

YS Biopharma Co., Ltd. – YS Biopharma Expands Intellectual Property with New Patent and Executive Share Acquisitions Highlight Confidence in Business Prospects

YS Biopharma Co., Ltd. (NASDAQ: YS)

Share Price: \$0.88

Valuation: \$5.10



Key Statistics

52 Week Range	\$0.75 - \$18.44
Avg. Volume (3 months)	978.98K
Shares Outstanding	93.06M
Market Capitalization	\$81.43M
EV/Revenue	1.60x
Cash Balance*	\$43.15M
Analyst Coverage	1

*Cash balance as of June 2023

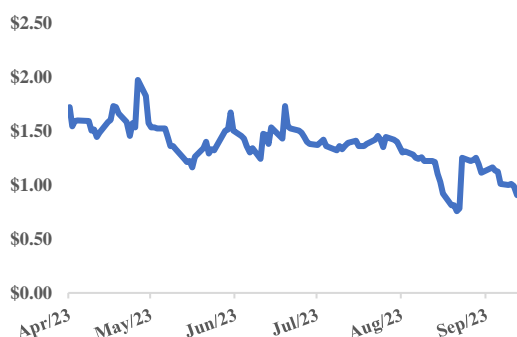
Revenue (in RMB millions)

Mar - FY	2023A	2024E	2025E
Q1	-	176.27	192.70
Q2	-	168.73	194.63
Q3	-	139.46	198.51
Q4	-	142.82	212.45
FY	687.20	627.28	798.29

EPS (in RMB)

Mar - FY	2023A	2024E	2025E
Q1	-	(0.75)	(0.32)
Q2	-	(0.62)	(0.23)
Q3	-	(0.51)	(0.21)
Q4	-	(0.51)	(0.03)
FY	(1.56)	(2.39)	(0.79)

Stock Price Chart (in \$)



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Investment Highlights

- YS Biopharma Secures Pivotal U.S. Patent for Novel HBV Immunotherapeutic Vaccine:** YS Biopharma has further solidified its intellectual property portfolio with the acquisition of a pivotal U.S. patent for its innovative immunotherapeutic vaccine, PIKA YS-HBV-002, specifically designed to address chronic Hepatitis B Virus (HBV) infections. This milestone not only strengthens the company's competitive positioning but also targets a significant unmet medical need that affects up to 2.2 million individuals in the U.S. and 400 million people globally. This condition poses elevated risks for cirrhosis, liver failure, and liver cancer, with existing treatments offering limited efficacy. Unlike conventional prophylactic HBV vaccines, PIKA YS-HBV-002 is engineered to serve patients who are already suffering from chronic HBV. The vaccine employs YS Biopharma's proprietary PIKA immunomodulating technology with the aim to activate and re-establish a desirable immune response in patients in order to eradicate HBV infection. As the company progresses targeting a submission of an Investigational New Drug (IND) application and commencing clinical trials in 2024, it is strategically positioned to potentially redefine the existing treatment landscape for chronic HBV. This development could herald a paradigm shift in the management of chronic HBV, offering a more targeted and potentially more effective treatment option. The patent's issuance also underscores the growing importance of immune-based interventions in combating infectious diseases, marking a significant advancement in the broader field of biopharmaceuticals.
- YS Biopharma Leadership Purchases Company Shares, Signaling Confidence in Long-Term Strategy:** The company disclosed that its founder and chairperson, Mr. Yi Zhang, and its CEO, Dr. Hui Shao, have acquired a substantial number of the company's ordinary shares in the open market. Specifically, Mr. Yi Zhang purchased 429,188 shares at an average price of \$1.407 per share, while Dr. Hui Shao acquired 46,300 shares at an average price of \$1.46 per share. This action as a strong endorsement of the company's long-term business strategy and growth prospects. The purchases also indicate a high level of confidence in the company's mission and its commitment to shareholder value. Both executives have indicated the possibility of additional share purchases, depending on market conditions and regulatory requirements. This development could be a positive indicator for investors, as it aligns the economic interests of the company's leadership more closely with those of its shareholders.
- Valuation:** After successfully raising over \$200 million from leading healthcare-focused investors like Fidelity, OrbiMed, HillHouse, and Adjuvant Capital, which is backed by the Gates Foundation, YS Biopharma has gained substantial visibility in the industry. To assess its valuation, we have utilized a risk-adjusted discounted cash flow (DCF) as the primary method, supplemented by comparable analysis using the EV/sales valuation metric. We reaffirm a blended valuation of \$474.29 million, or \$5.10 per share, contingent on successful execution by company.

Company Description

YS Biopharma Co., Ltd. is a Beijing-based biopharmaceutical company founded in 2002. Specializing in vaccines and therapeutic biologics, it targets diseases such as Rabies, Coronavirus, Hepatitis B, Influenza and Shingles via a proprietary PIKA[®] immunomodulating technology platform. The firm operates in various regions including China, the U.S., and Southeast Asian Countries.

Company Overview

YS Biopharma, headquartered in the Cayman Islands, is a global biopharmaceutical company at the forefront of discovering, developing, manufacturing, and commercializing vaccines and therapeutic biologics. Primarily aiming to address infectious diseases and cancer, YS Biopharma is committed to tackling multiple global health concerns that still have high unmet medical needs. Central to the company's operations is its proprietary PIKA[®] immunomodulating technology platform. This platform is based on biologic complexes that engage multiple pathways of immune signaling, specifically TLR3, RIG-I, and MDA5. When integrated with appropriate protein-based molecules, PIKA[®] technology facilitates the development of a broad spectrum of novel biotherapeutics. These include a new generation of antiviral vaccines, antiviral therapeutics, and anticancer therapeutics. The innovative PIKA[®] platform, thus, empowers YS Biopharma to create a diverse portfolio of products targeting diseases such as Rabies, Hepatitis B, Shingles, Influenza, and Coronavirus. YS Biopharma has earlier achieved significant strides with the rabies vaccine, the evidence of which is their YSJA[™] vaccine. The YSJA[™] vaccine, the first aluminum-free lyophilized rabies vaccine launched in China, is a testament to the company's prowess in research and development. The YSJA[™] rabies vaccine has proven to be a critical product, with over 22.2 million doses sold to county-level CDCs in China as of June 30, 2023. The company manufactures its vaccines, including the YSJA[™] rabies vaccine, in GMP-compliant facilities, indicating its commitment to meeting high regulatory standards.

YS Biopharma specializes in developing vaccines and biologic therapies for infectious diseases and cancer. Using its proprietary PIKA[®] technology, the firm creates a broad range of novel biotherapeutics by engaging various immune pathways

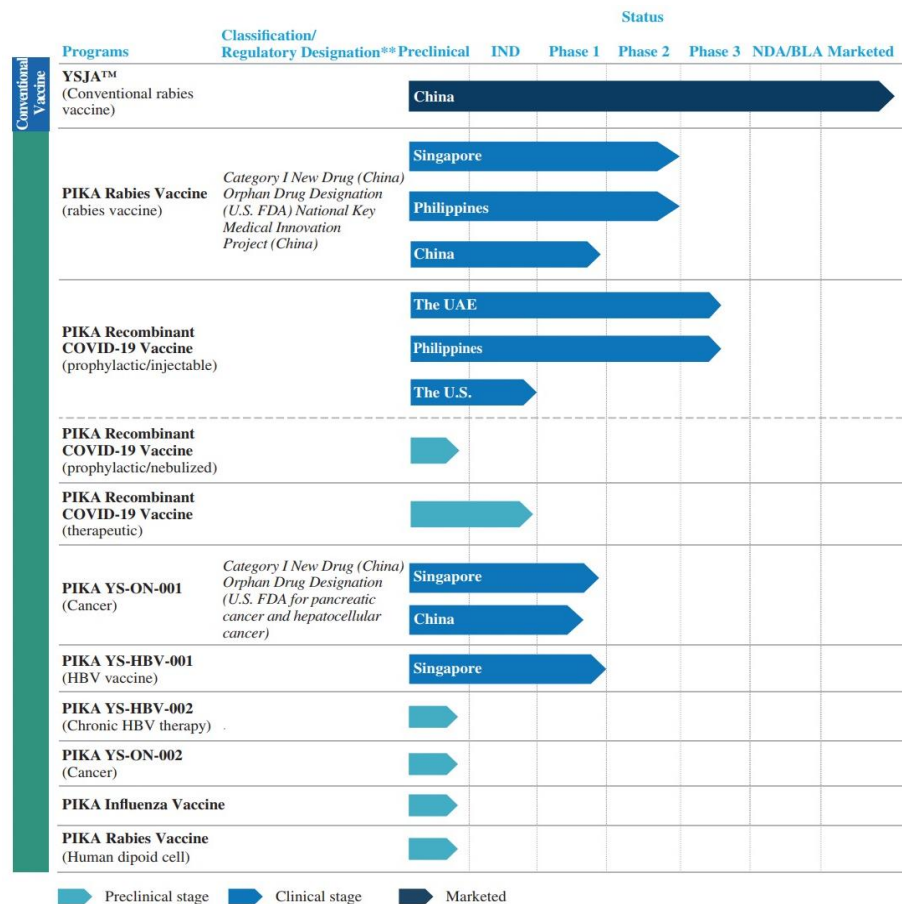


Exhibit 1: YS Biopharma Product Pipeline. Source: YS Biopharma Filings

A glance at YS Biopharma's R&D pipeline reveals a promising landscape. Currently, there are four clinical-stage product candidates—PIKA[®] rabies vaccine, PIKA[®] recombinant COVID-19 vaccine, PIKA[®] YS-ON-001, and PIKA[®] YS-HBV-001 vaccine. Additionally, four more preclinical-stage product candidates are in the pipeline, aiming to prevent diseases like Hepatitis B and cancer potentially. These pipeline products aim to meet unmet medical needs in areas such as HBV, influenza, rabies, and cancer, indicating high potential future growth.

YS Biopharma has extended its global footprint to key markets such as China, Singapore, the United States, the UAE, and the Philippines. Despite its recent incorporation into the Cayman Islands in 2020, the company's long-standing history and strong market presence point to stability and future global expansion potential. With a sizeable workforce of over 770 employees, YS Biopharma amalgamates local expertise with a global vision. This strategic blend positions the company to deftly navigate the challenges and seize the biopharmaceutical industry's opportunities.

YS Biopharma has a multi-faceted corporate structure with a mix of domestic and international operations. The equity ownership of the company is distributed among several major shareholders, which contributes to a broad-based governance structure. The major equity stakeholders include Yi Zhang and All Brilliance Investments. The rest of the equity ownership is spread among Hopeful World Company, Apex Pride Global, Action Town International, and other ordinary shareholders. On the operational front, YS Biopharma has established a strong global presence through its offshore entities. YS Biopharma US, Yisheng Singapore, and Yisheng HK are the primary offshore operational branches, each strategically located in key global markets. This geographical diversification supports the company's global market access and potentially mitigates the risk of operational disruption in any single market.

Domestically, YS Biopharma operates through two main entities: Liaoning Yisheng and Beijing Yisheng. These onshore operations signify the company's robust presence in China's domestic market.

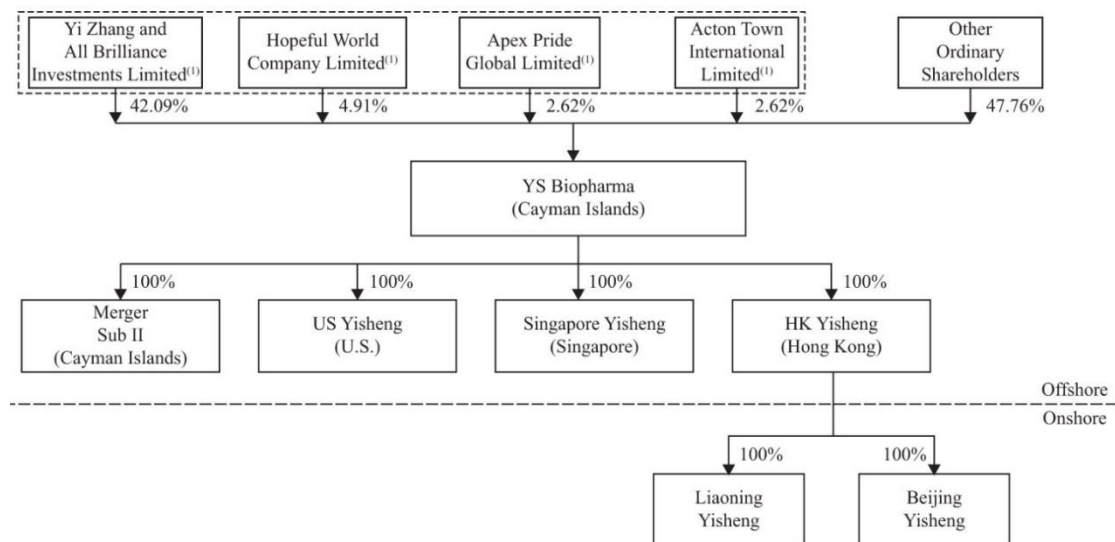


Exhibit 2: YS Biopharma Corporate Structure. Source: YS Biopharma Registration Filing

Innovative PIKA[®] Immunomodulating Technology Platform

YS Biopharma's core platform is the PIKA[®] technology, a synthetic biologic complex synthesized based on their proprietary GMP manufacturing technology. This technology triggers a multi-pronged approach of immunomodulation through TLR3, RIG-I, and MDA-5 signalling pathways, thereby inducing a prompt production of interferon, cytokines, chemokines, and co-stimulatory factors.

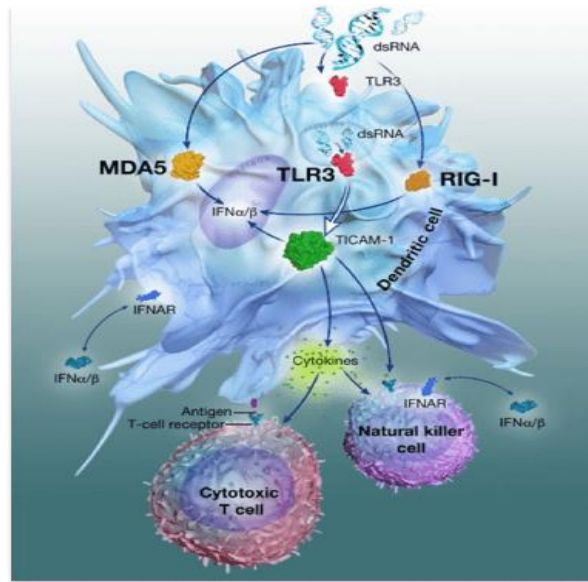


Exhibit 3: PIKA[®] Technology Overview. Source: YS Biopharma Filings

YS Biopharma's PIKA technology is a synthetic biologic complex inducing various immune responses. Used with suitable antigens, it enables development of new antiviral and anticancer treatments

The PIKA[®] technology is derived from YS Biopharma's research in a class of well-defined dsRNA molecules synthesized using their proprietary technology. The endosomal dsRNA can be recognized by TLR3, while cytosolic dsRNA can be sensed by the RIG-I-like receptor family, which includes RIG-I and MDA-5. The antiviral and antitumor effects of interferon have been well established. The production of type I interferon upon PIKA[®] administration facilitates antigen cross-presentation by dendritic cells and augments CD4⁺ T-cell, CD8⁺ T-cell, and natural killer-cell responses, which makes PIKA[®]-based therapeutics suitable for both antiviral and antitumor applications.

When delivered with relevant antigen-based molecules, PIKA[®] technology can be applied to the development of a new generation of antiviral vaccines, antiviral therapeutics, and anticancer therapeutics. This offers a promising platform for the development of a wide variety of novel biologics to improve treatments that are currently available and address unmet medical needs. The robust response stimulated by PIKA[®] technology can offer significant improvements over traditional antiviral and anticancer therapies. Conventional treatments often focus on attacking the disease directly and may not fully leverage the body's own immune response. PIKA[®] technology, in contrast, harnesses and enhances the body's natural defences, providing a more holistic approach to treatment.

Moreover, PIKA[®] technology's ability to be coupled with antigen-based molecules offers another level of versatility. By delivering the PIKA[®] molecule alongside relevant antigens, YS Biopharma can develop targeted vaccines and therapeutics for various diseases. This ability to customize the immune response to specific diseases could allow for more effective and personalized treatments. YS Biopharma has been granted about 70 patents across more than 30 countries and regions relating to its PIKA[®] immunomodulating technology and prophylactic and therapeutic product innovations.

The potential applications of PIKA[®] technology are vast. From creating powerful new vaccines for infectious diseases to developing novel anticancer therapeutics, this platform could revolutionize many areas of medicine. Furthermore, by improving upon currently available treatments and addressing unmet medical needs, YS Biopharma is positioning itself as a leader in the field of immunotherapy. The future of PIKA[®] technology is promising—as our understanding of the immune system continues to grow, the potential for innovative platforms like PIKA[®] will only continue to expand. The versatile and powerful approach of PIKA[®] technology makes it a key player in the next generation of immunomodulating therapeutics.

YS Biopharma's First Marketed Product: YSJA[™] Vaccine for Rabies Prevention

YSJA[™] Rabies Vaccine, the company's first marketed product, is also a first-of-its-kind inactivated vero cell-based rabies vaccine in China that does not contain aluminum, providing post-exposure protection against rabies. Additionally, it uses a fixed CTN-1 strain grown in Vero cells, which shares a higher similarity with most wild rabies strains in China, making it particularly effective. Since its introduction in 2003, approximately 98 million doses have been administered to patients. The vaccine stands out because of its improved suitability for rabies prevalent in China, its better tolerability, causing less pain, injection site discomfort, and a lower rate of fever compared to other locally available rabies vaccines. YS Biopharma's manufacturing facilities in Shenyang, China, which are compliant with Good Manufacturing Practices (GMP), have been producing the vaccine since February 2020. As of June 30, 2023, the company had produced more than 26.5 million doses, of which about 22.2 million have been sold to approximately 1,725 county-level CDCs in China, covering over 60% of all county-level CDCs in the country. The company is actively seeking partnerships and licensing agreements with prominent pharmaceutical companies to bring the YSJA[™] rabies vaccine to the primary markets of Southeast Asia. Additionally, the company plans to extend its reach into Europe, Africa, and South America, aiming to boost the commercial success and visibility of its products across these diverse regions.

Appendix

Income Statement	FY2022 A	FY2023 E	FY2024 E	FY2025 E	FY2026 E
Net sales	502,949,894.0	687,201,070.0	627,280,895.9	798,291,075.2	1,472,298,049.5
Cost of sales	(117,066,090.0)	(153,360,262.0)	(134,865,392.6)	(175,624,036.5)	(323,905,570.9)
Gross profit	385,883,804.0	533,840,808.0	492,415,503.3	622,667,038.6	1,148,392,478.6
Operating expenses					
Selling	(185,999,704.0)	(272,927,356.0)	(263,457,976.3)	(287,384,787.1)	(485,858,356.3)
General and administrative	(107,620,500.0)	(81,595,277.0)	(81,546,516.5)	(119,743,661.3)	(220,844,707.4)
Research & development expense	(211,222,263.0)	(318,700,326.0)	(345,004,492.7)	(263,436,054.8)	(368,074,512.4)
Income from Operations	(118,958,663.0)	(139,382,151.0)	(197,593,482.2)	(47,897,464.5)	73,614,902.5
Late fees related to income tax	-	-	-	-	-
Late fees related to taxes other than income tax	(231,231.0)	(3,603.0)	-	-	-
Late fees related to social security insurance	(1,852,378.0)	(747,609.0)	-	-	-
Government grants	23,020,413.0	26,072,517.0	-	-	-
Fair value of changes of warrant liability	-	21,358.0	-	-	-
Financial expenses, net	(2,717,433.0)	(30,857,673.0)	(26,813,993.7)	(26,813,993.7)	(26,813,993.7)
Other income (expenses), net	(327,987.0)	551,760.0	-	-	-
Profit before exceptional items, extraordinary items and tax	(101,067,279.0)	(144,345,401.0)	(224,407,476.0)	(74,711,458.3)	46,800,908.7
Exchange loss (net)	-	-	-	-	-
Employee separation cost	-	-	-	-	-
Profit before tax from continuing operations	(101,067,279.0)	(144,345,401.0)	(224,407,476.0)	(74,711,458.3)	46,800,908.7
Income tax (expense) benefit	(4,937,122.0)	(1,133,504.0)	-	-	(11,700,227.2)
Net earnings	(106,004,401.0)	(145,478,905.0)	(224,407,476.0)	(74,711,458.3)	35,100,681.5
Accretion to redemption value of convertible redeemable preferred shares	(130,662,326.0)	(137,991,697.0)	-	-	-
Net loss attributable to YS Biopharma Co. Ltd	(236,666,727.0)	(283,470,602.0)	(224,407,476.0)	(74,711,458.3)	35,100,681.5

Exhibit 4: Income Statement Snapshot (values in RMB). Source: Diamond Equity Research

Risks Profile

- **Regulatory Risks and Governmental Influence in China's Market:** YS Biopharma's considerable presence in China subjects it to certain legal and operational risks. The Chinese government's ability to significantly influence businesses, coupled with potential changes in the country's economic, political, or social conditions, could adversely affect the company's performance. Further, the company is domiciled in Cayman Islands; the perception of the Cayman Islands as a tax haven may lead to reputational risk, scrutiny from international regulators, and potential changes in tax treatment.
- **Dependence on a Single Product for Revenue:** YS Biopharma relies heavily on its rabies vaccine, YSJA™, which constituted nearly all of its total revenue in recent fiscal periods. The sustained success and sales expansion of YSJA™ hinge on factors like manufacturing standards, marketing effectiveness, and regulatory compliance. A failure to expand YSJA™'s sales could critically impact YS Biopharma's operations.
- **Significant Market Competition:** YS Biopharma operates within a highly competitive landscape, which could hinder its ability to market or commercialize its products effectively. The competition spans from global pharmaceutical giants to specialty biotechnology firms, along with academic institutions. If YS Biopharma cannot sustain its competitive standing, it may experience a reduction in market share, diminished pricing power, and a subsequent downturn in financial performance.
- **Market Acceptance Risk:** The commercial success of YS Biopharma's products is contingent upon market acceptance by end-users, CDCs, Key Opinion Leaders (KOLs), and others in the vaccine or disease prevention industry. Failure to secure and sustain such acceptance could have a materially adverse effect on YS Biopharma's business, financial condition, and operational results.
- **Adverse Event Risk:** The success of YS Biopharma's marketed product and product candidates could be hindered by undesirable adverse events or other properties that could delay or prevent their regulatory approval, limit the approved label's commercial profile, or result in significant negative consequences post-approval. These adverse events could cause interruptions, delays, or halts in clinical trials and could lead to more restrictive labels or denial of regulatory approval.
- **Success of Product Candidates Hinges on Preclinical and Clinical Trial Outcomes:** The success of YS Biopharma is highly contingent on the successful completion of preclinical and clinical trials for its product candidates, which involve complex, time-consuming, and expensive processes with uncertain results.

This list of risk factors is not comprehensive. For a full list, please refer to YS Biopharma's latest prospectus and/or annual filings.

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