

Optical Imaging - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2024 - 2029)

<https://marketpublishers.com/r/O1B7C4B1FFA4EN.html>

Date: July 2024

Pages: 198

Price: US\$ 4,750.00 (Single User License)

ID: O1B7C4B1FFA4EN

Abstracts

The Optical Imaging Market size is estimated at USD 2.60 billion in 2024, and is expected to reach USD 4.45 billion by 2029, growing at a CAGR of 11.30% during the forecast period (2024-2029).

Optical imaging is an emerging technology with great possibility for enhancing disease prevention, treatment, and diagnosis in the medical office or in the operating room. Optical imaging delivers the chance to differentiate between soft and affected tissues. This ability of optical imaging to distinguish between healthy and infectious tissues is creating a massive opportunity in the medical diagnosis industry.

Optical imaging systems are used in the diagnosis of disease, preclinical research, and scanning of multiple cellular and molecular in vivo processes such as protein degradation, protein integration, and protease activity. The market has gained prominence in biotechnological and pharmaceutical companies. Additionally, optical imaging technology offers great flexibility owing to its multispectral potential and high resolution, which helps diagnose and treat atherosclerosis and related diseases.

Medical imaging technologies continue to advance, presenting new applications in diagnosing and treating diseases. Rapid developments in optical imaging technology and instruments have led to significant breakthroughs in understanding fundamental biological phenomena and rapid diagnosis of diseases, such as optical coherence tomography, photo-acoustic imaging, stimulated resonance raman imaging, multiphoton microscopy, and super-resolution microscopy. Some technologies have been translated into biomedical applications, and some are on the doorstep. Collaborative efforts from both

optical and biomedical communities are still needed to fully discover the potential of these optical modalities and promote them as routine laboratory and/or clinical apparatus.

Optical imaging techniques, such as optical coherence tomography, offer high spatial resolution and contrast, allowing medical practitioners to visualize tissue structures, cellular morphology, and molecular interactions with exceptional detail. Enhanced imaging capabilities enable the detection of subtle abnormalities and early-stage pathology that may not be apparent with conventional imaging methods.

Optical imaging products have high initial costs primarily because of several factors, including the complexity of the technology, precision manufacturing processes, quality materials, and, often, limited market demand. Further, the research and development phase requires significant investment in exploring and refining advanced photonics technologies.

More people are seeking medical care that was delayed or postponed due to the COVID-19 pandemic. It may take several years for many healthcare systems to address huge patient backlogs, which is expected to increase the demand for new medical equipment and, consequently, more chips. In addition, the global growth in chip demand is expected to accelerate significantly in the coming years, causing severe chip shortages for numerous industries.

Optical Imaging Market Trends

Oncology Application Segment is Expected to Hold Significant Market Share

In oncology, optical imaging technology is crucial in cancer diagnosis, treatment, and research. Optical imaging techniques, such as fluorescence imaging and optical coherence tomography (OCT), can assist in the early detection of cancerous lesions. These methods provide high-resolution images, helping clinicians identify abnormal tissue changes that may indicate the presence of cancer.

In addition, optical imaging is utilized during surgical procedures to guide surgeons in real time. Intraoperative imaging techniques, like fluorescence-guided surgery, help surgeons visualize tumor boundaries and ensure more precise removal of cancerous tissue while minimizing damage to surrounding healthy tissue. Also, it can be used to

monitor the response of tumors to treatment, such as chemotherapy or radiation therapy. Changes in tissue optical properties can indicate the effectiveness of the treatment, allowing for timely adjustments to the therapeutic approach.

The oncology segment registered a significant revenue share in the optical imaging market. Primarily due to the optical way of examining tissues, it can detect both the structural and biochemical aspects of the tissue. It also has the benefits of increased sensitivity, low cost, and high resolution. The technique is also gaining popularity since it assists in the early identification of cancer and is non-invasive. As cancer is becoming prevalent, along with the benefits optical imaging delivers in early cancer detection, the segment's growth is expected to surge.

Furthermore, the growing burden of cancer globally further raises the need for advanced cancer treatments to treat different types of cancers, which is anticipated to drive market growth. For instance, in January 2024, according to the American Cancer Society, over 18 million Americans were reported to have cancer in the year 2022. It is estimated that over 2 million new cancer cases are predicted to be diagnosed in the United States in 2024.

According to the WHO and the International Agency for Research on Cancer, globally, there are around 19.2 million new cases of cancer. This number is predicted to increase to around 30.2 million incident cases in the year 2040. Thus, the high burden of cancer worldwide is expected to propel market evolution in the coming years.

Asia-Pacific to Hold Major Market Share

The optical imaging market in China is experiencing rapid growth, driven by technological advancements, increasing healthcare expenditure, and a growing aging population. According to the National Bureau of Statistics of China, in 2023, approximately 68.3% of the population worked between 15 and 64 years of age. Retirees aged 65 and above comprised about 15.4% of the total population. The demand for optical imaging devices, like optical coherence tomography and endoscopy systems, is rising due to their effectiveness in diagnosing various medical conditions.

Optical imaging techniques have sown promise in the study and diagnosis of dementia, particularly Alzheimer's disease. These techniques offer non-invasive and potentially more accessible methods for early detection and monitoring of neurodegenerative

diseases. Label-free optical imaging techniques, like spectroscopic imaging and optical coherence tomography, have emerged as promising tools for diagnosing and studying neurodegenerative disorders.

Optical imaging techniques, including near-infrared spectroscopy and OCT, provide non-invasive and portable neuroimaging methods for quantifying changes in the brain's oxygenated and deoxygenated hemoglobin concentrations. These techniques offer an attractive alternative to traditional imaging methods, such as positron emission tomography and functional magnetic resonance imaging, due to their non-invasiveness, portability, and potential for a larger variety of experiments.

One of the primary factors fueling the demand for optical imaging in India is the country's rapidly advancing healthcare infrastructure. As India continues to invest in modernizing its medical facilities, there is a growing emphasis on incorporating advanced diagnostic and imaging technologies.

Optical imaging, with its ability to detect early signs of diseases and guide minimally invasive procedures, is becoming indispensable in diagnosing and managing various medical conditions.

Optical Imaging Industry Overview

The optical imaging market is highly fragmented, with the presence of major players like Carl Zeiss AG, Leica Microsystems (Danaher Corporation), Topcon Corporation, Canon Medical Systems Corporation (Canon Inc.), and Koninklijke Philips NV (Philips). Players in the market are adopting strategies such as partnerships and acquisitions to enhance their product offerings and gain sustainable competitive advantage.

October 2023 - Leica Microsystems ("Leica") announced the official opening of its USD 60 million medical manufacturing and R&D facility in Singapore. As one of Leica's four global production sites, Singapore is solely responsible for manufacturing surgical microscopes for export to global markets.

August 2023 - Abbott announced its ILUMIEN IV OPTIMAL PCI (ILUMIEN IV) clinical study, which demonstrated that intravascular imaging through optical coherence tomography (OCT) can enhance stent procedural outcomes, especially in complex cases. The study demonstrated that OCT guidance resulted in a statistically significant

7% rise in MSA compared to angiography guidance alone.

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