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Psychedelic Drugs

A market poised for takeoff

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With advanced clinical trials showing efficacy of psychedelic drugs for conditions ranging from post-traumatic stress disorder (PTSD) to chronic depression, drugs such as psilocybin are poised to move quickly from the far fringes of medical practice to the mainstream. With a market projected to reach $6.85 billion by 2027 and likely to grow much larger as drugs are approved,[1] the sector has attracted growing venture capital investment and several high-profile startups. Major biopharma companies have made investment, too. They believe that this is the moment to get in on a new growth area in the treatment of a broad range of CNS (central nervous system) disorders.

In this paper, we show how rapidly the psychedelics market is evolving and how substances that were once known as "party" drugs could soon take their place among tested, proven, and regulated treatments for CNS disorders. Although frequently lumped together in the media with medical marijuana, psychedelic drugs are following a much different development path. Marijuana has not been legalized at the federal level or approved by the FDA. And, while marijuana is now freely available in many states, quality varies widely and there are few scientific controls on purity, bioavailability, and strength.

In contrast, psychedelics are being engineered to be pharmaceutical-grade compounds, with uniform quality standards. They would be prescribed and/or administered by medical professionals. In some cases, they are being administered through "microdosing," which mitigates the psychedelic "trip," limiting the appeal for recreational use and abuse. This research outlines the pros and cons that biopharma companies must weigh when contemplating entry into this market.

[1] Source: "Psychedelics Drug Market Projected to reach $6.85 Billion by 2027," prnewswire.com, June 2020.

A market poised for takeoff

If the flow of money into psychedelics is an indicator, it looks like the market is poised for takeoff. At least 18 venture capital firms, including but not limited to the Conscious Fund, re.Mind Capital , Negev Capital, Noetic Fund, Convergence Partners, and Iter Investments are committed to spending more than $1.8 billion on psychedelic development, according to Bloomberg.[2]

Psychedelic drug IPOs include Atai Life Sciences, which went public in June 2021, MindMed, whose IPO on Nasdaq happened in April 2021, Compass Pathways, which went public in the U.S. in September 2020, raising $146 million in its IPO and another $144 million in a secondary offering, and Cybin which went public in July 2021.[3]

Atai last year increased its ownership stake in Compass, which like Atai is backed by PayPal founder Peter Thiel, to 20.8 percent.[4]

Development of psychedelic drugs has gained momentum in the last 12 months from a variety of venture capital investments. Some of the largest deals include:

Date	Companies	Investors	Deal size (US$, million)
Sep 2021	Delix Therapeutics	Apeiron Ventures, ARTIS Ventures, Bail Capital, Casa Verde Capital, RA Capital	70.0
May 2021	Seelos Therapeutics (NAS: SEEL)	AiiM Partners, Breakout Ventures, Siam Capital, Standard Investments	64.5
Sep 2021	Mindstate Design Labs	Apoorva Mehta, Day One Ventures, Fred Ehrsam, Harvard Management Company	11.5
Apr 2021	Gilgamesh Pharmaceuticals	Aera VC, Ambria Capital, Gron Ventures, JLS Fund, Negev Capital, Noetic Fund	27.0
Sep 2021	CaaMTech	Kortschak Investments, Noetic Fund	22.0

[2] Source: Chris Bryant, "Magic Mushrooms Are Giving Investors a Bad Trip ,"April. 14, 2022

[3] Source: Suzanne Woolley, "Magic Mushroom" Company Goes Mainstream, Jumps 71% Post-IPO," bloomberg.com, September 18, 2020,

[4] Source: "atai Life Sciences Increases its Ownership Position in COMPASS Pathways," atai.com, November 29, 2021

There are even three exchange-traded funds that track psychedelics, including the Enhanced Consciousness Index. Its top holdings are Jazz Pharmaceuticals, a traditional biotech firm, and Sage Therapeutics, which makes a drug to treat post-partum depression.[5]

Despite the growing commercial potential for these therapeutics, big pharma has mostly remained on the sidelines. One of the first forays into this space by a big pharma firm was in March, 2019, when Johnson & Johnson subsidiary Janssen Pharmaceuticals received FDA approval for Spravato, a ketamine analog nasal spray for treatment-resistant depression and depression with suicidal ideation.

A Japanese pharmaceutical company, Otsuka Pharmaceuticals, has invested $5 million in developing two psychedelic compounds in collaboration with Toronto-based Mindset Pharma, which is focused on creating "patentable next-generation psychedelic medicines to treat neurological and psychiatric disorders with unmet medical needs."[6] Otsuka is also working with Perception Neuroscience, a unit of Atai Life Sciences, on developing ketamine-type drugs for depressive disorders and did put money into the Compass Pathways Series B round.[7]

[5] Source: "The Three Psychedelics ETFs: Which Is The Best Fit For Your Portfolio?", theseedinvestor.com, September 20, 2021

[6] Source: "The McQuade Center for Strategic Research and Development and Mindset Pharma Collaborate to Develop Psychedelic Medicines," msrd-us.com, Jan. 5, 2022

[7] Source: "Perception Neuroscience And Otsuka Pharmaceutical Announce Collaboration On Development Of PCN-101 (R-ketamine) In Japan For Treatment-of Depressive Disorders," psilocybinalpha.com, March 16, 2021

Is the moment right for big pharma?

Because of recent research and regulatory developments, the risk/reward ratio is changing for pharma companies considering entry in the psychedelic marketplace. Here are five development milestones that, when reached, could change how big pharma thinks about psychedelics:

01

Clinical trial successes

The sector received a huge boost from the results of a 2021 clinical trial from the Multidisciplinary Association for Psychedelic Studies (MAPS), which showed significant benefits using MDMA in combination with in-patient therapy in the treatment of PTSD. A second Phase 3 trial is currently under way and if successful could pave the way for FDA approval in 2023. That would open the floodgates for further development.

02

Clarification of reimbursement

The combination of psychedelic drugs with in-patient psychotherapy needs commercial validation, possibly via partnerships or other models. One complication is reimbursement: most in-office treatment is usually reimbursed by medical insurance, while pharmaceuticals are reimbursed by the pharmaceutical benefit plans. This is further exacerbated by the potential need for pre- and post-treatment therapy. Further, there may be a need for treatment outside of protocol with additional dosing/psychotherapy that is a further complicating factor. Commercial success for MAPS could help to alleviate the concern and their launch will be watched closely.

03

Wider application

A growing number of non-mood disorders, such as in dementia and pain, are being considered for treatment with psychedelics, but these therapies may need different delivery models. A possible solution: decoupling of the drug from psychotherapy that could make delivery and reimbursement more feasible as well as delivery from a typical pharma perspective. This would likely be the model for disorders such as dementia where psychotherapy is not as critical. Data readouts will be eagerly watched.

04

Intellectual property exclusivity

For first generation versions of psychedelic therapies, there is concern that there is limited opportunity to patent existing naturally occurring compounds. In 2021, a Canadian court ruled that Spravato was not an "innovative drug," denying it data protection. Further, some companies may look to develop these therapies via a 505(b)2 pathway which can limit commercial opportunity. In future generations of drug development, companies could shift to synthetic or deuterated versions that afford them the chance to differentiate their products from naturally occurring substances or look for other IP strategies to maintain viability. However, companies that are developing future generations of molecules are able to strengthen IP through their clinical strategy in terms of indication selection, innovative trial designs, methods of use patents, and novel formulations that gain patent exclusivity. This is a critical step for big pharmaceutical companies to assuage concerns about patient viability that clinical-state psychedelic companies are taking.

05

Supply-chain readiness

Because these drugs are considered Schedule 1 controlled substances in the U.S., there is a hurdle to potential distribution that needs to be overcome. Centers/HCPs may need to become trained to prescribe the therapy as in Spravato or methadone. Also considering the risks of abuse, there will be requirements for storage and safekeeping. Oregon became the first U.S. state to legalize psychedelics for therapy and Washington, D.C. voted to decriminalize their use for medicinal purposes.[8]

[8] Source: Cameron Costa, "Peter Thiel-backed psychedelic start-up's shares pop in Wall Street debut," CNBC.com, June 18, 2021

[9] Source: Joseph Walker, "Biotech Stocks, Once Booming, Enter Bear Territory," wsj.com, April 3, 2022

What to do now?

Major pharma companies that want to consider psychedelics should be doing their homework now. They should study the market and identify promising psychedelic companies to keep on their radar. Follow companies that are developing products for indications that would fit with or complement CNS drugs in your portfolio. And, given the continuing uncertainty about clinical potential and hypothesized mechanisms of how the class works, pharma companies may want to consider investments in psychedelic start-ups from corporate venture funds or innovation hubs first. Big pharma companies should also be tracking the explosion of academic research into psychedelics for a variety of indications such as addiction by Johns Hopkins, NYU, and other institutions.

How KPMG can help

KPMG Deal Advisory & Strategy (DAS) has a full suite of transaction services to support clients across the growth life cycle. DAS supports both small biotech integrations and large complex, transformational transactions. Additionally, KPMG Strategy provides support to small and mid-size pharmaceutical companies that need to explore which indications and assets in their portfolio to prioritize to optimize value and long-term growth. KPMG has a valuation practice that advises clients on appropriate deal multiples so they can remain competitive during the bidding process. DAS also provides clients with a full suite of due diligence services:

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Synergy assessments

Back office-specific due diligence on HR, IT, and other topics

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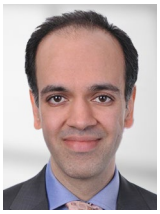

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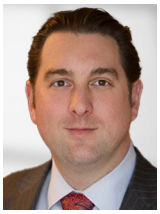

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