

Optogenetics Market - Growth, Trends, Covid-19 Impact, and Forecasts (2023 - 2028)

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Report description:

The optogenetics market was valued at USD 522.5 million in 2021, and it is expected to reach USD 648.41 million by 2027, registering a CAGR of 3.86% during 2022-2027.

The COVID-19 pandemic is expected to impact the optogenetics market significantly. According to the article published by PUS University in February 2022 by Shanet Suzan Alex, SARS-CoV-2 causes neurological abnormalities and respiratory symptoms, with an 85% occurrence rate in Alzheimer's patients. As per the same source, SARS-CoV-2 infiltrated COVID-19 patients' cognitive centers, causing Alzheimer's-like phenotypes in those with no underlying conditions and exacerbating Alzheimer's neuropathology in those with Alzheimer's and autism. As a result of COVID-19 patients with neurological disorders, the mortality rate has increased, and the market has been significantly impacted.

The major factors driving the market's growth include the scope of optogenetics as a potential diagnostic tool in neurosciences, the rapid growth of advanced technologies, and the increasing use of multimodal imaging. Optogenetics technology has revolutionized neuroscience in the last few years by allowing researchers to control specific neurons in experimental animals. The ability to control neurons has revealed information about brain pathways involved in diseases such as depression, obsessive-compulsive disorders, Parkinson's disease, and other conditions. In neural research, optogenetic methods for monitoring synaptic activity have proven to be extremely useful in several neurological diseases.

It allows researchers to study how the neurological activity patterns within specific brain cells give rise to thoughts, behaviors, and memories at an unprecedented precision. Thus, it helps find cures and treatments for neurological and psychiatric disorders, such as depression, addiction, schizophrenia, and Parkinson's disease. For instance, according to the article published in Nature Communication in May 2020, titled "Deep brain stimulation-guided optogenetic rescue of parkinsonian symptoms," the precision of optogenetics holds the promise of improved normalization of circuits that are dysfunctional in Parkinson's disease and its diagnosis, while the use of light rather than electricity (as in deep brain stimulation) may reduce the risk of unintended effects caused by non-specific influences. Thus, the use of optogenetics in the diagnosis of Parkinson's proved a potent tool used to

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diagnose brain activity.

Also, rising cases of neurological disorders such as Parkinson's, Alzheimer's, epilepsy, and Huntington diseases may boost the market. According to the Parkinson's Foundation 2020, approximately 1.2 million people in the United States may have Parkinson's disease by 2030. In addition, according to the Alzheimer Society of Canada 2021, over 500,000 Canadians were living with dementia. By 2030, this number is expected to rise to 912,000. The Public Health Agency of Canada News release 2019 stated that, on average, nine seniors are diagnosed with dementia every hour in Canada. According to the National Institutes of Health, in May 2020, the estimated investment for neurosciences was USD 10,353 million in 202, a significant increase from the 2020 figures of USD 10,353 million. The increasing investment in neuroscience is expected to boost the demand for optogenetics usage as it is a novel method to identify neurological diseases. This factor is expected to boost the market's growth.?

However, lack of awareness and the high costs of technology may be the major restraining factors for the market over the forecast period.

Optogenetics Market Trends

Light-emitting Diode (LED) Segment is Expected to Hold a Major Market Share in the Optogenetics Market

LEDs surpass lasers in every aspect, as they are cheaper, smaller, more reliable, and easier to control. They are being incorporated into implants, allowing untethered light delivery. Factors such as investment in technology, product launches, and research studies in the segment are expected to drive the segment's growth, thus driving the market. For instance, in February 2020, a project was launched with a EUR 3.6 million grant to treat neurological conditions such as Alzheimer's and Huntington's disease by making brain cells controllable with red light. A laser can control the neurons and boost cognition. Simultaneously, brain cell activity can be monitored non-invasively using a spectrometer. Thus, launching such projects promotes technological innovation and advancement in the market, thus contributing to the market's growth.

In January 2021, SYMBXX initiated two clinical trials in Adelaide, Australia, and Toronto, Canada, to develop laser light therapies to reduce the debilitating symptoms of Parkinson's disease. The clinical trials focused on seeking regulatory approvals may drive the studied market during the forecast period. According to a study titled "Ultrafast laser-based transient perforation of cellular membranes for in-vivo neuromodulation," published in January 2022, a near-infrared ultrafast laser micro irradiation platform can be used to deliver gene encoding for neuroprotective and anti-angiogenic pigment epithelium-derived factor (PEDF) molecule to the retina, which exhibited protection from different insults. The research studies expanding the scope of lasers will also contribute to the market's growth.

Therefore, due to such factors, the studied market is anticipated to witness notable growth during the forecast period.

North America is Expected to Dominate the Market Over the Forecast Period

North America is expected to lead the market due to the increasing use of optogenetic devices, primarily in academic and research labs, the high burden of chronic diseases in the region, and the collaborations and new product launches by key market players.

Increasing government initiatives in the neurological field are the key growth factors. Increasing funding allows multiple players to enter the market and provide innovative solutions to cater to patient needs. For instance, as per the National Center for Chronic Disease Prevention and Health Promotion (January 2021), 6 in 10 adults in the United States have a chronic disease, and 4 in 10 adults have two or more chronic diseases. These conditions cost USD 3.8 trillion to the country's healthcare system every year, which may have a significant impact on the growth of the studied market.

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According to the Alzheimer's Impact Movement report in July 2020, more than 5 million Americans are living with Alzheimer's, and an estimated 16 million are seeking unpaid care. Alzheimer's cost the nation USD 305 billion in 2020, including USD 206 billion in Medicare and Medicaid payments. The increasing patient population requires more care, increasing the demand for optogenetics, thus, boosting the market's growth. Collaborations and agreements are another reason for the market's growth. For instance, in September 2021, NeuroLux Inc. announced its exclusive partnership with TSE Systems to integrate its wireless technology with TSE System's IntelliCage and PhenoMaster platforms, providing optogenetic, pharmacology, telemetry, and other capabilities for cutting-edge behavioral neuroscience research. Such collaborations increase innovation due to the synchronization of key players' resources, thus boosting the market.

Similarly, in June 2021, Nanoscope Therapeutics Inc., a clinical-stage biotechnology company that is developing gene therapies for the treatment of retinal diseases, announced that vision improvements for all evaluated advanced retinitis pigmentosa (RP) patients persisted for one year following a single intravitreal injection in a Phase 1/2a clinical study with Multi-Characteristic Opsin (MCO) to retinal cells. Such studies improve the advantages of optogenetics and boost the market.

Hence, all such factors are likely to boost the market's growth.

Optogenetics Market Competitor Analysis

The optogenetics market is moderately consolidated due to the presence of various small and large players. Some players include Hubner Group (Cobolt Inc.), Coherent Inc., Gensight Biologics, Laserglow Technologies, Noldus Information Technology, Shanghai Laser & Optics Century Co. Ltd, and Thorlabs Inc.

Additional Benefits:

- The market estimate (ME) sheet in Excel format
- 3 months of analyst support

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