

Photoimmunotherapy Market - Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented By Therapeutic Area (Head & Neck Cancer, Metastatic Melanoma, Others), By End User (Hospitals & Clinics, Ambulatory Care Centers, Biotechnology & Pharmaceutical Companies, Others), By Region & Competition, 2021-2031F

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Abstracts

The Global Photoimmunotherapy Market is projected to expand from USD 1.99 Billion in 2025 to USD 3.65 Billion by 2031, reflecting a compound annual growth rate of 10.64%. This targeted oncological approach employs an antibody-photosensitizer conjugate that, when activated by near-infrared light, triggers precise cell necrosis. Growth in this sector is primarily fueled by the rising incidence of solid tumors and the clinical necessity for therapies that maintain organ function while limiting systemic toxicity. The demand is further solidified by a significant patient base needing effective management for locoregional diseases; for instance, the American Cancer Society reported that approximately 58,450 individuals in the United States were diagnosed with head and neck cancers in 2024, emphasizing the critical need for such therapeutic options.

Nevertheless, a major obstacle to market growth is the shallow penetration depth of near-infrared light into biological tissues. This physical limitation confines the therapy's effectiveness to tumors that are superficial or accessible via endoscopy, complicating its use for deep-seated malignancies absent invasive surgical measures. Consequently, the technical intricacies involved in light delivery systems persist as a core challenge, potentially impeding widespread clinical adoption across a broader range of cancer types.

Market Driver

Increased investment in research and development, alongside the broadening of clinical pipelines, is hastening the progression of photoimmunotherapy from experimental stages to commercially viable treatments. Financial support is essential for maintaining late-stage trials, especially for proprietary systems using antibody-photoabsorber conjugates that demand rigorous validation for regulatory authorities. As highlighted in a March 2024 press release titled "Rakuten Medical Closes \$119 Million Series E Financing," Rakuten Medical raised \$119 million to fast-track its global Phase 3 clinical trial of the Alluminox platform. This significant funding directly advances the strategic goal of widening the therapy's indications and securing regulatory clearance in major international markets, thereby confirming the commercial potential of precision cell-targeting therapies.

Concurrently, the market is propelled by the growing global prevalence of unresectable head and neck cancers, which necessitates interventions capable of managing locoregional disease without the adverse effects associated with radical surgery. This driver is especially critical in regions with high incidence rates where conventional treatments frequently fail to preserve organ function. According to Rakuten Medical's January 2024 press release, "Rakuten Medical Announces First Patient Treatment in India," over 200,000 new head and neck cancer cases are diagnosed annually in India, identifying a key demographic for this treatment. Globally, the urgent need for new solid tumor treatments is highlighted by the massive disease burden; the World Health Organization's February 2024 report, "Global Cancer Burden Growing," estimated 20 million new cancer cases worldwide in 2022, underscoring the vast market potential for targeted therapies offering reduced systemic toxicity.

Market Challenge

The shallow penetration capability of near-infrared light serves as a significant restraint on the expansion of the global photoimmunotherapy market. Because of this physical restriction, the therapy is largely limited to treating superficial or endoscopically reachable tumors, effectively reducing its utility for deep-seated malignancies. As a result, the technology encounters substantial obstacles in managing high-volume internal cancers unless paired with complex or invasive surgical procedures. This dependency on accessibility restricts the eligible patient pool and adds complexity to clinical workflows, which discourages widespread adoption among healthcare providers who prefer versatile treatment options for a wide array of oncology cases.

The consequences of this limitation become apparent when addressing internal malignancies that are challenging to target with external light sources. For instance, the American Cancer Society estimated that 234,580 new cases of lung and bronchus cancer were diagnosed in the United States in 2024. The challenge of delivering adequate light energy to these deep tissue structures diminishes the competitive edge of photoimmunotherapy compared to systemic treatments. Consequently, market stakeholders encounter difficulties in establishing this modality as a primary standard of care for major internal cancer indications.

Market Trends

A significant shift involves combining photoimmunotherapy with immune checkpoint inhibitors to boost systemic anti-tumor immunity. By triggering immunogenic cell death, photoimmunotherapy sensitizes the tumor microenvironment, which enhances the effectiveness of PD-1/PD-L1 inhibitors in treating refractory solid tumors. Recent data validates this synergy, showing improved survival rates in patients with recurrent head and neck squamous cell carcinoma (HNSCC) who had previously exhausted standard treatments. According to a September 2025 press release from Rakuten Medical regarding the publication of a Phase 1b/2 clinical study, the combination of ASP-1929 and pembrolizumab resulted in a median Overall Survival (OS) of 25.6 months, markedly exceeding historical benchmarks for monotherapy.

At the same time, the market is defined by the strategic global broadening of clinical development initiatives aimed at obtaining regulatory approvals in various regions outside of early adopter markets. Developers are actively expanding pivotal trials to encompass multi-regional cohorts, thereby ensuring robust data and satisfying regulatory demands in Europe and the Asia-Pacific region. This trend is illustrated by the increasing scope of late-stage studies for locoregional cancers, which are incorporating wider patient demographics to hasten commercial readiness; for example, Rakuten Medical announced in a July 2025 press release that it had expanded its global Phase 3 trial for recurrent HNSCC to enroll 412 patients, adding new clinical sites in Eastern Europe to accelerate recruitment and validation.

Key Market Players

Rakuten Medical, Inc.

Shimadzu Corporation

Modulight Corporation

Steba Biotech Ltd.

Luzitin SA

Report Scope

In this report, the Global Photoimmunotherapy Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

Photoimmunotherapy Market, By Therapeutic Area

Head & Neck Cancer

Metastatic Melanoma

Others

Photoimmunotherapy Market, By End User

Hospitals & Clinics

Ambulatory Care Centers

Biotechnology & Pharmaceutical Companies

Others

Photoimmunotherapy Market, By Region

North America

United States

Canada

Mexico

Europe

France

United Kingdom

Italy

Germany

Spain

Asia Pacific

China

India

Japan

Australia

South Korea

South America

Brazil

Argentina

Colombia

Middle East & Africa

South Africa

Saudi Arabia

UAE

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the Global Photoimmunotherapy Market.

Available Customizations:

Global Photoimmunotherapy Market report with the given market data, TechSci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

Detailed analysis and profiling of additional market players (up to five).

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