

Addiction

The Science of Substance Abuse & the Search For a Cure



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Addiction ranks as one of the world's major human health issues. It is recognized as a disease by the American Medical Association, the American Public Health Association, the World Health Organization, and the National Institute on Alcohol Abuse and Alcoholism (NIAAA), among other agencies and official bodies. And yet, this designation remains highly controversial.

Recent breakthroughs in [neurology](#) have allowed brain scientists, for the first time in history, to understand how several century's worth of external chemical pleasures have misled our brains. As psychologist Mihaly Csikszentmihalyi, author of *Flow*, writes: "The brain won't tell us when enough is enough."

If alcoholics and abusers of other drugs have specific chemical imbalances in the brain, and if these imbalances turn out to be reliable enough and measurable enough in sufficiently large numbers of human addicts, it is natural to wonder whether, eventually, we can find a way to correct them.

Some sort of neurotransmitter cocktail, maybe.

Or just possibly... [a pill?](#)

About This Book:

It was the dawn of the 1990s—the "Decade of the Brain," under the aegis of the National Institute of Mental Health (NIMH) and the Library of Congress. The object of the enterprise was "to enhance public awareness of the benefits to be derived from brain research." I was sitting in a Clement Street diner in San Francisco, reading a book called [The Hidden Addiction](#), by a Seattle M.D. named Janice Keller Phelps, and trying to understand why I could not stop drinking. Dr. Phelps was saying that most of what I thought I knew about alcoholism and other addictions was just plain wrong.

In fact, most of what I knew, or thought I knew, about the workings of my own brain were wrong. Over the past fifteen years, the science of neurology has created a paradigm shift in our basic understanding of the structure of the brain and the rest of the human nervous system. We know that neurons, and neurotransmitters like serotonin and dopamine, are at the core of emotional brain states. However, it took a very long time, and a large group of doctors, clinicians, assorted researchers, and lab workers to piece together the ways in which this new knowledge of the brain had direct application to the state of mind and body we call addiction.

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In struggling to overcome my own addictions, I needed to align the particulars of my situation with a more universally applicable point of view. I needed a broad, overarching template of what addiction truly was.

Years earlier, I had written a nonfiction book about the rise of Silicon Valley, so I was under no illusions about the scientific learning curve and the technical research that would be required to write about the beginning of addiction medicine. Nonetheless, the project was even more daunting than I had foreseen—than I could have foreseen—at the outset. Breakthroughs in brain research and the science of brain functions came faster than scientists and science journalists could digest them. My book manuscript mutated, underwent rewrites, was shelved, then revised again, and finally offered in its present form.

Along the way, I gathered information from medical researchers at universities, and at the government's massive National Institutes of Health (NIH). I spoke with clinicians at the University of Michigan, the University of Minnesota, the University of California-San Francisco, and the State University of New York-Brooklyn. Dr. Ting-Kai Li, an invaluable source in the early 1990s while he was professor of medicine and biochemistry at Indiana University, went on to become director of the National Institute of Alcohol Abuse and Alcoholism (NIAAA) under the NIH umbrella. Neurologist Miles Herkenham at the NIMH conveyed to me his early excitement about the unique properties of the cannabis brain receptor he helped to discover. In addition, I am particularly grateful to Dr. Ovide Pomerleau at the University of Michigan's Tobacco Research Network for sharing his early ideas about the strong biochemical relationship between smoking and depression. And sadly, I learned of the death of Dr. Henri Begleiter, who played such a pivotal role in establishing addiction as a physical brain disorder, and who headed up the first Collaborative Study on the Genetics of Alcoholism (COGA).

Along the way, I broke my own long-standing addiction to alcohol—the writer's "black lung disease," as Tom McGuane succinctly puts it. And eventually, I quit smoking cigarettes, after 24 years of it.

This book is the culmination of a decade-long odyssey through the maze of biomedical and psychological specialties that comprise the new science of addiction. As a scientific layperson, I can only hope to impart some small flavor of the work being done. I have endeavored to be honest about the available evidence, or lack of it, for various assertions, so that readers can judge for themselves. There are already enough well-established findings to forever change our thinking about addiction, without having to resort to speculation.

Also, I have felt compelled to balance the findings of laboratory science against what addicts themselves have to say. I was astonished by how often the common experiential knowledge of the participants in Alcoholics Anonymous and Narcotics Anonymous dovetailed with and amplified various threads of the scientific research. Some of the most powerful insights into addiction came to me from addicts themselves. Finally, there is my own practical exposure to this arena, which is "anecdotal evidence," in lab parlance, but which definitely shaped my approach to the topic.

My hope is that addicts and those who care about them will read this book, will recognize that it is addressed to them, and will find in it some new and useful ways of viewing treatment and recovery. For addicts, knowledge is power. Genes and neurotransmitters are about risk, not about destiny. One of the most exciting and controversial aspects of current addiction research is that it soon may be possible to identify addiction-prone individuals early in life, so that appropriate medical steps can be taken to prevent the potential for addiction from becoming the reality.

--Dirk Hanson

Dirk Hanson is a freelance science reporter and novelist who lives in Minnesota.

His two previous books—[The New Alchemists: Silicon Valley and the Microelectronics Revolution](#), and [The Incurison: A Novel](#)—were reviewed in the [New York Times](#), [The New Yorker](#), the [Los Angeles Times](#), [Fortune](#), and other publications.

He has written for [California Magazine](#), [Omni](#), [CoEvolution Quarterly](#), [Willamette Week](#), the [Whole Mind Newsletter](#), and other magazines. He has also worked as a business and technology reporter for the [Des Moines Register](#) and for numerous trade publications.

He received a B.S. degree in Journalism/Mass Communications from Iowa State University, and an M.A. in Humanities from California State University, Dominguez Hills.

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