Certain information and statistics set out in this section have been extracted from various official government publications, available sources from public market data providers and an Independent Third Party source, Frost & Sullivan. The report prepared by Frost & Sullivan and cited in this document was commissioned by us. We believe that the sources of this information are appropriate sources for such information and have taken reasonable care in extracting and reproducing such information. We have no reason to believe that such information is false or misleading or that any fact has been omitted that would render such information false or misleading. The information from official government sources has not been independently verified by us, the Joint Sponsors, the* [REDACTED]*, the* [REDACTED]*, the* [REDACTED]*, the* [REDACTED]*, the* [REDACTED]*, any of their respective directors, employees, agents or advisers or any other person or party involved in the* [REDACTED]*, and no representation is given as to its accuracy, fairness and completeness. For more details of the risks relating to our industry, see "Risk Factors" in this Document.

BROADER DERMATOLOGY TREATMENT AND CARE MARKET

Market Composition Overview

The broader dermatology treatment and care market in China could be classified into scalp diseases and care, skin diseases and care, localized adipose accumulation management medication and topical anesthesia market, among others as illustrated below.

Source: Frost & Sullivan analysis

The broader dermatology treatment and care market in China has the following features.

- *Mismatch between supply and demand.* The demand for dermatology treatment and care products is increasingly diversified as a result of the growing patient and consumer population, while the variety of supplies is relatively limited. As the population concerned with dermatological problems becomes more widespread, the severity of consumers' dermatological problems, their age, and their income levels become more diverse, the market demand for dermatological products continues to grow and diversify. Moreover, the development of demands has outpaced that of supply, leaving consumers' needs not fully met.

- *The lack of one-stop solution provider with complete product portfolios addressing consumer needs across major treatment fields and treatment and care cycle.* In China's broader dermatology treatment and care market, few players have extensive product pipelines that cover the major treatment fields and consumers' diverse demands during their treatment and care cycle. Most companies in the industry specialize in certain field, focusing on developing either dermatology care products or medications for treatment of certain types of diseases. Companies that have diverse product pipelines can benefit from the synergy among their product portfolios to constantly build brand awareness and gain market shares.

- *The demands for dermatologic products are diversified and constantly evolving during consumers' treatment and care cycle.* The demands for dermatologic products constantly evolve during consumers' life cycles, such as intense attention among teenagers for skin treatment and care, while high attention in scalp treatment and care among mid-age population. Correspondingly, dermatologic diseases progress such that consumers or patients demand differently with respect to the skin diseases at different stages. For example, mild acne treatment usually suggests monotherapy in topical fashion, and moderate to severe acne treatment usually combines oral and topical drugs treatment.

- *Lack of novel therapies in China.* Given the limitations of traditional therapies such as systemic exposure caused by oral drugs, a large unmet need in dermatologic treatment remains. Current topical drugs for dermatologic diseases approved in China are mostly generic drugs that lack of effective mechanisms. Novel topical therapies for the safe and effective long-term management of dermatologic problems are greatly needed to supplement current treatment regimens.

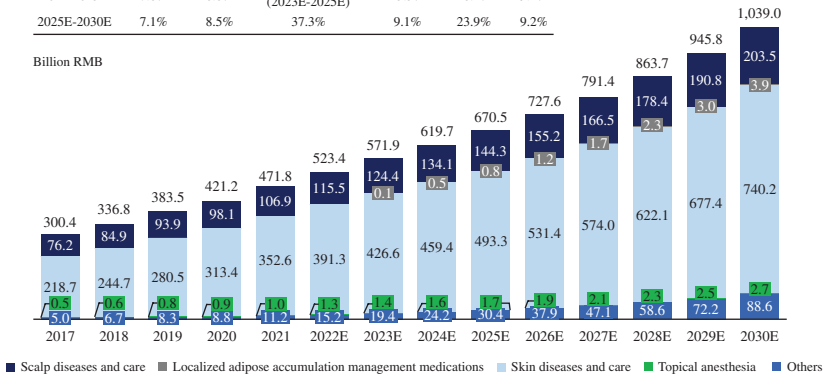
- *Most companies lack integrated capabilities across the industry value chain.* The whole industry value chain of dermatologic product contains R&D, registration, mass production marketing and commercialization. In China, a number of brand owners of dermatology products adopt combinations of in-house production, entrusted production, OEM and ODM to control their costs. Biotech companies might rely on CDMO to support their mass production. Companies that have end-to-end operating capabilities across the industry value chain can achieve positive internal synergy and reach operational efficiency.

Broader Dermatology Treatment and Care Market Size in China

The following table sets forth the size of the broader dermatology treatment and care market in China:

Market Size of Broader Dermatology Treatment and Care in China, 2017-2030E

Period	CAGR					
	Scalp diseases and care	Skin diseases and care	Localized adipose accumulation management medications	Topical anesthesia	Other	Total
2017-2021	8.8%	12.7%	–	18.3%	22.5%	11.9%
2021-2025E	7.8%	8.8%	144.7% (2023E-2025E)	15.3%	28.2%	9.2%
2025E-2030E	7.1%	8.5%	37.3%	9.1%	23.9%	9.2%



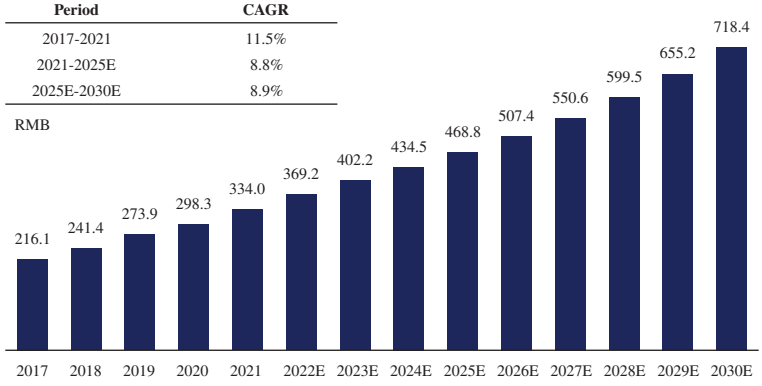
Source: Annual Reports, Expert Interview, Frost & Sullivan analysis

Rapidly Expanding Yet Still Lagging Per Capita Expenditure in China

The following table sets forth the historical and expected per capita expenditure on broader dermatology treatment and care in China:

Per Capita Expenditure On Broader Dermatology Treatment and Care in China, 2017-2030E

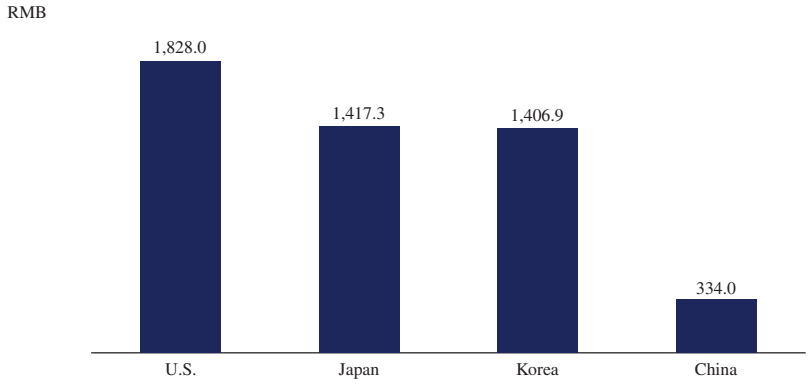
Period	CAGR
2017-2021	11.5%
2021-2025E	8.8%
2025E-2030E	8.9%



Source: NBSC, Frost & Sullivan analysis

A gap exists between developed countries and China in terms of per capita expenditure on broader dermatology treatment and care. In 2021, the per capita expenditure on broader dermatology treatment and care in the U.S., Japan and Korea reached RMB1,828.0, RMB1,417.3 and RMB1,406.9, respectively. By comparison, the per capita expenditure on broader dermatology treatment and care in China in 2021 was RMB334.0, which is still far behind that of developed countries, representing a large market potential.

Comparison of Per Capita Expenditure on Broader Dermatology Treatment and Care (China, U.S., Japan and Korea), 2021



Note: Exchange rate: 1 USD=6.4 RMB

Source: World Bank, NBSC, Frost & Sullivan analysis

Growth Drivers

The following key factors have primarily driven the growth of the broader dermatology treatment and care market in China:

- *Increase in disposable income.* China's per capita annual disposable income reached RMB35,128.0 in 2021 from RMB25,973.8 in 2017 with CAGR of 7.8%. With the increase in disposable income, an increasing number of Chinese consumers are able to afford the out-of-pocket costs relating to broader dermatology treatment and care products. China is also undergoing a consumption upgrade, making dermatology treatment and care products more appealing to Chinese consumers.

- *The rise of skin management consciousness and awareness, and willingness to pay.* As the market expands, consumers can receive more information through diverse marketing channels. With more information at the tip of their fingers, consumers are developing more diverse tastes and needs. The ease of access to dermatology treatment and care knowledge has increased consumers' acceptance of broader dermatology treatment and care products as well as their willingness to pay.

- *Despite rise of skin and hair management consciousness, the penetration of dermatology products remains low*. Modern sedentary lifestyle, poor dieting, highly-stressful office jobs and other complex factors could induce endocrine and other disorders, which may lead to dermatological complications such as alopecia and skin disease. Despite the rise of skin health and skin management consciousness, the per capita consumption of broader dermatology treatment and care products in China is still low compared with developed countries mainly because of unsatisfying clinical results and adverse effects of traditional therapies, high treatment costs of innovative products, etc.

- *Emergence of safe, effective, and consumers-friendly topical products.* In recent years, a number of novel products with innovative mechanisms of action and dosage forms have been launched or under development in China. The improvement in those new products makes them more effective, safer and more consumer-friendly, which caters to consumers' diverse demands and drives market growth. Transdermal drug delivery has emerged as one of the most attractive alternative to conventional oral and intravenous administrations because of its direct application at the site of action, consistent and reliable drug concentration over protracted dosing periods, and ease of administration. For dermatologic conditions, local administration helps reduce systemic buildup in drug concentration and the nonspecific action on non-targeted organs by the active ingredients, reducing the risks of side effects brought by the systemic exposure.

Entry Barriers

Despite the growth drivers discussed above, significant entry barriers remain in the broader dermatology treatment and care market in China:

- *Acute insights into consumer needs*. Dermatologic problems cover a wide range of conditions and target consumers can range from children and teenagers to the elderly. The needs and preference of different consumer groups can be significantly different. For example, alopecia patients are mostly male consumers who mainly focus on effects and safety problems while young consumers also take user experience of products into account. As a result, the acute understanding of consumer needs is critical. It is important for market players to gauge the needs and interests of the target consumer groups in different market segments, to stay abreast and to further guide latest market trends.

- *Scientific understanding of dermatology and pharmacology enabling transdermal drug/substance delivery for precision medicine*. The physicochemical properties of the skin translate to multiple obstacles and restrictions in transdermal delivery. It is important for market players to have a deep understanding of dermatology and pharmacology to conduct investigations and build up effective transdermal drug delivery systems.

- *Integrated capabilities*. Integrated capabilities, including the capabilities to conduct medical research based on the understanding of the mechanism of action of drugs and the pathophysiology of skin and human bodies, the capabilities to conduct product development based on the characteristics of raw materials and formulation components, the capabilities of registration, mass production as well as commercialization are crucial to developing dermatology treatment and care products. Developing such capabilities requires significant time, resources and expertise, posing a barrier for new market entrants. Mutually beneficial and sustainable collaboration with downstream medical institutions and consumers are indispensable elements for success in this market. It is essential for market players to have solid network, as well as strong capabilities to promote their products in the market.

- *Comprehensive product offerings*. Dermatologic problems cover a wide range of conditions, which are often caused by multiple factors and can rarely be solved by any single treatment. As the dermatologic conditions progress with time, the symptoms and consumers demands vary greatly. Moreover, dermatology treatment usually needs to be accompanied by effective daily care products. To address the diverse dermatological concerns of different consumers, it is crucial for companies in this market to provide a comprehensive portfolio of dermatology products and a one-stop solution tailored to different consumer groups, with ample cross-selling and up-selling opportunities. Developing such a comprehensive portfolio requires significant time and resources.

- *Recognition among consumers, physicians, medical institutions, and other industry stakeholders*. Given that dermatology treatment and care products have a direct effect on consumers, success in this market hinges on strong brand recognition among consumers, physicians, and medical institutions, and other industry stakeholders, who are inclined to adopt well-recognized products with proven efficacy and safety records.

Pain Points

The following significant pain points remain in the broader dermatology treatment and care market in China:

- *Limitation of the existing treatment.* Due to the low cost, oral antibiotics have been used for dermatologic diseases for a long time, however their adverse side effects of the high systemic exposure and possible induction of multiple drug-resistance infections have made them becoming increasingly unattractive to patients. Additionally, the skin tolerance is the issue of some topical treatment for dermatologic diseases. In order to achieve the better treatment effect, gradual increment of drugs dosage over a certain period of time is required. Lower dosage might be unable to give immediate and observable response to skin conditions, resulting longer treatment time.

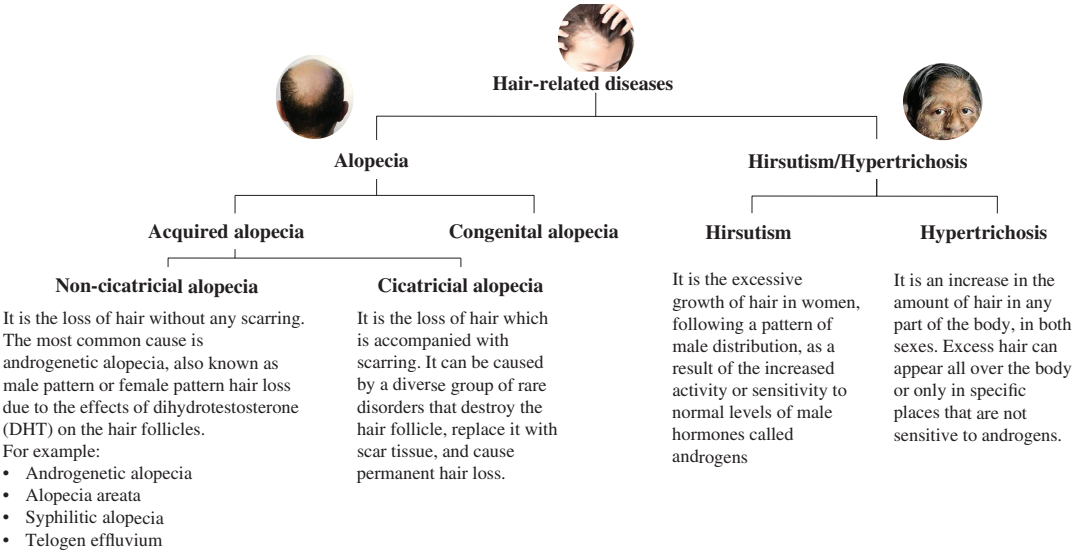
- *Lack of innovative solutions.* Innovative treatments of dermatological diseases may have less side effects and improve drug efficiency comparing with the traditional treatment. For example, topical antibiotics treatment greatly reduces the systemic antibiotics exposure and the associated risk of drug-resistance infection compared to oral administration of antibiotics. In atopic dermatitis treatment, the targeted treatment demonstrates improved clinical efficacy. However, such innovation in treatments requires dermatologic companies to constantly invest in R&D and cooperating experienced dermatologists. Currently, the China dermatological treatment and care market for most of the innovative dermatological treatments is still at its nascent stage.

- *Awareness of dermatological issues and low penetration rate.* With lower awareness of dermatologic treatment, only few patients with dermatological diseases seek for professional dermatological assistance. Patients with mild dermatological issues rarely realize the status of their skin health and mild symptoms compromise patients' qualities of life to a small degree. Comparing with developed countries, the per capital consumption of skin diseases and care products is much lower in China, suggesting that the awareness of the importance of skin health and the effects of dermatological product remain low penetration rate in China market.

SCALP DISEASES AND CARE MARKET

Scalp Diseases and Care Overview

Alopecia and hirsutism/hypertrichosis are the two major hair-related diseases. Alopecia mainly affects scalp hairs while hirsutism/hypertrichosis mainly affects hairs in multiple body areas such as lips, abdomen, back and limbs. Alopecia is a prevalent and signature scalp condition, and it could be categorized into congenital alopecia and acquired alopecia. Acquired alopecia includes non-cicatricial and cicatricial alopecia, and the latter cause permanent hair loss. Androgenetic alopecia and alopecia areata are the two most prevalent types of alopecia, both of which belong to the non-cicatricial alopecia category. The following figure shows the major categories of hair-related diseases:



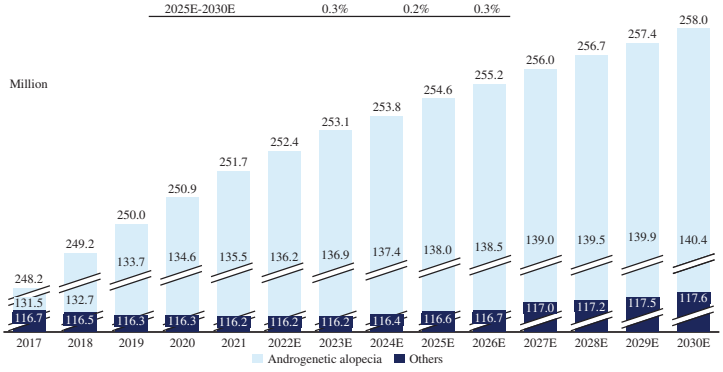
Source: Frost & Sullivan analysis

Alopecia Prevalence

The prevalence of alopecia in China reached 251.7 million in 2021, of which 53.8% was androgenetic alopecia. The prevalence of alopecia in China is expected to grow to 258.0 million in 2030. The following table sets forth the prevalence of alopecia in China:

Prevalence of Alopecia in China, 2017-2030E

Period	CAGR		
	Androgenetic alopecia	Others	Total
2017-2021	0.8%	-0.1%	0.4%
2021-2025E	0.4%	0.1%	0.3%
2025E-2030E	0.3%	0.2%	0.3%



Source: Literature Search, Frost & Sullivan analysis

Scalp Diseases and Care Paradigm and Market

Scalp Diseases and Care Paradigm

People with different condition severity and different needs shall seek different interventions, thus the demand matrix is relatively diverse. Scalp diseases and care products include daily scalp care products, anti-hair loss shampoo, OTCs, prescription drugs, laser therapies and hair transplants. The following table sets forth the scalp diseases and care products paradigm by disease severity, interventions, application scenarios, consumer profiles and marketing venue.

Severity	Treatment Options	Application Scenarios	Consumers	Marketing Channels
Mild	• **Supplements:** To ensure the nutrition that hair needs • **Scalp care products:** Shampoo, hair-restorer, etc.	• **Daily scalp care** • **Complementary treatment for hair diseases**	• **Gender:** More than 70% of consumers are female • **Age:** Most consumers are aged <35	• **To customers:** Offline marketing: offline advertisements, offline shops and counters, sales promotion, etc. Online marketing: sales e-commerce platforms, social media, streaming media, etc.
Moderate	• **OTC drugs:** Topical minoxidil, selenium sulfide lotion, etc. • **Prescription drugs:** Oral finasteride, cyproterone • **Low level laser treatment:** To energize hair follicles	• **Hair disease treatment:** Consumers self-diagnose and purchase OTC products in offline and online pharmacies Doctors prescribe Rx drugs and certain treatments in medical institutions	• **Gender:** Around 70% of consumers are male • **Age:** Most consumers are aged 18-40	• **To physicians:** Academic conferences, product training, expert visits • **To customers:** Offline advertisements, offline shops and counters, sales promotion, marketing on sales e-commerce platforms and social media, etc.
Severe	• **Hair transplantation:** Have normal hair follicle tissue transplanted in the area of hair loss • **Wigs:** Wearing wigs made of artificial hair	• **Hair disease treatment** • **Improve personal appearance**	• **Gender:** More than 70% consumers are male • **Age:** Young consumers aged 20-30 account for 57.4%	• **To customers:** Network platform marketing, customer referrals, press conference, public welfare activities free diagnosis and treatment, etc.

Source: Frost & Sullivan analysis

The following table shows the currently available intervention measures of alopecia in China.

	Mechanism	Effect of Anti-hair loss	Advantages	Disadvantages
Supplements and scalp care products	• The added ingredient can improve scalp environment and thus promote hair growth	• Supplement nutrition to hair	• Low-cost • Effective for early hair loss	• No effects on necrotic hair follicles
OTC and prescription medications	• **Minoxidil:** Vasodilator	• Most effective in hair on the back side of head	• Suitable for both genders • Low-cost	• May cause pruritus or hypertrichosis
	• **Finasteride:** 5-alpha-reductase type inhibitor	• Mainly used to treat hair loss on the top of head	• Effective for male androgenetic alopecia	• May cause sexual dysfunction
	• **Cyproterone:** Antiandrogen	• Alleviate hair loss	• Effective for female androgenetic alopecia	• May cause sterility
Laser treatments	• Low-level laser can energize hair follicles	• Energize hair growth while keeping hair follicles healthy	• Low risk of side effects and effective for early hair loss	• Expensive and not effective for serious hair loss
Hair transplantation	• Hair transplantation is mainly to have normal hair follicle tissue transplanted in the area of hair loss, and keep it alive	• High success rate	• Obvious effect and can symptomatically solve hair loss problem	• Expensive and may cause infections • Cannot cure root causes of alopecia
Wearing wig	• Wearing wigs made of artificial hair	• No anti-hair loss effects	• Low-cost	• May cause allergy and interfere the growth of hair

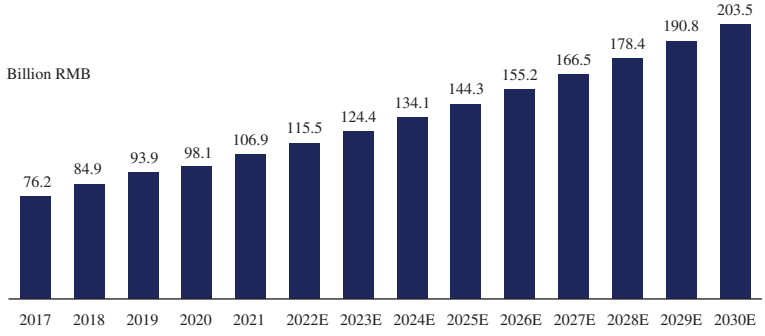
Source: Frost & Sullivan analysis

Market Size

The size of the scalp diseases and care market in China increased from RMB76.2 billion to RMB106.9 billion between 2017 and 2021, and is expected to grow to RMB144.3 billion in 2025, representing a CAGR of 7.8% from 2021 to 2025. The following chart shows the historical and projected size of the scalp diseases and care market in China:

Market Size of Scalp Diseases and Care in China, 2017-2030E

Period	CAGR
2017-2021	8.8%
2021-2025E	7.8%
2025E-2030E	7.1%



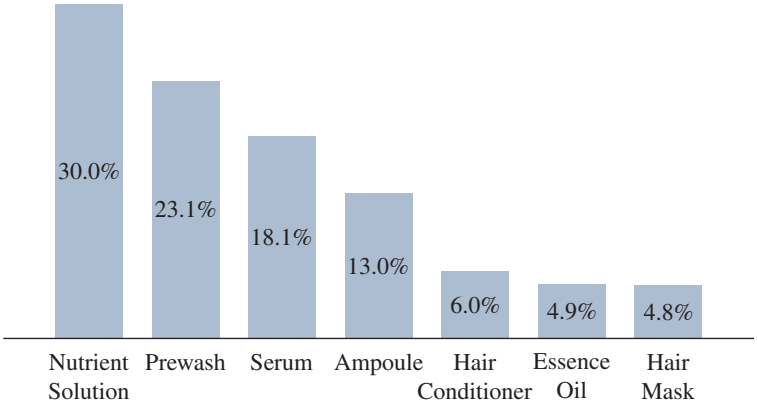
Source: Frost & Sullivan analysis

Scalp Care Products

Diversifying Consumer Needs Curating a Multi-Step Scalp Care Program

Scalp care products market has been developing rapidly since the gradual adoption of multi-step hair maintenance routine among consumers. Among daily care products, nutrient solutions are the most online popular products for consumers, while scalp prewashes, serums and ampoules are becoming popular in the market.

Consumption proportion by categories in online scalp care products market, 2021



Note: Shampoo is not included in the online performance analysis of multi-step scalp care products.

Source: T-mall, Frost & Sullivan analysis

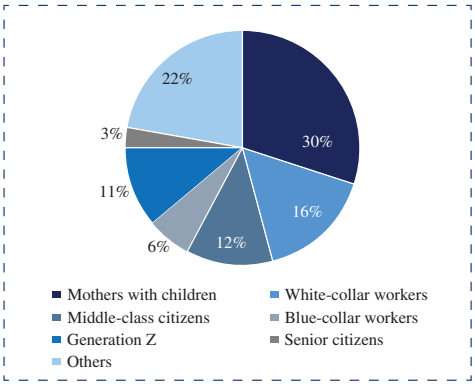
Consumer Portrait

Consumers of scalp care products are becoming more rational, with growing consciousness for the components of the products. Among different consumer groups, certain types of natural components including sea salt, milk, tea, ginger and polygonum multiflorum are popular. It is noteworthy that skin nourishing components that are primarily used in skin care products such as hyaluronic acid and amino acid have been introduced to scalp care products and accepted by a wide range of consumers. Among the consumers of scalp care products with skin care components, mothers with children, white-collar workers and middle-class citizens are the major consumer groups, which account for 58% of the total consumers and with more than 16% of repurchase rate among the total consumers.

Preference towards Components of Scalp Care Products among Different Consumer Groups

	Mothers with children	White-collar workers	Middle-class citizens	Blue-collar workers	Generation Z	Senior citizens
Top 1	Sea salt	Sea salt	Sea salt	Sea salt	Sea salt	Sea salt
Top 2	Hyaluronic acid	Milk	Hyaluronic acid	Milk	Milk	Milk
Top 3	Milk	Hyaluronic acid	Milk	Hyaluronic acid	Ginger	Hyaluronic acid
Top 4	Ginger	Ginger	Polygonum multiflorum	Polygonum multiflorum	Hyaluronic acid	Polygonum multiflorum
Top 5	Tea	Polygonum multiflorum	Ginseng	Ginseng	Tea	Amino acid

Consumer Analysis of Scalp Care Products with Skin Care Components

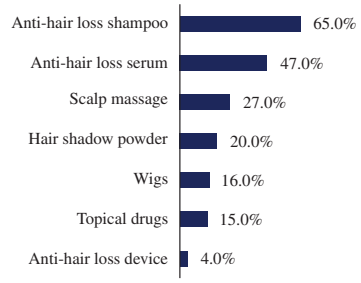


Source: T-mall, Frost & Sullivan analysis

With increased awareness of hair-related health and a strong desire to prevent hair loss, the younger generation of consumers has become the core customer segment of the anti-hair loss products market in China. Application of anti-hair loss shampoo has become the most popular method of hair loss management among consumers born in the 90's in China, 31.5% of which spent more than RMB500 on hair loss management in 2021.

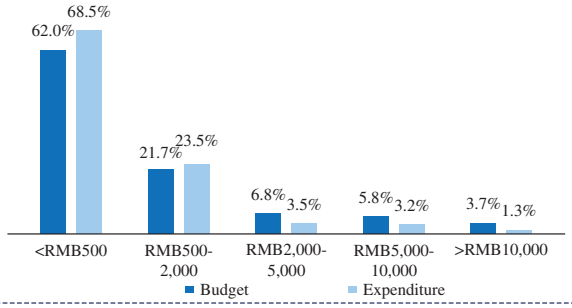
Adoption rate of anti-hair loss methods of young consumers

- In 2021, 65.0% of consumers born in the 90s have purchased anti-hair loss shampoo to manage their hair-related health. 47.0% have purchased anti-hair loss serum.



Costs on hair loss management of young consumers in China

- In 2021, most consumers born in the 90s spent less than RMB500 on hair loss management annually. Meanwhile, about 9.5% of young consumers were willing to spend more than RMB5,000 on hair loss management in 2021.



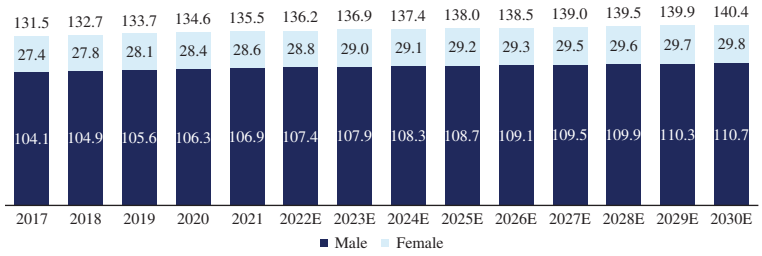
Source: Suning, Frost & Sullivan analysis

Androgenetic Alopecia Overview

Androgenetic alopecia is a common form of scalp hair loss. It is characterized by progressive hair loss, usually in a pattern distribution. The onset may be at any age after puberty and the frequency increases with age. The prevalence of androgenetic alopecia in China reached 135.5 million in 2021, of which 78.9% was male. The prevalence of androgenetic alopecia in female showed a slightly higher growth rate than in male from 2017 to 2021.

Prevalence of Androgenetic Alopecia in China, 2017-2030E

Period	CAGR		
	Male	Female	Total
2017-2021	0.7%	1.0%	0.8%
2021-2025E	0.4%	0.6%	0.4%
2025E-2030E	0.4%	0.3%	0.3%



Source: Frost & Sullivan analysis

Current Treatment Paradigm and Unmet Medical Needs

Typical treatment of androgenetic alopecia includes drug treatment and hair transplant. There are mainly two dosage forms for drug treatments, namely topical dosage form drug and oral dosage form drug. Each dosage form currently has one approved drug to treat male androgenetic alopecia in China, namely finasteride (oral drug) and minoxidil (topical drug). Among the two forms of drugs, topical medications are more acceptable to patients because the risk of causing side effects is relatively lower. The following charts set forth the current treatment paradigm for androgenetic alopecia:

Topical drug for treatment of androgenetic alopecia

- **Introduction and approved drugs:** Topical medication is widely used for the treatment for androgenetic alopecia. Minoxidil has been approved by FDA and NMPA to treat androgenetic alopecia.
- **Safety:** Compared with oral medication, topical drug is safer with much lower systemic exposure and thus is available as an over-the-counter (OTC) product, which makes topical drug more popular with patients.

Oral drug for treatment of androgenetic alopecia

- **Introduction and approved drugs:** Oral medication is one typical treatment for androgenetic alopecia. And the widely used drug is finasteride, which is approved by the FDA and NMPA for androgenetic alopecia. This drug works by inhibiting the conversion of testosterone to DHT.
- **Safety:** Oral medication has a higher risk of causing side effects than topical drug due to higher systemic drug exposure.

Hair transplantation for androgenetic alopecia

- **Introduction:** Though hair transplantation cannot actually cure patients with androgenetic alopecia, it is an effective method to alleviate hair loss. The way is to have normal hair follicle tissue transplanted in hair loss area, and keep it alive.
- **Safety:** Hair transplantation has side effects including inflammation of hair follicles, infections, etc.

Source: Frost & Sullivan analysis

The current androgenetic alopecia treatment paradigm is facing multiple major challenges, including:

- *Systemic exposure to finasteride causing potential side effects that deter wider adoption.* Minoxidil and finasteride are the only two approved treatments of male androgenetic alopecia in China. For the treatment of male patients, finasteride inevitably lowers serum DHT levels when administered in oral tablet form, and may cause side effects such as sexual dysfunction.

- *Limited choice of clinically validated and approved topical therapy*. Minoxidil is the only clinically validated and approved topical therapy for androgenetic alopecia since its first approval by FDA in 1988. Despite its validated efficacy in multiple clinical trials, there are patients that fail to have satisfactory response or not able to stay on the treatment due to allergy, unsatisfactory hair texture or inconvenience in application.

- *Hair transplant is not a functional cure and effects are often short-lived.* As a solution for patients with severe alopecia, hair transplant is not a functional cure. The recession will intensify if the root cause of alopecia is not cured, which might cause embarrassment leaving the patient with a separation of baldness between the implanted area and his or her own hair. Besides, not all transplanted follicles can survive after surgery. As a surgical procedure, hair transplant needs downtime and have certain risks of complication such as infection. In addition, hair transplant is expensive as the cost is usually based on the number of follicles transplanted.

Innovative Solutions

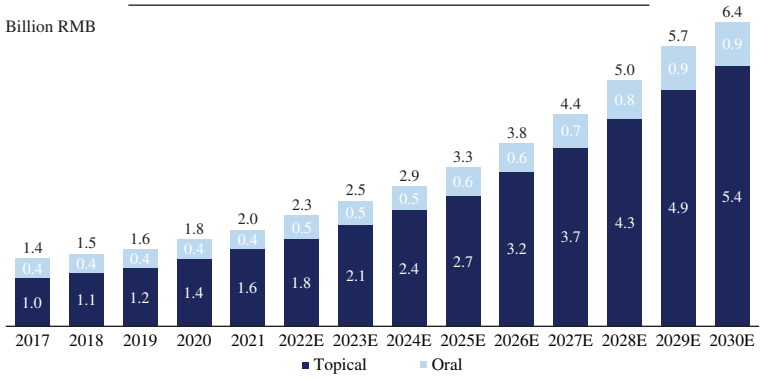
Topical drugs with novel mechanism of action that could directly target hair follicles while surpassing the circulation is an innovative solution for androgenetic alopecia, reducing the risks of complications brought by the systemic drug exposure, such as sexual dysfunction and depression associated with oral finasteride. In China, the new drugs under clinical trials for treatment of androgenetic alopecia are all in topical dosage forms, including drugs of different mechanisms such as 5-alpha reductase inhibitors, AR antagonist and thyroid hormone receptor agonist, which indicates a trend toward topical therapies in androgenetic alopecia drug treatments.

Androgenetic Alopecia Treatment Market in China

The total market of drugs approved for androgenetic alopecia in China grew from RMB1.4 billion in 2017 to RMB2.0 billion in 2021, representing a CAGR of 10.3%. With more drugs approved for androgenetic alopecia entering the market and the increasing acceptance of treating androgenetic alopecia, the market size is expected to reach RMB3.3 million in 2025, representing a CAGR of 13.1% from 2021 to 2025 and RMB6.4 million in 2030, representing a CAGR of 14.0% from 2025 to 2030. The following figure sets forth the historical and projected market size of drugs approved for androgenetic alopecia in China:

Market Size of Drugs Approved for Androgenetic Alopecia in China, 2017-2030E

Period	CAGR		
	Topical	Oral	Total
2017-2021	13.3%	2.1%	10.3%
2021-2025E	14.5%	7.4%	13.1%
2025E-2030E	15.0%	9.2%	14.0%



Source: Frost & Sullivan analysis

Competitive Landscape of Androgenetic Alopecia Drugs in China

In 2021, the sales of finasteride and minoxidil products for androgenetic alopecia treatment in China have reached around RMB0.4 billion and RMB1.6 billion, respectively. Globally, the sales of finasteride and minoxidil products in 2021 have reached around USD0.1 billion and USD1.0 billion, respectively. The following table shows the competitive landscape of the approved drugs for androgenetic alopecia in China:

Drugs	Dosage Form	RLD Holder/First Approved Company	Indications	First Approval Date	OTC/Rx	Number of Products	Costs per Treatment Course
Minoxidil	Spray	Jewim Pharmaceutical	Androgenetic alopecia	2011/1	OTC	2	~ RMB1,242
	Gel	Bausch + Lomb	Androgenetic alopecia	2005/1	OTC	1	~ RMB1,368
	Liniment	Ante Bio-pharmaceutical	Androgenetic alopecia	2002/1	OTC	3	~ RMB709
	Tincture	Wansheng Pharmaceutical	Androgenetic alopecia	2001/1	OTC	2	~ RMB680
Finasteride	Tablet	Merck Sharp & Dohme	Male androgenetic alopecia	2004/1	Rx	9	~ RMB961
Cyproterone	Tablet	Jenapharm	Severe androgenetic alopecia in females	1990/12	Rx	5	~ RMB1,975

Note: Information as of November 4, 2022. Treatment costs are based on bidding prices.

Source: NMPA, Frost & Sullivan analysis

The following table shows the competitive landscape of drugs for androgenetic alopecia under development in China:

Drugs	Company	Status	Active Ingredients	Indications	Dosage Form	Date First Posted
KX-826	Kintor Pharmaceutical/ Koshine	Phase III	Pyrilutamide (small molecule AR antagonist)	Androgenetic alopecia	Tincture	2021/11
CU-40102	Cutia	Phase III	Finasteride (5-alpha reductase inhibitors)	Androgenetic alopecia	Spray	2021/10
CU-40101	Cutia	Phase I	Thyroid hormone receptor agonist	Androgenetic alopecia	Liniment	2022/04
GT20029	Kintor Pharmaceutical	Phase I	Topical AR-PROTAC	Androgenetic alopecia Acne vulgaris	Tincture	2021/6
Minoxidil cream	Changzhou Siyao	IND Approval	Minoxidil	Androgenetic alopecia	Cream	2017/4
CU-40104	Cutia	Pre-clinical	Dutasteride (5-alpha reductase inhibitors)	Androgenetic alopecia	Topical agent	N/A

Note: Information as of November 4, 2022. Generics are excluded.

Source: CDE, Frost & Sullivan analysis

SKIN DISEASES AND CARE MARKET

Skin Diseases and Care Overview

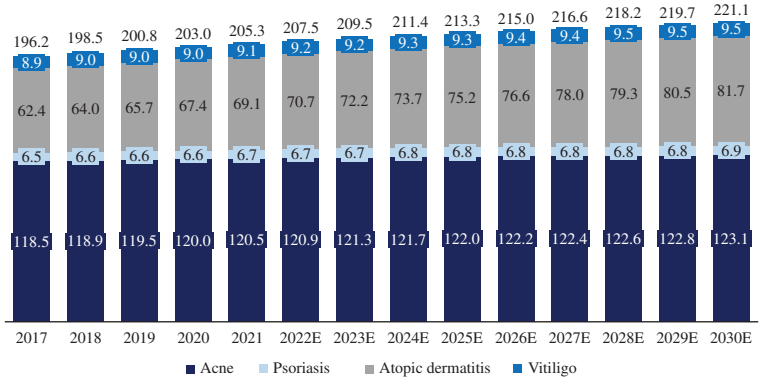
Skin diseases are mainly originated from malfunction, infection, allergy or genetic aberrations of skin and its appendages, such as acne vulgaris, atopic dermatitis, psoriasis and others. Skin diseases affect patients' quality of life physically, socially and psychologically. As they are associated with genetics and external factors such as environment and diets, skin diseases are usually prone to relapse and thus require long-term management and care.

Skin Diseases Prevalence

Due to the transformation of people's living and working habits, the prevalence of major dermatologic diseases including acne vulgaris, psoriasis, atopic dermatitis and vitiligo in China has increased from 196.2 million in 2017 to 205.3 million in 2021, representing a CAGR of 1.1%. The prevalence of major dermatologic diseases in China is forecasted to reach 213.3 million in 2025 and further reach 221.1 million in 2030. In 2021, the number of patients of acne vulgaris accounted for 58.7% of patients of major skin diseases. The following chart shows the historical and projected prevalence of major skin diseases in China:

Prevalence of Major Skin Diseases in China, 2017-2030E

CAGR	Acne	Psoriasis	Atopic dermatitis	Vitiligo	Total
2017-2021	0.4%	0.5%	2.6%	0.6%	1.1%
2021-2025E	0.3%	0.4%	2.2%	0.7%	1.0%
2025E-2030E	0.2%	0.2%	1.7%	0.5%	0.7%



Source: Literature Review, Frost & Sullivan analysis

Skin Diseases Treatment and Care Paradigm and Market

Skin Diseases Treatment and Care Paradigm

The application scenarios of skin disease treatment and skin care products are diverse, including, among others, daily skin care, skin barrier repair and improvement, skin disease treatment and skin care during disease recovery. Due to the various types and different severities of skin diseases as well as the diverse application scenarios, consumers' demands for products to address skin conditions vary greatly. Multiple solutions for consumers in this field include nutrition supplement, cosmeceutical, OTC drug, prescription drug, physical therapy and surgery, among others. The combination of different types of products and solutions is usually the preferred choice to achieve better results and compliance. Combination therapy of prescription and OTC drugs is recommended in the treatment paradigms of many skin diseases. Additionally, proper skin care routine is an important part of skin disease management. The following chart shows the treatment paradigm of skin care in China:

Demands	Treatment Options	Application Scenarios	Marketing Channels
Basic Care	• **Basic skin care products:** Lotion, cream, essence, masks, etc. • **Supplements:** Collagen, omega-3, etc. that ensure the nutrition needed for skin health	• **Daily care for healthy skin**	• **To customers:** Offline marketing: product launch events, offline advertisements, offline shops and counters, sales promotion Online marketing: sales e-commerce platforms, social media, streaming media, etc.
Repair and Improvement	• **Cosmeceuticals:** Skincare products with mild formulae and functional active ingredients • **Energy-based and injection procedures**	• **Fundamental treatment of skin diseases** • **Repair damaged skin barriers** • **Improve skin conditions**	• **To business:** Academic conferences, product training, expert visits • **To customers:** New product launch events, offline advertisements, offline shops and counters, sales promotion, marketing on sales e-commerce platforms and social media, etc.
Disease Treatment	• **OTC drugs:** Consumers in China tend to use topical OTC medications to control mild dermatoses, such as topical corticosteroids, etc. • **Prescription drugs:** When skin diseases progress, patients ask for professional medical advice and treatment including prescription drugs. • **Surgery and physical therapy**	• **Self-diagnosis and over-the-counter prescription to treat mild disorders** • **Professional intervention in medical institutions covering different severity of skin diseases**	

Source: Frost & Sullivan analysis

Intervention/Product Category

The following table sets forth the mechanism, effects, advantages and disadvantages of varied skin disease and care solutions:

	Mechanism	Effects	Advantages	Disadvantages
Supplements	• Supplements that help improve skin health	• Supplement nutrition for skin health	• Convenient	• Mild effects after long-term use
Skin care products and cosmeceuticals	• Topical cosmetic-pharmaceutical hybrids that enhance skin health	• Improve skin conditions and repair damaged skin barriers	• Low-cost • Convenient	• Mild effects after long-term use
Energy-based and injection procedures	• Utilizing various forms of energy and injection procedures to improve skin conditions	• Improve skin conditions	• Enhanced and long-lasting effects	• Expensive and need repeated treatments to maintain the effects • Skin barrier damaged during treatments
OTC and prescription medications	• Topical or systemic treatments for skin diseases	• Treat skin diseases	• Convenient • Proven effects	• Risks of treatment-related complications
Surgery and physical therapy	• Surgery and physical therapy for skin diseases	• Treat skin diseases	• Proven effects	• Expensive • Risks of treatment-related complications

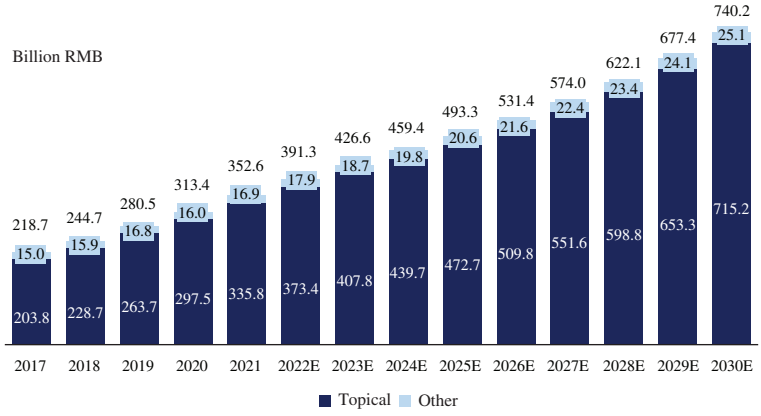
Source: Frost & Sullivan analysis

Market Size

With the growing demand for skin diseases and care products in China, the Chinese market is expected to continue to grow rapidly. The market size of skin diseases and care products in China grew from RMB218.7 billion in 2017 to RMB352.6 billion in 2021, representing a CAGR of 12.7% from 2017 to 2021. It is estimated that the market will increase from RMB493.3 billion in 2025 to RMB740.2 billion in 2030, representing a CAGR of 8.5%. The following chart shows the size of skin disease and care market in China:

China Skin Diseases and Care Market Breakdown by Dosage Forms, 2017-2030E

CAGR	Topical	Other	Total
2017-2021	13.3%	3.1%	12.7%
2021-2025E	8.9%	5.1%	8.8%
2025E-2030E	8.6%	4.0%	8.5%



Source: Frost & Sullivan analysis

Acne Vulgaris Condition and Treatment Overview

Acne vulgaris is a chronic inflammatory skin condition notable for open or closed comedones and inflammatory lesions, including papules, pustules and nodules. Acne vulgaris is a common disease, especially in adolescents and young adults. It can cause significant physical and psychological morbidity, such as permanent scarring, poor self-image and depression.

Current Treatment Paradigm and Unmet Clinical Needs

The current treatment paradigm of acne vulgaris primarily includes topical medication, systemic medication and physical and chemical therapy as shown below:

Treatments of Acne Vulgaris

Category	Major Treatments
Topical Medication	• Retinoids • Benzoyl peroxide • Antibiotics • Azelaic acid • Salicylic acid • Selenium disulfide
Systemic Medication	• Oral antibiotics • Isotretinoin • Anti-androgens • Glucocorticoids
Physical and Chemical Therapy	• Blue and red light combination therapy • Photodynamic therapy • Laser therapy • Salicylic acid, Alpha hydroxy acid or compound acids peeling treatment
Others	• Traditional Chinese medicine

Topical antibiotics have anti-inflammatory effects in addition to antimicrobial effects.

Thus, they are more suitable for treating papules and pustules.

Source: Frost & Sullivan analysis

The current treatment paradigm for acne vulgaris is still facing unmet medical needs:

- *Concerned of adverse events caused by current treatments:* As a fundamental component in combination therapies of moderate to severe acne vulgaris, antibiotics play an important role in acne treatment. Oral tetracyclines antibiotics, a group of antibiotics such as tetracycline, doxycycline and minocycline, is one of the most commonly used antibiotics group in acne treatment. However, the associated adverse events hinder wider adoption by physicians and patients, such as diarrhea and epigastric pain caused by tetracyclines, headache and nausea caused by doxycycline, and nausea, vomiting and dizziness caused by minocycline. Compared with topical antibiotics, oral antibiotics cause higher systemic exposure, leading to higher frequency of adverse events; however, many antibiotics are only available in oral dosage forms. Oral isotretinoin can result in adverse effects including dry lips, dry skin, cheilitis, vomiting, nausea, etc. In addition, oral isotretinoin is contraindicated during pregnancy due to known teratogenic effects.

- *Drug resistance of antibiotics hindering clinical use:* In addition to concerns over adverse events, the use of antibiotics, especially oral antibiotics, faces rising drug resistance that not only undermines the treatment effect but can also result in the emergence of other drug-resistant strains of bacteria through plasmid transmission of drug-resistant genes. It increases the risks of multiple drug-resistant infections such as upper respiratory infection and pneumonia. It is reported that over 50% of *P. acnes* strains are resistant to antibiotics, especially to macrolides.

- *A large number of patients without medical treatments:* Despite the high prevalence, only 22% of acne patients sought medical assistance as most of the patients have mild symptoms. In addition, concerns over side effects of existing therapies and high frequency of relapse also contribute to the reluctance of patients to seek medical assistance.

- *Skin irritation varies between individuals:* Common topical therapies for acne vulgaris including benzoyl peroxide, topical retinoids and various types of acid often cause some degree of skin irritation especially at early treatment stage. Treatment needs to be started with a lower dose and gradually increased over time. Such process can be time-consuming and requires strict medical supervision, leading to insufficient treatment efficacy and poor compliance.

Innovative Solution

The following therapies have been emerged as an existing innovative solution for acne vulgaris:

- *Topical antibiotics with low drug-resistant rate:* The drug resistance to antibiotics has been one of the obstacles for acne vulgaris treatment. The drug-resistant rate of *P. acnes* treated with clindamycin, erythromycin, tetracycline and minocycline is reported to be 54.7%, 53.5%, 20.0% and 16.3%, respectively. Minocycline has the minimal drug-resistant rate. With the fact that topical antibiotics treatment can greatly avoid systemic exposure to reduce adverse events, topical minocycline has a combined advantage of clinical efficacy and mild side effect, representing a promising future treatment in acne vulgaris. Current data in clinical trials suggest that serum minocycline concentration with topical minocycline was 730 to 765 times lower than that with oral minocycline, potentially reducing the frequency of adverse events.

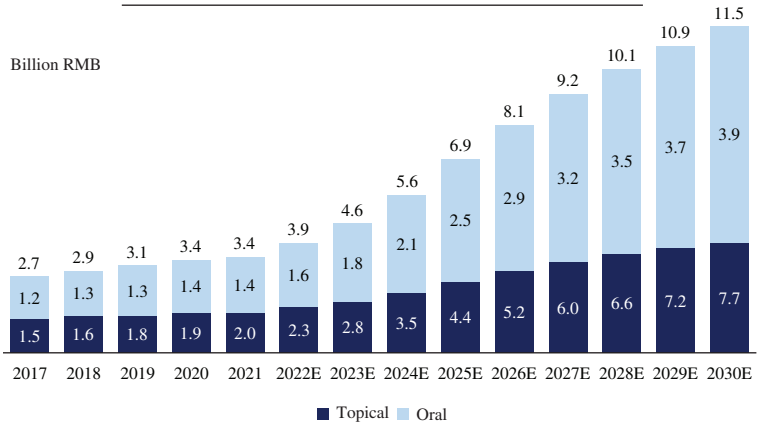
- *Exploration of new agents and physical therapy:* A number of new agents have shown potential in the treatment of acne vulgaris in research, including antimicrobial peptides, chitosan and chitosan-caffeic acid derivative. Meanwhile, physical therapies such as red light therapy, blue light therapy and photodynamic therapy have been adopted by more physicians and consumers recently.

Acne Vulgaris Treatment Market in China

The market size of acne treatment in China grew from RMB2.7 billion in 2017 to RMB3.4 billion in 2021, representing a CAGR of 5.9% from 2017 to 2021. It is estimated that the market will increase from RMB6.9 billion in 2025 to RMB11.5 billion in 2030, representing a CAGR of 10.9%. The following chart shows the historical and projected market size of acne vulgaris treatment in China:

Market Size of Acne Treatment in China, 2017-2030E

CAGR	Topical	Oral	Total
2017-2021	7.0%	4.3%	5.9%
2021-2025E	22.2%	14.7%	19.2%
2025E-2030E	11.8%	9.3%	10.9%



Source: Frost & Sullivan analysis

Competitive Landscape of Topical Acne Vulgaris Drugs in China

Currently, China has approved more than 20 kinds of drug formulations and over 150 products for topical treatment of acne vulgaris and most of them are antibiotics, retinoids and benzoyl peroxide. The following table sets forth topical acne vulgaris drugs under clinical trials.

Drug Name	Company	Indications	Active Ingredients	Status	Dosage Form	First Posted Date
Adapalene + Clindamycin Gel	Zhaoke	Moderate acne vulgaris	Adapalene and clindamycin (retinoid and antibiotic combination)	NDA	Gel	2021/2
CU-10201	Cutia	Moderate to severe acne vulgaris	Minocycline (antibiotic)	Phase III	Spray	2021/6
Aminolevulinic Acid Hydrochloride Topical Powder	Fudan-Zhangjiang	Combined with photodynamic therapy to treat moderate to severe acne vulgaris	Aminolevulinic acid hydrochloride (photosensitizing precursor)	Phase II	Powder	2021/12
Tazarotene Clindamycin Phosphate Cream	Sinomune	Moderate acne vulgaris	Tazarotene and clindamycin (retinoid and antibiotic combination)	Phase II	Cream	2021/1
KX-826	Kintor/Koshine	Mild to moderate acne vulgaris	Pyrilutamide (small molecule AR antagonist)	Phase I/II	Gel	2021/3
GT20029	Kintor	Androgenetic alopecia, acne vulgaris	Topical AR-PROTAC	Phase I	Gel	2021/6
Ibuprofen Piconol Cream	Bestcomm	Eczema, contact dermatitis, atopic dermatitis, perioral dermatitis, herpes zoster, acne vulgaris	Ibuprofen piconol (non-steroidal anti-inflammatory drug)	Phase I	Cream	2018/11

Note: As of November 4, 2022

Source: CDE, Frost & Sullivan analysis

LOCALIZED ADIPOSE ACCUMULATION MANAGEMENT MEDICATION MARKET

Treatment and Unmet Needs for Localized Adipose Accumulation Management

Localized adipose accumulation management include two main categories, namely non-surgical fat reduction and liposuction surgery. The non-surgical fat reduction including localized adipose accumulation management medications and energy-based fat reduction procedures such as cryolipolysis and ultrasonic cavitation. A detailed comparison for these three treatments is set forth below:

	Localized Adipose Accumulation Management Medications	Energy-based Fat Reduction	Liposuction Surgery
Introduction	Functional ingredients mainly include deoxycholic acid and recombinant mutant collagenase.	Energy-based fat reduction is non-surgical procedure that are performed with devices that utilize various forms of energy, such as cold temperature, ultrasound, laser, radiofrequency, etc. for fat reduction and body contouring. Treatments approved in China include cryolipolysis and ultrasonic cavitation.	Liposuction is a surgical procedure that uses a suction technique to remove fat from specific areas of the body, such as the abdomen, hips, thighs, buttocks, arms or neck. It can be performed alone or along with other plastic surgery procedures, such as autologous fat transfer or abdominoplasty. Treatments include suction assisted liposuction (SAL), water-assisted liposuction (WAL), laser liposuction, ultrasound assisted liposuction (UAL), etc.
Mechanisms	The medicine is given to the subcutaneous fat tissue and destroys the membrane of the adipocytes or the extracellular matrix, which induces apoptosis of the adipocytes. Then the body's immune system clears the fatty acid through the lymphatic system and liver.	The device is placed on the area to be treated and brings energy to the subcutaneous layers where fat cells accumulate, which destroys the fat cells or induces apoptosis of the fat cells. Then the body's immune system clears the fatty acid through the lymphatic system and liver.	SAL, WAL, etc. physically crush the localized adipose tissue and suck out the fat through the incision. Laser lipolyis, UAL, etc. rely on energy to induce adipocyte swelling and rupture, and then suck out the lysate through a needle.
Major Equipment	No equipment required	CoolSculpting (Zeltiq), UltraShape V3 (Syneron)	Body-jet (Human Med), VASER (Solta Medical), SP Dynamis (Fotona)
Procedure Duration	15-20 mins	~1 hour	2-4 hours
Invasiveness	Minimally invasive treatment with less postoperative pain	Non-invasive procedures	Invasive surgery with significant postoperative pain
Downtime	0-2 days	0-1 day	1-2 weeks
Full Recovery Time	2-4 weeks	Within a week	1-3 months
Side Effects	For deoxycholic acid: Swelling (65.8%, median duration: 9-10 days), bruising (54.6%), numbness (49.6%), erythema (38%), induration (22.5%), etc.	Erythema (26.3%), numbness (9.1%), bruising (3.7%), edema/swelling (2.5%), etc.	Swelling (almost every procedure, duration: 4-6 weeks), seromas (3.5%), surface irregularities (8.2%), skin laxity (4.2%), etc.
SAE rates	For deoxycholic acid: 0.1% (recovered mandibular nerve injury) For recombinant allosteric collagenase: 0	0.7% (paradoxical adipose hyperplasia)	0.1%. The rates of fatal complications is 1 in 5000.
Treatment Restrictions	Burden on liver to metabolize, several treatments are needed to see the results and long interval between each treatments	High costs, risks of cold injury and erythema, efficacy depending on technical factors including device's applicator	Permanent bumpy and wavy skin due to uneven fat removal, temporary pockets of fluid formed under skin requiring routine drainage operator-dependence, high costs, invasiveness

Source: Literature Search, Frost & Sullivan analysis

Localized Adipose Accumulation Management Medication

Overview

The main components of localized adipose accumulation management medication include collagenase, phosphatidylcholine and, among others. The following table sets forth the main components and mechanism of action of localized adipose accumulation management medication:

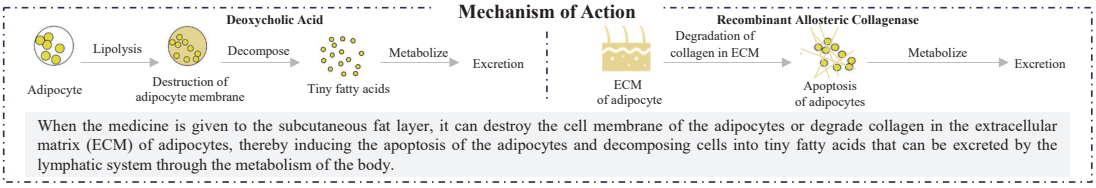
Main Components	Role
❄ Deoxycholic Acid	It can effectively dissolve the adipocyte membrane, leading to the disintegration of adipocytes. It is targeted to adipocytes and has a long-lasting effect.
❄ Recombinant Allosteric Collagenase	It can degrade the ECM of adipocytes, resulting in the adipocytes losing their support and inducing apoptosis of adipocytes.
❄ Phosphatidylcholine	It reacts with sodium deoxycholate to destroy the adipocyt membrane, and the decomposed fat is transformed into water and other fat microspheres to participate in the metabolism of the body.
❄ L-carnitine	A nutrient like vitamin found in animals, plants and microorganisms that promotes fatty acid oxidation.
❄ Polypeptides	It can stimulate the secretion of more lipolytic enzymes that decompose fat into fatty acids and glycerol, thus promoting fat metabolism.

Three Key Characteristics

Less invasive
Target only the subcutaneous fat layer without injuries to muscle and other tissues, making the entire fat-reduction procedure safer.

Favorable prognosis
Unlike liposuction, localized adipose accumulation management medications can largely reduce recovery time and decrease post surgical risks including infection, bruising and scarring at surgical site.

High applicability
As comparing with energy-based fat reduction methods, localized adipose accumulation management medications require less restrictions such as the thickness of subcutaneous fat, aiming for wider range of patients.



When the medicine is given to the subcutaneous fat layer, it can destroy the cell membrane of the adipocytes or degrade collagen in the extracellular matrix (ECM) of adipocytes, thereby inducing the apoptosis of the adipocytes and decomposing cells into tiny fatty acids that can be excreted by the lymphatic system through the metabolism of the body.

Source: Frost & Sullivan analysis

Unmet Needs in Localized Adipose Accumulation Management Medication

The localized adipose accumulation management medication in China is facing multiple major challenges, including:

- *Lack of Certificated Products.* In China, no adipose tissue management product has been certificated as a drug, which greatly limits the application of adipose accumulation management. There are a few adipose tissue management products approved by NMPA, but all of them are cosmetic products that are approved for topical application only. All these products are not indicated for adipose accumulation management administration into human body in China. Consumers are in great need of products that are certificated as drugs for more effective and safer adipose accumulation management. In addition, most currently available products are composed of natural extract and peptides, which can only temporarily shrink fat cells, but not permanently decompose them to achieve longer term efficacy.

- *Disturbance of Uncertificated Products and Unsafe Operations.* Though the application of cosmetics to manage adipose accumulation is now prohibited by regulations in China, some institutions still provide such services because of high profit margin. As the approval of cosmetic products does not require strict clinical trials, their efficacy and safety is not verified and the administration of such products into human body may cause serious adverse effects, such as severe pain, tissue necrosis and so on. Besides, due to the lack of certificated products in the market, practitioners lack systemic training and standard operation instructions, which might lead to improper operation, such as inaccurate dosing.

- *Safety Concerns over Deoxycholic Acid.* Subcutaneous treatment of deoxycholic acid works by causing adipocyte membrane lysis as a result of its cytotoxic and detergent effects on the cell membrane. Such mechanism involving adipocyte death and adipose tissue inflammation causes adverse effects and safety concerns among practitioners and consumers. A patient receiving deoxycholic acid administration to manage localized adipose accumulation usually needs two to four weeks of full recovery time and may suffer side effects such as swelling (65.8%, median duration: 9-10 days), bruising (54.6%), numbness (49.6%), erythema (38%), and induration (22.5%), etc.

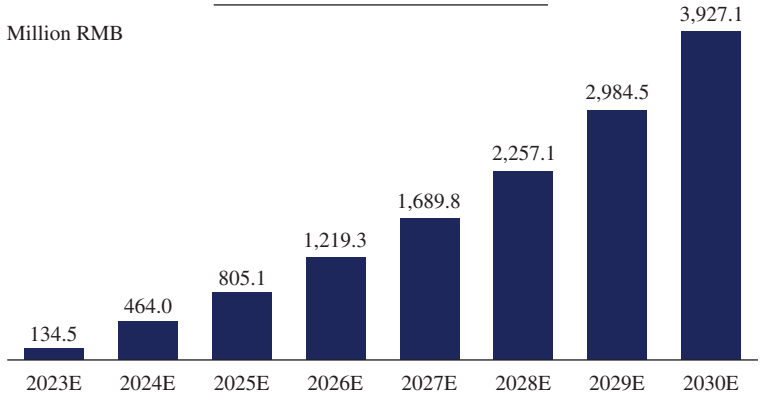
- *Relapse & rebound.* Generally, during a course of treatment, consumers need two to three doses of fat accumulation management products and the effects last less than two years. Usually, in order to maintain the appearance after treatments, consumers need to receive the treatment on a regular basis.

Market Size of Localized Adipose Accumulation Management Medication

China's localized adipose accumulation management medication market is still at an early stage of growth with no approved products. The market size of localized adipose accumulation management medications is expected to grow from RMB134.5 million in 2023 to RMB805.1 million in 2025, representing a CAGR of 144.7% from 2023 to 2025. The market in 2030 will reach RMB3,927.1 million, representing a CAGR of 37.3% from 2025 to 2030. The following table sets forth the market size of localized adipose accumulation management medication in China:

Market Size of Localized Adipose Accumulation Management Medications in China, 2023-2030E

Period	CAGR
2023E-2025E	144.7%
2025E-2030E	37.3%



Note: Based on the ex-factory price

Source: Frost & Sullivan analysis

Competitive Landscape of Localized Adipose Accumulation Management Medication in China

Currently, there has been no localized adipose accumulation management medication approved in China. Three product candidates are in clinical trial stages in China.

Drug	Registration Classification[1]	Applicant	Indication	Status	First Posted Date[2]
Deoxycholic Acid	3	Nanjing Noratech	Moderate to severe contour bulging/excessive facial fullness due to the accumulation of submental fat	Phase III	2021/09
CU-20401	1	Cutia	Submental adipose accumulation	Phase I completed	2021/08
			Abdominal adipose accumulation	Phase I (ongoing)	
Deoxycholic Acid	3	Nanjing Minova	Submental fat	IND Approval	2021/07

Notes:

1. Registration Classification:

Class 3: Drugs manufactured by domestic applicants by imitating the original drugs that have been marketed overseas but not yet in China

Class 1: Innovative drugs that have not been marketed in China or overseas

2. First posted date denotes the date when the trial is first publicly announced on the CDE website. Information as of November 4, 2022. Phase I trial of CU-20401 in submental adipose accumulation has been completed.

Source: CDE, Frost & Sullivan analysis

TOPICAL ANESTHESIA MARKET

Topical Anesthesia Overview

Topical anesthetics are highly penetrating local anesthetics which are sprayed or applied to skin or mucous membranes, conjunctive, and other surfaces to cause superficial loss of pain sensation. Topical anesthesia can be applied in consumption and clinical scenarios. In consumption scenarios, topical anesthetics are generally applied before superficial dermatological procedures. In clinical practices, topical anesthetics are applied before puncture procedures and operations concerning superficial tissue. In addition, it can be used as a pretreatment for infiltration anesthesia combined with other anesthetics.

Currently Available Topical Anesthetics and Unmet Needs

The currently available topical anesthesia products for puncture and superficial dermatological procedures in China are compound lidocaine and proparacaine creams. None of them is composed of tetracaine which has been proven more effective in pain relief. The market gives an opportunity for companies that develop products meeting the need for lidocaine and tetracaine topical anesthesia products.

The current topical anesthesia product market in China is facing multiple major challenges:

- *Lack of highly effective products:* The existing approved topical anesthesia products in China are lidocaine and prilocaine compounds. As comparing with lidocaine/prilocaine (EMLA), the lidocaine/tetracaine cream displays superior efficacy in a shorter period of time, improved ease of use and a better safety profile for superficial dermatological procedures. However, no lidocaine/tetracaine topical anesthesia product has been approved in China despite all the advantages of lidocaine/tetracaine. Currently, there are two lidocaine/tetracaine products developed by Cutia Therapeutics and Liangfu Pharmaceutical in clinical stage in China. The original drug of lidocaine/tetracaine cream utilizes the proprietary phase-changing technology, which is a technical barrier to other market players.

- *Lack of products for various application scenarios:* The current approved products in China can hardly meet the needs of all application scenarios. For example, topical anesthesia products are widely used in superficial dermatologic procedures. However, current products approved in China are in small dosage form, providing limited dosage options for medical procedures that require large dosage to cover the entire treatment areas, such as superficial treatments and energy-based procedures. New products that meet demands in different application scenarios are needed in market.

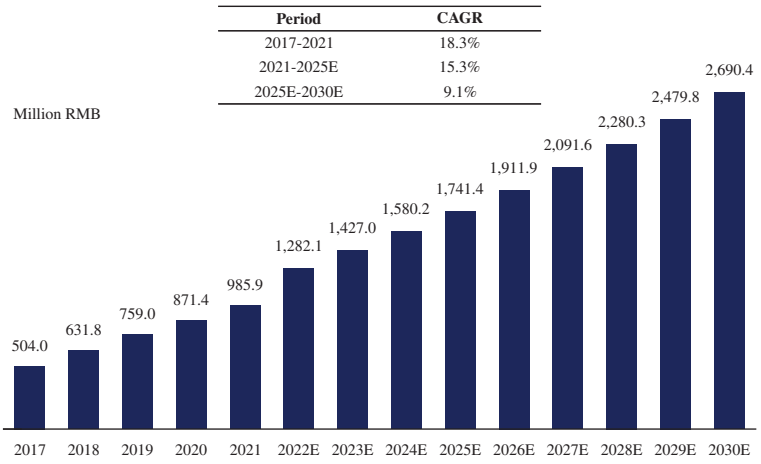
Innovative Solutions

There are two approved topical anesthesia products in China and none of them is composed of tetracaine which has been tested more effective in pain relief, with more subjects reported adequate pain relief with lidocaine/tetracaine (75%) compared to lidocaine/prilocaine (67.5%) applied for 30 minutes before superficial dermatologic procedures. The lidocaine/tetracaine compound produces rapid and durable topical anesthesia due to the pharmacokinetics of the two components. The anesthesia produced by lidocaine is faster and more extensive. Tetracaine, a long-acting amino-ester, is more lipophilic than lidocaine, concentrating in the stratum corneum of the epidermis, where it slowly diffuses. The duration of tetracaine is thus prolonged and the systemic uptake is limited. In addition, the application of lidocaine/prilocaine cream needs plastic occlusion while lidocaine/tetracaine cream is self-occluding, which is more convenient for users. The market gives an opportunity for companies that develop products meeting the need for lidocaine/tetracaine topical anesthesia products. Currently, there have been two pipelines of lidocaine/tetracaine products from Liangfu Pharmaceutical and Cutia Therapeutics are under developed in China.

Market Size of Topical Anesthetics in China

Currently, there are only a limited number of approved products for topical anesthesia in China. With the growing demand for skin puncture and superficial surgery, the Chinese topical anesthetics market will continue to grow rapidly. The market size of topical anesthetics grew from RMB504.0 million in 2017 to RMB985.9 million in 2021, representing a CAGR of 18.3% from 2017 to 2021. It is estimated that the market will increase from RMB1,741.4 million in 2025 to RMB2,690.4 million in 2030, representing a CAGR of 9.1%. The following chart shows the market size of topical anesthesia products in China:

Market Size of Topical Anesthetics in China, 2017-2030E



Note: *Only considered for puncture and superficial surgical procedures.

Based on the ex-factory price

Source: Frost & Sullivan analysis

Competitive Landscape of Topical Anesthetics in China

Currently, there are two topical anesthesia products approved by the NMPA as set forth below. There are more than 10 topical anesthesia products under clinical development in China.

NMPA Approved Products For Topical Anesthesia

Brand Name	Ingredient	Company	Approved Date	Indication
EMLA	Lidocaine/Prilocaine	AstraZeneca AB	1998.01	Topical anesthetic analgesia (for puncture procedure and superficial surgeries)
Compound Lidocaine Cream	Lidocaine/Prilocaine	Tongfang Pharmaceutical Group Co., Ltd.	2006.01	Topical anesthetic analgesia (for puncture procedure and superficial surgeries)

**Note:* Only consider the topical anesthesia products for puncture and superficial dermatological procedures

Source: NMPA, Frost & Sullivan analysis

REPORT COMMISSIONED BY FROST & SULLIVAN

In connection with the [**REDACTED**], we commissioned Frost & Sullivan, an Independent Third Party, to prepare a report on global and China's markets regarding scalp diseases and care, skin diseases and care, localized adipose accumulation management medication, and topical anesthesia market. Except as otherwise noted, all data and forecasts in this section come from the Frost & Sullivan Report. We have agreed to pay a total of RMB1.05 million in fees for the preparation of the Frost & Sullivan Report. Frost & Sullivan is a market research and consulting company that provides market research on a variety of industries including healthcare. In preparing the report, Frost & Sullivan collected and reviewed publicly available data such as government-derived information, annual reports and industry association statistics, as well as market data collected by conducting interviews with key industry experts and leading industry participants. Frost & Sullivan has exercised due care in collecting and reviewing the information so collected.