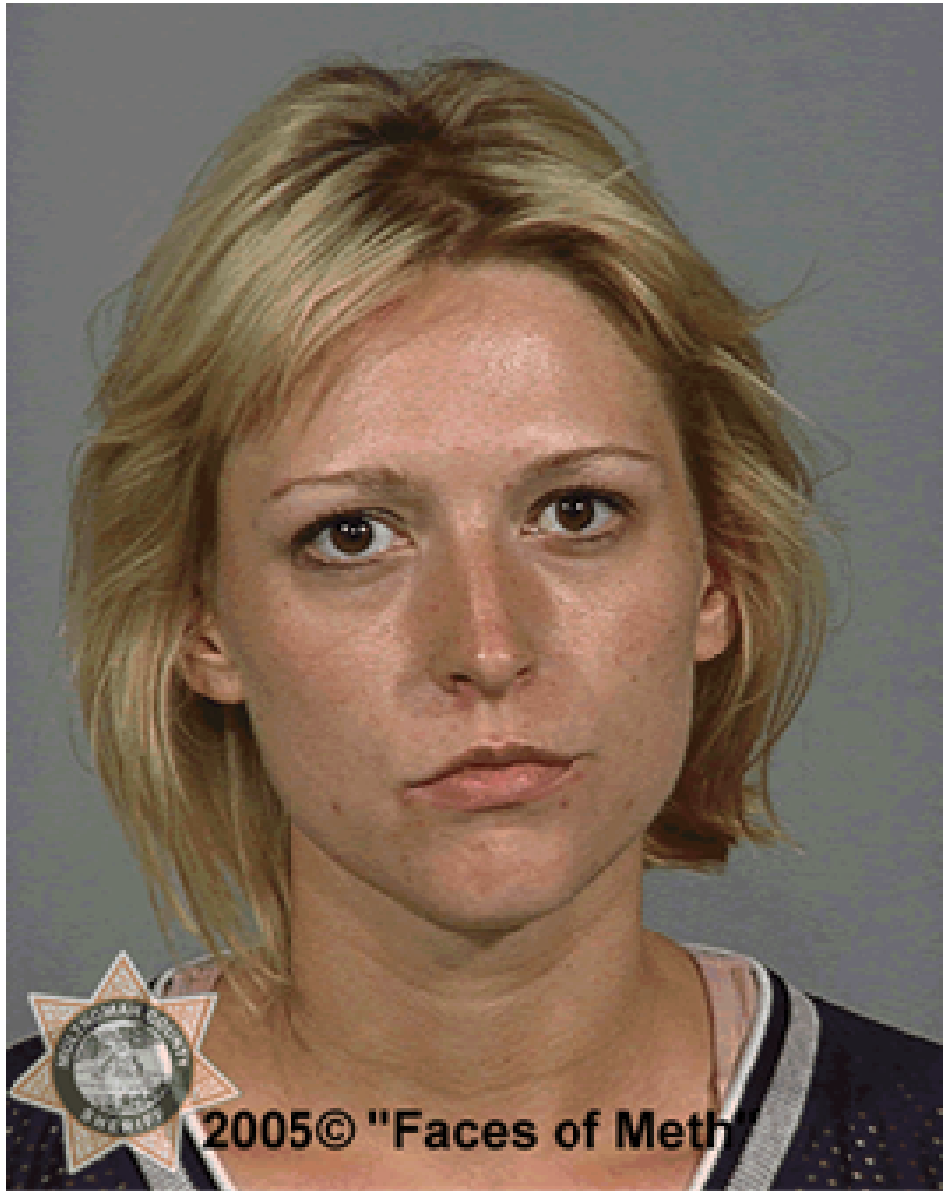
An international [scientific research](#) project with a primary goal of determining the sequence of chemical base pairs which make up [DNA](#), and of identifying and mapping the approximately 20,000–25,000 [genes](#) of the [human genome](#) from both a physical and functional standpoint.

Many scientists believe the “addiction gene,” Tetrahydroisoquinoline (or THQ), is a reality. Some people who inherit the gene go on to act out addictive and potentially self-destructive behaviors

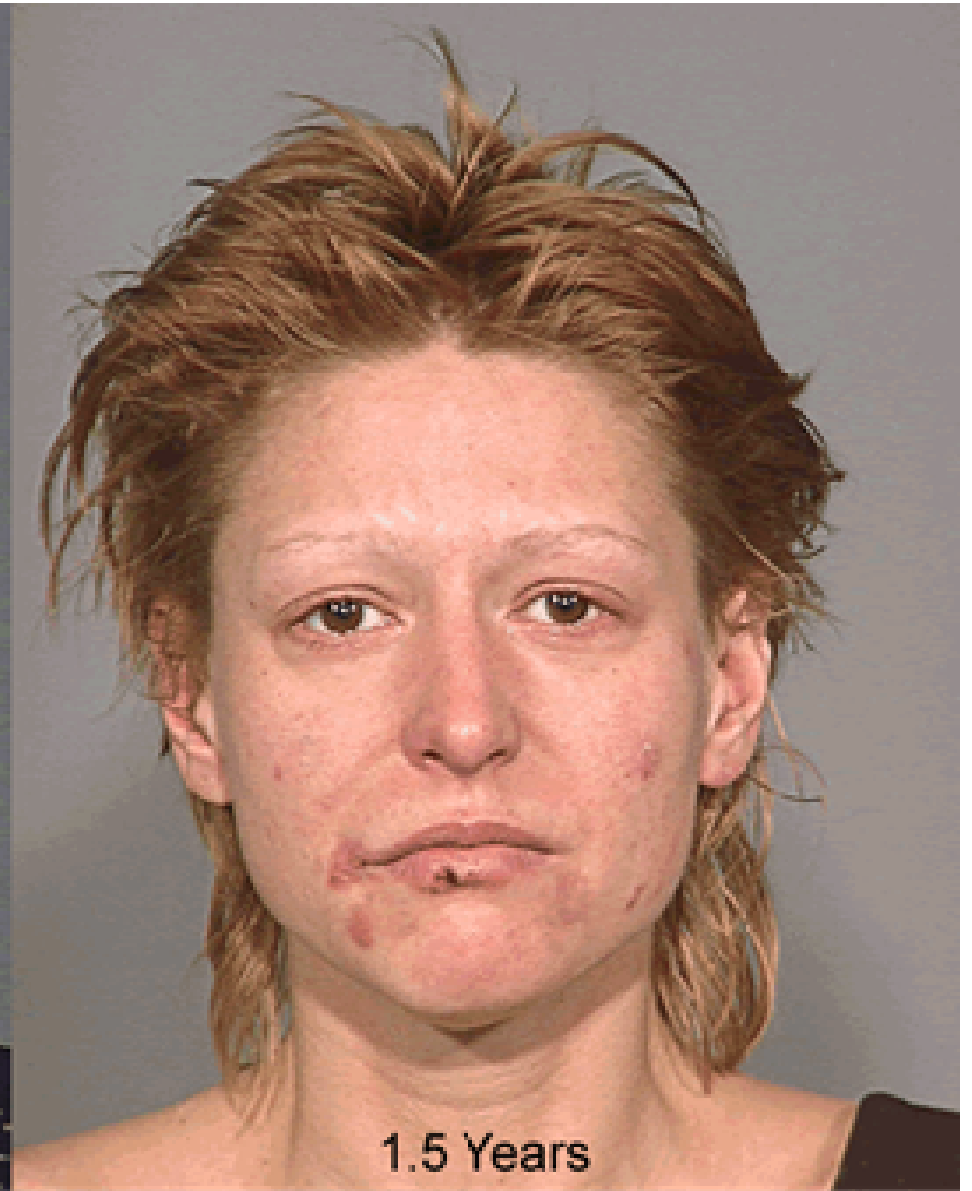
Addiction is a classic condition requiring the interaction of genetic, environmental and behavioral factors,” Bierut says. “A person with a genetic tendency to become addicted to alcohol, nicotine or other drugs will never develop that addiction if that individual never drinks, smokes or uses. We want to get a better handle on how genes and environment interact to cause disease.” Laura Jean Bierut, M.D., professor of psychiatry at the School of Medicine, Washington University in St. Louis

Genetics and molecular biology have provided some significant insights into behaviors associated with inherited disorders. For example, we know that an extra chromosome 21 is associated with the mental retardation that accompanies Down's syndrome, although the processes that disrupt brain function are not yet clear. We also know the steps from gene to effect for a number of single-gene disorders that result in mental retardation, including phenylketonuria (PKU), a treatable metabolic disorder for which all newborns in the United States are tested.

In general, it is easier to discern the relationship between biology and behavior for chromosomal and single-gene disorders than for common, complex behaviors that are of considerable interest to specialist and nonspecialist alike. So the former are at the more informative end of a sliding scale of certainty with respect to our understanding of human behavior. At the other end of the scale are the hard-to-define personality traits, while somewhere in between are traits such as schizophrenia and bipolar disorder—organic diseases whose biological roots are undeniable, yet unknown and whose unpredictable onset teaches us about the importance of environmental contributions, even as it reminds us of our ignorance.

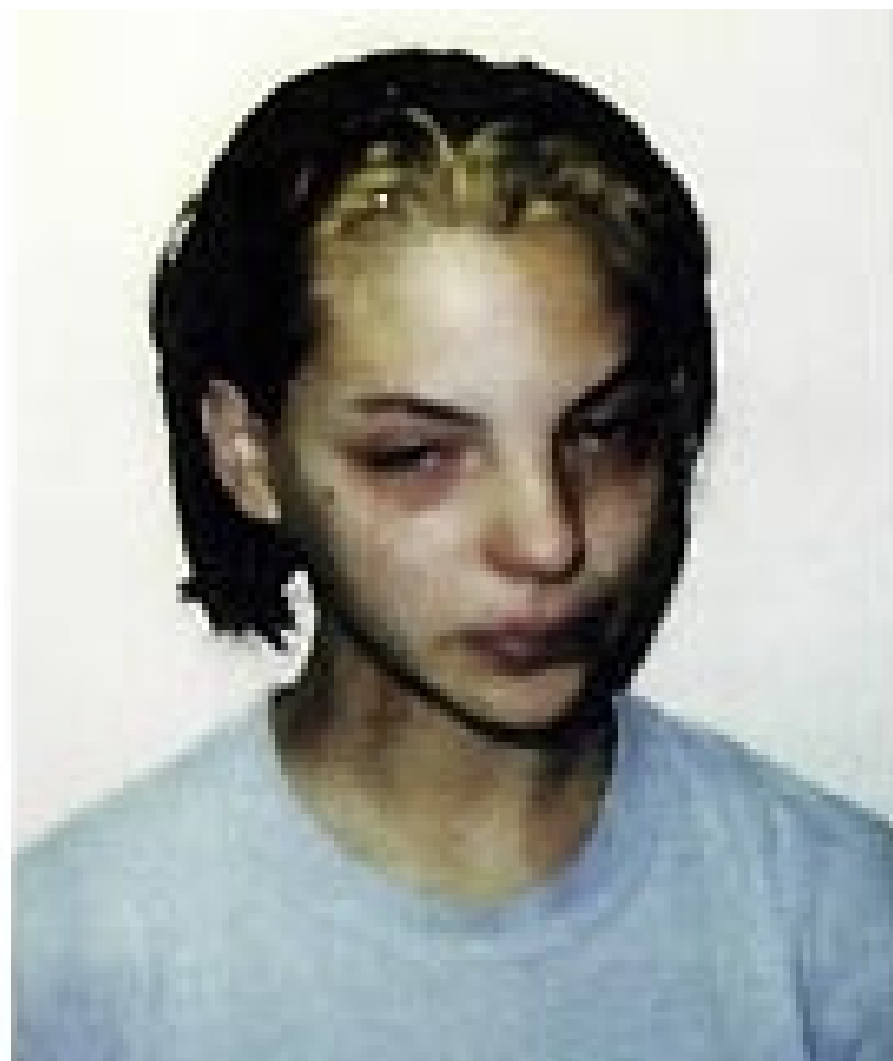
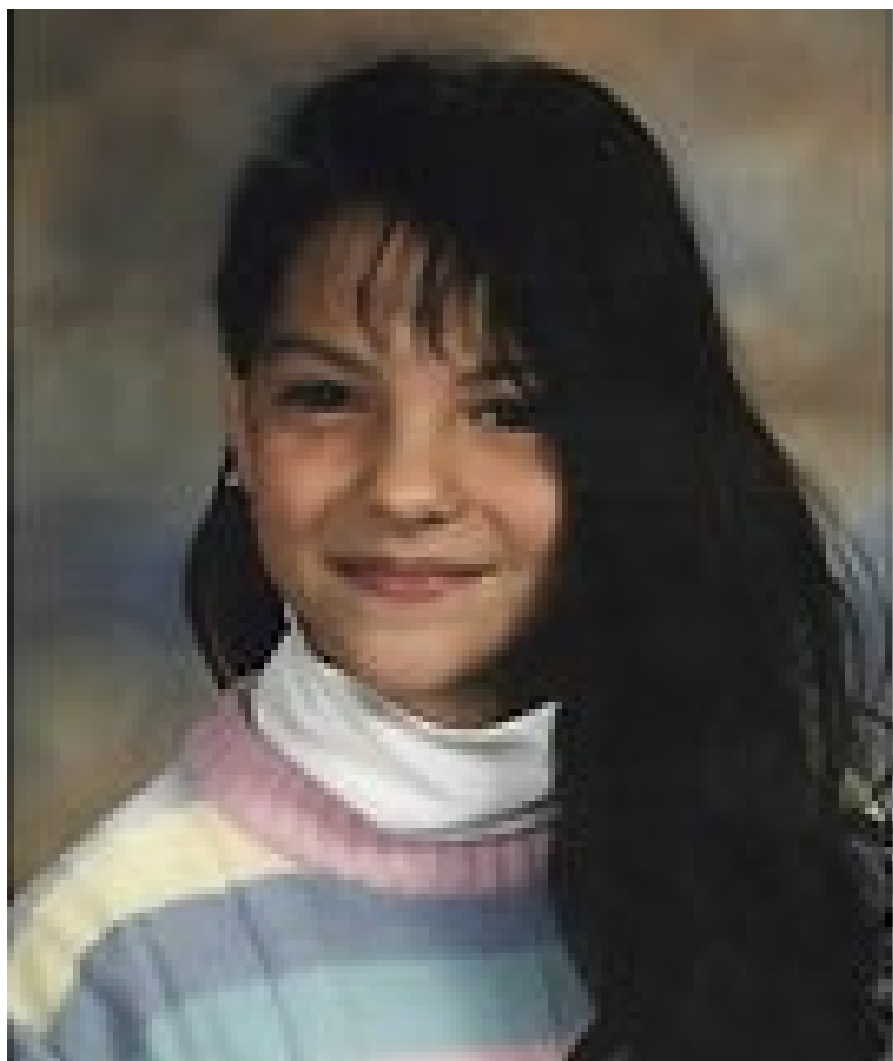


2005© "Faces of Meth"



1.5 Years

Jennifer





1 year later

Meth is addictive and causes brain damage from its first use. There are many side effects however that meth causes to the entire body.

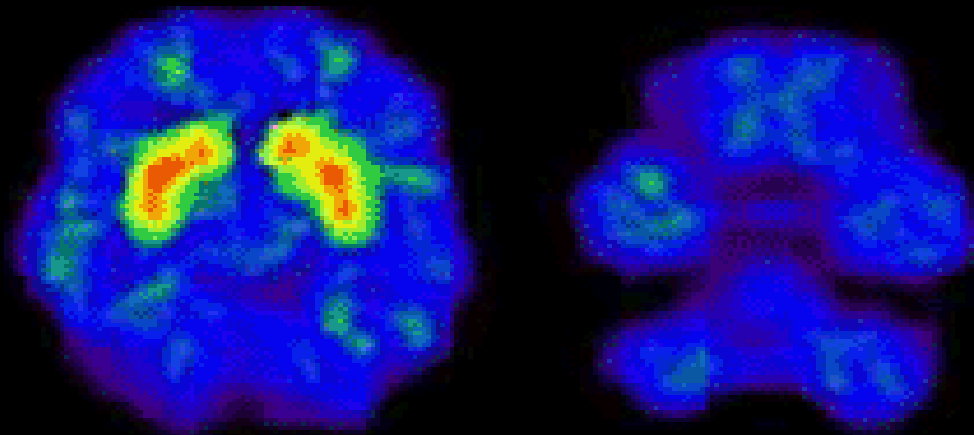
Meth causes a large release of **dopamine** into the brain. Dopamine is a natural neurotransmitter in the brain. **High levels of dopamine** will cause damage to the nerve endings of the brain. The large release of dopamine also causes its chronic depletion. **Low levels of dopamine** cause symptoms and the appearance of Parkinson's disease.

Psychopharmacology of Meth

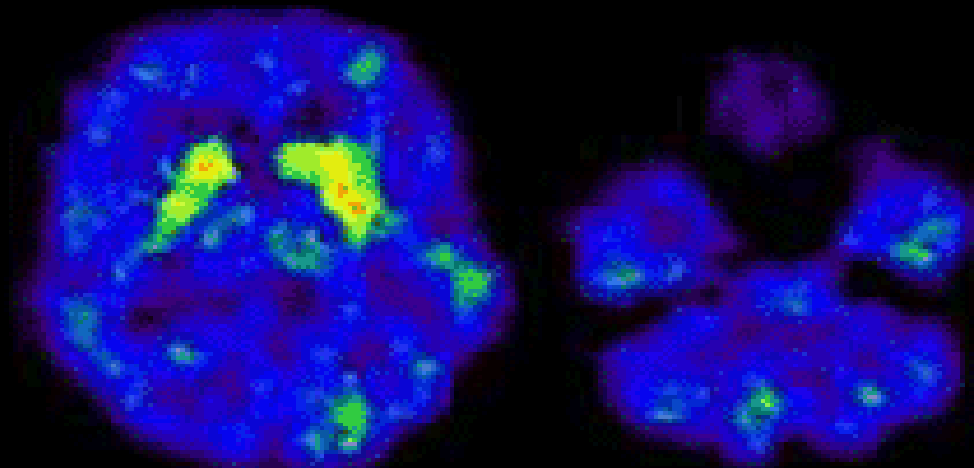
As a result of methamphetamine-induced neurotoxicity to dopaminergic neurons, chronic abuse may also lead to symptoms which persist beyond the withdrawal period for months, and even up to a year.^[6] Research has found that 20% of methamphetamine addicts experience a psychosis resembling schizophrenia which persists for longer than six months post-methamphetamine use; this amphetamine psychosis can be resistant to traditional treatment.^[7] In addition to psychological harm, physical harm, primarily consisting of cardiovascular damage, may occur with chronic use or acute overdose.^[8]

Methamphetamine use has a high association with depression and suicide as well as serious heart disease, [amphetamine psychosis](#), anxiety and violent behaviours. Methamphetamine also has a very high addiction risk.^[8] Methamphetamine is [neurotoxic](#) and is associated with an increased risk of [Parkinson's disease](#).^{[6][21]} Methamphetamine abuse can cause neurotoxicity which is believed to be responsible for causing persisting cognitive deficits, such as memory, impaired attention and executive function. Over 20 percent of people addicted to methamphetamine develop a long-lasting [psychosis resembling schizophrenia](#) after stopping methamphetamine which persists for longer than 6 months and is often treatment resistant.^[7]

Meth Use Changes Your Brain

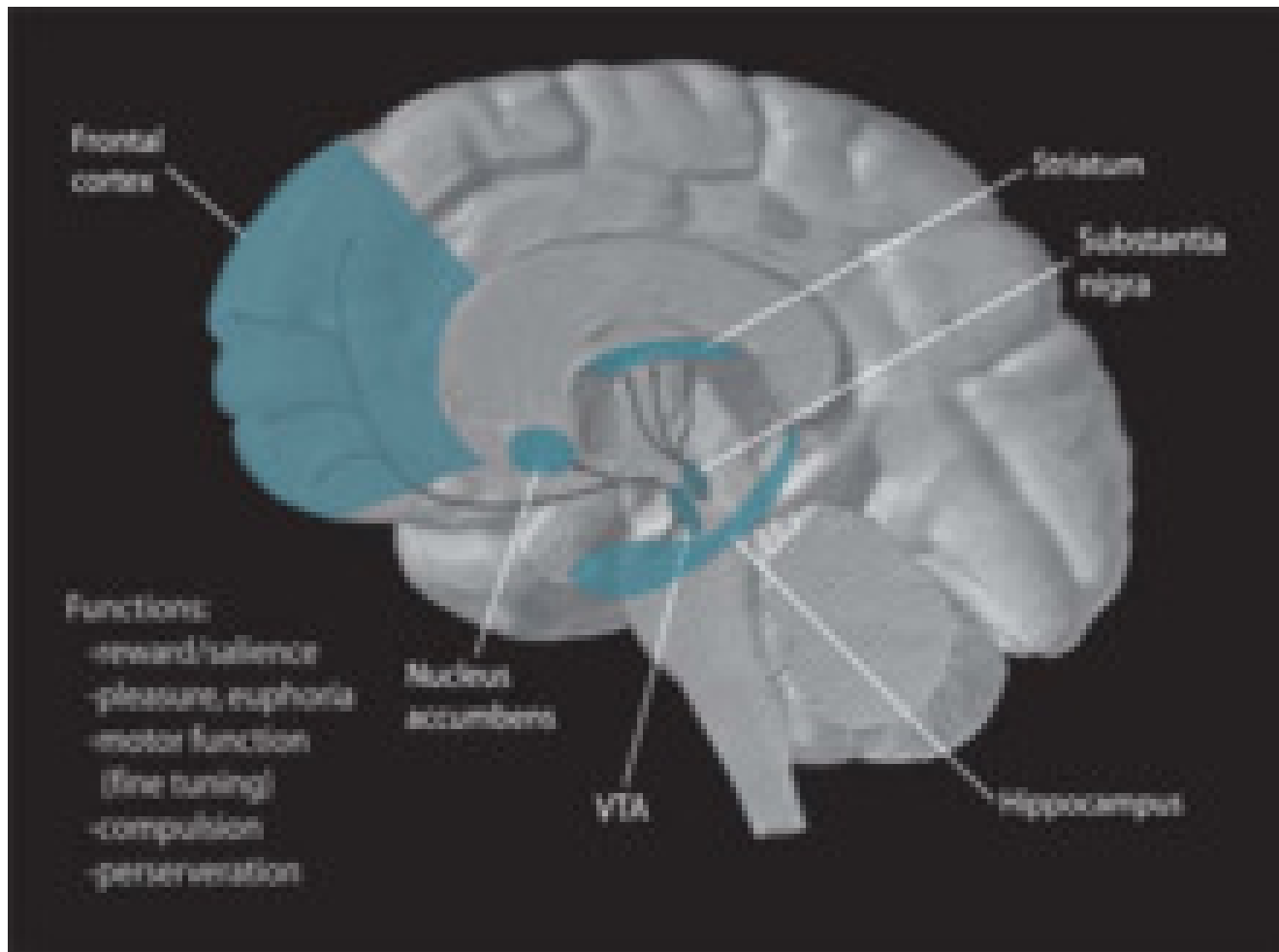


Normal Control



Methamphetamine Abuser

Schizophrenics have a problem with dopamine levels and drug users (Meth) have a problem with dopamine levels.



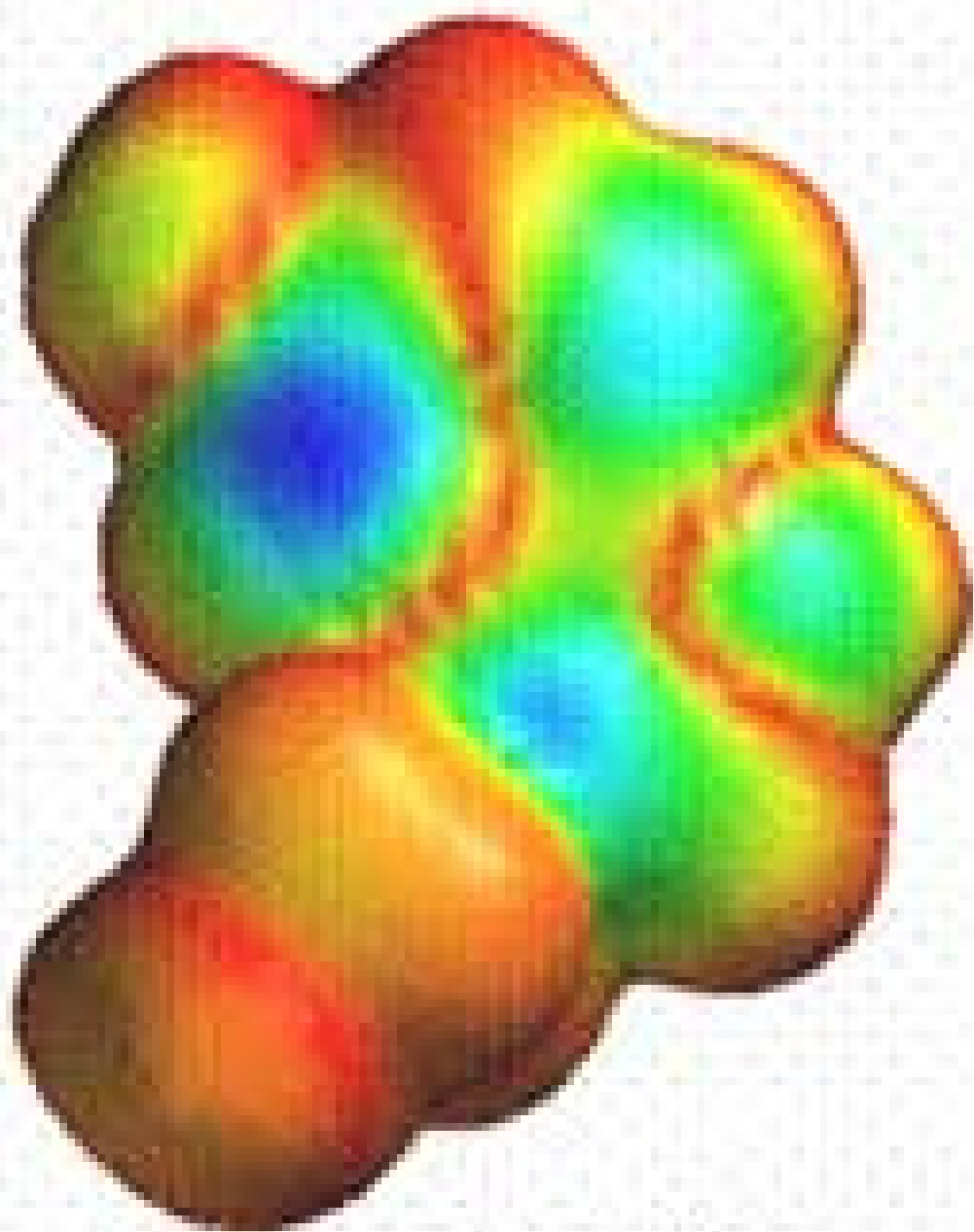
Dopamine is manufactured in nerve cell bodies located within the ventral tegmental area (VTA) and is released in the nucleus accumbens and the prefrontal cortex. Its motor functions are linked to a separate pathway, with cell bodies in the substantia nigra that manufacture and release dopamine into the striatum.

If you want to move beyond hive-docility, you must become God the Moralist.

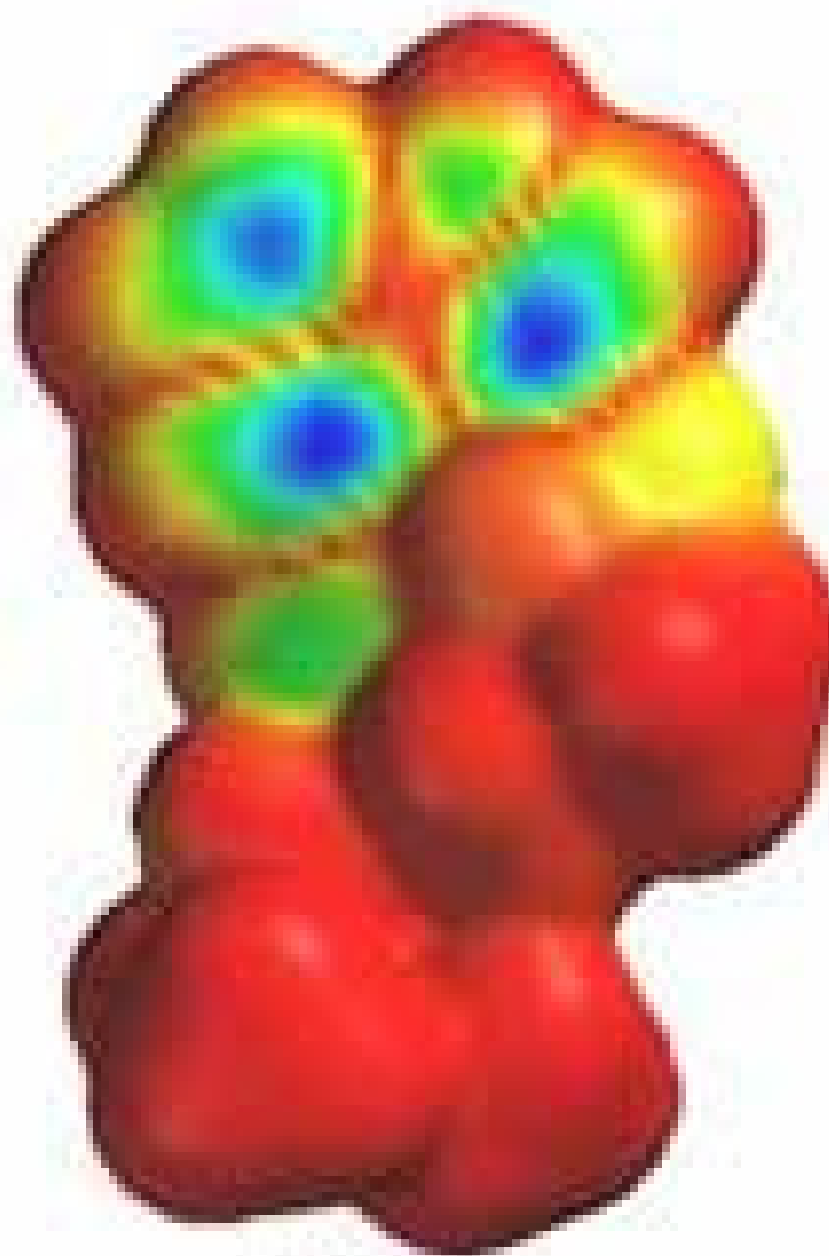
TIMOTHY LEARY

Some hallucinogenics (LSD) mimic the chemical structure of **serotonin**, fooling the brain into operating in **various alternative configurations**. LSD is distributed throughout the brain, simply because of its [similarity in chemical structure to serotonin](#).

Other drugs (MDMA) effectively '**uninhibit**' the supply of **serotonin** to the brain, giving users the characteristic high associated with the drug:



Serotonin



LSD

Turn on, Tune in, Drop out

TIMOTHY LEARY

Drop Out--detach yourself from the external social drama which is as dehydrated and ersatz as TV. **Turn On**--find a sacrament which returns you to the temple of God, your own body. Go out of your mind. Get high. **Tune In**--be reborn. Drop back in to express it. Start a new sequence of behavior that reflects your vision.

Reverend *Jim* (Christopher Lloyd)



Dual Diagnosis ?



IADCP listening to Timothy or Reverend Jim



- **"Reverend" Jim Ignatowski**: Yeah, I did some drugs, though probably not as many as you think. How many drugs do you think I did?
Elaine Nardo: A lot.
"Reverend" Jim Ignatowski: Wow! Right on the nose!

- **Louie De Palma**: Ignatowski! Where have you been all week?

"Reverend" Jim Ignatowski: I don't work weekends.

Louie De Palma: You been gone nine days!

"Reverend" Jim Ignatowski: Yeah...

Tony Banta: Jim, weekends are only two days.

"Reverend" Jim Ignatowski: Oh, I thought we'd switched to the metric system.

- [*while filling out an application*]
Bobby Wheeler: Mental illness or narcotic addiction?
"Reverend Jim" Ignatowski: Now that's a tough choice...

Psychopharmacology & Mental Illness Interaction

A Tough Choice Or Big Picture?



A Review of the Literature

- **Mental Illness and Crystal Methamphetamine**
- **Mental Illness and Cocaine**
- **Mental Illness and Lysergic Acid Diethylamide**
- **Mental Illness and Marijuana**