Kintor Pharmaceutical (9939 HK)

Specializing in AR-related innovative therapies

- **Strong capabilities in AR-related diseases.** Kintor Phamarceutical Limited (Kintor) is a clinical-stage novel drug developer in China focused on the proprietary R&D of potential first-in-class and best-in-class drugs for cancers and other androgen receptor-related (AR-related) diseases. Its leading drug candidate, Proxalutamide, is a potential best-in-class drug undergoing phase III clinical trials in China and phase II clinical trials in the US for metastatic castration-resistant prostate cancer (mCRPC). Kintor has four clinical-stage drug candidates, including Proxalutamide (GT0918, 普克鲁胺) in phase III trials, Pyrilutamide (KX-826, 福瑞他恩) and ALK-1 (GT90001) in phase II trials, and Detorsertib (GT0486, 迪拓賽替) in phase I trials. Kintor also has one IND-stage drug candidate, GT1708F, as well as several pre-clinical drug candidates.
- **Kintor's portfolio of drug candidates addresses major cancer types and other AR-related diseases with large market potential.** According to the Frost & Sullivan (F&S) Report, prostate cancer was the second fastest growing cancer among major cancer types in China in terms of the growth rate of new cases from 2014 to 2018, and breast cancer was the most common type of cancer in women globally in 2018. Meanwhile, the population of male patients aged 30 to 70 with androgenetic alopecia, an AR-related disease, reached over 92.8mn in China and 31.1mn in the US in 2018, respectively, according to F&S.
- **Drug sales to start from 2021E.** The most advanced drug is Proxalutamide which we believe will be approved by NMPA in 2021E. We also forecast Pyrilutamide and ALK-1 to receive NMPA's approvals in 2022E and 2024E, respectively. To factor in the risks in drug development, we apply different probability of success (PoS) to our sales forecasts and expect risk-adjusted revenue of RMB104mn/ RMB382mn/ RMB1,006mn in FY2021E/22E/23E. We forecast net losses of RMB405mn / RMB312mn / RMB91mn in FY20E/21E/22E and expect RMB213mn net profit in 2023E.
- **Initiate at BUY.** We expect Kintor to commercialize the first product, Proxalutamide in 2021E and its future cash flows will rely on the successful commercialization of pipeline drugs. Therefore, we use DCF method to value the Company and we derive TP of HK$27.6 based on 10-year risk-adjusted DCF model (WACC: 11.8%, terminal growth rate: 2.0%).
- **Risks:** Delay in pipeline progress; Competition from peers.

Earnings Summary

(YE 31 Dec)	FY18A	FY19A	FY20E	FY21E	FY22E
Revenue (RMB mn)	1	0	0	104	382
Attributable net profit (loss) (RMB mn)	(108)	(233)	(405)	(312)	(91)
R&D expenses	N/A	N/A	N/A	N/A	N/A
EPS (RMB)	N/A	N/A	(1.10)	(0.85)	(0.25)
ROE (%)	(43)	(63)	(26)	(25)	(8)
ROA (%)	(26)	(42)	(24)	(23)	(7)
Net gearing (%)	Net cash	Net cash	Net cash	Net cash	Net cash
Current ratio (x)	2.0	1.5	14.4	10.4	7.3

Source: Company data, CMBIS estimates

BUY (Initiation)

Target Price	**HK$27.6**
Up/Downside	**+74.8%**
Current Price	**HK$15.8**

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Mkt. Cap. (HK$ mn)	5,836
Avg. 3mths t/o (HK$ mn)	N/A
52W High/Low (HK$)	22.95/14.20
Total Issued Shares (mn)	1,289

Source: Bloomberg

Shareholding Structure

Management	34.03%
Pre-IPO & corner stone investors	34.07%
Free float	31.90%

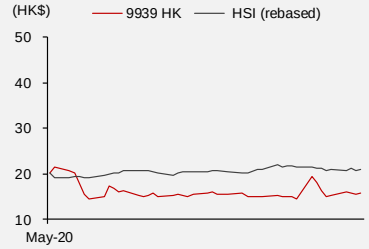
Source: HKEx, Bloomberg

Share performance

	Absolute	Relative
1-mth	-1.9%	-4.0%
3-mth	N/A	N/A
6-mth	N/A	N/A

Source: Bloomberg

12-mth price performance



Source: Bloomberg

Auditor: Ernst & Young
Web-site: www.kintor.com.cn

Please cast your valuable vote for CMBIS research team in the 2020 Asiamoney Brokers Poll:

https://euromoney.com/brokers

Contents

Investment Thesis

Founded in 2009, Kintor Pharmaceutical Limited (Kintor) is a clinical-stage novel drug developer in China focused on the proprietary R&D of potential first-in-class and best-in-class drugs for cancers and other AR-related diseases.

Strong capabilities in AR-related diseases

Kintor has a risk-balanced and diversified pipeline of drug candidates. Its leading drug candidate, Proxalutamide, is a potential best-in-class drug undergoing phase III clinical trials in China and phase II clinical trials in the US for metastatic castration-resistant prostate cancer (mCRPC). Kintor has four clinical-stage drug candidates, including Proxalutamide (GT0918, 普克鲁胺) in phase III trials, Pyrilutamide (KX-826, 福瑞他恩) and ALK-1 (GT90001) in phase II trials, and Detorsertib (GT0486, 迪拓賽替) in phase I trials. Kintor also has one IND-stage drug candidate, GT1708F, as well as a number of pre-clinical drug candidates.

Kintor has strategically focused on applying its AR-related expertise in developing drugs for indications with both large market sizes and strong growth potential. According to Frost & Sullivan (F&S), prostate cancer was the second fastest growing cancer among major cancer types in China in terms of the growth rate of new cases from 2014 to 2018, and breast cancer was the most common type of cancer in women globally in 2018. Meanwhile, the population of male patients aged 30 to 70 with androgenetic alopecia, an AR-related disease, reached over 92.8mn in China and 31.1mn in the US in 2018, respectively, according to F&S.

Proxalutamide is a potential best-in-class AR antagonist

As one of the Company's core products, Proxalutamide is an innovative second-generation AR antagonist with best-in-class potential. Kintor is currently developing Proxalutamide for the treatment of mCRPC and AR+ metastatic breast cancer both in China and the US.

Phase III clinical trials of Proxalutamide for mCRPC in China was started in May 2018. Kinor expects to obtain the interim analysis result of phase III clinical trials by 2H20E and apply for an accelerated NDA for Proxalutamide for treatment of mCRPC to the NMPA by end-2020E. Kintor also received approval from the NMPA in 2018 for initiating a Phase III clinical trial for Proxalutamide in combination with abiraterone for mCRPC as a first-line therapy. Kintor aims to complete the trial by 2021E.

Meanwhile, Kintor is exploring Proxalutamide's potential for treatment of breast cancer. The Company completed phase I/Ib clinical trials for Proxalutamide as a monotherapy for metastatic breast cancer in China in 2019, and targets to complete phase Ic clinical trials for Proxalutamide in combination therapy with Exemestane, Letrozole and Fulvestrant in 2020E. The Company expects to focus on AR+ TNBC within metastatic breast cancer for its phase III clinical trials for Proxalutamide as a monotherapy. The Company also plans to select a drug for its phase III clinical trials on HR+ metastatic breast cancer for Proxalutamide in combination therapy.

We believe Proxalutamide has the potential to become the best-in-class second generation AR antagonist for mCRPC with advantages such as 1) A unique dual-acting mechanism. It not only effectively inhibits ARs, but also exhibits the biological effect of down regulating AR expression; 2) Higher AR antagonist binding affinity than Enzalutamide without AR agonist activity; 3) Not triggering seizure. There has been no incidence of triggering seizure among over 600 Proxalutamide users that received clinical trials; 4) Suitable for combination therapy. In vitro hepatocytes metabolise enzymes tests demonstrated that Proxalutamide had no induction effect on enzyme CYP1A2, CYP2B6 and CYP3A4 while Apalutamide is a strong inducer for CYP3A4 and CYP2B6.

We expect Proxalutamide to receive approval from the NMPA for treatment of 2L+ mCRPC in 2021E and to obtain approval from the NMPA for treatment of 1L mCRPC in 2022E. In addition, we forecast Proxalumatide to receive approval from the NMPA for treatment of AR+ mBC in 2023E. We estimate Proxalutamide to reach RMB2.9bn risk-adjusted peak sales in China by 2028E. Meanwhile, we expect Proxalutamide to receive approval from the US FDA for the treatment of mCRPC in 2023E and to receive US FDA's approval for the treatment of AR+ TNBC in 2025E. We forecast Proxalutamide's risk-adjusted royalty income from the US to peak at RMB156mn in 2025E.

Pyrilutamide is a potential first-in-class AR antagonist for topical dermatological use

Pyrilutamide is currently being developed as a potential first-in-class topical drug for the treatment of androgenic alopecia and acne vulgaris. Kintor had completed phase I/Ib clinical trials for Pyrilutamide in China and was conducting phase II clinical trials in China and phase I clinical trials in the US which may be completed in 2020E. Kintor plans to conduct MRCT phase III clinical trials in China, the US and other countries in 2021E.

We believe Pyrilutamide holds the possibility of redefining the market potential for androgenetic alopecia drugs. Currently, the primary treatments for androgenetic alopecia in US and China are Minoxidil (米诺地尔) and Finasteride (非那雄胺), each of which has limitations that we believe have led to significant unmet medical needs for treatments targeting androgenetic alopecia.

In the Phase I trial completed in China, Pyrilutamide showed satisfying safety profile with no severe adverse event observed, no subjects withdrew from the clinical trial due to AE, and no subjects suspended or down-regulated due to AE.

We expect Pyrilutamide to receive approval from the NMPA for treatment of Androgenetic Alopecia in 2022E and to obtain approval from the NMPA for treatment of Acne Vulgaris in 2023E. We estimate Pyrilutamide to reach RMB1.4bn risk-adjusted peak sales in China by 2030E. Meanwhile, we expect Pyrilutamide to receive approval from the US FDA for the treatment of Androgenetic Alopecia in 2023E and to receive US FDA's approval for the treatment of Acne Vulgaris in 2024E. We forecast Pyrilutamide's risk-adjusted royalty income from the US to peak at RMB194mn in 2030E.

ALK-1 is a potential first-in-class anti-angiogenesis antibody

ALK-1 is a new biological target spot globally. The Company obtained an exclusive global licence from Pfizer to develop and commercialize GT90001 (ALK-1) for oncological indications. GT90001 has the potential to become the first fully human monoclonal antibody therapeutic drug for ALK-1 target. Kintor aims to the develop ALK-1 to become a better treatment as compared to the second-line standard therapy for metastatic HCC.

Pfizer has completed two phase I clinical trials, one in the US and Italy and the other in South Korea and Japan, for ALK-1 for advanced solid tumors, including HCC, as a monotherapy. Kintor is undergoing phase II clinical trials for ALK-1 as a combination therapy with Nivolumab for metastatic HCC in Taiwan, which may be completed by 2020E.

The results of phase I trial carried out in US and Italy by Pfizer supported ALK-1 as a novel approach to antiangiogenic therapy, with manageable safety profile and single-agent, anti-tumour activity in patients with advanced solid tumors. There is no approved drug using the same mechanism of action or the same target as ALK-1, though there is one drug candidate (Dalantercept in combination with Sorafenib) undergoing phase I/II clinical trials in the US that had the same mechanism of action as ALK-1.

We expect ALK-1 to receive approval from the NMPA for treatment of HCC in 2024E and to reach RMB484mn risk-adjusted peak sales in China by 2030E.

Adressing the large and fast-growing prostate cancer market

Prostate cancer is one of the 10 most common cancer types by the number of new cases in both the US and globally, while in China, prostate cancer is the 11th most common cancer type in terms of new cases in 2018. The growth rate of prostate cancer from 2014 to 2018 in terms of new cases is the second highest among the 10 most common cancer types in China, and is the highest among the 10 most common cancer types globally. Prostate cancer is one of the most common cancer types in the male population with over 1.2mn new cases globally in 2018, ranking the second in terms of the number of new cases in male cancer patients worldwide. F&S forecasts the global prostate cancer market to grow at a CAGR of 8.7% from US$11.8bn in 2018 to US$17.9bn in 2023E and at a CAGR of 8.1% from 2023E to US$26.4bn in 2028E.

The number of new prostate cancer cases in China reached 102,500 in 2018, ranking the sixth in terms of the number of new cases in male cancer patients in China. Driven by the increasing number of new prostate cancer cases and increased survival rates of prostate cancer patients, F&S forecasts the total number of prostate cancer patients in China is expected to grow at a CAGR of 21.8% from 289,100 in 2018 to 774,200 in 2023E and at a CAGR of 17.3% from 2023E to 1,716,300 in 2028E.

According to F&S, China's prostate cancer drug market grew at a CAGR of 21.6% from RMB1.8bn in 2014 to RMB4.0bn in 2018. The growth of China's prostate cancer drug market during this period was higher than China's oncology drug market, which grew at a CAGR of 14.9% during the same period. This trend is expected to continue with the prostate cancer drug market in China expected to grow at a CAGR of 25.2% from 2018 to RMB12.3bn in 2023E and at a CAGR of 21.5% from 2023E to RMB32.6bn in 2028E, based on F&S estimates.

According to F&S, the growth in the prostate cancer drug market in China will be mainly driven by 1) a growing number of newly diagnosed prostate cancer patients in the next 10 years resulting from the increased use of PSA screening technology; 2) the inclusion of prostate cancer drug such as abiraterone in NRDL which is expected to boost drug sales; and 3) the continuous launch of new drugs such as Enzalutamide and Proxalutamide which will promote market growth.

Meeting the large unmet need in androgenetic alopecia

The total number of males aged from 30 to 70 in the US with androgenetic alopecia was 31.1mn in 2018. This is expected to increase at a CAGR of 1.0% from 2018 to 32.6mn in 2023E and then at a CAGR of 0.7% from 2023E to 33.9mn in 2028E.

In 2018, the market size of drugs for androgenetic alopecia in the US was US$407.9mn. The market size of drugs for androgenetic alopecia in the US is expected to increase at a CAGR of 9.9% from 2018 to US$655.3mn in 2023E and then at a CAGR of 16.7% from 2023E to US$1,417.8mn in 2028E.

According to F&S, the growth of the androgenetic alopecia drug market globally is driven by the following factors: 1) with the change of lifestyle, the issue of hair loss, especially for male population, is becoming drastically severer than before and the population of androgenetic alopecia patients is expanding; and 2) inclining trend of awareness of individual appearance. The number of pipeline drugs for androgenetic alopecia is also limited, while the demand for effective treatment is increasing with the expansion of the patient pool.

According to the Guideline of Chinese androgenetic alopecia, around 21.3% of Chinese male and 6.0% of Chinese female suffers androgenetic alopecia. According to F&S, in 2018, over 92.8mn males had androgenetic alopecia to different degrees in China. The total number of androgenetic alopecia

patients is expected to increase at a CAGR of 0.8% from 2018 to 96.3mn in 2023E and then at a CAGR of 0.3% from 2023E to 97.8mn in 2028E.

In 2018, the market size of drugs for androgenetic alopecia in China was RMB1,470.0mn. The market size of drugs for androgenetic alopecia in China is expected to increase at a CAGR of 9.6% from 2018 to RMB2,320.3mn in 2023E and then at a CAGR of 15.3% from 2023E to RMB4,732.5mn in 2028E.

Drug sales to start from 2021E

The most advanced drug is Proxalutamide which we believe will be approved by NMPA in 2021E. We also forecast Pyrilutamide and ALK-1 to receive NMPA's approval in 2022E and 2024E, respectively.

We forecast drug sales to start from 2021E. To factor in the risks in drug development, we apply different probability of success (PoS) to our sales forecasts and expect risk-adjusted revenue of RMB104mn/ RMB382mn/ RMB1,006mn in FY2021E/22E/23E. We forecast net losses of RMB405mn / RMB312mn / RMB91mn in FY20E/21E/22E and expect RMB213mn net profit in 2023E.

Initiate at BUY

We expect Kintor to commercialize the first product, Proxalutamide in 2021E and its future cash flows will rely on the successful commercialization of pipeline drugs. Therefore, we use DCF method to value the Company and we derive TP of HK$27.6 based on 10-year risk-adjusted DCF model (WACC: 11.8%, terminal growth rate: 2.0%).

Investment risks

1) Having incurred net losses in the past and will continue to incur losses for the foreseeable future;

2) Failure in obtaining regulatory approval for drug candidates;

3) Competition from peers with more competing and successful drugs;

4) Failure in protecting intellectual property rights throughout the world.

Company Overview

Strong expertise in innovative therapies for AR-related diseases

Kintor Phamarceutical Limited (Kintor) is a clinical-stage novel drug developer in China focused on the proprietary R&D of potential first-in-class and best-in-class drugs for cancers and other AR-related diseases. Its leading drug candidate, Proxalutamide, is a potential best-in-class drug undergoing phase III clinical trials in China and phase II clinical trials in the US for metastatic castration-resistant prostate cancer (mCRPC) as well as clinical trials for breast cancer.

Kintor's portfolio of drug candidates addresses major cancer types and other AR-related diseases with large market potential. According to the Frost & Sullivan (F&S) Report, prostate cancer was the second fastest growing cancer among major cancer types in China in terms of the growth rate of new cases from 2014 to 2018, and breast cancer was the most common type of cancer in women globally in 2018. Meanwhile, the population of male patients aged 30 to 70 with androgenetic alopecia, an AR-related disease, reached over 92.8mn in China and 31.1mn in the US in 2018, respectively, according to F&S.

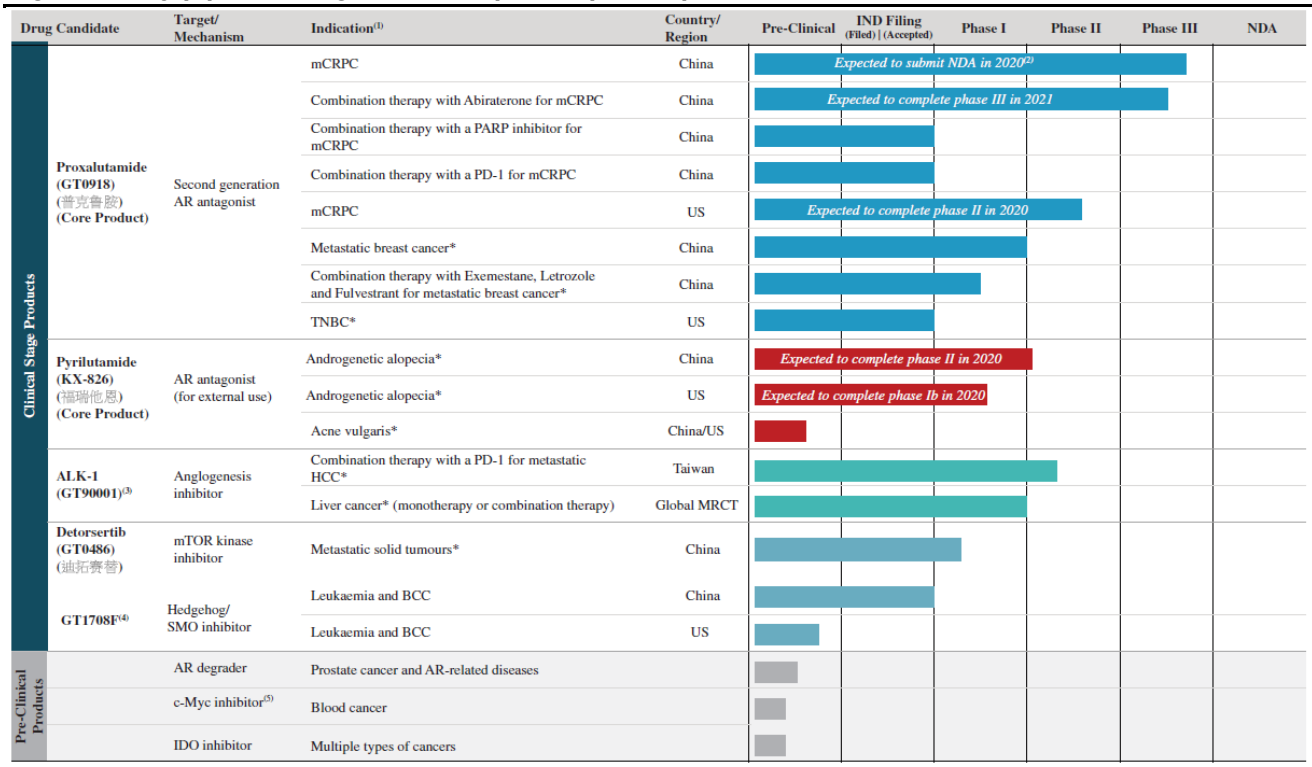
Figure 1: Major milestones of Kintor

Year	Major milestones
2009	Suzhou Kintor was established.
2011-2012	Kintor received funding from the Angel Investors at an aggregate amount of RMB12mn.
2013	Kintor submitted the clinical trial application of Proxalutamide to the NMPA.
2014	Kintor received funding from the Series A Investor at the amount of RMB20mn.
2015	Kintor received approval from the NMPA to conduct phase I to phase III clinical trials for Proxalutamide for mCRPC in China. Kintor received approval from the US FDA to commence phase I and phase II clinical trials for Proxalutamide for mCRPC in the US. Kintor received the first investment from the Series B Investors at an aggregate amount of approximately US$6mn (equivalent to approximately RMB42mn).
2016	Kintor commenced phase I and phase II clinical trials for Proxalutamide for mCRPC in the US. Kintor completed phase I clinical trials for Proxalutamide for mCRPC in China.
2017	Kintor received approval from the NMPA to commence phase I to phase III clinical trials for Proxalutamide for breast cancer in China. Kintor received the second investment from Series B Investors at an aggregate amount of approximately RMB33mn.
2018	Kintor commenced phase III clinical trials for Proxalutamide for mCRPC in China. Kintor received IND approval for KX-826 for androgenetic alopecia in China and the US. Kintor received funding from the Series C Investors at an aggregate amount of approximately RMB288.47mn.
2019	Kintor commenced phase I clinical trials for KX-826 for androgenetic alopecia in the US. Kintor received funding from the Series D Investors at an aggregate amount of approximately US$44 mn (equivalent to approximately RMB308mn).
2020	Kintor completed Hong Kong IPO in May 2020.

Source: Company data, CMBIS

Kintor has built a risk-balanced and diversified pipeline that contemplates sequenced product launches commencing in 2021E. Kintor had developed a pipeline of five drug candidates, including four clinical-stage drug candidates for which Kintor had obtained approvals to commence clinical trials in China, the US and/or Taiwan (China). These clinical-stage drug candidates are composed of a phase III small molecule drug candidate, Proxalutamide (GT0918, 普克鲁胺), a phase II small molecule drug candidate, Pyrilutamide (KX-826, 福瑞他恩), a phase II monoclonal antibody drug candidate, ALK-1 (GT90001), and a phase I mTOR inhibitor drug candidate, Detorsertib (GT0486, 迪拓赛替). In addition to the four clinical-stage drug candidates, Kintor also has one IND-stage drug candidate, GT1708F, as well as a number of pre-clinical drug candidates.

Figure 2: Key pipeline drugs of Kintor (as of Apr 2020)



Source: Company data, CMBIS

Notes:

1) Unless specifically referred to as combination therapies, the applicable therapy for an indication refers to monotherapy. Other than Proxalutamide's combination therapy with Abiraterone for mCRPC in China, which Kintor is developing as a first-line therapy, all of the Company's other drug candidates are currently being developed as a later stage therapy in the case of cancer indications.

2) Kintor intend to apply for accelerated NDA based on the interim analysis result while the phase III clinical trials are ongoing.

3) Kintor obtained an exclusive global licence from Pfizer to develop and commercialise ALK-1 in Feb 2018, after Pfizer had completed two phase I clinical trials for ALK-1 for advanced solid tumours, including HCC, as a monotherapy in the US and Italy, as well as in South Korea and Japan.

4) Kintor entered into a technology transfer agreement with Suzhou Yunxuan Pharmaceutical Co., Ltd. in Dec 2016 for the development and commercialisation of GT1708F.

5) Kintor obtained all information, data and technological know-how from Peking University pursuant to a technology transfer agreement in connection with the development and commercialisation of c-Myc inhibitor in Jan 2019.

* Represents a potential first-in-class drug candidate for the relevant indication.

Kintor has established an integrated R&D platform to support its drug development programmes from drug discovery to clinical trials. The Company conducts proprietary laboratory research to identify and select new compounds as its potential drug candidates, and it manages the drug development process primarily using its internal R&D resources to ensure that the process meets the quality standards it has set internally.

Through the development of Proxalutamide and Pyrilutamide, Kintor has accumulated significant expertise in AR-related knowhow and has developed a leading AR technology platform. Kintor has accumulated industry-leading expertise in the field of AR signalling pathway, molecule design and PK/PD modelling. Leveraging its AR technology platform, Kintor has successfully progressed Proxalutamide to phase III clinical trials in China, expanded the indication of Proxalutamide to metastatic breast cancer, and has also developed Pyrilutamide for androgenetic alopecia and acne vulgaris.

Kintor's R&D work is led by senior scientists, including Dr. Tong, supported by nine other returnee scientists who have accumulated decades of pharmaceutical R&D and entrepreneurship experience

in the US and who together provide the Company with combined expertise covering small molecule, biologics, compound design and commercialisation.

Kintor's R&D capabilities and drug development efforts are also supported by a number of renowned experts who serve as the Company's senior advisors. These experts include Dr. Liang Tong, a tenured professor and the chair of the Department of Biological Science at Columbia University specialising in the research of protein structure and functions. Dr. Liang Tong has been deeply involved in the key steps of Kintor's drug development programmes to provide valuable guidance and professional advice throughout the drug development process.

Figure 3: Experienced world-class scientists of Kintor

Key scientists	Position	Experiences
Dr. Youzhi Tong	Chairman & CEO	17+ years of experience in biopharm R&D and management; former vice-president of Angion in US
Dr. Xunwei Dong	Chief Medical Officer	18+ years medical related experience in Novartis, Pfizer and GSK; Previous Clinical Development Medical Director at Novartis; 10 years of experience as an attending surgeon
Dr. Guohao Zhou	US Chief Medical Officer	20+ years of experience in oncology R&D and clinical trials; 20+ years of experience in global pharma and CRO companies
Dr. Liandong Ma	Vice President, Head of R&D	Previous experiences in Eli Lily
Dr. Ruo Xu	Vice President, R&D (Chemistry)	Previous experiences in Merck, Schering-Plough, CHEMSPEC-API
Dr. Weijiang Xia	Vice President, R&D (Formulation)	Previous experiences in SALUBRIS
Dr. Jianfei Yang	Vice President, R&D (Biologists)	Previous experiences in GSK, Boehringer Ingelheim

Source: Company data

On top of strong inhouse R&D capability, Kintor also actively expands its pipeline portfolio via licensing in drug candidates with large market potential.

In Feb 2018, Kintor entered into a licence agreement with Pfizer Inc. (Pfizer), pursuant to which Kintor obtained an exclusive global license under certain patents and know-how to use, develop, manufacture and commercialise the monoclonal ALK-1 antibody designated by Pfizer as PF-03446962 and any pharmaceutical product in all dosage forms and formulations that includes or incorporates PF-03446962 for the treatment of cancer.

Kintor entered into a technology transfer agreement with Suzhou Yunxuan Pharmaceutical Co. Ltd. (Suzhou Yunxuan) in Dec 2016 and a supplemental agreement in Jun 2019, pursuant to which Kintor acquired from Suzhou Yunxuan all patents, information, data and technological know-how relating to Hedgehog/SMO inhibitor (GT1708F) to develop and commercialise the corresponding drug candidate.

In Jan 2019, Kintor entered into a technology transfer agreement with Peking University, pursuant to which Kintor acquired from Peking University all information, data and technological know-how relating to c-Myc/Max compound to develop and commercialise the corresponding drug candidate.

Well prepared for commercialization

Kintor has recruited Mr. Mingming Yan, who has significant experience in marketing prostate cancer drugs in China, to lead its sales and marketing team. Kintor aims to conduct the sales and marketing

of Proxalutamide through its inhouse team, and plans to recruit a sales and marketing team of over 100 personnel.

Clinical trials for Proxalutamide in China have covered patients in 48 hospitals with prostate cancer specialists, which has built a strong foundation for the pre-launch market education. The lead PIs for clinical trials for Proxalutamide are also influential KOLs who regularly share their views or the outcomes from the clinical trials with other physicians and participants at various academic conferences, seminars and symposiums. We believe that these KOLs' views on Proxalutamide will help drive the clinical acceptance of Proxalutamide amongst China's leading oncologists and accelerate its market penetration.

For Pyrilutamide, Kintor plans to conduct the sales and marketing of Pyrilutamide primarily using its internal sales and marketing team, and Kintor expects to commence recruiting sales and marketing personnel when it approaches receiving NDA approval. Kintor also expects to collaborate with major distributors in China as well as online pharmacies for the distribution of Pyrilutamide, which will enable the Company to tap into the large population with androgenetic alopecia through a combination of online and offline distribution channels.

The Company aims to have its own manufacturing facilities with a site area of 19,998 sq m in Suzhou to be ready for GMP manufacturing in 2H20E, following which Kintor will gradually shift the production of Proxalutamide from a CMO to its own manufacturing facilities. Kintor expects its facility in Suzhou to initially consist of a tablet production line for Proxalutamide with an expected production capacity of approximately 4.0mn tablets per annum. The Company also expects to expand its product lines to tincture (酊剂).

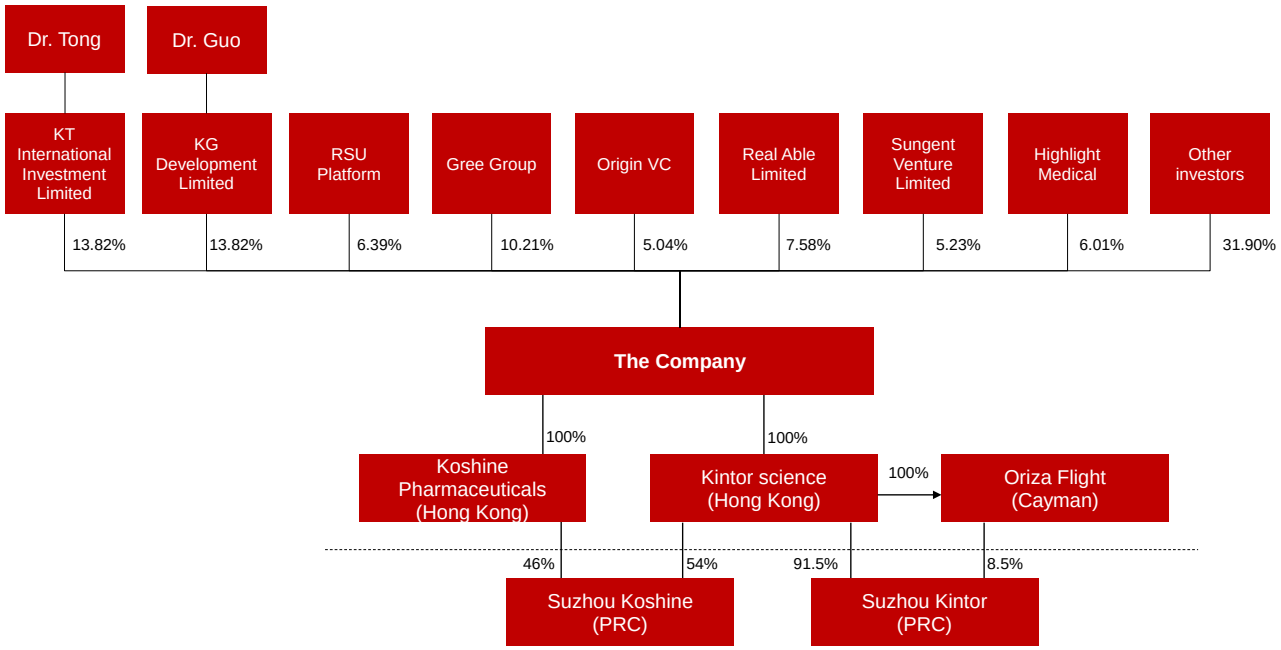
Kintor has also signed an agreement with the government of Pinghu, Zhejiang in May 2019 and expects to purchase a parcel of land with an area of 60 mu (亩) in Pinghu, Zhejiang for the establishment of manufacturing facilities for APIs in connection with manufacture of Proxalutamide and Pyrilutamide. Under the Pinghu Investment Agreement, the designed annual production capacity for the production facilities in Pinghu is 6.0mn bottles of Pyrilutamide preparations and its APIs and 2.5 million tablets of Proxalutamide and its APIs. Kintor expects the manufacturing facilities in Pinghu will be ready for GMP manufacturing by 2023E and will be primarily used for the manufacturing of Proxalutamide and Pyrilutamide.

Supported by top-tier investors

As of Jul 2020, Dr. Tong and Dr. Guo, co-founders of Kintor, each held 13.82% stake in the Company. RSU (restricted share unit) platform held 6.39% stake, indicating large flexibility in employee share incentives in the future.

Key financial investors include Gree Group (格力集团) holding 10.21% stake, Real Able (联想之星) with 7.58% stake, Origin VC (原点创业投资) holding 5.04% stake, Sungent Venture (新建元生物创业投资) holding 5.23% stake and Highlight Medical holding 6.01% stake.

Figure 4: Shareholding structure of Kintor (as of Jul 2020)



Source: Company data, CMBIS

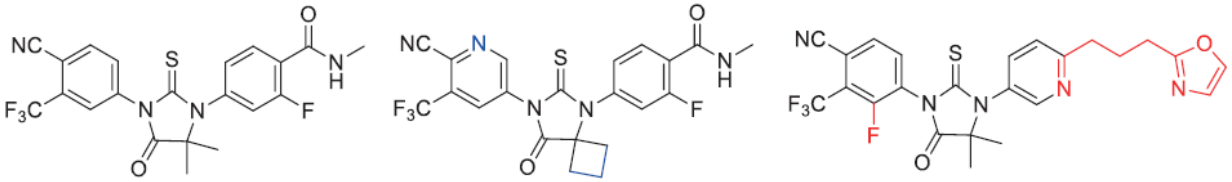
Proxalutamide (GT0918), a potential best-in-class AR antagonist

Proxalutamide is a 2nd generation AR antagonist with innovative chemical structure

Nilutamide, Flutamide and Bicalutamide are first generation AR antagonists, among which Bicalutamide is the best-in-class first-generation AR antagonist as it has lower toxicity. Bicalutamide can effectively treat prostate cancer patients in the initial stage but loses its efficacy within one or two years. Drug resistance to Bicalutamide in CRPC patients is due to the increased expression of AR or receptor gene mutations in cancer cells, resulting in a repressive effect on AR antagonists. Moreover, Bicalutamide has lower specificity compared with second generation AR antagonists such as Enzalutamide as an AR antagonist and it has certain activation effects for ARs in CRPC cells, and it is therefore no longer a full antagonist to ARs. Consequently, Bicalutamide plays an important role in the treatment of early stage prostate cancer, but its efficacy in the treatment of advanced CRPC is limited. The main difference between the first generation and the second generation AR antagonists is that the second generation AR antagonists do not have agonism effect on ARs in tumor cells and thus maintain full antagonist activity.

Compared with other second-generation AR antagonists represented by Enzalutamide, the chemical structure of Proxalutamide (GT0918) has changed significantly. Proxalutamide's chemical structure has several changes that improve the solubility and pharmacokinetics of the molecules and avoid excessive drug accumulation, which may eliminate seizure, the clinically revealed central nervous system side effects of Enzalutamide. While such changes are consistent with the development efforts of the AR antagonist Apalutamide, Proxalutamide's chemical structure differs more significantly from Enzalutamide compared with Apalutamide. Proxalutamide also has a mechanism to induce the down-regulation of AR expression.

Figure 5: The differences in chemical structures of Enzalutamide, Apalutamide and Proxalutamide



Enzalutamide (MDV3100) | **Apalutamide (ARN-509)** | **Proxalutamide (GT0918)**

Source: Company data, Drug manuals of Enzalutamide and Apalutamide, CMBIS

We believe Proxalutamide has the potential to become the best-in-class second generation AR antagonist for mCRPC with advantages such as 1) A unique dual-acting mechanism. It not only effectively inhibits ARs, but also exhibits the biological effect of down regulating AR expression; 2) Higher AR antagonist binding affinity than Enzalutamide without AR agonist activity; 3) Not triggering seizure. There has been no incidence of triggering seizure among over 600 Proxalutamide users that received clinical trials; 4) Suitable for combination therapy. In vitro hepatocytes metabolise enzymes tests demonstrated that Proxalutamide had no induction effect on enzyme CYP1A2, CYP2B6 and CYP3A4 while Apalutamide is a strong inducer for CYP3A4 and CYP2B6. Clinical trials have also proven that Apalutamide could significantly improve the activity of CYP3A4 and CYP2B6 and reduce the drug exposure in vivo. Abiraterone is metabolised mainly through CYP3A4, and as a result, the combination of Proxalutamide and Abiraterone has advantages in safety and efficacy.

Proxalutamide has multiple trials on going in China and US

As one of the Company's core products, Proxalutamide is an innovative second-generation AR antagonist with best-in-class potential. Kintor is currently developing Proxalutamide for the treatment of mCRPC and AR+ metastatic breast cancer both in China and the US.

Kintor received approval from the NMPA in 2015 for conducting phase I to phase III clinical trials for Proxalutamide for mCRPC in China. Phase III clinical trials of Proxalutamide for mCRPC in China was started in May 2018. Kinor expects to obtain the interim analysis result of phase III clinical trials by 2H20E and apply for an accelerated NDA for Proxalutamide for treatment of mCRPC to the NMPA by end-2020E.

In addition, Kintor received approval from the NMPA in 2018 for initiating a Phase III clinical trial for Proxalutamide in combination with abiraterone for mCRPC as a first-line therapy. Kintor aims to complete the trial by 2021E.

Kintor also intends to pursue Proxalutamide's combination therapies with a PARP inhibitor by 2020E, and is evaluating different options for the PD-1 drug to be used for Proxalutamide's combination therapy with a PD-1.

Separately, Kintor is currently undergoing a phase II clinical trial for Proxalutamide for mCRPC in the US and targets to complete the trial by end-2020E. The Company plans to progress its clinical development of Proxalutamide in the US as a second-line monotherapy for mCRPC patients who have failed either Abitraterone or Enzalutamide.

Meanwhile, Kintor is exploring Proxalutamide's potential for treatment of breast cancer. The Company received approval from the NMPA in 2017 for commencing phase I to phase III clinical trials for Proxalutamide for breast cancer in China. The Company completed phase I/Ib clinical trials for Proxalutamide as a monotherapy for metastatic breast cancer in China in 2019, and targets to complete phase Ic clinical trials for Proxalutamide in combination therapy with Exemestane, Letrozole and Fulvestrant in 2020E. Following the completion of phase I/Ib and phase Ic clinical trials, Kintor expects to commence phase III clinical trials for Proxalutamide as a monotherapy and in combination therapy for breast cancer, respectively.

Separately, Kintor plans to start clinical trials for Proxalutamide for TNBC in the US in 2020E, following the completion of relevant phase I/Ib and phase Ic clinical trials in China.

Figure 6: Clinical trials of Proxalutamide (as of Apr 2020)

Indication	Phase	Dose	Mono-/Combo-Therapy	Location	Patient No.	Progress
mCRPC	Phase III	200mg QD (after meals)	Mono	China	294	Expected to submit NDA in 2020E
mCRPC	Phase III	400mg QD (pre-meal)	Combo with Abiraterone	China	6+588	Expected to complete in 2021E
mCRPC	IND	-	Combo with PARP inhibitor	China	-	-
mCRPC	IND	-	Combo with PD-1	China	-	-
mCRPC	Phase II	400mg or 500mg QD (pre-meal)	Mono	US	60	Expected to complete in 2020E
AR+mBC	Phase Ib	200mg or 300mg QD	Mono	China	45	Competed
HR+, AR+ mBC	Phase Ic	200mg QD	Combo with Exemestane, Letrozole and Fulvestrant	China	18	-
TNBC	IND	-	Mono	US	-	-

Source: Company data, CMBIS

Proxalutamide is a potential 2nd to market new-generation AR anagonist for mCRPC in China

AR antagonists for prostate cancer in the US

Enzalutamide (brand name XTANDI) was co-developed by Astellas Pharma and Medivation (which was acquired by Pfizer in 2016). Enzalutamide first received US FDA's approval for the treatment of metastatic castration-resistant prostate cancer (mCRPC) in 2012 and has been approved for the treatment of non-metastatic castration-resistant prostate cancer (nmCRPC) in 2018, metastatic castration-sensitive prostate cancer (mCSPC) in 2019. Enzalutamide is further expanding its indication to non-metastatic castration-sensitive prostate cancer (nmCSPC) with related Phase III trials ongoing.

Apalutamide (brand name ERLEADA) was developed by Aragon which was acquired by Johnson & Johnson in 2013. Apalutamide received approval from the US FDA in Feb 2018 for treatment of nmCRPC and further obtained approval for treatment of metastatic castration-sensitive prostate cancer (mCSPC) in Sep 2019.

Darolutamide (brand name Nubeqa) was developed by Bayer and received approval from the US FDA in Jul 2019 for treatment of nmCRPC.

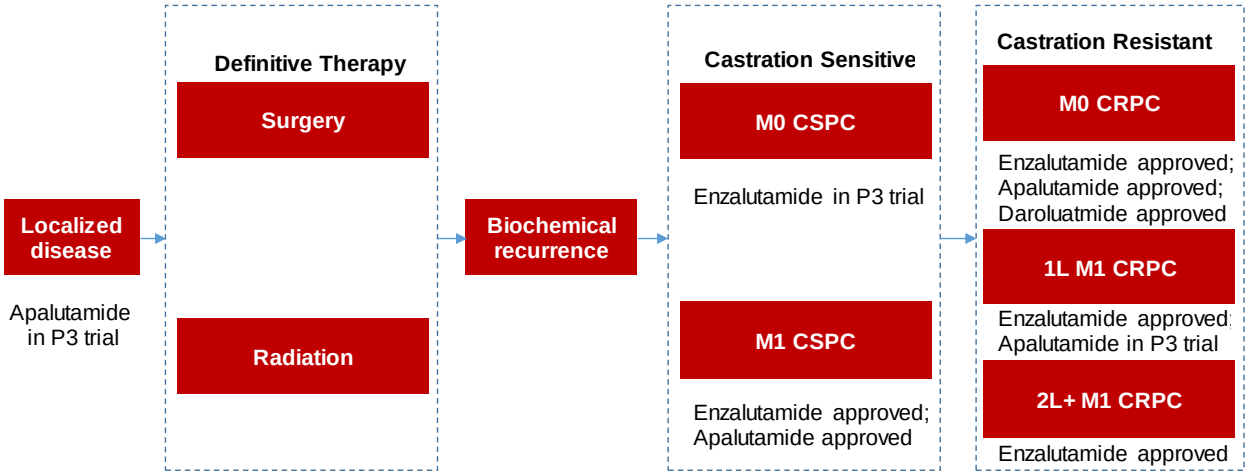
Figure 7: 2nd generation AR antagonists approved for prostate cancer in US

Drug name	Enzalutamide	Apalutamide	Darolutamide
Brand name	Xtandi	Erleada	Nubeqa
Company	Astellas/Pfizer	Aragon/JNJ	Bayer
US FDA approval time	Aug 2012; Jul 2018; Dec 2019	Feb 2018; Sep 2019	Jul 2019
US FDA approved indications	mCRPC; nmCRPC; mCSPC	mCSPC; nmCRPC	nmCRPC
Dose	160mg QD	240mg QD	600mg BID
Retail price in US	$12,450 per month	$12,790 per month	$12,070 per month
US patent expiry	2027	2027	2030

Source: Company data, US FDA, Drugs.com, CMBIS

Major 2nd generation AR antagonists have received approvals from US FDA for treatment of mCRPC (M1 CRPC), nmCRPC (M0 CRPC), and mCSPC (M1 CSPC). Enzalutamide and Apalutamide are conducting phase III trials to further expand indications to nmCSPC (M0 CSPC) and high-risk localized prostate cancer.

Figure 8: Illustration of target indications of 2nd generation AR antagonists in US



Source: Company data, Clinicaltrials.gov, CMBIS

Proxalutamide is under a Phase II trial for mCRPC (after Abiraterone or Enzalutamide) in the US. Apalutamide is conducting a Phase III trial for chemo-naïve mCRPC in the US while Darolutamide, TRC253, TAS3681, and ONC1-0013B are in Phase I/II or Phase I trials for mCRPC in the US.

Figure 9: AR antagonist candidates for mCRPC in US

Drug name	Company	Status	Indication	Milestone (date first posted)	Patient erollment No.	Progress	Mechanism of Action
Proxalutamide	Kintor	Phase II	2L mCRPC (after Abiraterone or Enzalutamide)	2-Apr-19	60	Ongoing	A unique dual-acting mechanism that not only inhibits ARs, but also exhibits the biological effect of down-regulating AR expression.
Apalutamide + Abiraterone + Prednisone	Aragon/ JNJ	Phase III	Chemo-naive mCRPC	6-Oct-14	983	Ongoing	Directly binds to the ligand-binding domain of AR, inhibits AR nuclear translocation, inhibits DNA binding, and impedes AR-mediated transcription.
Darolutamide	Bayer/Orion	Phase I/II	mCRPC	17-Mar-11	136	Completed	Competitively inhibits androgen binding, AR nuclear translocation, and AR-mediated transcription
TRC253	Tracon/ JNJ	Phase I/IIa	3L mCRPC	9-Dec-16	71	Ongoing	TRC253 is a paninhibitor of multiple AR mutations, including the F876L mutation, which results in an alteration in the ligand binding domain that confers resistance to current AR inhibitors.
TAS3681	Taiho	Phase I	mCRPC	2-Oct-15	200	Ongoing	TAS3681 suppresses ligand independent AR activation, caused by induction of AR splice variants or c-Myc expression, to overcome the drugresistant issue of current AR antagonists.
ONC1-0013B	Avionco	Phase I	3L mCRPC	8-Mar-17	17	Completed	ONC1-0013B inhibits DHT-stimulated PSA expression and proliferation of prostate cancer cells, and prevents binding of androgens to the AR ligand-binding domain, androgenstimulated AR nuclear translocation and coactivator complex formation.

Source: Frost & Sullivan, Clinicaltrials.gov, CMBIS

AR antagonists for prostate cancer in China

As of Jan 2020, two second-generation AR antagonist drugs have been approved by the NMPA in China, including Apalutamide approved in Sep 2019 for treatment of nmCRPC and Enzalutamide approved in Nov 2019 for treatment of chemo-therapy naïve mCRPC.

In Nov 2019, Enzalutamide received approval in China for first line mCRPC treatment. The drug was launched to Chinese market in Mar 2020. Astellas Pharma also filed NDA on Enzalutamide for treatment of nmCRPC to the NMPA in Oct 2019. In addition, a Phase III China-ARHES study on Enzalutamide for treatment of mCSPC enrolled its first patient in Sep 2019.

In addition, Apalutamide has filed the NDA for its second indication, mCSPC, to the NMPA in Dec 2019. Darolutamide has filed NDA for treatment of mCSPC to the NMPA in Feb 2020.

Castration-sensitive prostate cancer (CSPC) is also referred to as hormone-sensitive prostate cancer (HSPC) which refers to prostate cancer that still responds to testosterone suppression therapy.

As of Mar 2020, Apalutamide is priced at RMB39,900 per month while Enzalutamide is sold at RMB36,000 per month with both PAP available for qualified patients. After PAP, Apalutamide is priced at c. RMB19,950 per month while Enzalutamide is priced at c. RMB15,000 per month. Given that both Apalutamide and Enzalutamide were approved by the NMPA in 2019, these two drugs could be included into the National Reimbursement Drug List (NRDL) in 2020E, in our view.

Abiraterone competes with AR antagonists in treating mCRPC. Abiraterone first received US FDA's approval in Apr 2011 and first received NMPA's approval in May 2015. As of Mar 2020, Abiraterone in combination with prednisone has received approvals from the NMPA for treatment of mCRPC and mHSPC. Given that the patent of Abiraterone has expired, a few generic drugs have commercialized in China, including generics manufactured by Sino Biopharm, Jiangsu Hengrui Medicine, Qilu Pharma and Jiangxi Shanxiang Pharma. Generic Abiraterone is priced at c. RMB2,600 per month as of Jul 2020 while Abirateron is already covered by the NRDL.

We think Proxalutamide is a potential second to market AR antagonist for mCRPC indication in China and a potential fourth to market 2nd generation AR antagonist in China.

Figure 10: Abiraterone and 2nd generation AR antagonists for prostate cancer in China

Drug name	Apalutamide	Enzalutamide	Darolutamide	Proxalutamide	Abiraterone
Brand name	Erleada	Xtandi	Nubeqa	N/A	Zytiga (Generics available)
Company	JNJ	Astellas/Pfizer	Bayer	Kintor	JNJ
NMPA approval time	Sep 2019	Nov 2019	NDA filed in Feb 2020	To file NDA in 2020E	May 2015
NMPA approved indications	Approved for nmCRPC; NDA filed for mCSPC	Approved for mCPRC; NDA filed for nmCRPC	NDA filed for mCSPC in Feb 2020	To file NDA for mCRPC	Approved for mCRPC, mHSPC
Dose	240mg QD	160mg QD	600mg BID	200mg QD	Abiraterone 1000mg QD + Prednisolone
Retail price in China	RMB39,900 per month (RMB19,950 per month after PAP)	RMB36,000 per month (RMB15,000 per month after PAP)	N/A	N/A	Generics at RMB2,600 per month; Original drug at RMB13,015 per month
PAP policy in China	Initially buy 3 cycles and get 3 cycles free; then buy 1 cycle and get 1 cycle free	Initially buy 3 cycles and get 4 cycles free; then buy 2 cycle and get 3 cycle free	N/A	N/A	N/A
China patent expiry	2027	2026	2030	2030	Expired

Source: Company data, Insight, CMBIS

In Nov 2019, Enzalutamide received approval in China for first line mCRPC treatment. Besides Enzalutamide, four AR antagonists are under development for treatment of mCRPC in China, including

Proxalutamide in Phase III trials for 2L+ mCRPC and 1L mCRPC, HC-1119 in a Phase III trial for 2L+ mCRPC, SHR-3680 in Phase II trials for 2L+ mCRPC and Apalutamide in a Phase I trial for 1L mCRPC.

Figure 11: AR antagonist candidates for mCRPC in China

Drug name	Company	Indication	Status	Milestone (date first posted)	Intervention	Dose	Patient enrollment No.	Primary endpoint	Progress
Enzalutamide	Pfizer/Astellas	1L mCRPC	Approved	18-Nov-19		160mg QD			
Proxalutamide (mono)	Kintor	2L+ mCRPC	Phase III	2-Jul-18	Proxalutamide vs placebo	200mg QD	294	rPFS, OS	Ongoing
Proxalutamide (combo Abiraterone)	Kintor	1L mCRPC	Phase III	20-Dec-18	Proxalutamide + Abiraterone vs Abiraterone	200mg QD	606	rPFS	Ongoing
HC-1119	Haisco	2L+ mCRPC	Phase III	1-Mar-19	HC-1119 vs placebo	80mg QD	255	OS	Ongoing
SHR-3680 (combo Fluzoparib)	Hengrui	2L+ mCRPC	Phase II	4-Apr-19	SHR-3680 + Fluzoparib, single arm	N/A	108-144	Safety, RP2D	Ongoing
SHR-3680 (mono)	Hengrui	2L mCRPC	Phase I/II	2-Feb-16	SHR-3680, single arm	N/A	120-140	Safety	Ongoing
Apalutamide	J&J	1L mCRPC	Phase I	5-Jun-18	Apalutamide, single arm	240mg QD	17	Safety	Ongoing

Source: Frost & Sullivan, Insight, CMBIS

Besides mCRPC, AR antagonists also have potential to treat other types of prostate cancer. Apalutamide, Enzalutamide, Darolutamide and SHR-3680 are under clinical trials in China for treatment of nmCRPC, nmCSPC, mCSPC, etc.

Figure 12: AR antagonist candidates for other types of prostate cancer in China

Drug name	Company	Indication	Status	Milestone (date first posted)	Intervention	Dose	Patient enrollment No.	Primary endpoint	Progress
Apalutamide	J&J	nmCRPC	Approved	5-Sep-19					
		mHSPC	Phase III (NDA filed in Dec 2019)	12-Jun-16	Apalutamide + ADT vs placebo + ADT	240mg QD	1,000 worldwide incl. 120 in China	rPFS, OS	Ongoing
		High-Risk, Localized or Locally Advanced Prostate Cancer	Phase III	14-Nov-16	Apalutamide + GnRH + RT	240mg QD	1,500 worldwide incl. 120 in China	MFS	Ongoing
		High-Risk, Localized or Locally Advanced Prostate Cancer	Phase III	16-Oct-19	Apalutamide + ADT vs placebo + ADT	240mg QD	1,500 worldwide incl. 120 in China	pCR, MFS	Ongoing
Enzalutamide	Pfizer/ Astellas	nmCRPC	Phase III (NDA filed in Dec 2019)	20-Nov-14	Enzalutamide vs placebo	160mg QD	1,560 worldwide incl. 100 in China	MFS	Ongoing
		mHSPC	Phase III	30-Jul-19	Enzalutamide + ADT vs placebo + ADT	160mg QD	180	TTPP	Ongoing
Darolutamide (ODM-201)	Bayer	1L mCSPC	NDA filed in Feb 2020	20-Mar-17	Darolutamide + ADT + Docetaxel vs placebo + ADT + Docetaxel	600mg BID	1,300 worldwide incl. 200 in China	OS	Ongoing
SHR-3680 (mono)	Hengrui	2L HSPC	Phase III	30-May-18	SHR-3680 vs Bicalutamide	240mg QD	572	rPFS, OS	Ongoing

Source: Frost & Sullivan, Insight, CMBIS

Promising clinical results for Proxalutamide on mCRPC

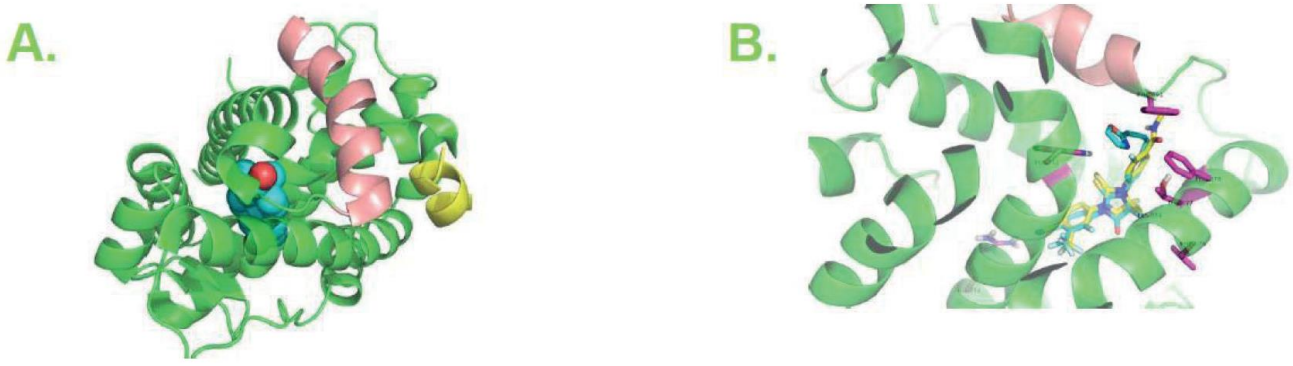
The mechanism of action (MOA) of Proxalutamide for mCRPC

The reactivation of AR plays a key role in prostate cancer growth, especially in CRPC progression. Accumulated data have demonstrated that AR reactivation results from AR amplification, AR over-expression and mutations in the AR ligand binding domain ("LBD"), as well as AR splicing variants. AR reactivation also drives resistance to AR-targeted therapies, including first and second generations of AR antagonists, such as Bicalutamide and Enzalutamide.

A novel AR binding pose through Proxalutamide has been found to inhibit androgen from binding to AR by overcoming AR reactivation and to induce decreased AR expression in patients with mCRPC. Proxalutamide binds to the AR LBD binding pocket and its structure pushes away AR helix 12, resulting in decreased interaction between the AR helix 12 and the AR LBD pocket and increased binding affinity to the AR LBD. This creates a unique and significant difference from other AR blockers such as Enzalutamide.

In addition, Proxalutamide can significantly inhibit the androgen-induced transactivation of wild-type AR, and it also blocks the transcriptional activity of test mutant ARs that arise in targeted AR therapies, including the AR F877L mutation that converts Enzalutamide and Apalutamide from antagonist to agonist activity.

Figure 13: The MOA of Proxalutamide's binding to the AR LBD based on computer modelling



Source: Company data, CMBIS
Notes: In picture A, AR agonistic conformation helix 12 is marked in salmon and the co-regulator peptide is marked in yellow. Picture B shows Proxalutamide's binding to the AR LBD with an additional hydrophobic interaction with the AR helix 12 (via3-(oxazol-2-yl) propylgroup), which enhances the binding affinity and pushes away the AR helix 12 from the AR LBD.

Efficient progress of clinical trials of Proxalutamide for mCRPC

For mCRPC, Proxalutamide has three clinical trials ongoing, including two phase III trials in China and one phase II trial in the US. The Company has completed one phase II trial in China and two phase I trials in China and US, respectively. We summarized details of these trials as below.

Phase I trial using Proxalutamide as mono therapy for mCRPC in China (completed):

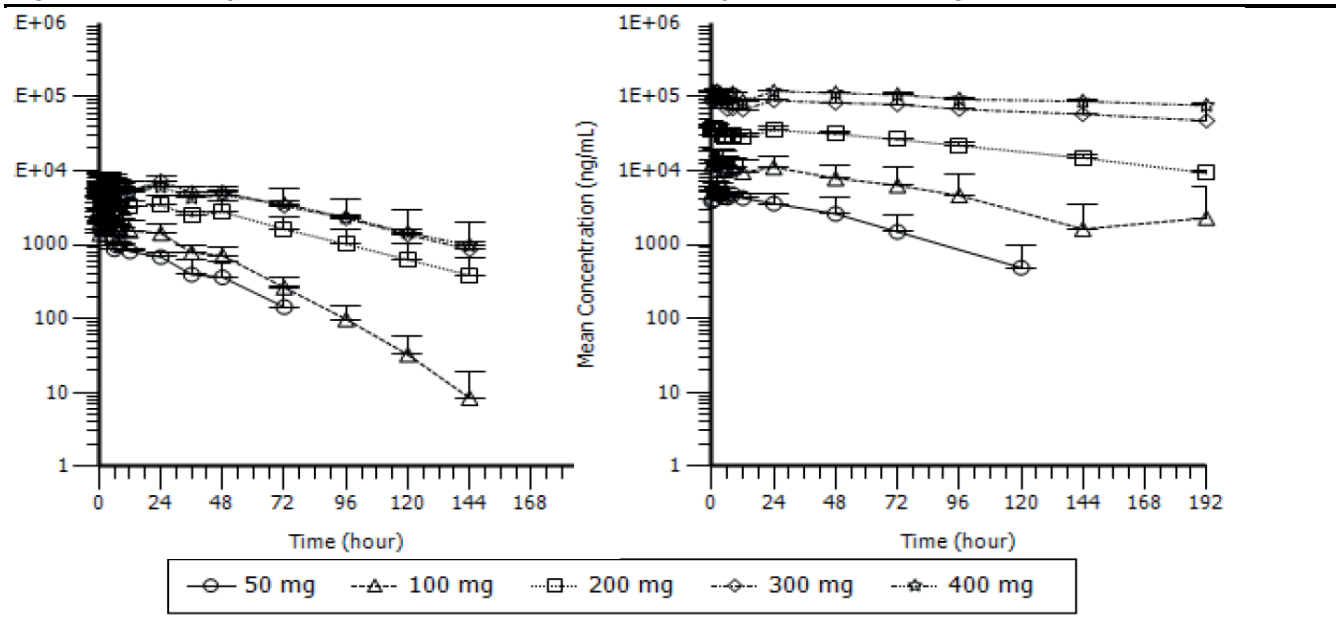
The purpose of the phase I clinical trial was to evaluate the safety, tolerance, pharmacokinetics and pharmacodynamics, as well as preliminary efficacy of Proxalutamide on advanced stage mCRPC patients. Fourteen subjects completed the 28-day first cycle of multiple dosing dose escalation tests.

Proxalutamide was administered orally following overnight fasting. The dose escalation reached 400 mg. There was no does limiting toxicity (DLT) observed in any of the dose groups, nor was the

maximum tolerated dose (MTD) reached. The adverse reactions occurred were grade 1, comprising one case of hypercholesterolemia, one case hypertriglyceridemia and one case of fatigue in the 400 mg group, as well as one case of anaemia in the 50 mg group. There were no adverse reactions in the 100 mg, 200 mg and 300 mg groups.

Pharmacokinetics results showed that the exposure of Proxalutamide in the human body increased with dose escalation from 50 mg to 300 mg and the drug exposure tended to saturate when the dose reached 300 mg to 400 mg. The drug showed a tendency for delayed elimination from the 100 mg group to the 200 mg group, and was considered a low clearance compound.

Figure 14: The exposure of Proxalutamide in human body in different dosage levels



Source: Company data, CMBIS

Based on the preliminary observation of imaging, all of the 12 patients who completed three cycles of multiple dosing dose escalation tests showed no progression of target lesions and non-target lesions in imaging as compared to baselines at the end of the third cycle. Both patients who completed six cycles of multiple dosing dose escalation tests showed no progression of target lesions and non-target lesions in imaging as compared to baselines. Eight out of the 12 patients at the end of the third cycle of multiple dosing dose escalation tests had decreased lowest Prostate Specific Antigen (PSA) levels as compared to baselines.

Dose escalation results demonstrated a good safety and tolerability profile of Proxalutamide in advanced-stage mCRPC patients. Proxalutamide remains well tolerated at 400 mg per day during long-term treatment with no maximum tolerable dose ("MTD") observed, good drug exposure and good elimination in patients. The two patients in the 200 mg group had no disease progression after completing six cycles of multiple dosing dose escalation tests, which, in combination with imaging results, demonstrated preliminary efficacy of Proxalutamide in advanced-stage mCRPC patients.

Phase I trial using Proxalutamide as mono therapy for mCRPC in US (completed):

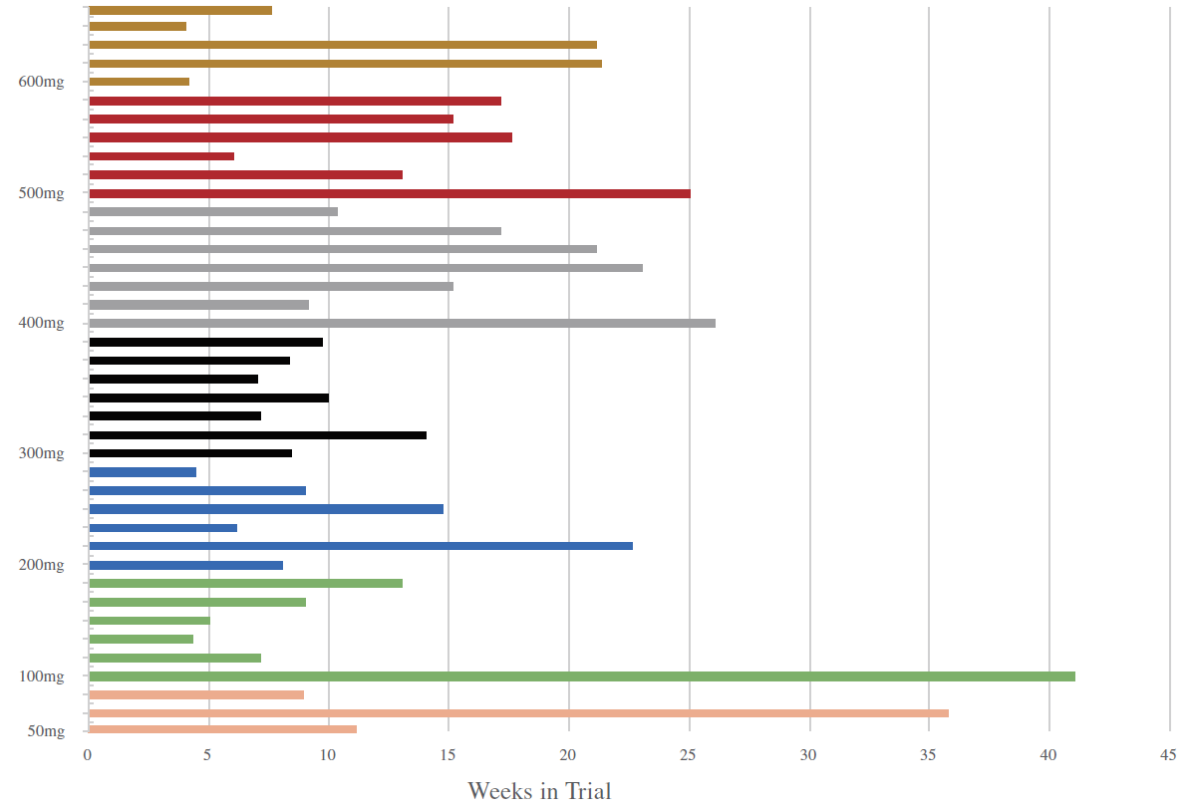
The purpose of the phase I clinical trial was to identify DLTs and to assess safety, tolerability, and pharmacokinetics of Proxalutamide in patients with mCRPC who have progressed on standard of care and experimental therapies in the US.

A total of 40 patients were treated with Proxalutamide at seven dose levels: daily 50 mg (n=3), 100 mg (n=6), 200 mg (n=6), 300 mg (n=7), 400 mg (n=7), 500 mg (n=6) and 600 mg (n=5). During the dose escalation stage, all patients took Proxalutamide oral administration once daily in a fasted state for 28 consecutive days, followed by at least a seven-day off-treatment period for pharmacokinetics analysis.

In this trial, the dose escalation reached 600 mg and there was no Proxalutamide-related DLT identified. Adverse reactions included fatigue, nausea, dizziness, loss of appetite, back pain, hot flush, hypercholesterolemia, anemia, and constipation. Two events of grade 3 fatigue and one event of grade 4 elevated creatine kinase unrelated to Proxalutamide were reported.

All patients progressed on multiple lines of therapies including but not limited to Bicalutamide, Abiraterone, Enzalutamide, Docetaxel, Cabazitaxel, Radium 223, Sipuleucel T and Pembrolizumab.

Figure 15: The treatment duration in 40 patients with Proxalutamide doses from 50 mg to 600 mg



Source: Company data, CMBIS

Data showed that Proxalutamide administrated orally once daily in a fasted state is well tolerated up to 600 mg dose cohort during long-term treatment with no MTD observed. Based on clinical outcomes from phase I studies in the US, the expanded/phase II was recommended to further evaluate the safety and tolerability of Proxalutamide at two dosages: 400 mg and 500 mg in eligible subjects with mCRPC.

Phase II trial using Proxalutamide as mono therapy for mCRPC in China (completed):

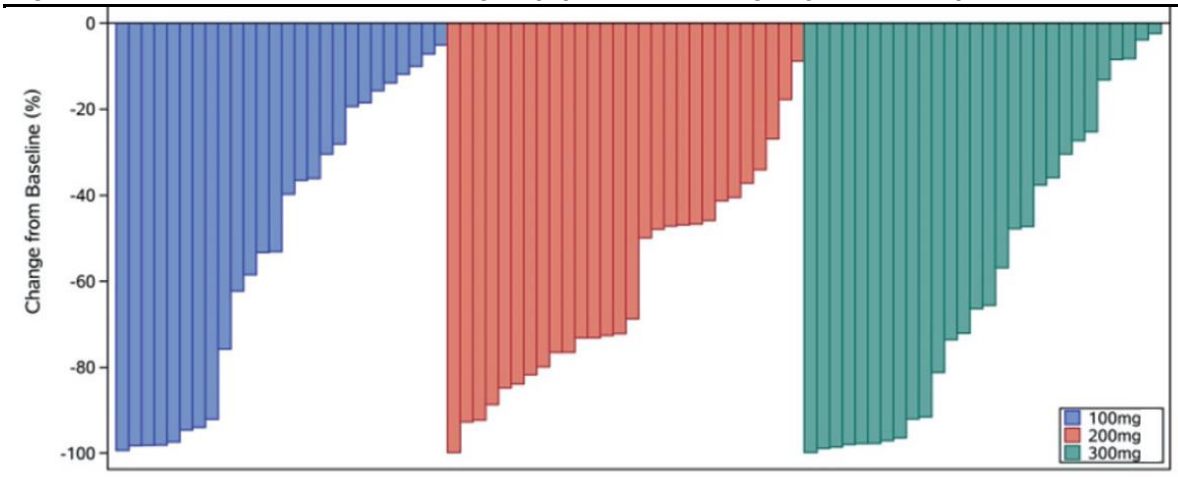
This is an open-label, randomised and multi-centre clinical trial with 108 patients enrolled during Jul 2017 and May 2018. Among the total 108 patients, 37 patients were in 100 mg/day dose group, 35 patients in 200 mg/day dose group and 36 patients in 300 mg/day dose group. 98 patients met the per protocol set (PPS) (33:33:32), all of whom were mCRPC patients who had failed standard

chemotherapy regimen containing Docetaxel or were unable to tolerate or unwilling to receive standard chemotherapy treatment.

Proxalutamide demonstrated good overall safety profile in phase II clinical trials. 75.0% of the patients in the phase II clinical trials had AE associated with Proxalutamide, among which 13.0% of the patients had grade 3 or higher AE associated with Proxalutamide, 4.6% of the patients had SAEs. Common SAEs were vomiting, anemia, fatigue, hypokalemia and pulmonary infection. 8.3% of the patients had AEs associated with Proxalutamide leading to discontinuation of administration of the test drug; 2.8% of the patients had AEs associated with Proxalutamide leading to withdrawal from clinical trials, while no AE-related death was found.

The median age of the 108 patients with mCRPC was 70.0 years old. 95 patients (88.0%) had stage IV prostate cancer in their initial diagnosis, and 69.4% of the patients had Gleason score of 8 or higher. In most cases, distant metastases occurred in the patient's initial diagnosis. All patients had undergone endocrine castration therapy in the past. In the full analysis set (FAS), the proportion of patients with a maximum prostate-specific antigen (PSA) decline of more than 50% during the study period was 41.9% (44 out of 105 patients).

Figure 16: PSA decline in three dose group (100:200:300 mg/day = 37:35:36)



Source: Company data, CMBIS

According to RECIST 1.1 guidelines, 19 patients in the phase II clinical trials had target lesions (5, 9 and 5 in 100, 200 and 300 mg dose group, respectively). Based on the results of radiographic imaging, there were 15.8% PR, 63.2% SD and 21.2% PD, implying 15.8% ORR and 78.9% DCR.

In the full analysis set (FAS), 52.8% (57 out of 108 patients) of the patients entered the extended or donated period, among which there were 48.6%, 62.9% and 47.2% in the 100 mg/day, 200 mg/day and 300 mg/day dose groups, respectively. The longest patient medication period was 28 treatment cycles as of 25 Nov 2019.

The phase II clinical trials preliminarily demonstrated the anti-tumor effect of Proxalutamide in mCRPC patients, and the AEs were mostly mild, generally showing a dose-dependent trend, overall safety was good and no epilepsy occurred. Based on overall safety and efficacy considerations, the recommended dose for phase III clinical trials in China is 200 mg/day (postprandial oral administration).

Phase II trial using Proxalutamide as mono therapy for mCRPC in US (ongoing):

In the US, Kintor commenced a multi-centre, open-label, randomised phase II clinical trials for Proxalutamide for mCRPC patients who have failed Abiraterone or Enzalutamide treatment. The trial started in Jun 2019.

All patients are randomised to take 400 mg or 500 mg of Proxalutamide by oral administration once daily in a fasted state for an initial treatment period of six months and will continue treatment with Proxalutamide at their assigned dose until disease progression, intolerable AEs occur or the patient's consent is withdrawn. Disease progression is assessed by three methods over the duration of the study. Patients are assessed for PSA progression measured monthly, as well as radiographic progression by CT scan or/and bone progression by radionuclide bone scan every 12 weeks.

Kintor aims to enrol 60 patients in 10 study centres located in the US. The 30 patients in arm 1 (15 of whom have failed Enzalutamide and 15 of whom have failed Abiraterone) will take 400 mg of Proxalutamide per day and the 30 patients in arm 2 (15 of whom have failed Enzalutamide and 15 of whom have failed Abiraterone) will take 500 mg of Proxalutamide per day (all in fasted state).

As of 24 Apr 2020, Kintor had enrolled 28 patients in treatment arm 1 and 27 patients in treatment arm 2, respectively, for phase II clinical trials in the US. Kintor targets to complete this on-going phase II clinical trials for Proxalutamide in patients with mCRPC who have failed Abiraterone or Enzalutamide treatment in US by end-2020E.

Phase III trial using Proxalutamide as mono therapy for 2L+ mCRPC in China (ongoing):

Kintor initiated a phase III clinical trial for Proxalutamide for mCRPC in China in May 2018. It's a multi-centre, randomised, double-blind, placebo-controlled clinical trial evaluating Proxalutamide in patients with mCRPC who have failed Abiraterone and Docetaxel treatments. Patient enrolment was started in Sep 2018.

The trial is expected to enroll approximately 294 patients from 38 sites nationwide. For patients in the test group, the dosage of Proxalutamide is currently fixed at 200 mg (dosing after meals). Each treatment cycle lasts 28 days until subjects first experience disease progression, intolerable AE or withdraw their consents.

As of 24 Apr 2020, Kintor had enrolled 275 patients for this clinical trial in China and the enrolment of the remaining patients is expected to be completed around mid-2020E. Since the rPFS and OS of patients with mCRPC who have failed Abiraterone and Docetaxel treatments are relatively short, Kintor expects to complete the collection, analysis and summary of rPFS events in 2H20E. Kintor plans to submit an official NDA to the NMPA for the commercialisation of Proxalutamdie tablets after obtaining the interim analysis results of the phase III clinical trials by end-2020E.

Phase III trial using Proxalutamide as combo therapy for 1L mCRPC in China (ongoing):

It's a multi-centre, randomised, double-blind phase III clinical trials evaluating the efficacy and safety of Proxalutamide's combination therapy with Abiraterone in comparison with Abiraterone in monotherapy as a first-line treatment for mCRPC.

The phase III clinical trials are divided into two stages. The safety and tolerability of Proxalutamide in combination therapy with Abiraterone are determined in the first stage, and a safe and tolerable dose will be selected for entering the second stage. The enrolment of patients in the first and second phases began in Apr and Aug 2019, respectively. Kintor targets to complete the enrolment of all patients by end-2020E.

For first stage, as of 27 Jun 2019, the safety evaluation of the combination therapy of Proxalutamide of 400 mg (oral pre-meal administration) and Abiraterone of 1000 mg (oral pre-meal administration) in the six patients was completed and no DLT was observed in the patients. The Safety Monitoring Committee meeting was held on 10 Jul 2019, agreeing to conclude the first stage of the clinical trial of the combination therapy and enter the second stage.

The first patient in the second stage was enrolled in Aug 2019. As of 24 Apr 2020, 252 patients were enrolled for the second stage of the phase III clinical trials. Kintor aims to complete the enrolment of 588 patients by end-2020E, and expects the phase III clinical trials results to be available in 2021E for the official NDA to the NMPA for the combination therapy of Proxalutamide and Abiraterone for 1L mCRPC.

Proxalutamide shows good safety and potent efficacy

Enzalutamide has clinically revealed central nervous system side effects of seizure. Seizure occurred in 0.5% of patients receiving Enzalutamide in seven randomized clinical trials. In these trials, patients with predisposing factors for seizure were generally excluded. Seizure occurred from 13 to 1,776 days after initiation of Enzalutamide. In a single-arm trial designed to assess the risk of seizure in patients with pre-disposing factors for seizure, 8 of 366 (2.2%) XTANDI-treated patients experienced a seizure. Enzalutamide also causes other adverse effects such as ischemic heart disease (2.9%), fracture (≥G3) (3.0%), hypertension (≥G3) (2.1~7.2%).

Seizure also occurred in patients receiving Apalutamide. In two randomized studies (SPARTAN and TITAN), five patients (0.4%) treated with Apalutamide. Seizure occurred from 159 to 650 days after initiation of Apalutamide. Patients with a history of seizure, predisposing factors for seizure, or receiving drugs known to decrease the seizure threshold or to induce seizure were excluded. Apalutamide causes 2.2% of heart failure, 3% fracture (≥G3) and 8~14% hypertension (≥G3).

Based on the clinical data to date, there has been no incidence of seizure among over 600 Proxalutamide users enrolled in clinical trials, demonstrating a favourable safety profile.

Figure 17: Summary of safety of 2nd generation AR antagonists

	Enzalutamide	Apalutamide	Darolutamide	Proxalutamide
Trials	Pooled analysis	SPARTAN and TITAN	ARAMIS (NCT02200614)	CTR20170177
N	NA	1,327	955	108
Discontinuation due to AEs	16% (AFFIRM); 9.4% (PROSPER); 7.6% (TERRAIN); 6% (PREVAIL); 4.9% (ARCHES)	8.0% (TITAN); 11.0% (SPARTAN)	9.0%	8.3%
AEs of special interests:				
Seizure	0.5% (4,081 patients)	0.4% (1,327 patients)	0.2% (955 patients)	0% (600+ patients)
Ischemic heart disease	2.9%		4.0%	NA
Heart failure	NA	2.2%	2.1%	NA
Fracture (≥G3)	3.0%	3% (SPARTAN)	NA	NA
Hypertension (≥G3)	7.2% (PREVAIL); 7.1% (TERRAIN); 4.6% (PROSPER); 3.3% (ARCHES); 2.1% (AFFIRM)	14% (SPARTAN); 8% (TITAN)	NA	NA

Source: Company data, US FDA Label, CMBIS

Proxalutamide also shows potent efficacy in clinical trials. In a phase II trial of Proxalutamide for mCRPC (after chemotherapy), the proportion of patients with a maximum PSA decline of more than 50% during the study period was 41.9% (35.1%, 45.5% and 45.7% in the 100 mg/day, 200 mg/day, and 300 mg/day dose groups, respectively). We expect more efficacy proofs will be available after the completion of the ongoing two phase III trials in China.

Figure 18: Summary of clinical trial results for mCRPC

	Proxalutamide	Enzalutamide			SHR-3680	Abiraterone	
Company	Kintor	Pfizer/Astellas			Hengrui	JNJ	
Trial ID	CTR20170177	NCT02294461 (Asian PREVAIL)	NCT01212991 (PREVAIL)	NCT00974311 (AFFIRM)	NCT02691975	NCT00887198 (COU-AA-302)	NCT00638690 (COU-AA-301)
Drug	Proxalutamide	Enzalutamide vs Placebo	Enzalutamide vs Placebo	Enzalutamide vs Placebo	SHR-3680	Abiraterone+Prednisone vs Placebo+Prednisone	Abiraterone+Prednisone vs Placebo+Prednisone
Indication	mCRPC	mCRPC	mCRPC	mCRPC	mCRPC	mCRPC	mCRPC
Line of treatment	2L (after chemo)	1L (chemo naïve)	1L (chemo naïve)	2L (after chemo)	1L (chemo naïve)	1L (chemo naïve)	2L
N	108	198	872	800	197	546	797
Phase	II	III	III	III	I/II	III	III
Regimen	100~300mg QD	160mg QD	160mg QD	160mg QD	40~480mg QD	Abiraterone 1000mg QD + Prednisone 5mg BID	Abiraterone 1000mg QD + Prednisone 5mg BID
Median follow-up	NA	7.3m	31m	14.4m	NA	49.2m	20.2m
PSA response rate	41.9%	65.9%	78.0%	54.0%	68.7%	62.0%	29.5%
Median time to PSA progression	NA	8.3m	11.2m	8.3m	8.4m	11.1m	8.5m
rPFS	NA	NR	20.0m	8.3m	17.0m	16.5m	5.6m
OS	NA	NR	35.3m	18.4m	NA	34.7m	15.8m
Discontinue due to AEs	8.3%	3.0%	6.0%	16.0%	NA	10.0%	13.0%
SAE	4.6% (SAE), 13% (≥G3 AE)	17% (SAE), 25% (≥G3 AE)	32.0%	47% (≥G3 AE)	NA	33.0%	NA
Seizures	0.0%	NA	0.1%	0.9%	NA	0.0%	0.0%

Source: Company data, US FDA Label, NEJM, Lancet, NCBI, CMBIS

Proxalutamide leads the clinical trials for metastatic breast cancer

The MOA of Proxalutamide for metastatic breast cancer

The frequency of AR expression is significantly different among different molecular phenotypes of breast cancer. Among these phenotypes of breast cancer, for examples, 91% of Luminal A expresses AR, 67.5% of Luminal B expresses AR, 58.7% of HER2+ expresses AR, 31.7% of basal-like carcinoma (mainly TNBC) expresses AR, and 46.1% of other unclassified cancers expresses AR.

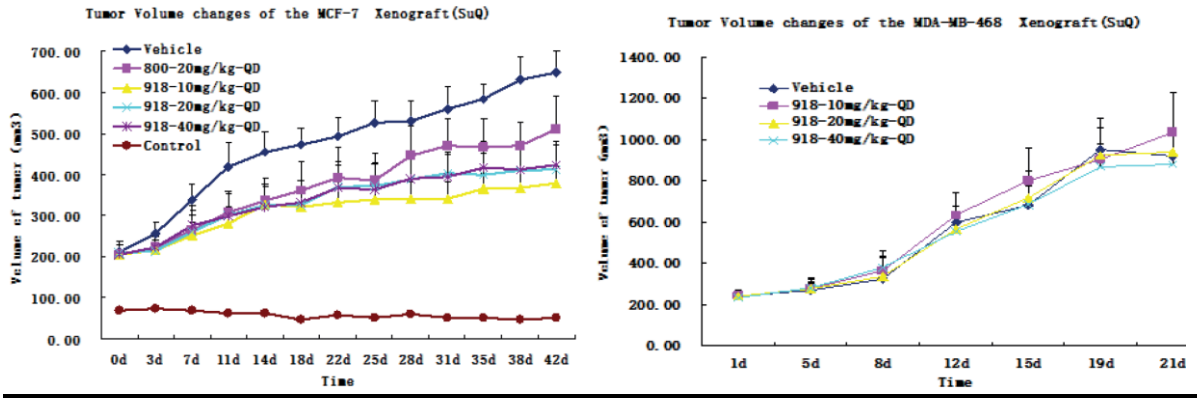
Figure 19: AR expression in invasive tumors of breast cancer

N (%)	All invasive tumors			
	AR+		AR-	
ER				
+ *(1/2)*	1,476	86.8%	225	13.2%
-	225	44.0%	287	56.1%
PR				
+	1,243	86.8%	187	13.1%
-	475	59.3%	326	40.7%
HER2				
+(2+/3+)	154	64.7%	84	35.3%
-	1,551	78.5%	425	21.5%
EGFR				
+	209	50.4%	206	49.6%
-	1,486	83.1%	302	16.9%
CK5/6				
+	44	35.8%	79	64.2%
-	1,663	79.2%	438	20.9%
Luminal A (ER+ and/or PR+, HER2-, histologic grade 1 or 2)	1,256	91.0%	124	9.0%
Luminal B (ER+ and/or PR+ and HER2+, or ER+ and/or PR- and HER2-, histologic grade 3)	220	67.5%	106	32.5%
HER2-type (ER-, PR-, HER2+)	74	58.7%	52	41.3%
Basal-like (ER-, PR-, HER2-, CK5/6+ and/or EGFR+)	75	31.7%	162	68.4%
Unclassified (Lacked expression of all five markers)	47	46.1%	55	53.9%

Source: Company data, CMBIS

Based on these findings, it is hypothesised that the AR signalling pathway may be a driving force of the growth of TNBC and an important cause of resistance to endocrine therapy in advanced breast cancers. Subsequent studies have demonstrated that blocking AR signalling can inhibit the growth of AR+ breast cancer cells *in vivo* and *in vitro*. In animal model, Proxalutamide has demonstrated good tumor inhibitory activity on AR-expressing breast cancer tumours (MCF-7) in a dose-dependent manner with no significant influence on animals' body weight. Proxalutamide also exhibited a higher tumour inhibition rate at its maximum efficacy (10-20 mg/kg) compared with Enzalutamide, while the drug dose required is lower and the drug exposure required is significantly less than Enzalutamide (<1/10). On the other hand, Proxalutamide has no effect on breast cancer tumors (MDA-MB-468) which do not express AR, which demonstrates that Proxalutamide, as a specific AR antagonist, has no effect *in vivo* or *in vitro* on cancer cells that do not express AR.

Figure 20: Effects of Proxalutamide (GT0918) and Enzalutamide (800) on tumor volume in MCF-7 (AR+) or MDA-MB-468 (AR-) tumor-bearing mice



Source: Company data, CMBIS

2nd generation AR antagonists showed efficacy in breast cancer

Although over 50% breast cancer patients are AR+, no AR antagonist treatment had been approved for metastatic breast cancer so far. As of Jul 2020, Proxalutamide was the only AR antagonist candidate undergoing clinical trials in China for AR+ breast cancer. Several potential competing drugs were currently in clinical trials in the US for AR+ breast cancer, including Enzalutamide, Bicalutamide and a few combination therapies.

Figure 21: AR antagonists under clinical development for AR+ breast cancer in US

Drug name	Indication	Company	Clinical Status	Date First posted
Enzalutamide	Advanced, AR+ TNBC	Pfizer/Astellas	Phase II	28-Jun-2013
Enzalutamide and Exemestane	ER+/PR+, HER2- Advanced Breast Cancer	Pfizer/Astellas	Phase II	10-Dec-2013
Enzalutamide and Trastuzumab	HER2+, AR+ mBC or locally advanced BC	Astellas	Phase II	19-Mar-2014
Enzalutamide and Taxol	Stage I-III AR+ TNBC	Astellas	Phase II	26-Feb-2016
Enzalutamide	Early Stage AR+ TNBC	Astellas	Phase II	25-Apr-2016
Bicalutamide	AR+, ER-, PR- mBC	AstraZeneca	Phase II	3-May-2007
Palbociclib and Bicalutamide	AR+ mBC	Pfizer	Phase I/II	16-Nov-2015
Taselisib and Enzalutamide	AR+ metastatic TNBC	Genentech	Phase I/II	29-May-2015
Alpelisib and Enzalutamide	AR+, PTEN+ mBC	Novartis/Astellas	Phase I	2-Jul-2017

Source: F&S, Clinicaltrials.gov, CMBIS; Note: Clinical trials sponsored by research institutions are not included here.

Enzalutamide has completed a phase II clinical trial on advanced AR+ TNBC. A total of 118 AR+ TNBC patients were enrolled. In the evaluable group, median PFS was 3.3 months and median OS was 17.6 months. An updated analysis of OS was performed after an additional 18 months of follow-up and median OS reached 16.5 months in the evaluable group.

In a phase II trial of Enzaluatamide combined with Trastuzumab for patients with HER2+ AR+ mBC, a total of 103 patients were enrolled. Median PFS was 108 days (or 3.6 months).

Figure 22: Clinical results of Enzalutamide for AR+ breast cancer

	Enzalutamide	
Trial ID	NCT01889238	NCT02091960
Regimen	Enzalutamide	Enzalutamide+Trastuzumab
Indication	Advanced AR+ TNBC	HER2+ AR+ mBC
N	118	103
Phase	II	II
Line of treatment	≥2L	≥2L
Regimen	160mg QD	Enzalutamide 160mg QD + Trastuzumab 6mg/kg Q3W
Median follow-up	NA	4.8m
PFS	3.3m	3.6m
OS	17.6m	NA
Discontinue due to AEs	7%	9%
Common AEs	≥G3 AE： fatigue (5%), dyspnea (3%), back pain (1%), constipation (1%). SAE: 25%	≥G3 AE：22.7% SAE: 27.3%

Source: Journal of Clinical Oncology, Clinicaltrials.gov, CMBIS

Proxalutamide's ongoing clinical trials for metastatic breast cancer

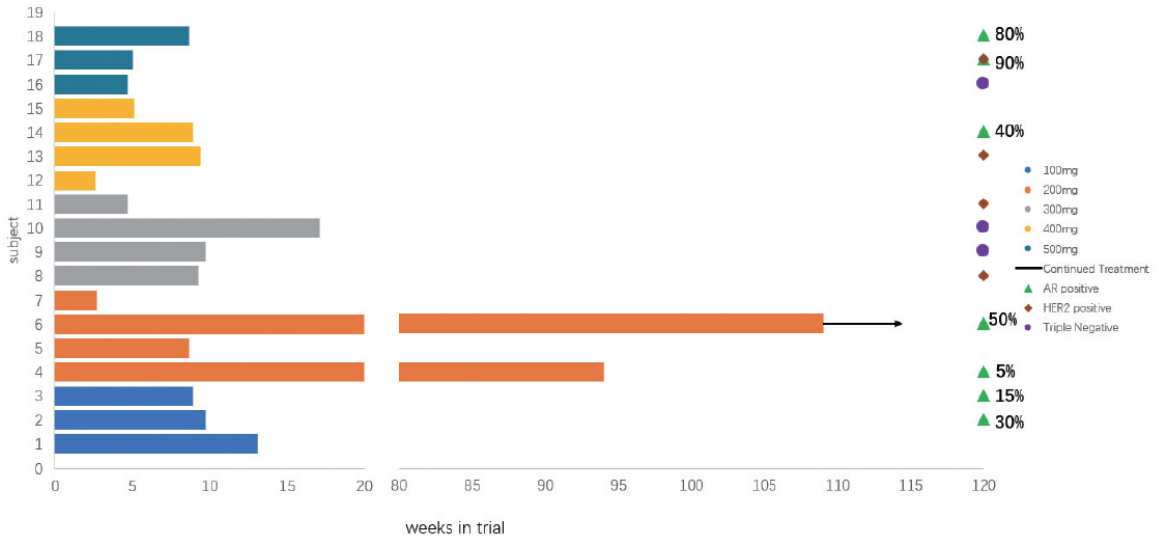
As of Mar 2019, Kintor has completed a phase I/Ib clinical trial for Proxalutamide as a monotherapy for metastatic breast cancer in China and was conducting a phase Ic clinical trial for Proxalutamide in combination therapy with Exemestane, Letrozole and Fulvestrant for metastatic breast cancer in China.

Phase I trial using Proxalutamide as mono therapy metastatic breast cancer in China (completed):

Kintor completed a phase I clinical trial in China to assess Proxalutamide in metastatic breast cancer female patients who have progressed after systemic treatments to evaluate the safety, pharmacokinetics and pharmacodynamics of Proxalutamide.

In this phase I trial, 18 patients were enrolled and treated with Proxalutamide at five dose levels: 100 mg (n = 3), 200 mg (n = 4), 300 mg (n = 4), 400 mg (n = 4) and 500 mg (n = 3). All patients have progressed after more than two lines of therapies, and 83.3% (15/18) patients have progressed three lines or more. Out of the six confirmed AR+ patients, one patient in the 200 mg cohort had completed treatment of 23 cycles and another one was still under treatment as of 24 Apr 2020 with more than 27 cycles.

Figure 23: Treatment cycles of patients with metastatic breast cancer in the Phase I trial



Source: Company data, CMBIS

No DLT was observed and MTD has not been reached. Proxalutamide-related AEs were grade 1 or 2, including fatigue, hypertriglyceridemia, anemia, hypercholesterolemia, increased LDL, nausea, loss of appetite, increased ALT, increase of weight loss, constipation and thrombocytopenia. Grade 3 AEs were not related to Proxalutamide.

Figure 24: Proxalutamide-related AEs in the Phase I trial

AE	No. (%); N=18	
	All grades	Grade 3
Asthenia	14 (77.8%)	
Blood cholesterol increased	7 (38.9%)	
Anaemia	6 (33.3%)	
Blood triglycerides increased	6 (33.3%)	
Aspartate aminotransferase increased	4 (22.2%)	1 (5.6%)
Decreased appetite	4 (22.2%)	
Low density lipoprotein increased	4 (22.2%)	
White blood cell count decreased	4 (22.2%)	
Alanine aminotransferase increased	3 (16.7%)	1 (5.6%)

Source: Company data, CMBIS

The phase I clinical trials showed that Proxalutamide administrated orally once a day is well tolerated in late-stage patients with metastatic breast cancer. No DLT has occurred at the maximum dose of 500 mg. The trials also showed that patients with AR+ biomarker could have better clinical outcomes with Proxalutamide treatment. Proxalutamide and its main metabolite exhibited a nonlinear pharmacokinetic profile over the dose range from 100 mg to 500 mg.

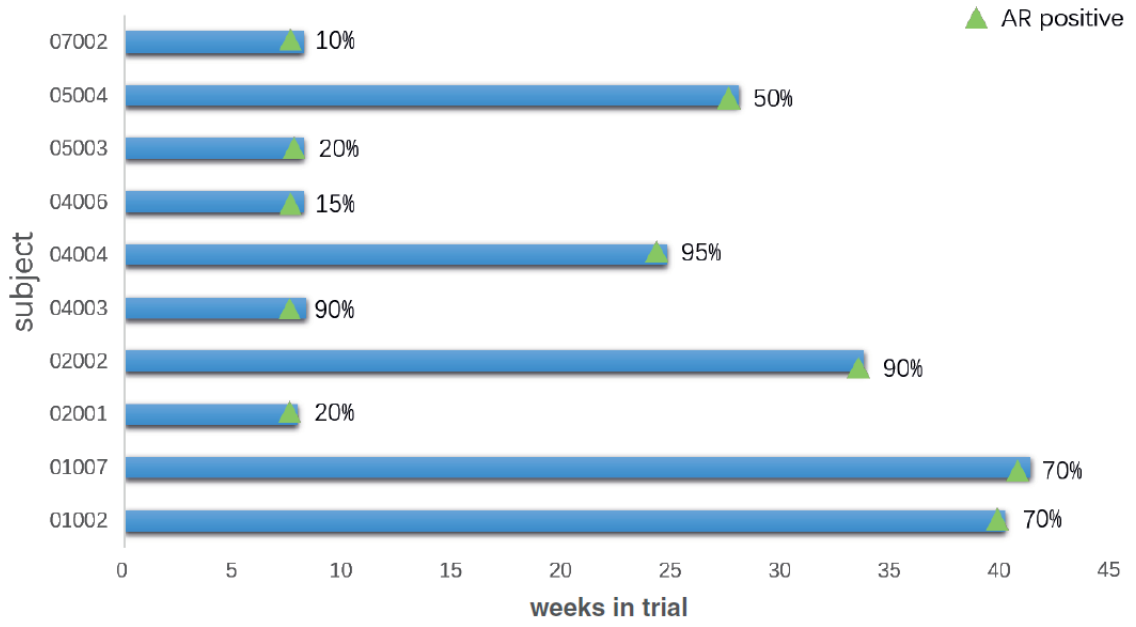
Phase Ib trial using Proxalutamide as mono therapy metastatic breast cancer in China (≥3L, completed):

To further evaluate the anti-tumor activity and safety of Proxalutamide, Kintor selected 200 mg and 300 mg dose to conduct a two-dose, open-label, multi-centre phase Ib clinical trial. Patient enrolment was completed during Jun 2018 and Apr 2019. The phase Ib clinical trial is currently in the final stage, having completed preliminary efficacy and safety data and exploring studies of biomarkers.

All patients had advanced AR+ metastatic breast cancer and had previously experienced at least two lines of treatments, including 1) 12 patients with AR+TNBC, 15 patients with AR+HR+ and 3 patients with AR+HER2+ in the 200 mg group; and 2) two patients with AR+TNBC, 9 with AR+HR+ and 4 with AR+HER2+ in the 300 mg group.

As of 24 Apr 2020, for the 200mg dose group, five out of 10 patients were treated with more than six treatment cycles, each cycle lasting for 28 days, showing that Proxalutamide has therapeutic effect on advanced metastatic AR+TNBC.

Figure 25: Treatment cycles of AR+ TNBC patients in the 200mg dose group



Source: Company data, CMBIS

Phase Ic trial for Proxalutamide combination therapy for metastatic breast cancer in China (ongoing):

Kintor is conducting an open and multi-centre phase Ic clinical trial to evaluate the safety, pharmacokinetic characteristics and initial efficacy of Proxalutamide in combination with Exemestane, Letrozole and Fulvestrant in patients with HR+ and AR+ metastatic breast cancer. The enrolment of subjects began in Jun 2019 and is expected to finish by 2020E. The administration of Proxalutamide will be 200 mg daily with oral administration after meal. Letrozole, Exemestane, and Fulvestrant are given at clinically recommended doses. The trial plans to enrol 18 subjects with six subjects in each clinical trial group.

As of 29 Feb 2020, the phase Ic clinical trial had completed the enrolment of 6 subjects in the Proxalutamide in combination with Fulvestrant group and 2 subjects in the Proxalutamide in combination with Letrozole group.

Expect RMB2.9bn risk-adjusted peak sales from Proxalutamide

We expect Proxalutamide to receive approval from the NMPA for treatment of 2L+ mCRPC in 2021E and to obtain approval from the NMPA for treatment of 1L mCRPC in 2022E. In addition, we forecast Proxalumatide to receive approval from the NMPA for treatment of AR+ mBC in 2023E. We estimate Proxalutamide to reach RMB2.9bn risk-adjusted peak sales in China by 2028E.

Meanwhile, we expect Proxalutamide to receive approval from the US FDA for the treatment of mCRPC in 2023E and to receive US FDA's approval for the treatment of AR+ TNBC in 2025E. We expect Kintor to commercialize Proxalutamide in the US market with a local partner and to charge 15% royalty income from the sales in the US. Thus, we forecast Proxalutamide's risk-adjusted royalty income from the US to peak at RMB156mn in 2025E.

Figure 26: Proxalutamide China sales forecasts

Proxalutamide sales projection (China)	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E
Proxalutamide sales in mCRPC (RMB mn)	125	445	1,123	2,342	3,547	3,434	3,358	3,425	3,344	3,175
Probability of success for mCRPC	*70%*	*70%*	*70%*	*70%*	*70%*	*70%*	*70%*	*70%*	*70%*	*70%*
Proxalutamide sales in AR+ mBC (RMB mn)	55	109	226	540	917	1,282	1,419	1,527	1,564	1,569
Probability of success for mBC	*30%*	*30%*	*30%*	*30%*	*30%*	*30%*	*30%*	*30%*	*30%*	*30%*
Risk-adjusted Proxalutamide sales in China (RMB mn)	**104**	**344**	**854**	**1,802**	**2,758**	**2,788**	**2,776**	**2,855**	**2,810**	**2,693**

Source: Company data, CMBIS; Note: The revenue forecasts are for the purpose of DCF valuation.

Figure 27: Proxalutamide US royalty income forecasts

Proxalutamide sales projection (US)	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E
Proxalutamide sales in mCRPC (RMB mn)	1,051	2,136	3,255	2,361	2,062	1,785	1,526	1,287
Probability of success for mCRPC	*30%*	*30%*	*30%*	*30%*	*30%*	*30%*	*30%*	*30%*
Proxalutamide sales in AR+ TNBC (RMB mn)	0	0	221	285	335	326	314	298
Probability of success for TNBC	*30%*	*30%*	*30%*	*30%*	*30%*	*30%*	*30%*	*30%*
Risk-adjusted Proxalutamide sales in US (RMB mn)	**315**	**641**	**1,043**	**794**	**719**	**633**	**552**	**476**
Kintor's % of royalty sharing	*15%*	*15%*	*15%*	*15%*	*15%*	*15%*	*15%*	*15%*
Risk-adjusted royalty income from Proxalutamide in US (RMB mn)	**47**	**96**	**156**	**119**	**108**	**95**	**83**	**71**

Source: Company data, CMBIS; Note: The revenue forecasts are for the purpose of DCF valuation.

Pyrilutamide (KX-826): a potential FIC AR antagonist for topical dermatological use

Pyrilutamide is a promisting therapy for androgenic alopecia and acne vulgaris

Pyrilutamide (KX-826, 福瑞他恩) is currently being developed as a potential first-in-class (FIC) topical drug for the treatment of androgenic alopecia and acne vulgaris. Pyrilutamide is in phase II clinical trials in China for androgenetic alopecia with expected first patient enrolment in 3Q20E. Pyrilutamide is also in phase I clinical trials for androgenetic alopecia in the US which may be completed in 2020E. Kintor plans to conduct MRCT phase III clinical trials in China, the US and other countries in 2021E, with a target to commence commercialisation for Pyrilutamide.

We believe Pyrilutamide holds the possibility of redefining the market potential for androgenetic alopecia drugs. Currently, the primary treatments for androgenetic alopecia in US and China are Minoxidil (米诺地尔) and Finasteride (非那雄胺), each of which has limitations that we believe have led to significant unmet medical needs for treatments targeting androgenetic alopecia.

According to F&S, Minoxidil, which is applied topically, lacks clear evidence of mechanism. As Minoxidil adopts topical administration, it lacks specific targeted therapy and the coverage and response of androgenetic alopecia patients are also limited. In addition, patients using Minoxidil may suffer from allergy to propylene glycol, and orthostatic hypotension if they take it along with peripheral vasodilators.

Finasteride, which is a 5-alpha-reductase type II inhibitor administered orally, promotes hair-growth by systemically inhibiting synthesis of androgen DHT. As evidenced by the clinical effectiveness of treating androgenetic alopecia by Finasteride, locally over-active AR signalling (leading to shrinkage of hair root) is the leading cause of hair loss. Finasteride poses adverse sexual side effects, including decreased libido, erectile dysfunction and ejaculation disorder, with first-year incident rates of 1.8%, 1.3% and 1.2% in clinical studies, respectively. Integrated analysis of clinical adverse experiences showed that during treatment with Finasteride, 3.8% of men had reported one or more of these adverse experiences. In a 4-year controlled clinical study, 3.7% of patients were treated with Finasteride discontinued therapy as a result of adverse reactions related to sexual function.

The adverse sexual side effects of Finasteride have been a significant deterrent to a large pool of patients in electing to treat a primarily cosmetic condition.

Figure 28: Adverse events of Finasteride

Drug-related AE for PROPECIA (finasteride 1mg) in first year	PROPECIA N=945	Placebo N=934
Decreased Libido	1.8%	1.3%
Erectile Dysfunction	1.3%	0.7%
Ejaculation disorder *(Decreased Volume of Ejaculate)*	1.2% *(0.8%)*	0.7% *(0.4%)*
Discontinuation due to drug-related sexual adverse experiences	1.2%	0.9%

Source: US FDA label, CMBIS

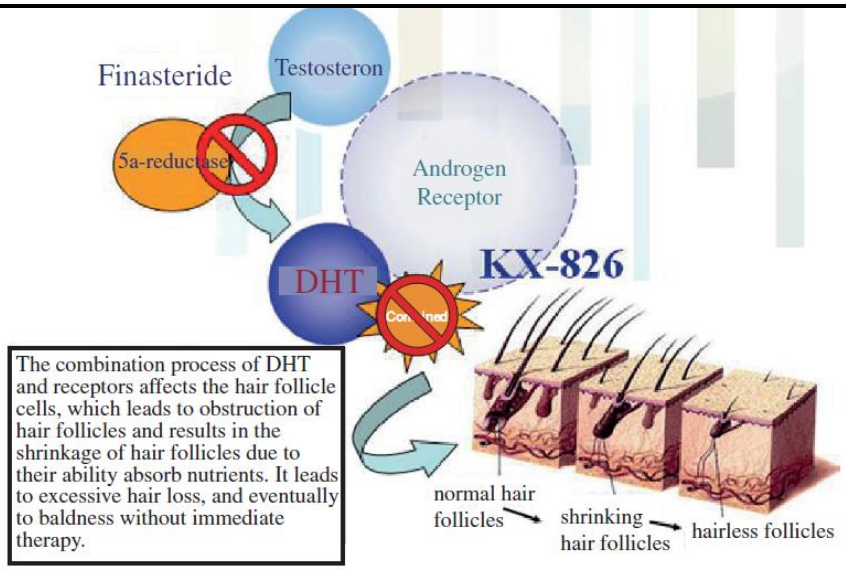
Androgenetic alopecia is an androgen-dependent genetically predisposed hair loss disease. Male androgen mainly comes from the testis, primarily in the form of testosterone. Androgens can promote the growth of body hair in certain parts of the body, such as whiskers and manes, but inhibits the

growth of hair on the scalp (in particular the top of the forehead), where the hair follicle is a target organ for androgen. AR is recognised as a risk factor for androgenetic alopecia.

Pyrilutamide is a novel AR antagonist designed for topical application, and it acts directly on the target treatment areas of the scalp. It is developed to locally block the androgen mediated signalling by competing with binding of androgen to AR in the targeted tissues instead of reducing androgen level systematically. Therefore, Pyrilutamide for topical use is anticipated to have minimal systemic exposure, thereby limiting side effects, while demonstrating effectiveness in treating androgenetic alopecia.

Based on pharmacological research and clinical trial data so far, Pyrilutamide had not demonstrated adverse sexual side effects. We therefore believe Pyrilutamide has the potential to attract a significantly larger pool of patients suffering from androgenetic alopecia than existing treatment options and redefine the market landscape for androgenetic alopecia drugs, with further potential on markets for other AR-related diseases, including acne vulgaris.

Figure 29: The differences of the MOA between KX-826 and Finasteride for androgenetic alopecia



Source: Company data, CMBIS

Clinical trial data show satisfying safety profile

Kintor had completed phase I/Ib clinical trials for Pyrilutamide in China and was conducting phase II clinical trials in China and phase I clinical trials in the US.

Phase I/Ib trial of Pyrilutamide in China (completed)

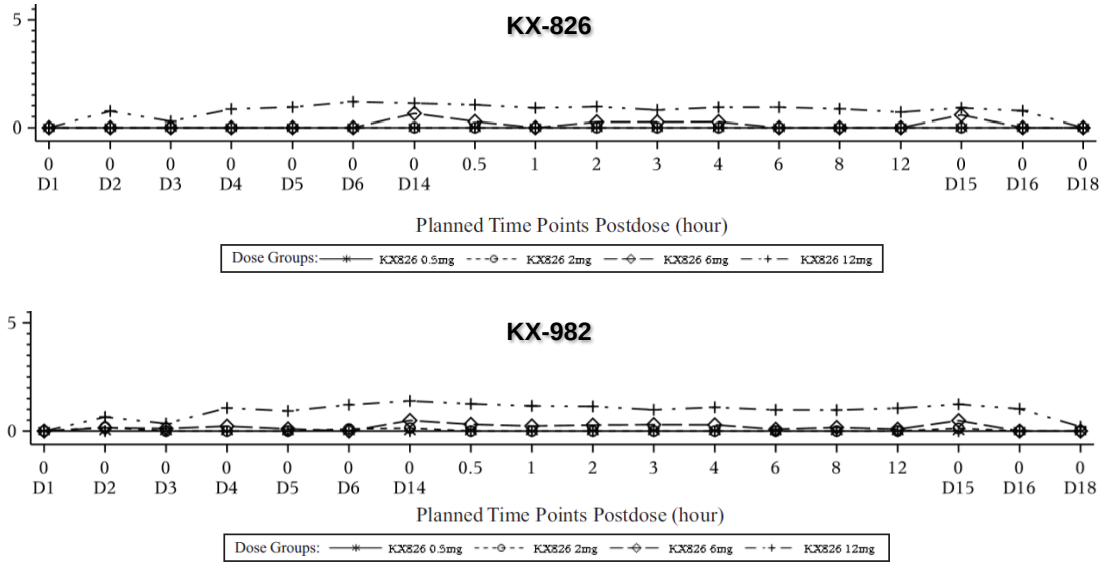
The phase I clinical study of the tolerance and pharmacokinetics of single and multiple doses of Pyrilutamide (KX-826) tincture in healthy Chinese subjects was divided into two phases (I/Ib) for single-dose and multiple-dose, respectively. Both phases were designed to be randomized, double-blind, dose-escalating, placebo-controlled and single-center. These trials commenced in Dec 2018 and were completed in Jul 2019.

A total of 40 healthy Chinese male and female subjects were enrolled in the single-dose phase of the phase I clinical trial. Dose escalation was performed in five dose groups with doses of 0.5, 2, 6, 12, and 24 mg/body/day, respectively. In each group, two subjects were randomized to receive placebo

on the back, and the other six subjects received the test drug. In addition, a total of 32 healthy Chinese male and female subjects were enrolled in the phase Ib multi-dose phase and entered four dose groups of eight patients with the doses of 0.5, 2, 6, 12 mg/body/day, respectively. Eight subjects who completed the single-dose phase entered the multiple-dose phase of the same-dose group, two of whom entered the placebo-controlled group and accumulated dosing on the back (test drug or placebo) for 14 consecutive days.

No severe adverse event (sAE) was observed. No subjects withdrew from the clinical trial due to AE, and no subjects were suspended or down-regulated due to AE. A total of 22 (55%) subjects had 24 mild AEs in the single-dose phase, and 15 (37.5%) subjects had 15 AEs that were determined to be related to the test drug. A total of 115 AEs occurred in 18 (56.3%) subjects during the multiple-dose phase, and 102 of the AEs in 13 (40.6%) subjects were determined to be related to the test drug. The severity of all AEs was mild. The main AEs were all “contact dermatitis”, which were mild and were determined to be related to the study drug. All AEs of “contact dermatitis” recovered or restored in a short time. The maximum tolerated dose (MTD) was not reached in both single-dose phase and multiple-dose dose-climbing phase. In the Pharmacokinetics studies, KX-826 and its metabolite KX-982 could be detected in plasma in a dose-dependent manner, though the concentrations were quite low.

Figure 30: Plasma concentration of KX-826 and KX982 in different dose group



Source: Company data, CMBIS

In conclusion, KX-826 showed good safety and tolerability in single and multiple doses in healthy Chinese subjects. The recommended dose of KX-826 in the phase II clinical trials is 0.5-12 mg/body/day.

Phase Ib trial of KX-826 in US (ongoing)

Kintor is conducting a randomised, double-blind, placebo-controlled, parallel group, dose escalation Phase I study in healthy male subjects with androgenetic alopecia to evaluate the safety, tolerability and pharmacokinetics of KX-826 following topical single ascending dose administration in US.

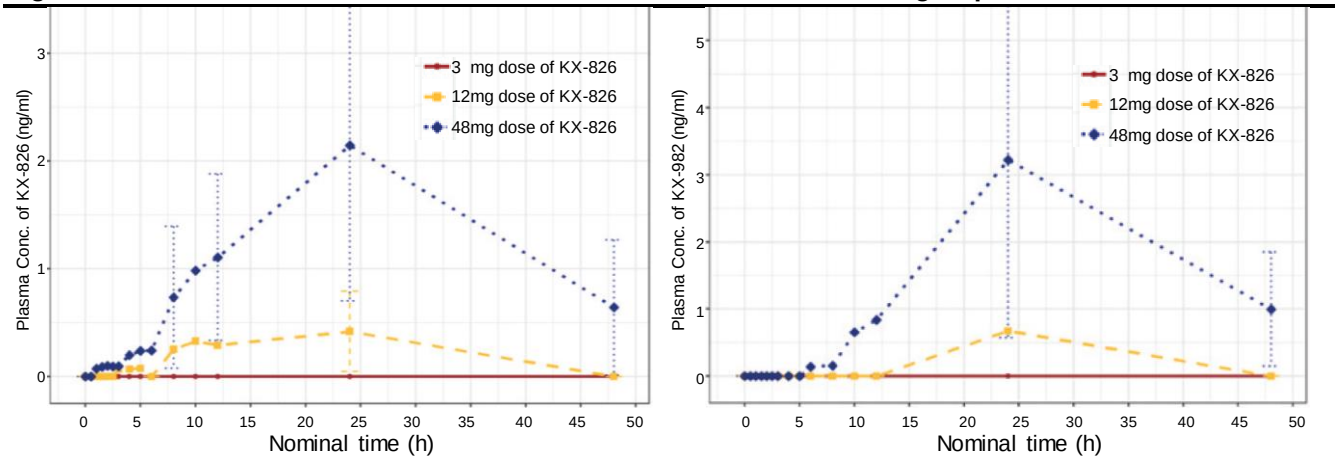
A total of 30 healthy male subjects with androgenetic alopecia were enrolled to be evaluated with 24 subjects randomised to receive active drug and six subjects randomised to receive placebo in a double-blind manner (10 subjects in each dose cohort with two subjects randomised to placebo) for a

total of three dose cohorts. Dose levels of 3 mg, 12 mg and 48 mg of KX-826 as a topical application are being evaluated.

Administration of topical KX-826 as a single ascending dose ranging from 3 mg to 48 mg was safe and well tolerated in healthy male subjects. There were no deaths, SAEs or AEs leading to discontinuation reported in this study. Overall, eight (26.7%) subjects experienced a total of 11 TEAEs. All TEAEs were mild in severity. There was no apparent dose relationship in either the incidence or severity of the AEs reported across the dose range of 3 mg to 48 mg.

In the Pharmacokinetics studies, KX-826 was detectable in 12mg and 48mg group, while its metabolite KX-982 was only detectable in 48mg group.

Figure 31: Plasma concentration of KX-826 and KX982 in different dose group



Source: Company data, CMBIS

In conclusion, the topical administration of KX-826 at the studied doses ranging from 3 mg to 48 mg was safe and well tolerated in healthy male subjects. The administration of KX-826 as a topical single ascending dose of 3 mg to 48 mg produced minimal systemic exposure within the therapeutic range predicted to have efficacy in treating male pattern baldness from preclinical models without inhibiting synthesis of androgen DHT.

Phase II trial of KX-826 in China (ongoing)

Kintor aims to commence the first patient enrolment for phase II clinical trials for KX-826 for androgenetic alopecia in China in 3Q20E, with anticipated completion in 4Q20E.

A multicentre, randomized, double-blind, double-dummy, placebo-parallel control design is used in the phase II trial to assess the safety pharmacokinetics and efficacy of Pyrilutamide tincture in Chinese male androgenetic alopecia patients. The trials are planned to be conducted in five clinical centers and a total of 160 male androgenetic alopecia patients will be enrolled in a total of five groups. The five groups receive Pyrilutamide tincture 2.5 mg QD, 5 mg QD, 2.5 mg BID, 5 mg BID and placebo, respectively.

As of Jul 2020, Pyrilutamide was the only innovative drug candidate in clinical trials in China for androgenetic alopecia. A few potential competing drugs are currently in clinical trials for androgenetic alopecia globally.

Figure 32: Potential competing drugs in clinical trials for androgenetic alopecia globally

Generic name	Company	Status	Milestone (Date first posted)	MOA
SM04554	Samumed LLC	Phase III	15-Nov-2018	WNT pathway activator
Dutasteride	GlaxoSmithKline	Phase III	4-Oct-2012	Selective inhibitor of both reproductive tissues (type 2) and skin and hepatic (type 1) 5α -reductase
CB-03-01	Intrepid Therapeutics	Phase II	31-Oct-2014	Selective androgen antagonist
Bimatoprost	Allergan	Phase II	9-Dec-2015	Synthetic structural analogs of prostaglandin
FOL-005	Follicum AB/ Bioskin GmbH	Phase II	16-Apr-2018	Synthesised polypeptide
Setipiprant	Allergan	Phase II	5-Apr-2019	Antagonist of the prostaglandin D2 receptor 2

Source: F&S, CMBIS

Expect RMB1.4bn risk-adjusted peak sales from Pyrilutamide

We expect Pyrilutamide to receive approval from the NMPA for treatment of Androgenetic Alopecia in 2022E and to obtain approval from the NMPA for treatment of Acne Vulgaris in 2023E. We estimate Pyrilutamide to reach RMB1.4bn risk-adjusted peak sales in China by 2030E.

Kintor has entered into collaboration agreements with Sinopharm and JD in Pyrilutamide, laying a solid foundation of Pyrilutamide's commercialization. On 16 Apr, Kintor entered into a strategic collaboration with Sinopharm, the largest pharmaceutical and medical device distributor in China. According to the agreement, both sides will cooperate in channel development, customer services and product marketing of Pyrilutamide. On 20 Jun, Kintor entered into a framework agreement with Beijing Jingdong Healthcare Company (JD Healthcare, 京东健康) on collaboration of the sales and marketing of Pyrilutamide on the online pharmaceutical retail platform JD.com Pharmacy (yiyaojd.com) operated by JD Healthcare.

Figure 33: Pyrilutamide China sales forecasts

Pyrilutamide sales projection (China)	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E
Pyrilutamide sales in Androgenetic Alopecia (RMB mn)	76	177	301	561	866	1,217	1,609	2,046	2,524
Probability of success for Androgenetic Alopecia	*50%*	*50%*	*50%*	*50%*	*50%*	*50%*	*50%*	*50%*	*50%*
Pyrilutamide sales in Acne Vulgaris (RMB mn)	0	56	126	211	310	423	550	689	842
Probability of success for Acne Vulgaris	*20%*	*20%*	*20%*	*20%*	*20%*	*20%*	*20%*	*20%*	*20%*
Risk-adjusted Pyrilutamide sales in China (RMB mn)	**38**	**99**	**176**	**323**	**495**	**693**	**915**	**1,161**	**1,430**

Source: Company data, CMBIS; Note: The revenue forecasts are for the purpose of DCF valuation.

Meanwhile, we expect Pyrilutamide to receive approval from the US FDA for the treatment of Androgenetic Alopecia in 2023E and to receive US FDA's approval for the treatment of Acne Vulgaris in 2024E. We expect Kintor to commercialize Pyrilutamide in the US market with a local partner and to charge 15% royalty income from the sales in the US. Thus, we forecast Pyrilutamide's risk-adjusted royalty income from the US to peak at RMB194mn in 2030E.

Figure 34: Pyrilutamide US royalty income forecasts

Pyrilutamide sales projection (US)	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E
Pyrilutamide sales in Androgenetic Alopecia (RMB mn)	77	273	532	854	1,246	1,561	1,916	2,317
Probability of success for Androgenetic Alopecia	*50%*	*50%*	*50%*	*50%*	*50%*	*50%*	*50%*	*50%*
Pyrilutamide sales in Acne Vulgaris (RMB mn)	0	45	106	182	275	387	519	671
Probability of success for Acne Vulgaris	*20%*	*20%*	*20%*	*20%*	*20%*	*20%*	*20%*	*20%*
Risk-adjusted Pyrilutamide sales in US (RMB mn)	**38**	**146**	**287**	**464**	**678**	**858**	**1,062**	**1,293**
Kintor's % of royalty sharing	*15%*	*15%*	*15%*	*15%*	*15%*	*15%*	*15%*	*15%*
Risk-adjusted royalty income from Pyrilutamide in US (RMB mn)	**6**	**22**	**43**	**70**	**102**	**129**	**159**	**194**

Source: Company data, CMBIS; Note: The revenue forecasts are for the purpose of DCF valuation.

GT90001 (ALK-1): an anti-angiogenesis antibody

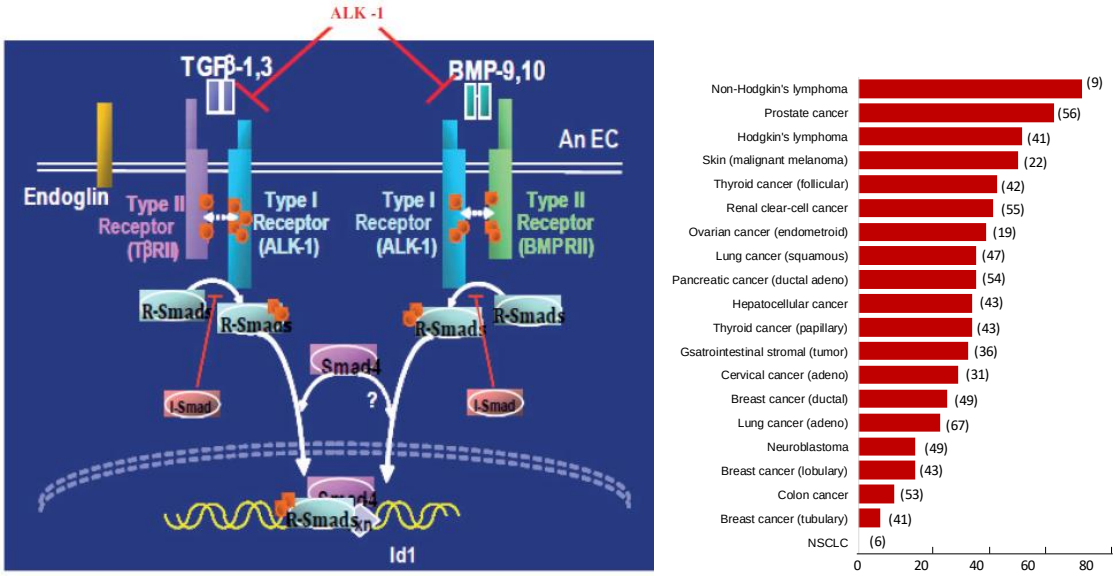
GT90001 is a potential FIC AKL-1 antibody

ALK-1 is a new biological target spot globally. The Company obtained an exclusive global licence from Pfizer to develop and commercialize GT90001 (ALK-1) for oncological indications. GT90001 has the potential to become the first fully human monoclonal antibody therapeutic drug for ALK-1 target. Kintor aims to develop ALK-1 into a better treatment as compared to the second-line standard therapy for metastatic HCC.

ALK-1 is selectively expressed in endothelial cells, especially in tumor vessels. ALK-1 is a fully humanised IgG2 neutralising monoclonal antibody for vascular endothelial cells ALK-1. ALK-1 binds to its ligands BMP9 and BMP10, regulates SMAD, the fusion of Caenorhabditis elegans SMA genes and the Drosophila MAD family of genes, phosphorylation, and promotes stable vascular maturation. ALK-1 can inhibit the growth of tumor vessels and reduce their blood flow and vascularisation by blocking the receptors, thereby slowing down the development of tumors. ALK-1 can also alter the tumor microenvironment.

Conventional cytotoxic drugs have severe side effects including bleeding, hypertension, fatigue, and nausea. However, drugs inhibiting angiogenesis generally have milder side effects. For instance, anti-angiogenic therapies, mainly in the form of inhibitors of VEGF signalling, have been in routine clinical use for years for various malignancies. ALK-1 is a type of anti-angiogenic drug. Anti-angiogenic drugs are the key treatment method for liver cancer and include VEGF inhibitors, such as Avastin, a monoclonal antibody, Axitinib and Sorafenib, which are small molecule drugs, and Sorafenib. ALK-1's signalling pathway may be one of the mechanisms that allow tumours to escape from the inhibitory effects of VEGF inhibitors in patients with advanced solid tumours. ALK-1 signalling may also be a complementary angiogenesis pathway that can be activated upon the development of VEGF resistance.

Figure 35: The MOA of ALK-1 and expression level in tumor vessels of multiple types of cancers



Source: Company data, Cancer Res. 15 Feb 2011; 71(4): 1362-1373

Clinical data indicate preliminary safety and efficacy

Pfizer has completed two phase I clinical trials, one in the US and Italy and the other in South Korea and Japan, for ALK-1 for advanced solid tumors, including HCC, as a monotherapy. As of Jul 2020, Kintor was undergoing phase II clinical trials for ALK-1 as a combination therapy with Nivolumab for metastatic HCC in Taiwan, which is expected to be completed by 2020E.

Kintor has obtained the acceptance notice for ALK-1's MRCT for both monotherapy and combination therapies from the CDE and will determine the strategies for ALK-1's MRCT based on the clinical trial results for ALK-1's combination therapy with Nivolumab in Taiwan. Kintor may seek to explore the opportunity to conduct clinical trials for additional combination therapies for ALK-1 with other PD-1s.

The results of phase I trial carried out in US and Italy by Pfizer supported ALK-1 as a novel approach to antiangiogenic therapy, with manageable safety profile and single-agent, anti-tumour activity in patients with advanced solid tumors. In the dose-finding study, three (6.8%) patients with advanced HCC, renal cell carcinoma or non-small cell lung cancer achieved a partial response (PR), and 12 (27.3%) patients had stable disease (SD) across dose levels. In the expansion cohort, 12 (50%) patients achieved SD, which lasted for 12 weeks or more in seven (29.2%) patients. The median time to progression was three months. For nine (38%) patients, the duration of treatment with ALK-1 exceeded the duration of the last prior systemic therapy.

Similarly, the results of another phase I trial carried out in South Korea and Japan by Pfizer demonstrated that mono therapy of ALK-1 exhibited preliminary anti-tumour activity in patients with solid malignancies, and particularly HCC. Nine (25.7%) of the 35 evaluable patients had clinical benefit with SD for 12 weeks or more across dose levels and tumour diagnosis, including HCC, colorectal cancer, non-small-cell lung cancer, renal cell carcinoma, and GIST. Four (44.4%) of the nine patients with HCC had SD for 12 weeks or more. The median progression free survival (PFS) was 1.4 months in all 35 patients and 1.8 months in the nine patients with HCC.

Phase II trial clinical trials in combination with Nivolumab in Taiwan (ongoing):

Kintor received an approval from MOHW on 13 Nov 2018 for conducting phase II clinical trials for ALK-1 in Taiwan, and is currently undergoing multi-centre, open-label, two-stage phase II clinical trials for ALK-1's combination therapy with Nivolumab, a PD-1 mAb, for metastatic HCC in Taiwan. Kintor planned to enrol 20 patients in total (six in stage one, if dose de-escalation cohorts are not required, and 14 in stage 2). In the event that dose de-escalation cohorts are opened, six or 12 more patients will be enrolled for the de-escalation cohorts.

Stage one focused on determining safety and tolerability of the combination therapy in patients with HCC. The starting dose cohort involved six patients who had failed Sorafenib treatment, each receiving a combination of 7.0 mg/kg of ALK-1 and 3.0 mg/kg of Nivolumab.

As of 24 Apr 2020, there were two grade 3 AE (decreased platelets count) and one SAE (renal disorder) that possibly related to ALK-1. Dose de-escalation cohorts were not required. As there were no DLT in stage one, the trial will be continued and enter the expansion period (Stage 2) after the Safety Monitoring Committee meeting. This stage further assesses anti-tumour activities of ALK-1 in combination with Nivolumab in patients with preliminary metastatic HCC.

ALK-1 has potential to become standard 2L therapy for mHCC

For patients with HCC who were intolerant to VEGF inhibitor Sorafenib or experiencing disease progression after treatment with Sorafenib, there are currently no standard second-line treatment options, and the results of clinical trials of several targeted therapies have so far been disappointing. The response rate of Sorafenib as a first-line treatment of HCC is only 2%, while in the second-line

treatment of HCC, the response rate of ramucirumab, brivanib and everolimus is 7%, 10% and 8%, respectively.

As of Jul 2020, there was no approved drug using the same mechanism of action or the same target as ALK-1, though there was one drug candidate (Dalantercept in combination with Sorafenib) undergoing phase I/II clinical trials in the US that had the same mechanism of action as ALK-1.

Figure 36: The summary of ALK-1 and other competing drugs for HCC

	ALK-1	Sorafenib	Lenvatinib
Indication	Metastatic HCC	HCC	HCC
MOA	Activin receptor-like kinase-1, an antagonistic mediator of lateral transforming growth factor-beta/ALK-5 signalling.	Sorafenib interacts with multiple intracellular and cell surface kinases, and several of these kinases are considered to inhibit angiogenesis.	Lenvatinib is a receptor tyrosine kinase (RTK) inhibitor. Lenvatinib also inhibits other RTKs that have been implicated in pathogenic angiogenesis, tumour growth, and cancer progression.
Safety	Subjects found the maximum tolerance dosage of 10.0 mg/kg safe and were tolerant. Overall, treatment-related grade 3/4 adverse events were reported in eight patients (33.3%).	Grade 3 adverse reactions were reported in 39% of patients, and grade 4 adverse reactions were reported in 6% of patients.	Adverse reactions led to dose reduction or interruption in 62%. Treatment discontinuation due to adverse reactions occurred in 20% of patients.
Efficacy	12 (50%) patients achieved SD. The median time to progression was three months. For nine (38%) patients, the duration of treatment with ALK-1 exceeded the duration of the prior systemic therapy.	Median OS in the sorafenib group was 10.7 months. Median time to progression (TTP) was 5.5 months. The DCR was 43%.	The median OS for patients treated with lenvatinib was 13.6 months. Median PFS was 7.3 months, and median TTP was 8.9 months. In addition, Lenvatinib demonstrated significantly higher ORR of 44%.

Source: Company data, Frost & Sullivan, CMBIS

Expect RMB0.5bn risk-adjusted peak sales from ALK-1

We expect ALK-1 to receive approval from the NMPA for treatment of HCC in 2024E and to reach RMB484mn risk-adjusted peak sales in China by 2030E. Kintor has obtained an exclusive global license from Pfizer for development of ALK-1. Kintor plans to conduct MRCT for ALK-1 globally, and has obtained the acceptance notice for ALK-1's MRCT for both monotherapy and combination therapies from the CDE. Nevertheless, we conservatively only factored in market potential in China for ALK-1 in our model.

Figure 37: Pyrilutamide China sales forecasts

ALK1 sales projection (China)	2024E	2025E	2026E	2027E	2028E	2029E	2030E
ALK1 sales in HCC in China (after royalties paid to Pfizer, RMB mn)	406	761	1,265	1,446	1,457	1,539	1,612
Probability of success for HCC	*30%*	*30%*	*30%*	*30%*	*30%*	*30%*	*30%*
Risk-adjusted ALK1 sales in China (RMB mn)	**122**	**228**	**380**	**434**	**437**	**462**	**484**

Source: Company data, CMBIS; Note: The revenue forecasts are for the purpose of DCF valuation.

Detorsertib (GT0486): a potential FIC 2nd-generation mTOR inhibitor

Detorsertib for metastatic solid tumors

Detorsertib (GT0486) is an inhibitor of the PI3K/mTOR signalling pathway and a second generation mTOR inhibitor. Kintor is currently developing Detorsertib primarily for the treatment of metastatic solid tumours such as breast cancer, prostate cancer and liver cancer.

Kintor received the IND approval from the NMPA for Detorsertib in patients with solid tumors in Aug 2019 and aims to commence patient enrolment in 3Q20E.

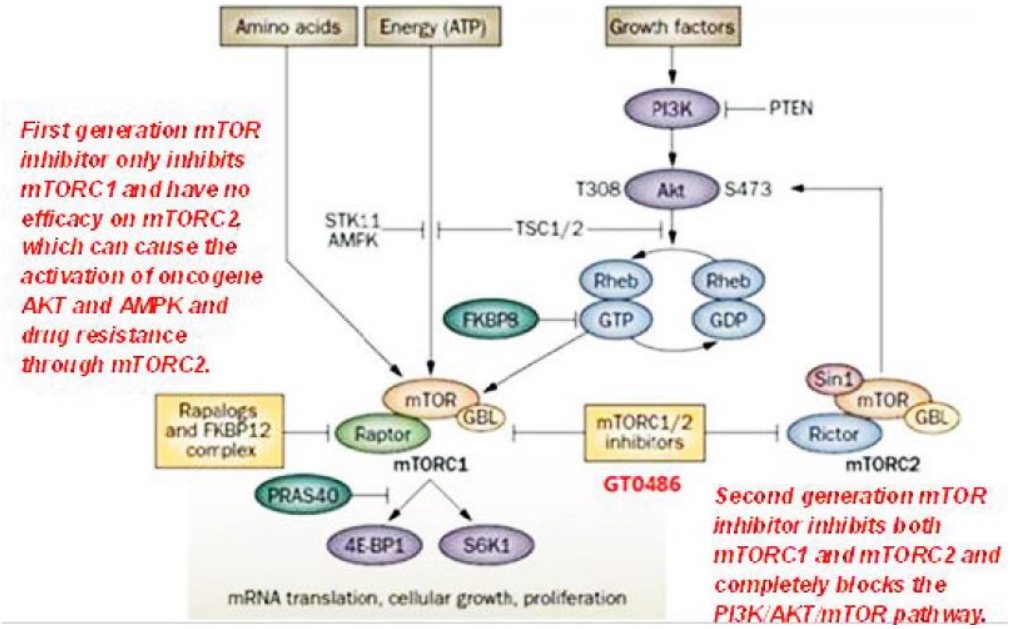
The PI3K/AKT/mTOR signalling pathway helps regulate various cellular functions including cell proliferation, differentiation, apoptosis and nutrition. It is the most commonly activated oncogenic signalling pathway in cancer cells and has been clinically proven to be a crucial mechanism that causes a variety of cancers develop drug resistance or metastasis. In recent years, the most important junctions of the downstream of PI3K have been found to be AKT and mTOR.

Compared with the first generation mTOR inhibitors such as Sirolimus, Temsirolimus and Everolimus, which are derivatives of Rapamycin, GT0486 not only selectively inhibits mTORC1 but also selectively inhibits mTORC2. mTORC1 inhibitors Temsirolimus (indications: advanced renal cell carcinoma) and Everolimus (indications: advanced breast cancer, neuroendocrine tumours, advanced renal cell carcinoma, etc.) have been approved for clinical treatment. However, the first generation mTOR inhibitors only inhibit mTORC1 but have no efficacy on mTORC2, which can cause the activation of the MEK/MAPK pathway and the PI3K/Akt pathway and decrease of negative feedback inhibition. Such effect can cause the reduction of anti-tumour action, which can lead to dissatisfactory results of clinical treatment.

The second generation mTOR inhibitors, especially the mTORC1/mTORC2 dual inhibitors, compete with the catalytic site of mTOR for ATP and highly selectively inhibit mTORC1 and mTORC2, which can overcome the shortcomings of the first generation mTOR inhibitors. Second generation mTOR inhibitors can reduce the toxicity of dual inhibition of PI3K/mTOR without affecting the feedback pathway such as AKT, which have a greater therapeutic advantage than the single-targeted mTOR inhibitors.

GT0486 has the same mechanism as other clinical second generation mTOR inhibitors such as AZD2014 and CC223, but shows better in vitro and in vivo efficacy. Therefore, GT0486 has the potential to be developed into a new generation of anti-tumour innovative drug targeting mTOR kinase. As of Jul 2020, there was no mTORC1/mTORC2 dual inhibitors that had been approved for marketing.

Figure 38: The MOA of Detorsertib



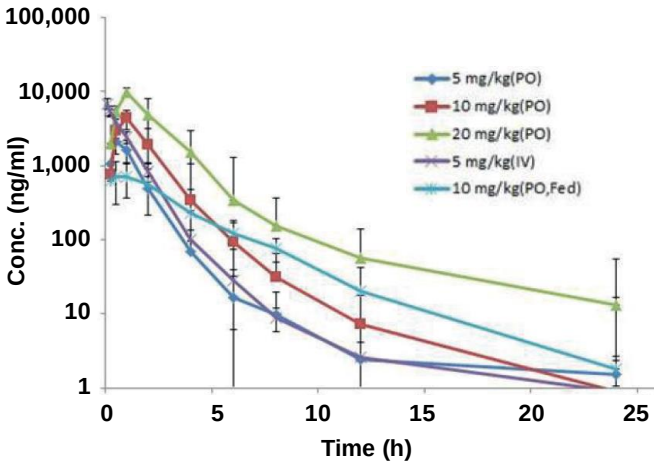
Source: Company data, CMBIS

High druggability based on promisting pre-clinical data

According to pre-clinical studies, including biological activity, pharmacodynamics, pharmacokinetics, absorption, distribution, metabolism, and excretion and efficacy (in vivo and in vitro), Detorsertib has shown very high druggability.

Pharmacokinetics experiments showed that Drug exposure of Detorsertib for animal dose at the highest non-severely toxic dose level is more than two times higher than the drug exposure required for optimal efficacy with a T_{max} of 0.5-1.0 hour, a $T_{1/2}$ of 0.9-2.5 hours and absolute bioavailability of 44.1-74.4%.

Figure 39: Mean blood concentration of single dose of Detorsertib in beagle dogs

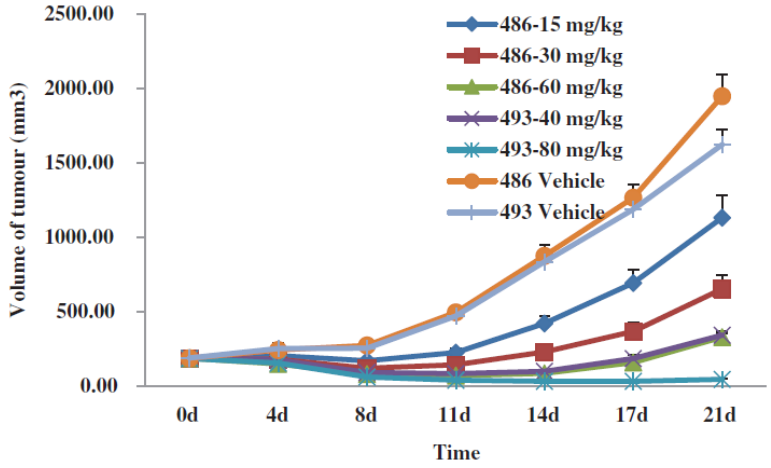


Source: Company data, CMBIS

In vivo pharmacology studies demonstrated that Detorsertib can inhibit tumour growth in glioma (U87MG model), prostate cancer (PC-3 model) and liver cancer (Huh-7 model) in a dose-dependent

manner, with the optimal effective dose at 30 mg/kg in mice. The test results from 60 different tumor cells conducted by the National Cancer Institute (NCI) show that GT0486 has different degrees of inhabitation for leukaemia cells, non-small lung cancer cell, colon cancer cells, central nervous system cancer cells, melanoma cells, ovarian cancer cells, renal cancer cells, prostate cancer cells, and breast cancer cells.

Figure 40: GT0486 and GT0493 (a mTORi) showed significant dose-dependent tumor inhibitory activity



Source: Company data, CMBIS

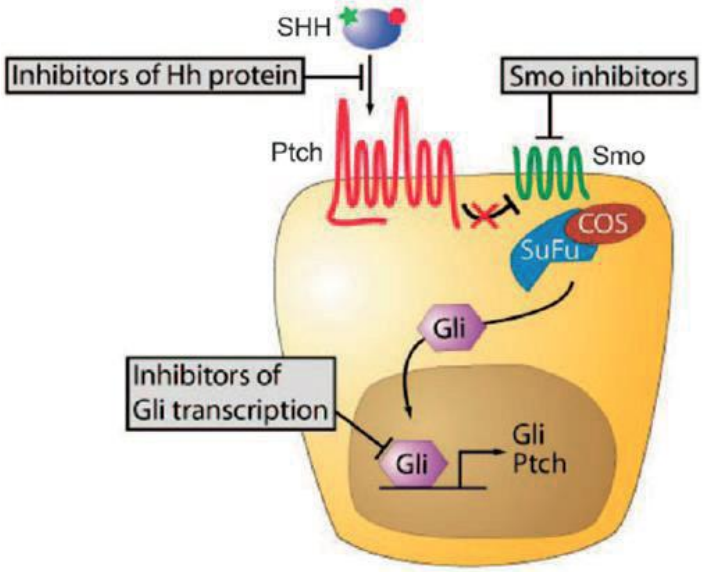
Other early stage pipelines

GT1708F (Hedgehog/SMO Inhibitor)

GT1708F is a hedgehog signal transduction pathway SMO (a Class Frizzled G protein-coupled receptor that is a component of the hedgehog signalling pathway) inhibitor. Kintor is currently developing GT1708F primarily for the treatment of leukaemia and BCC. Kintor has obtained IND approval from NMPA for GT1708F in Feb 2020. Kintor plans to conduct two phase I clinical trials in China simultaneously for the treatment of solid tumours and hematological tumours and targets to commence patient enrolment in 3Q20E. Kintor also aims to submit IND for GT1708F to the US FDA in 2020E.

The hedgehog signal transduction pathway is a signal transduction pathway that classically controls the development of embryos. It is important in the development and differentiation of cells post embryonic development and embryogenesis. Since the discovery of hedgehog signal transduction pathway, accumulated data have demonstrated that this pathway plays an important role in cancer initiation and progression. Activating mutations in the hedgehog pathway have been identified in medulloblastoma and in rhabdomyosarcoma. In addition, deregulation of this pathway modulates tumor microenvironment in other cancers, including breast, lung, liver, stomach, colon and prostate cancers. These results reveal that hedgehog signaling pathway is an attractive therapeutic pathway for oncology indications.

Figure 41: The MOA and blocking molecule sites of Hedgehog signal pathway



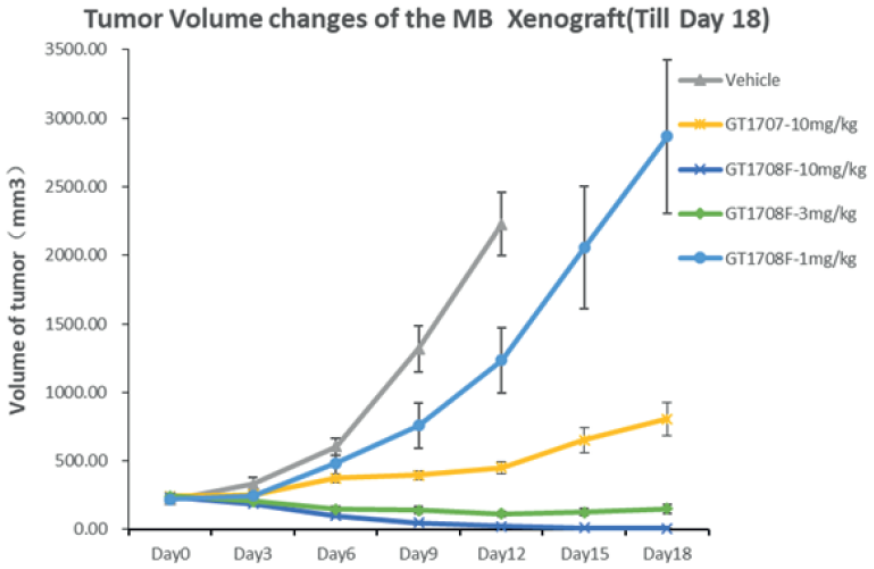
Source: Company data, CMBIS

GT1708F is a highly active SMO inhibitor. Both in vitro and in vivo pharmacodynamic studies confirmed that GT1708F inhibits the activity of SMO protein.

In vitro results showed that the activity of GT1708F inhibiting the Hedgehog signaling pathway was 0.11 nM, and the inhibitory activity of the positive control GT1707 (Vismodegib, GDC-0449 Roche) was 10.98 nM, indicating that GT1708F can significantly inhibit the activity of the Hedgehog signaling pathway.

In vivo studies showed that GT1708F inhibited tumor growth in both medulloblastoma and basal cell carcinoma. The effective dose for medulloblastoma nude mice was 6 mg/kg/day. The effective dose for basal cell carcinoma nude mice was 12.5 mg/kg/day.

Figure 42: *In vivo* tumor growth inhibitory effect of GT1708F in mice xenograft model



Source: Company data, CMBIS

SMO inhibitors have been approved for the treatment of basal cell tumours and acute myeloid leukaemia in overseas markets, but there was no SMO inhibitors commercialised in China as of Jul 2020. Through pre-clinical analysis of the drug metabolism, efficacy and safety results of GT1708F and the comparison of mechanism and safety performance with the commercialised clinical drugs (such as GDC-0449 and LED225) and other drugs under development, GT1708F has better pharmacological effects and can pass the blood-brain barrier.

Other discovery phase projects

In addition to the drug candidates described above, Kintor is also in the discovery phase for the development of other potential drug candidates, including an IDO inhibitor as a novel immune oncology agent, an AR degrader for the treatment of prostate cancer and a c-Myc inhibitor for the treatment of blood cancer.

In Jun 2020, Kintor released the preclinical results of GT19077 (a novel c-Myc/Max PPI inhibitor) at AACR conference which was recognized as a “Late-Breaking Research”. C-Myc was considered undruggable and GT19077 has the potential to become a First-in-Class c-Myc/Max PPI inhibitor in the world.

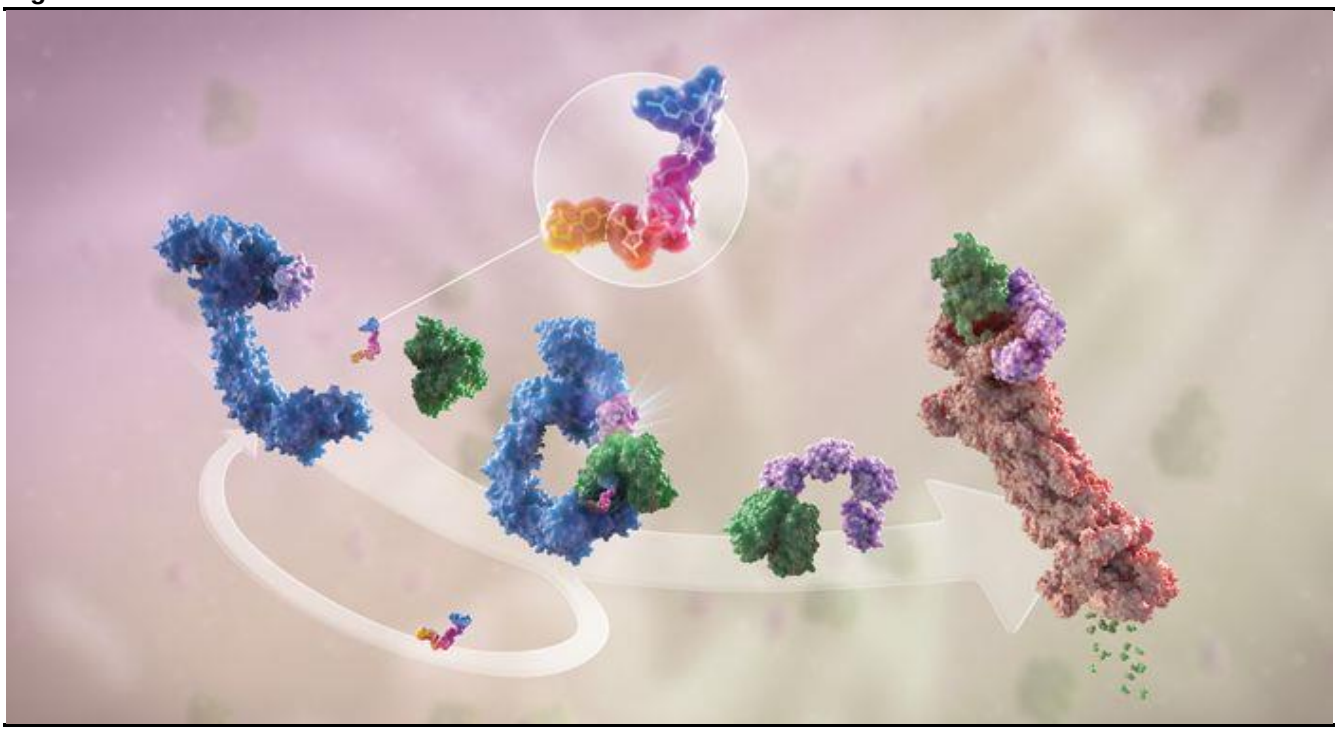
Pionner in PROTAC technology

Kintor is currently employing the Proteolysis targeting chimera (PROTAC) technology with an aim to develop the AR degrader and other degraders for cancer patients with unmet medical needs globally.

PROTAC is a novel drug discovery technology platform for targeting and/or degrading undruggable and oncogene mutant drivers that drive the resistance to the targeted therapies.

As part of this natural protein disposal system, a group of proteins, called E3 ligases, naturally recognize mutated and misfolded proteins, or proteins that are no longer needed, and tag them with ubiquitin protein molecules. This process of tagging specific proteins directs the target proteins to the proteasome, a large complex that degrades the protein into small peptides. PROTAC protein degraders work by recruiting an E3 ligase to tag the target protein so that it can be identified for ubiquitination and degradation by the proteasome. After the protein is degraded, the drug is released to continue its degradation mission.

Figure 43: MOA of PROTAC



Source: Arvinas, CMBIS

According to the article “PROTACs: great opportunities for academia and industry” published at Nature in Dec 2019, as new and promising techniques, PROTACs show great opportunities for the following aspects.

First, PROTACs have demonstrated a particular sensitivity to drug-resistant targets. Notably, the dramatic developments of kinase inhibitors have been achieved in the past few decades that have providing amazing therapeutic effects in clinical practice and have greatly prolonged the patient survival. Regrettably, fast growing of resistance to these kinase inhibitors was onset after the first euphoric period, resulting in consequent relapse, especially for some patients with advanced cancer. Alterations in the drug target, activation of prosurvival pathways and ineffective induction of cell death, etc. contributed to the acquirements of drug resistance. Since PROTACs influence protein function by eliminating the entire target to delete the whole functions of the targets, including enzymatic activity and nonenzymatic functions, PROTACs can address the potential resistance faced by current therapeutic treatments. In addition, PROTACs are less susceptible to increases in target expression

and mutations in the target protein because only low doses of PROTACs are needed because they act catalytically.

Second, PROTACs have the potential to target undruggable targets. As is well known, there are only 20–25% of all protein targets are currently in research for drug discovery. The remaining protein targets are still unexplored. The focus on making more potential drug targets accessible is increasing, which has been sped up by PROTACs due to their unique mode of action motion.

Third, PROTACs can influence the nonenzymatic function by degrading the whole protein. Traditional small-molecule drugs generally exert their functions by eliminating the enzymatic activity of their targets. For instance, inhibition of FAK though modulation of FAK kinase activity has not been successful in clinical studies. PROTACs offer the possibility to simultaneously block the kinase signaling and scaffolding capabilities of FAK. Thus, PROTACs could expand the druggable space and control protein enzymatic and non-enzymatic functions that are not easily addressed by traditional small-molecule inhibitors.

Many other advantages are presented by PROTACs. For instance, PROTACs afford better selectivity compared with traditional inhibitors. Ibrutinib can bind a series of BTK homologs, including BTK, ITK, and TEC, while PROTACs derived from ibrutinib only degrade BTK.

Last but not least, PROTACs may present new and interesting biology as a chemical knock-down approach in a fast and reversible way. Traditionally, animal models are constructed by genetic modification mechanisms, such as RNA interference, transcription activator-like effector nucleases (TALEN) and CRISPR-Cas9 genome editing. However, these approaches have failed to achieve acute and reversible changes, which makes the research more challenging due to the long duration and high cost of genetic modifications, particularly in nonhuman primates. PROTACs are a chemical knockdown approach of targeted proteins in a novel, fast and effective way to generate protein depletion models.

Figure 44: Comparison of PROTACs with other therapeutic modalities

	Small Molecule	Monoclonal Antibody	SiRNA	CRISPR	PROTAC
Intracellular Target	Yes	No	Yes	Yes	Yes
Systemic Deliver	Yes	Yes	No	Yes	Yes
Tissue Penetration	Yes	Poor	Poor	Yes	Yes
Target Protein with Scaffolding Function	No	Yes	Yes	Yes	Yes
Eliminates Pathogenic Proteins	No	No	Yes	Yes	Yes
Oral Bioavailability	Yes	No	No	No	Yes
Ease of Developing High Potency/Selectivity	Poor	Yes	Yes	Yes	Yes
Catalytic MOA	No	No	Yes	Yes	Yes

Source: Arvinas, CMBIS

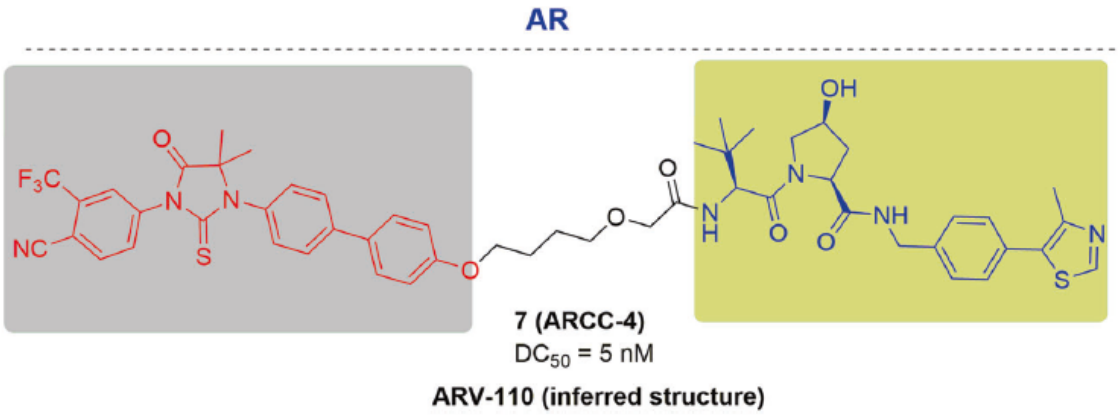
PROTACs have been widely explored around the world with degraders of 42 targets published. These degraders not only outperformed in cancer diseases but also in immune disorders, viral infections and neurodegenerative diseases.

In Mar 2019, Arvinas' AR degrader, ARV-110, for the potential treatment of mCRPC entered into clinical trials, becoming globally the first targeted protein degrader entering into clinical phase. ARV-

110 exhibited high potency of degrading both AR and AR mutants after oral administration. ARV-110 could degrade 95–98% of the AR in a variety of cell lines commonly used in prostate cancer studies.

In 2020 ASCO meeting in May 2020, Arvinas announced updated Phase I Data demonstrating clinical activity of ARV-110 in tatients with mCRPC following enzalutamide and/or abiraterone (NCT03888612). A total of 18 patients with mCPRC who previously received at least two anticancer therapies participated in the study. Prior to enrollment, 12 patients underwent enzalutamide and abiraterone therapy, and 14 underwent chemotherapy. The patients were stratified into four ARV-110 dosing groups: 35 mg (n = 3), 70 mg (n = 4), 140 mg (n = 8), and 280 mg (n = 3). Grade 4 elevated aspartate transaminase/alanine transaminase (AST/ALT) and acute renal failure were observed in one patient in the 280 mg dosing group who was concurrently taking rosuvastatin. A second patient taking rosuvastatin experienced a grade 3 elevation in AST/ALT. Concurrent rosuvastatin therapy was subsequently prohibited. Of the 15 patients evaluable for prostate-specific antigen (PSA) response, 2 patients in the 140 mg dosing group achieved confirmed declines of more than 50%. Both patients were previously treated with enzalutamide and abiraterone, chemotherapy, bicalutamide, and radium-223. The first patient had two androgen receptor mutations associated with enzalutamide resistance. According to the investigators, the second patient experienced an unconfirmed partial response.

Figure 45: Representative PROTACs degrading drug-resistant AR



Source: Sig Transduct Target Ther 4, 64 (2019), CMBIS

Kintor has accumulated extensive data and knowledge about the biology of ARs through the research conducted to develop Proxalutamide, which, in turn, has enhanced the Company's expertise and capabilities to develop next-generation AR degraders. AR degraders are considered a natural progression from AR inhibitors such as Proxalutamide, and have the potential to become a new generation of treatment for prostate cancers. Kintor is in the discovery phase for the development of AR degraders for the treatment of prostate cancer and other AR-related diseases.

Overview of prostate cancer

Current therapies and limitations for prostate cancer

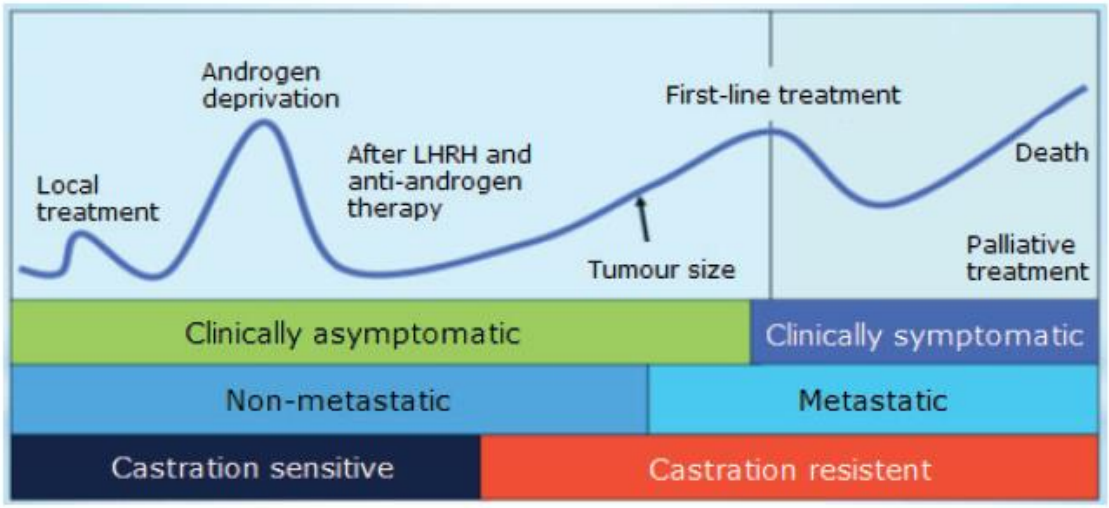
Prostate cancer is one of the top 10 most common cancer types by the number of new cases in both the US and globally, while in China, prostate cancer is the 11th most common cancer type in terms of new cases in 2018. The growth rate of prostate cancer from 2014 to 2018 in terms of new cases is the second highest among the 10 most common cancer types in China, and is the highest among the 10 most common cancer types globally. Prostate cancer is one of the most common cancer types in the male population with over 1.2mn new cases globally in 2018, ranking the second in terms of the number of new cases in male cancer patients worldwide. The number of new prostate cancer cases in China reached 102,500 in 2018, ranking the sixth in terms of the number of new cases in male cancer patients in China.

Since the 1940s, endocrine therapy and chemotherapy have been the optimised option for first-line therapies of prostate cancer. According to the latest National Comprehensive Cancer Network ("NCCN") guidelines for the treatment of prostate cancer, several combination therapies, which are all endocrine-based therapies, are also recommended for the treatment of prostate cancer.

Patients with prostate cancer that have relapsed after local therapy or that have spread distantly usually respond to androgen deprivation therapy (ADT); however, despite receiving ADT, most of these patients eventually experience disease progression and develop castrate-resistant prostate cancer (CRPC) within a median of 18 to 24 months from receiving ADT.

CRPC is prostate cancer that progresses clinically, radiographically or biochemically, despite castrate levels of serum testosterone (<50 ng/dL) in the patient. A substantial majority of CRPC will be developed into metastatic CRPC (mCRPC).

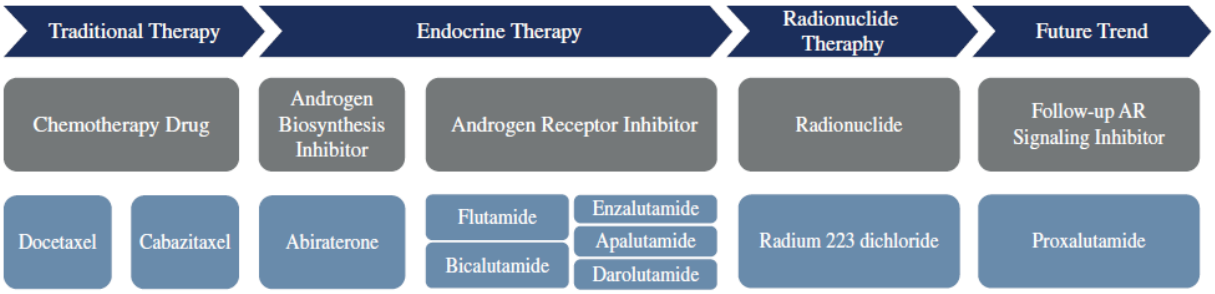
Figure 46: Therapies that are typically used in different stages of prostate cancer



Source: Drug Management of Prostate Cancer: 2010., CMBIS

Treatment options are currently limited for CRPC patients. Common therapies include chemotherapies and endocrine therapies, which can only retard progression by several months, rather than prevent the progression of the disease. New therapeutic drugs are in an advanced stage of clinical testing in order to fill the need for improvement in CRPC treatments.

Figure 47: Treatment Evolution for CRPC

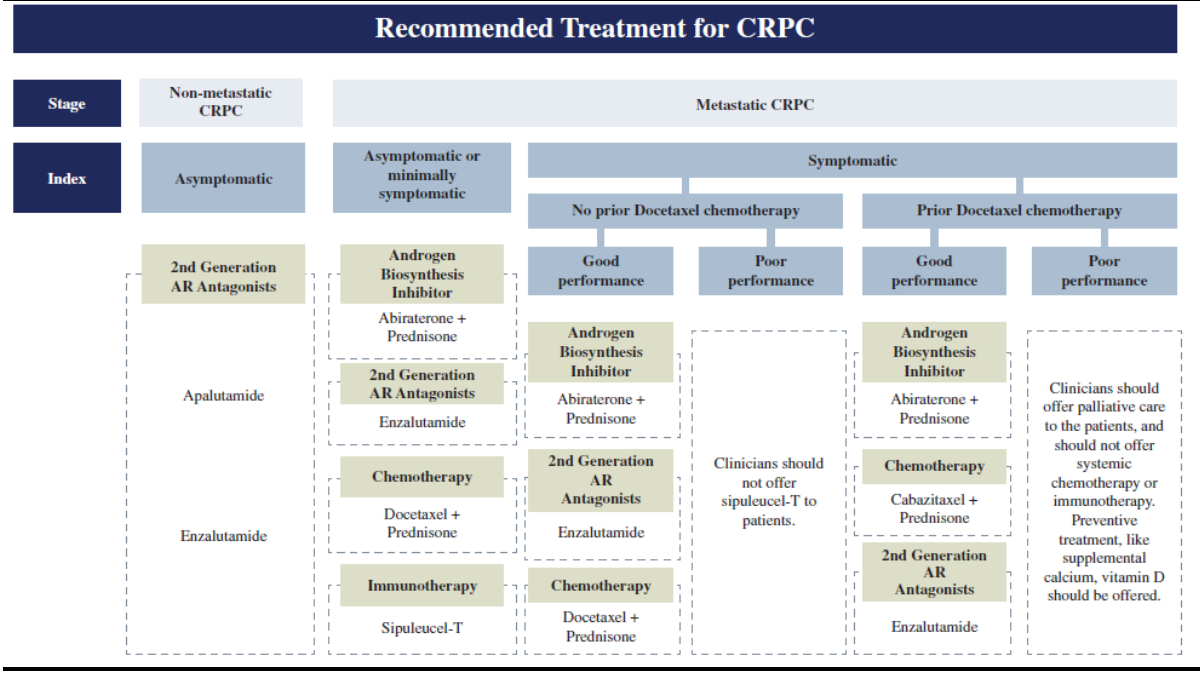


Source: F&S, CMBIS

The current treatments for mCRPC can be broadly classified into four categories based on their mechanism of action: 1) anti-microtubule drugs such as Docetaxel (多西他赛) and Cabazitaxel (卡巴他赛); 2) CYP17A enzyme irreversible inhibitors such as Abiraterone; 3) AR antagonists such as Enzalutamide; and 4) radiation therapies such as Xofigo.

According to American Urology Association ("AUA") guidelines, AR antagonists are recommended for treatment of nmCRPC and mCRPC.

Figure 48: Recommended CRPC treatment in American Urology Association (AUA) guidelines



Source: F&S, CMBIS

Docetaxel acts mainly through the suppression of microtubule dynamic assembly and disassembly. As a chemotherapy drug, docetaxel has shown relatively more serious side effects, including allergic reactions, myelosuppression, digestive tract reactions, fluid retention and angioedema, cardiovascular toxicity, fatigue and tearing.

Abiraterone acetate blocks the synthesis of androgen from testes, adrenal glands and prostate. Abiraterone must be used in combination with steroids such as prednisone and, as a result, may not be suitable for the patients for whom steroid use is not recommended. In addition, some studies have

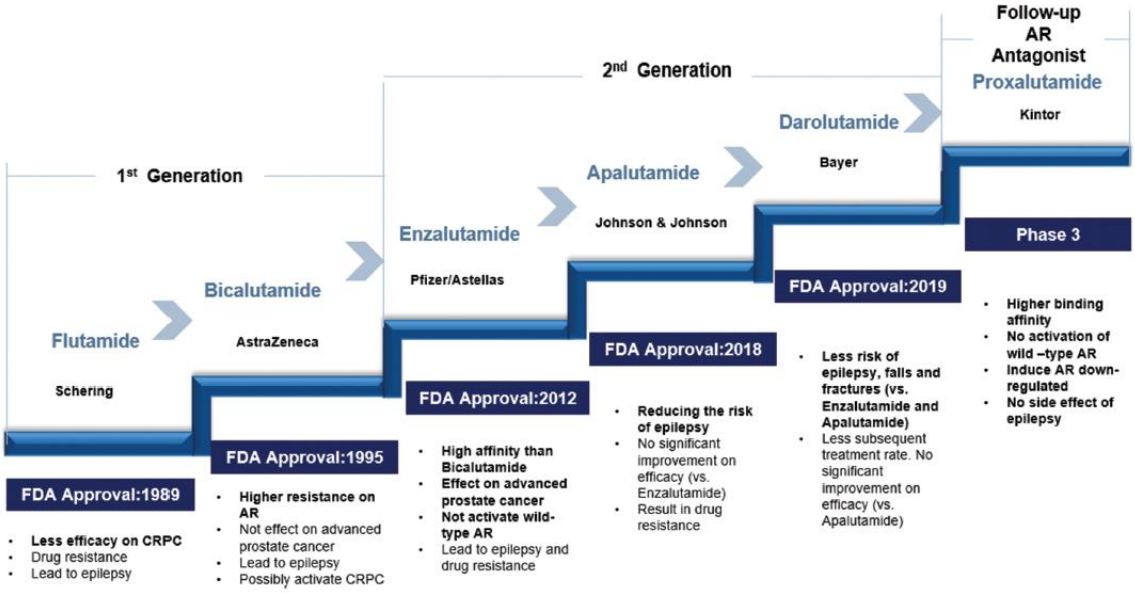
shown that abiraterone provides a lower survival rate for patients in worse physical condition, so it should be used in early stages before the physical condition of the patients begin to decline.

Xofigo (Radium 223 dichloride), an alpha particle-emitting pharmaceutical, is a radiotherapeutic drug that was only approved by the US FDA for the treatment of mCRPC with bone metastases. It may not be suitable for the treatment of mCRPC patients with visceral metastases.

Enzalutamide is a second-generation AR signalling inhibitor that blocks androgen binding to ARs and prevents nuclear translocation of the ligand-receptor complex and recruitment of coactivators. Enzalutamide has clinically revealed central nervous system side effects of seizure (癫痫). In addition, Enzalutamide eventually leads to drug resistance.

There are currently two generations of AR antagonists. First generation AR antagonists include Flutamide and Bicalutamide. Second generation AR antagonists include Enzalutamide, Apalutamide and Darolutamide. Kintor's Proxalutamide is a potential best-in-class second generation AR antagonists with superior safety and potent efficacy.

Figure 49: Evolution of AR antagonists



Source: F&S, CMBIS
Notes:
(1) Nilutamide is not listed here because nilutamide and bicalutamide are all structure optimisation products of Flutamide.
(2) Among 2nd generation AR antagonists, Enzalutamide is approved for mCRPC and nmCRPC, Apalutamide and Darolutamide are approved for nmCRPC.

In addition to the current treatments above, there are drug candidates under development for targeted therapies of selected PARP 1/2 inhibitors, which also act on BRCA1 and BRCA2 mutations. Olaparib is a poly (ADP-ribose) polymerase (PARP) inhibitor. It selectively binds to and inhibits PARP, inhibiting PARP-mediated repair of single strand DNA breaks. Olaparib (Lynparza) has been approved by the US FDA for recurrent germline BRCA-mutated ovarian cancer and gBRCAm and HER2- metastatic breast cancer, but has not been approved for the treatment of patients with mCRPC. Olaparib may be effective in men with mCRPC who have a homologous recombination repair gene mutation (HRRm) and have failed prior treatment with new hormonal anticancer agents (second generation anti-androgen agent).

In ESMO 2019 Congress, the results of a Phase III trial (NCT02987543) for Olaparib vs Enzalutamide and Abiraterone for 2L+ mCRPC with Homologous Recombination Repair (HRR) gene alterations were released. Cohort A included patients with alterations in BRCA1, BRCA2 or ATM; Cohort B patients with any one of 12 other HRR alterations. Patients were randomized (2:1) to Olaparib (300 mg bid) or physician's choice (pcNHA) of Enzalutamide (160 mg/d) or Abiraterone (1000 mg/d + Prednisone 5 mg bid). There were 4,425 men screened, leading to 245 randomized to Cohort A, and 142 to Cohort B (of which 65.6% had prior Taxane chemotherapy). Olaparib was associated with improved rPFS compared to Enzalutamide/Abiraterone among patients in Cohort A (7.39m vs 3.55 m, HR 0.34, 95% CI 0.25-0.47). Furthermore, patients in Cohort A had a confirmed ORR of 33.3% for Olaparib compared to 2.3% for Enzalutamide/Abiraterone.

Figure 50: Phase III trial for Olaparib vs Enzalutamide and Abiraterone for 2L+ mCRPC

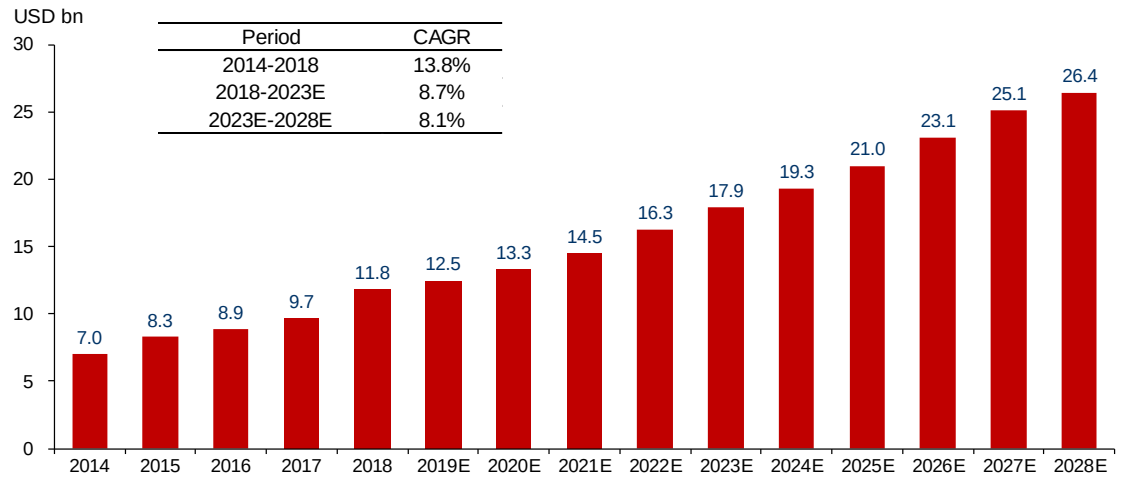
	Cohort A (alterations in BRCA1, BRCA2, or ATM)		Cohorts A+B (alterations in any qualifying HRR gene)	
	Olaparib N = 162	pcNHA N = 83	Olaparib N = 256	pcNHA N = 131
rPFS (Median, months)	7.39	3.55	5.82	3.52
% progression-free at 12 months	28.11	9.4	22.13	13.47
Hazard ratio (95% CI)	0.34 (0.25 to 0.47)	0.49 (0.38 to 0.63)		
P value	<0.0001	<0.0001		
Confirmed ORR (RECIST v1.1 + PCWG3 by BICR) %	33.3	2.3	21.7	4.5
Odds ratio (95% CI)	20.86 (4.18 to 379.18)	5.93 (2.01 to 25.40)		
P value	<0.0001	0.0006 (nominal)		
Time to pain progression (Median, months)	NR	9.92	NR	NR
Hazard ratio (95% CI)	0.44 (0.22 to 0.91)	0.64 (0.35 to 1.21)		
P value	0.0192	0.1490 (nominal)		
OS (interim) (Median, months)	18.5	15.11	17.51	14.26
Hazard ratio (95% CI)	0.64 (0.43 to 0.97)	0.67 (0.49 to 0.93)		
P value	0.0173	0.0063 (nominal)		

Source: ESMO 2019, CMBIS

Global prostate cancer market

According to F&S, the global prostate cancer market grew at a CAGR of 13.8% from US$7.0bn in 2014 to US$11.8bn in 2018. F&S forecasts the global prostate cancer market to grow at a CAGR of 8.7% from 2018 to US$17.9bn in 2023E and at a CAGR of 8.1% from 2023E to US$26.4bn in 2028E.

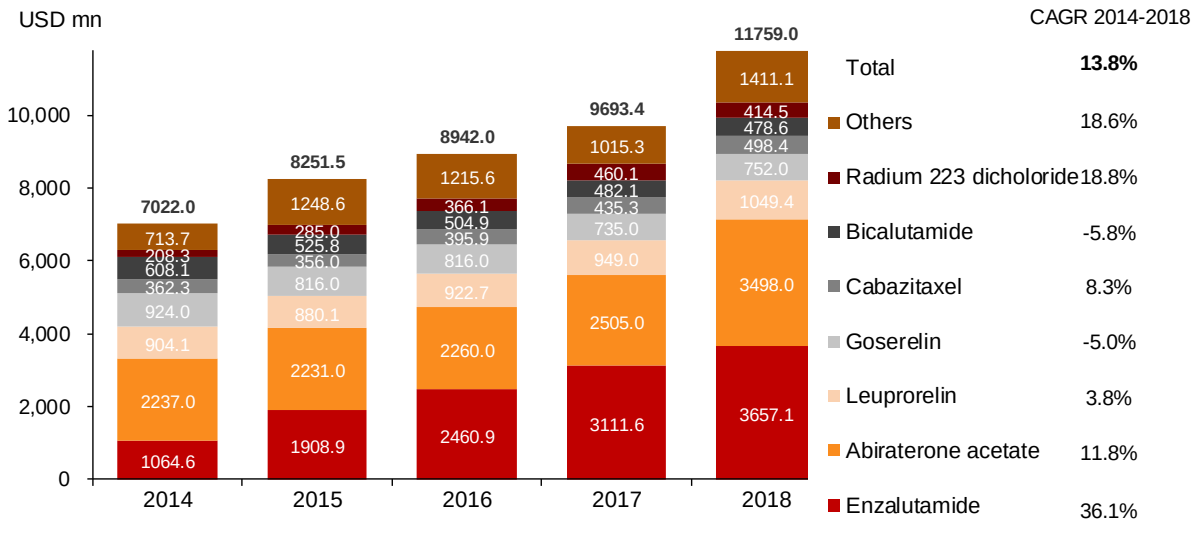
Figure 51: Global prostate cancer drug market size (2014-2028E)



Source: F&S, CMBIS

Enzalutamide, abiraterone and leuprorelin are the top three drugs in the global prostate cancer market by revenue in 2018, which in total accounted for 69.8% of the overall global prostate cancer market in terms of revenue. The growth rate of Enzalutamide's and Radium 223 dichloride's market size during the past five years outperformed the other drugs, with a CAGR of 36.1% and 18.8% from 2014 to 2018, respectively.

Figure 52: Breakdown of global prostate cancer drug market size by generic name (2014-2018)



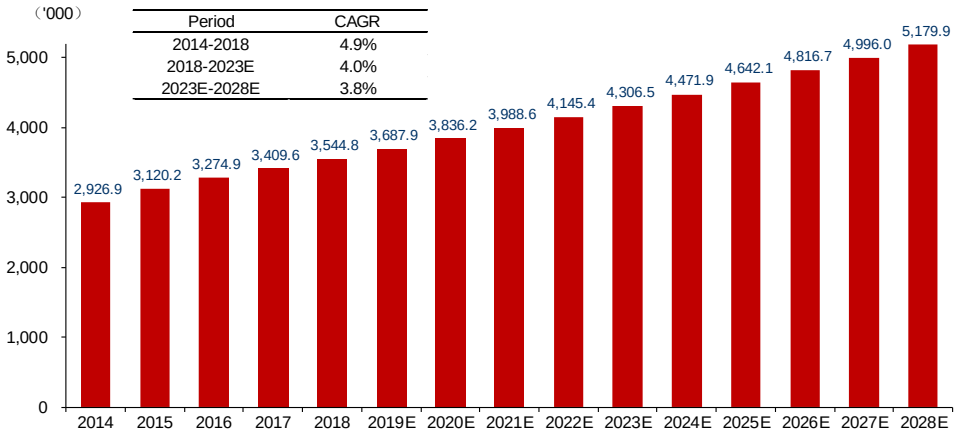
Source: F&S, CMBIS

US prostate cancer market

According to F&A, there is a higher prevalence of prostate cancer in the US compared to China, and the total number of prostate cancer patients in the US grew at a CAGR of 4.9% from 2.9mn in 2014 to

3.5mn in 2018. The total number of prostate cancer patients in the US is expected to grow at a CAGR of 4.0% from 2018 to 4.3mn in 2023E and at a CAGR of 3.8% from 2023E to 2028E, reaching 5.2mn in 2028E.

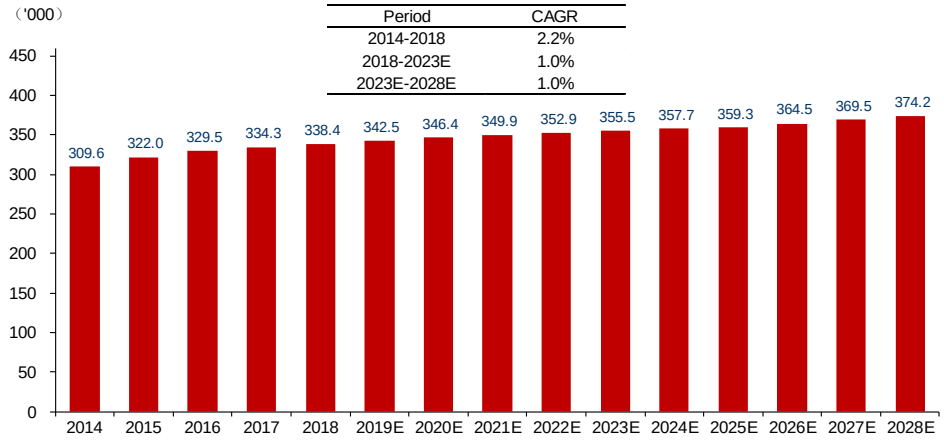
Figure 53: Total number of prostate cancer patients in the US (2014-2028E)



Source: F&S, CMBIS

F&S estimates that the total number of mCRPC patients in the US grew at a CAGR of 2.2% from 309,600 in 2014 to 338,400 in 2018. This trend is expected to continue, with the number of CRPC patients in the US expected to grow at a CAGR of 1.0% from 2018 to 355,500 in 2023E and at a CAGR of 1.0% from 2023E to 374,200 in 2028E.

Figure 54: Total number of mCRPC patients in the US (2014-2028E)



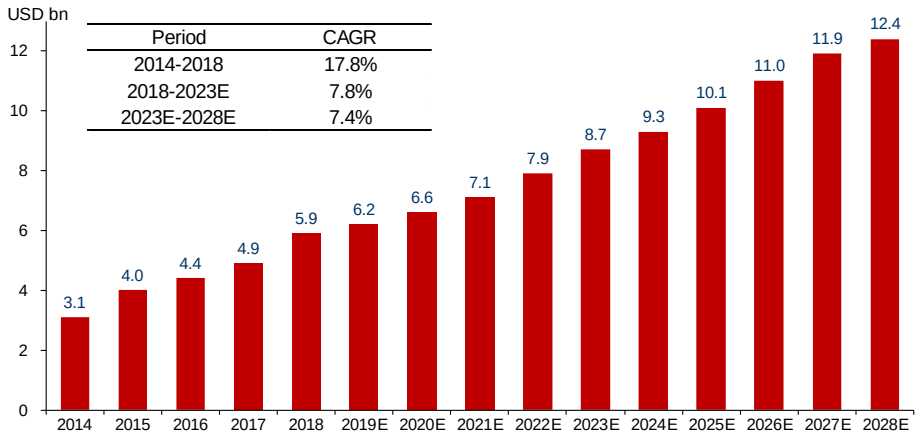
Source: F&S, CMBIS

According to F&S, the number of patients receiving second-line therapies in the US increased at a CAGR of 2.6% from 306,800 in 2014 to 339,600 in 2018. The growth in the number of prostate cancer patients receiving second-line therapies in the US is expected to decelerate to a CAGR of 1.3% from 2018 to 2023E and a CAGR of 1.2% from 2023E to 2028E, reaching 383,800 in 2028E. This slowdown is expected to primarily result from the decreasing number of patients who are diagnosed with advanced stage prostate cancer as a result of early stage screening and the development of treatments that are effective in the early stages of prostate cancer.

F&S estimates that the US prostate cancer drug market is the largest market for prostate cancer drugs globally and accounted for 50.6% of the global prostate cancer market in 2018. The US prostate cancer drug market grew at a CAGR of 17.8% from US$3.1bn in 2014 to US$5.9bn in 2018, and is expected

to grow at a CAGR of 7.8% from 2018 to US$8.7bn in 2023E and at a CAGR of 7.4% from 2023E to US$12.4bn in 2028E. The slowdown in growth from 2023E to 2028E is expected to be primarily due to the patent expiration of Enzalutamide in 2027E in the US and in 2026E in Europe and Japan.

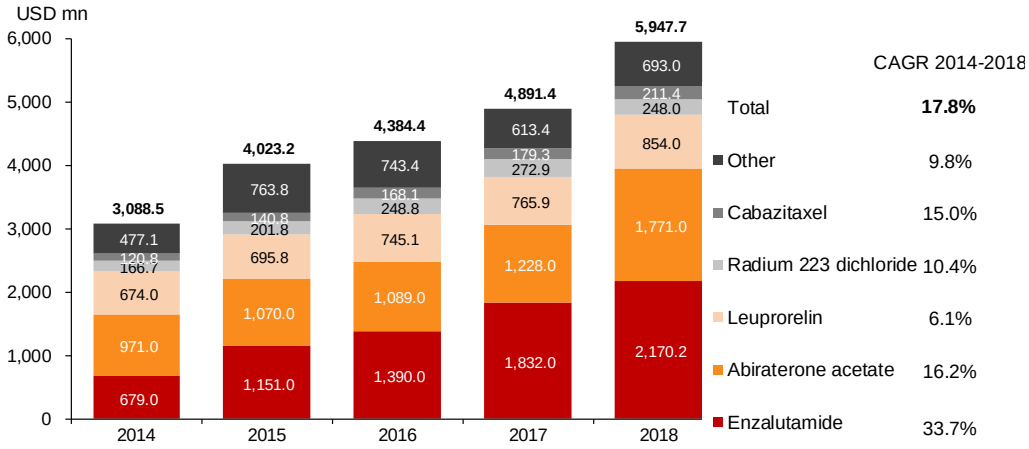
Figure 55: US prostate cancer drug market size (2014-2028E)



Source: F&S, CMBIS

Similar to the global prostate cancer market, in the US, Enzalutamide, Abiraterone and Leuprorelin were the top three prostate cancer drugs by revenue in 2018 and accounted for 80.6% of the total US market in terms of revenue. In terms of revenue growth over the past five years, Enzalutamide and Abiraterone outperformed other drugs with a CAGR of 33.7% and 16.2%, respectively, from 2014 to 2018.

Figure 56: Breakdown of the US prostate cancer drug market size by generic name (2014-2018)

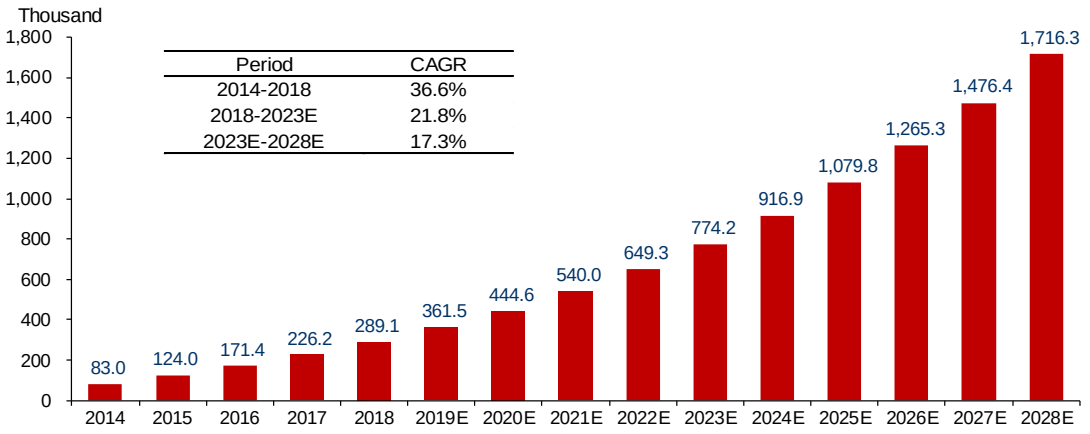


Source: F&S, CMBIS

China prostate cancer market

According to F&S, driven by the increasing number of new prostate cancer cases and increased survival rates of prostate cancer patients, the total number of prostate cancer patients in China grew at a CAGR of 36.6% from 83,000 in 2014 to 289,100 in 2018. This trend is expected to continue, with the number of prostate cancer patients in China expected to grow at a CAGR of 21.8% from 2018 to 774,200 in 2023E and at a CAGR of 17.3% from 2023E to 1,716,300 in 2028E.

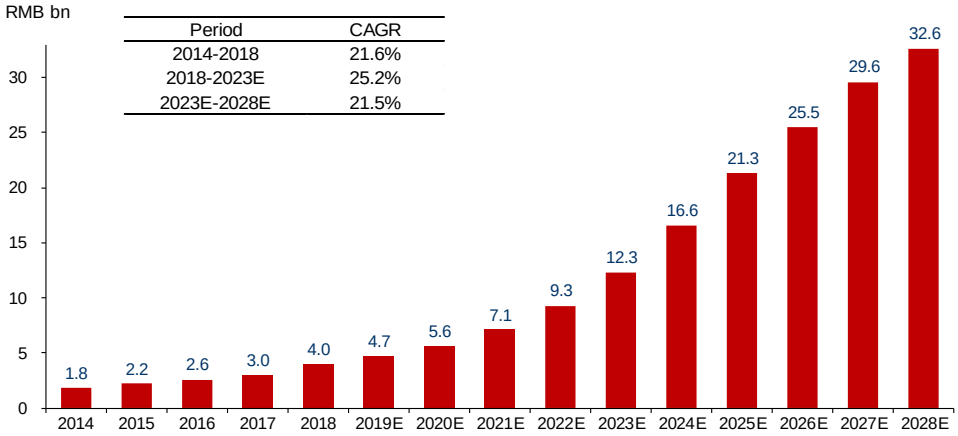
Figure 57: Total number of prostate cancer patients in China (2014-2028E)



Source: F&S, CMBIS

According to F&S, the growth in the prostate cancer drug market in China will be mainly driven by 1) a growing number of newly diagnosed prostate cancer patients in the next 10 years resulting from the increased use of PSA screening technology; 2) the inclusion of prostate cancer drug such as abiraterone in NRDL which is expected to boost drug sales; and 3) the continuous launch of new drugs such as Enzalutamide and Proxalutamide which will promote market growth.

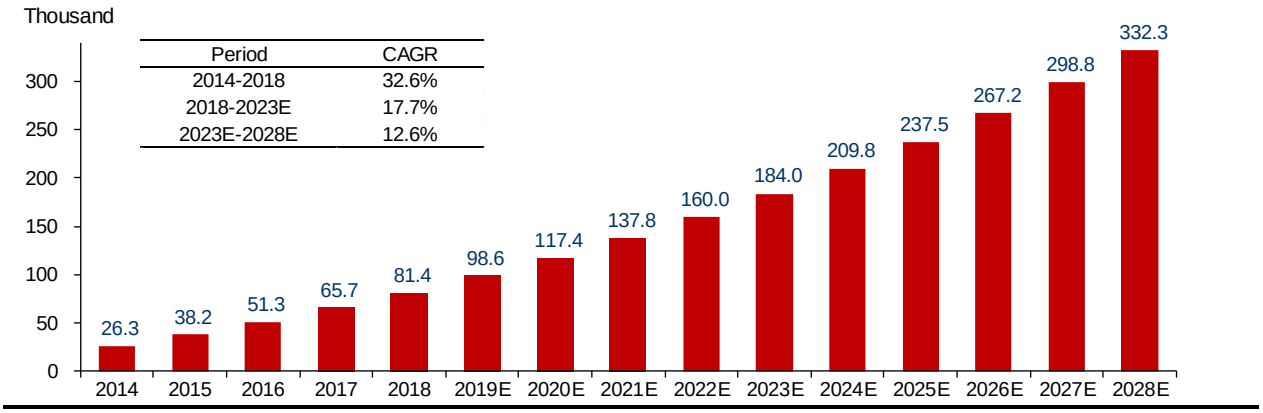
Figure 58: China prostate cancer drug market size (2014-2028E)



Source: F&S, CMBIS

According to F&S, the total number of mCRPC patients in China grew at CAGR of 32.6% from 26,300 in 2014 to 81,400 in 2018. This trend is expected to continue, according to F&S, with the number of mCRPC patients in China expected to grow at a CAGR of 17.7% from 2018 to 184,000 in 2023E and at a CAGR of 12.6% from 2023E to 332,300 in 2028E.

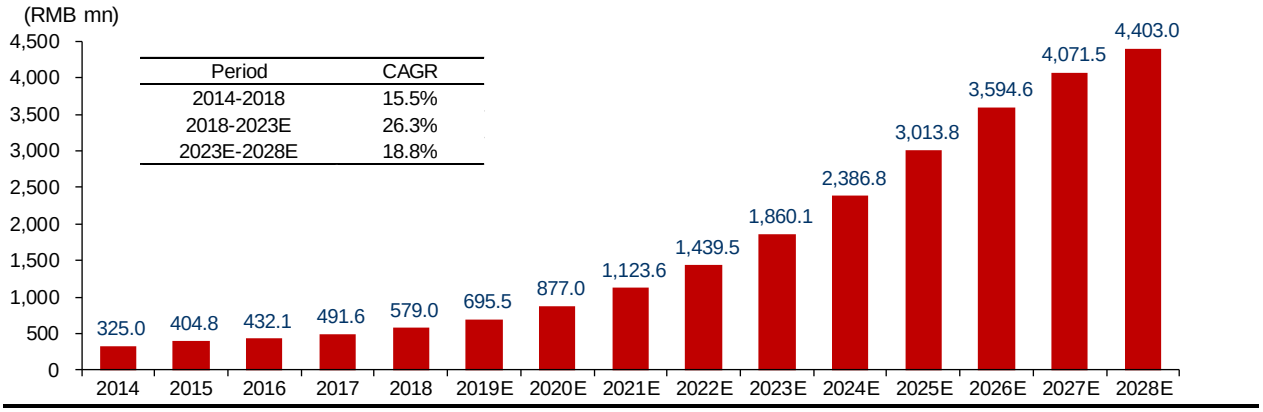
Figure 59: Total number of mCRPC patients in China (2014-2028E)



Source: F&S, CMBIS

The primary first-line treatment for mCRPC is Abiraterone and Enzalutamide. With the inclusion of Abiraterone into the NRDL and national centralised procurement, the economic burden of using Abiraterone was lowered and the number of Abiraterone users is expected to increase.

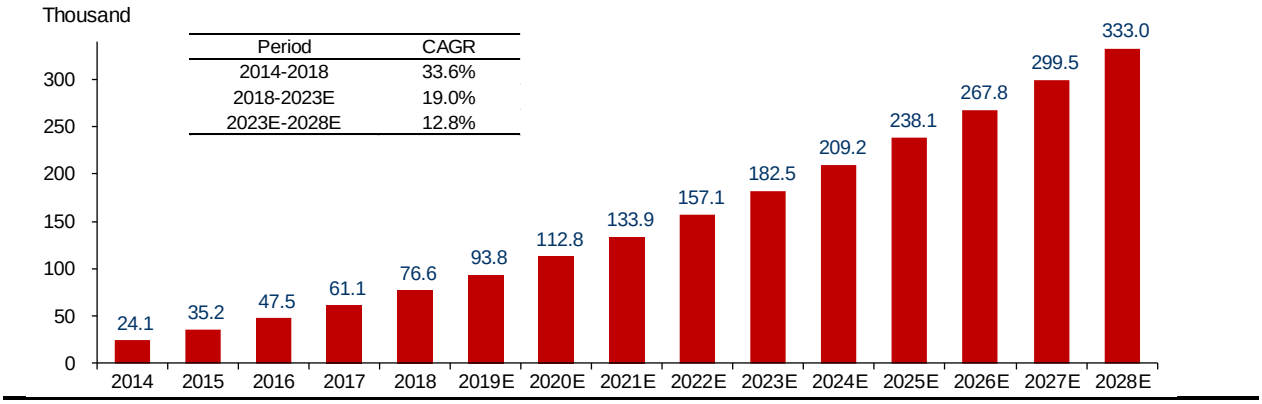
Figure 60: Market size of first-line treatment of mCRPC in China (2014-2028E)



Source: F&S, CMBIS

Second-line therapies refer to therapies that are given when the initial therapies do not work or stop working. The number of patients receiving second-line therapies for prostate cancer increased at a CAGR of 33.6% from 24,100 in 2014 to 76,600 in 2018, and is expected to increase at a CAGR of 19.0% to 182,500 in 2023E and at a CAGR of 12.8% from 2023E to 333,000 in 2028E. The increasing number of patients receiving second line therapies may relate to the emergence of new anti-cancer drugs, such as small molecule targeted drugs, which offer more choices for patients, according to F&S.

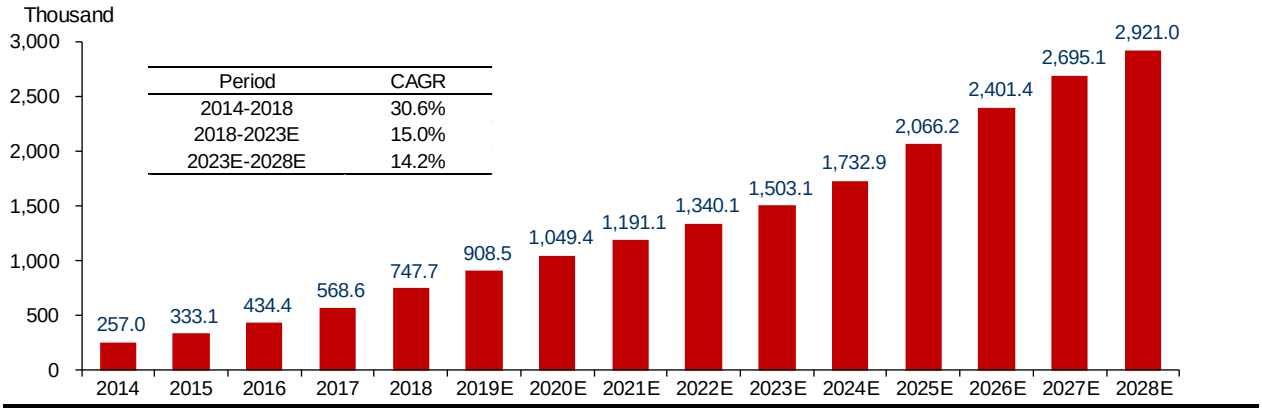
Figure 61: Number of later stage patients taking second line treatment in China (2014-2028E)



Source: F&S, CMBIS

Between 2014 and 2018, the market size of second-line treatment for mCRPC grew from RMB257.0mn to RMB747.7mn, at a CAGR of 30.6%. Chemotherapy has become the major choice for second-line treatment of mCRPC, and the market size is expected to grow to RMB2,921.0mn in 2028E.

Figure 62: Market size of second-line treatment of mCRPC in China (2014-2028E)

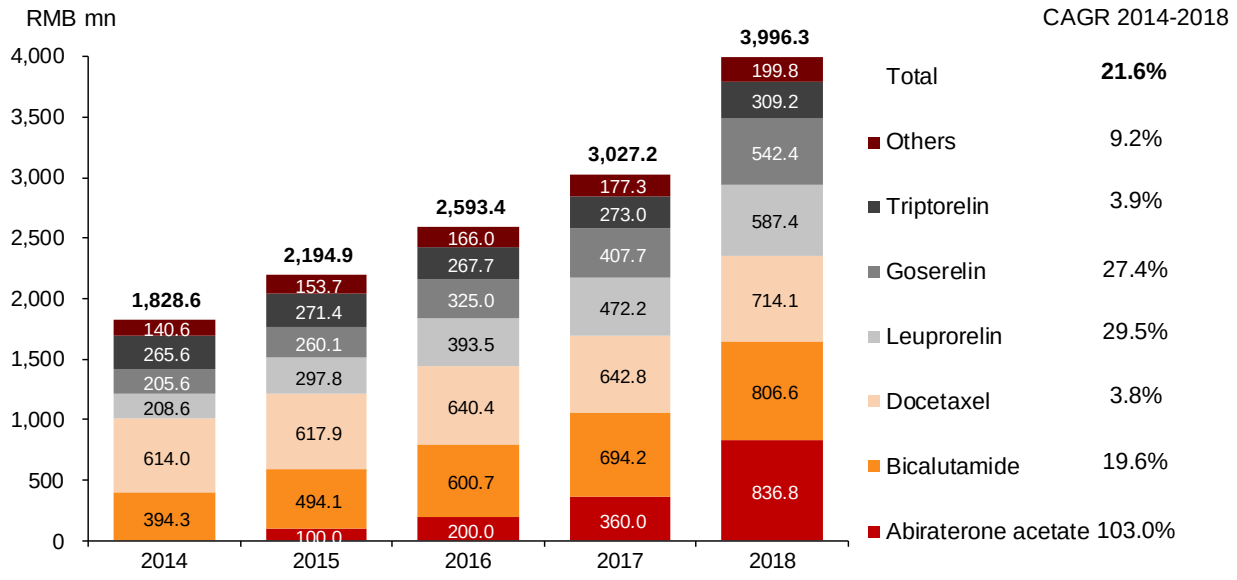


Source: F&S, CMBIS

According to F&S, China's prostate cancer drug market is concentrated that the top six generic categories accounted for 95.0% of the RMB3,996.3mn in revenue generated in China's prostate cancer drug market in 2018.

Abiraterone is the largest generic drug segment and generated revenue of RMB836.8mn, or 20.9% of the total China prostate cancer drug market, in 2018. The revenue generated by abiraterone as a percentage of total revenue generated in the prostate cancer drug market has increased significantly since 2015, when it was approved for use in China. Abiraterone was also added to China's NRDL in 2017.

Figure 63: Breakdown of China prostate cancer drug market size by generic name (2014-2018)



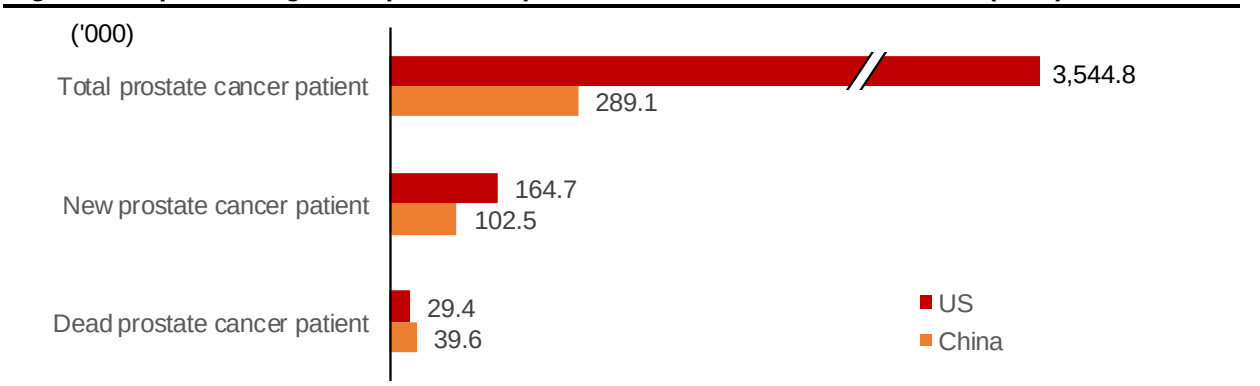
Source: F&S, CMBIS

Different prostate cancer market in US and China

According to F&S, growth of the prostate cancer drug market in China and US can be categorised into several shared factors by both countries: 1) increasing patient pool of prostate cancer in the future due to ageing population, improvement on prostate cancer detection, and other factors such as change of life style leading to irregular sleep and unhealthy diet; 2) unmet medical needs for prostate cancer due to lack of effective and safe medicines. In both countries, especially for China, the options for medication of prostate cancer is circumscribed with few drugs commercially available and common therapies can usually only postpone disease progression by months; 3) advancement of medication.

Compared to China, the US has a higher number of total patients and new cases, as well as lower deaths. Risk factors such as genetic predisposition, diet, lifestyle or environment are associated with the epidemiologic differences. As the majority of prostate cancer cases are diagnosed between the age of 50 and 79, the growth of ageing population has a major influence on the increase of new cases. In addition, China has experienced a shift from traditional high fibre and carbohydrate diets based on vegetables to a westernised diet that centres around red or processed meat with high total and saturated fat content. This change in diet has also caused the increase of new cases in China.

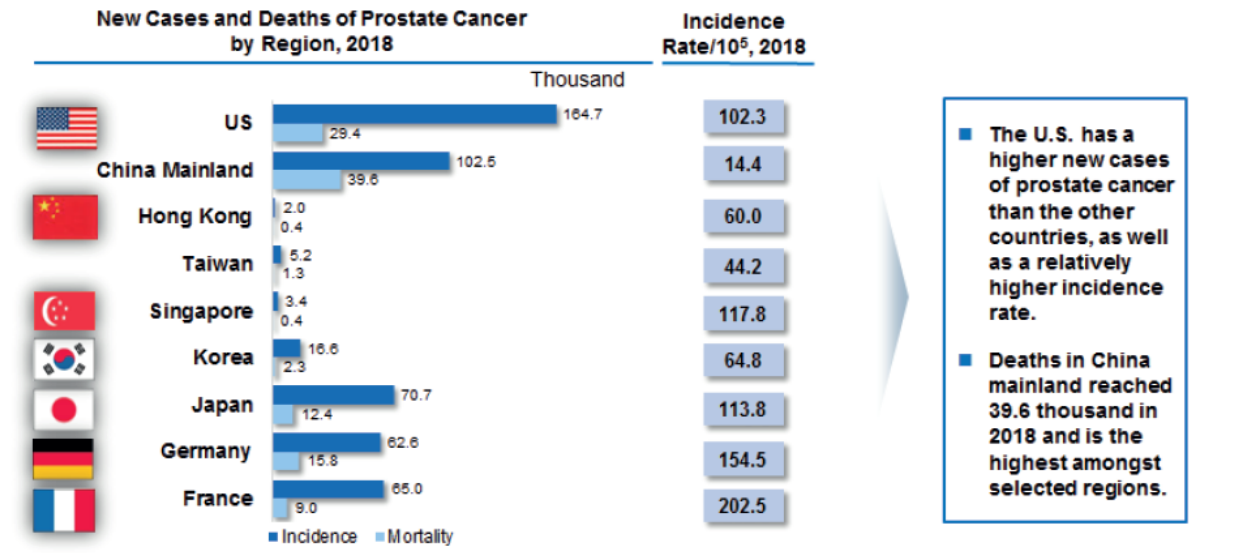
Figure 64: Epidemiologic comparison of prostate cancer in China and the US (2018)



Source: F&S, CMBIS

For Asian countries, the number of new cases in China and Japan was 102,500 and 70,700, respectively, while the number of deaths in China is approximately three times of that in Japan. With more patients in China benefiting from new prostate cancer therapies in the future, we expect death rate will decrease in China.

Figure 65: New cases and deaths of prostate cancer by region (2018)



Source: F&S, CMBIS

According to “China’s guideline for prostate cancer”, thanks to the wide adoption of prostate cancer screening, about 91% of newly diagnosed patients in the US are localized prostate cancer, i.e. at early stage. Localized prostate cancer patients can achieve almost 100% 5-year survival rate after definitive surgeries or radio therapies. However, in China, only around 30% newly diagnosed patients are localized prostate cancer while the majority of newly diagnosed patients are locally advanced prostate cancers or metastatic prostate cancers with poor prognosis. With more Chinese people receiving regular prostate cancer screening, we believe the prevalence of prostate cancer will increase fast in China while the prognosis will improve significantly thanks to early diagnosis and early treatment.

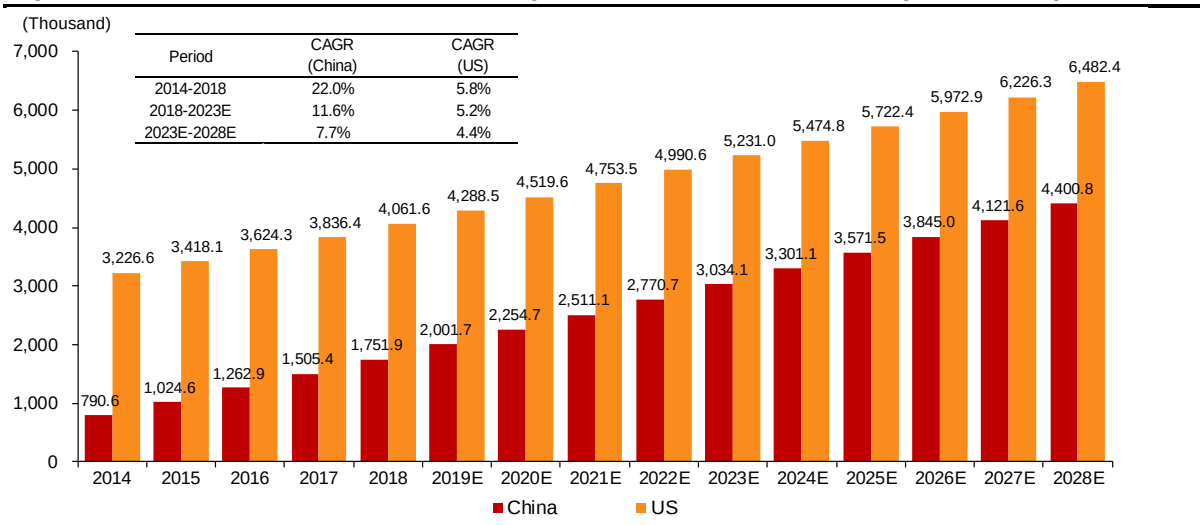
Overview of breast cancer

Breast cancer is the most common cancer in women globally

Breast cancer is the most common type of cancer in women globally in 2018 and occurs most frequently in women aged 50 and over. Breast cancer develops in breast tissue and may present itself as a lump in the breast, a change in breast shape, a dimpling of the skin, fluid coming from the nipple, a newly inverted nipple or a red or scaly patch of skin. Factors that may increase the risk of developing breast cancer include: genetic predisposition (BRCA1 or BRCA2 mutations), oestrogen and progesterone exposure, oral contraceptives or birth control drugs, atypical hyperplasia of the breast, lobular carcinoma in situ, lifestyle factors (such as weight, food, alcohol or physical activity), breast density (dense breast tissue) and family history of breast cancer.

F&S forecasts the total number of breast cancer patients in China to reach 4.4mn by 2028E and the number in the US to reach 6.5mn by 2028E.

Figure 66: Total number of breast cancer patients in China and the US (2014-2028E)



Source: F&S, CMBIS

The frequency of AR expression is significantly different among different molecular phenotypes of breast cancer. Among these phenotypes of breast cancer, for examples, 91.0% of Luminal A expresses AR, 67.5% of Luminal B expresses AR, 58.7% of HER2+ expresses AR, 31.7% of basal-like carcinoma (mainly TNBC) expresses AR, and 46.1% of other unclassified cancers expresses AR.

Figure 67: AR expression rate in different kinds of breast cancer and their treatment regimen

Classification	AR Expression (%)	Treatment Regimen
Luminal A (ER+ and/or PR+, HER2-, histologic grade 1 or 2)	91.0%	Treated with hormones
Luminal B (ER+ and/or PR+ and HER2+, or ER+ and/or PR- and HER2-, histologic grade 3)	67.5%	Treated with hormones +/- anti-HER2
HER2 (ER-, PR-, HER2+)	58.7%	Treated with anti-HER2
Basal-like (ER-, PR-, HER2-, CK5/6+ and/or EGFR+)	31.7%	Treated with cytotoxic agents
Unclassified (Lacked expression of all five markers)	46.1%	Treated with cytotoxic agents

Source: F&S, CMBIS

The total number of AR+ breast cancer patients in China grew at a CAGR of 22.0% from 611,900 in 2014 to 1,356,000 in 2018. This trend is expected to continue, with the number of AR+ breast cancer

patients in China expected to grow at a CAGR of 11.6% from 2018 to 2,348,400 in 2023E and at a CAGR of 7.7% from 2023E to 3,406,300 in 2028E.

In the US, the total number of AR+ breast cancer patients grew at a CAGR of 5.9% from 2,497,400 in 2014 to 3,143,700 in 2018. This trend is expected to continue, with the number of AR+ breast cancer patients in the US expected to grow at a CAGR of 5.2% from 2018 to 4,048,800 in 2023E and at a CAGR of 4.4% from 2023E to 5,017,400 thousand in 2028E.

Current therapies and limitations for breast cancer

Breast cancer is a cancer that metastasises early. Different molecular diagnostic results often lead to very different prognosis. Therefore, patients who have metastasised breast cancer are typically classified according to their breast cancer gene markers. Currently, the important prognostic factors for breast cancer include oestrogen receptor (ER), progesterone receptor (PR) and HER2, which are clinically treated with the corresponding treatment.

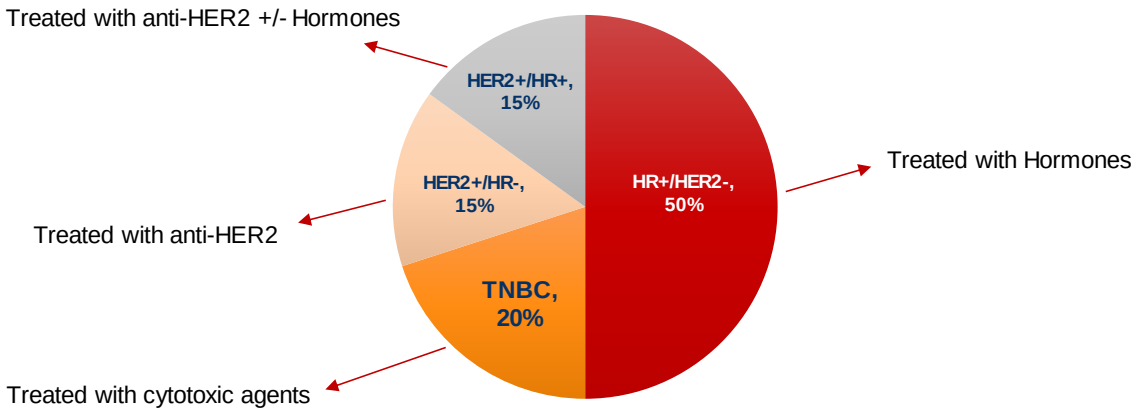
Breast cancer with positive hormone receptor expression (ER+ or PR+ or ER+/PR+) is normally treated with endocrine therapy. The drugs used for such therapy includes oestrogensecreting blocking drugs such as goserelin and leuprolide, oestrogen-synthesis inhibiting drugs such as anastrozole, letrozole and exemestane, and oestrogen-inhibiting drugs such as tamoxifen, raloxifene, toremifene and fulvestrant.

Breast cancers with HER2 gene expression are generally treated with monoclonal antibody inhibitor Herceptin or in combination with chemotherapy. In addition, most patients with metastatic breast cancer eventually develop resistance to Herceptin or drugs used in endocrine therapy. For example, some patients treated with Herceptin develop resistance after 10 months, and Herceptin will eventually stop being effective to almost all patients. Approximately 20% of breast cancer patients receiving endocrine therapy will relapse within 10 years, and almost all patients with advanced breast cancer will develop drug resistance.

Triple Negative Breast Cancer (TNBC) generally grows faster than breast cancers with other genetic backgrounds and TNBC patients are normally treated with chemotherapy. As TNBC lacks a clear drug target, some patients experience poor efficacy from chemotherapy and relapses are likely to occur in a short period of time after surgery. Due to the side effects and poor efficacy of chemotherapy, TNBC has become a difficult field in breast cancer management. According to the NCCN guidelines, the preferred treatment regimens are chemotherapies including single drugs such as anthracycline (Adriamycin), Taxanes (Docetaxel, Paclitaxel and Albumin Paclitaxel) and anti-metabolites (Capecitabine and Gemcitabine) as well as various combinations of these drugs.

Based on published research, TNBC patients account for approximately 20% of all breast cancer patients. The number of TNBC patients receiving first/second line treatment in the US increased at a CAGR of 1.1% from 81.6 thousand in 2014 to 85.3 thousand in 2018, and is expected to increase at a CAGR of 1.0% from 2018 to 89.7 thousand in 2023E and then at a CAGR of 0.9% from 2023E to 93.5 thousand in 2028E.

Figure 68: Treatment for different types of metastatic breast cancer

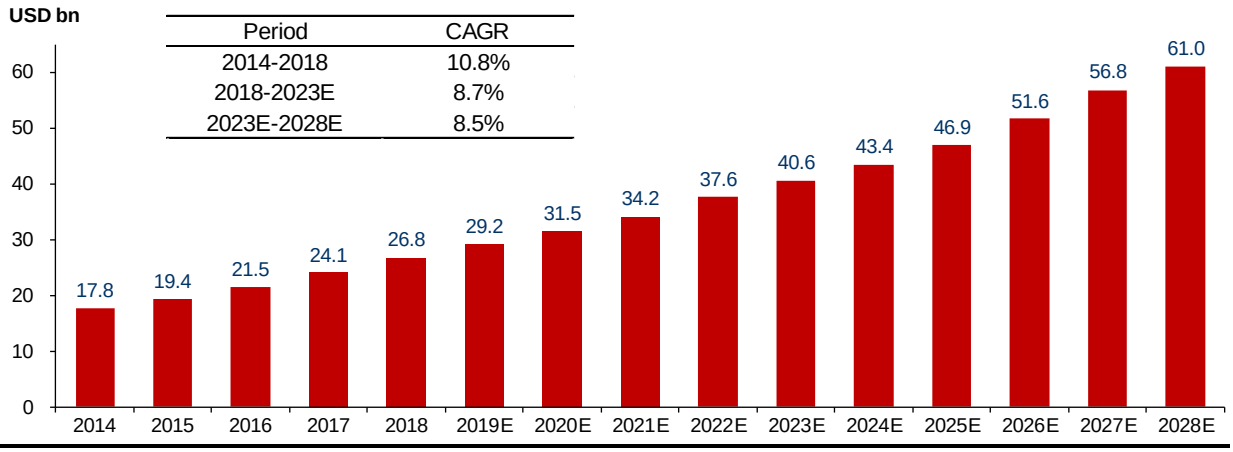


Source: US, EU5, and Japan, Stage IV 1L Patients MDVN internal analysis; CancerMPact ® Patient Metrics and Treatment Architecture. Kantar Health

Breast cancer market

F&S forecasts the global breast cancer drug market to grow from US$26.8bn in 2018 to US$40.6bn in 2023E, indicating an 8.7% CAGR.

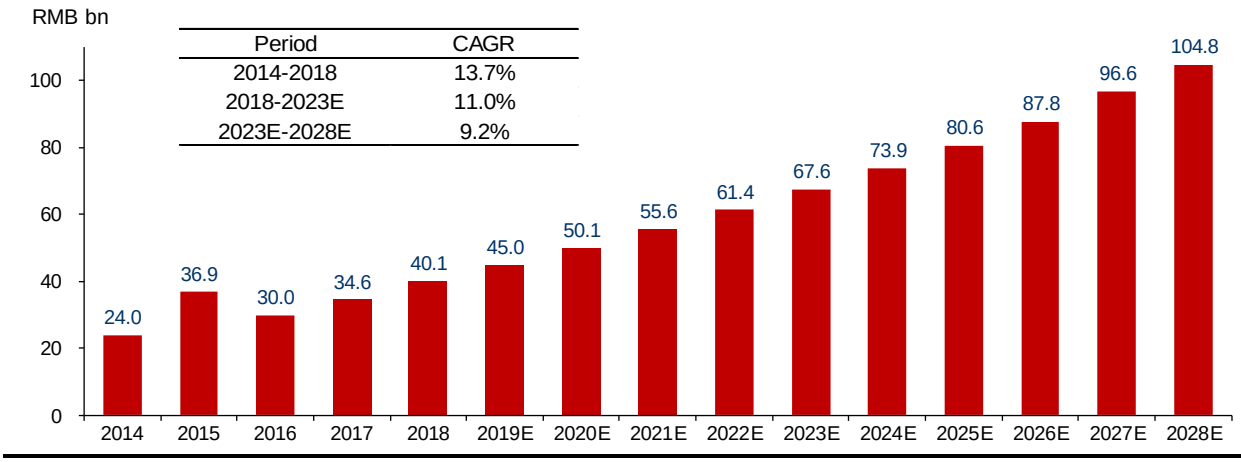
Figure 69: Global breast cancer drug market size (2014-2028E)



Source: F&S, CMBIS

The breast cancer drug market in China is one of the largest by revenue compared to the other cancer drug markets globally. The recent inclusion of additional cancer drugs, such as Herceptin, in the NRDL will accelerate the growth of breast cancer drug market in China. F&S forecasts China breast cancer market to grow at 11.0% CAGR from RMB40.1bn in 2018 to RMB67.6bn in 2023E.

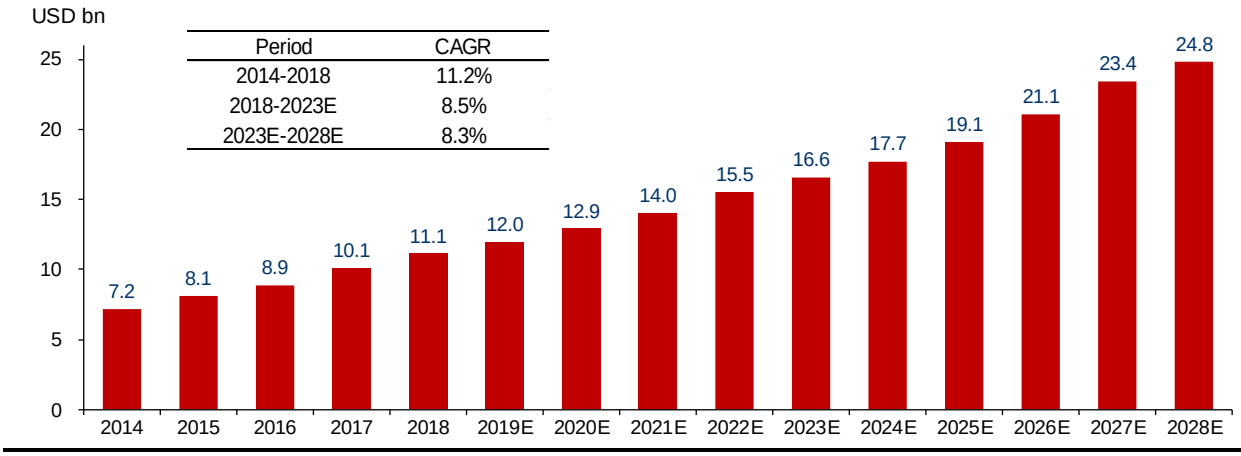
Figure 70: China breast cancer drug market size (2014-2028E)



Source: F&S, CMBIS

The US breast cancer drug market is the largest market for breast cancer drugs globally and accounted for 41.4% of the global breast cancer market in 2018. Consistent with the global market for breast cancer drugs, the utilisation of cutting-edge therapies with high costs are expected to drive up the total revenue in breast cancer drug market in the US.

Figure 71: US breast cancer drug market size (2014-2028E)



Source: F&S, CMBIS

According to F&S, the growth of the breast cancer drug market in the US and China is driven by the following key factors:

1) Increasing patient pool. Factors such as deteriorating environmental conditions, unhealthy lifestyles and higher levels of stress for woman has meant that the risk of women developing breast cancer is increasing.

2) Rising demand for breast cancer therapies. Increased access to breast cancer screening and the use of improved technology in the screening, diagnosis and treatment of breast cancer is expected to boost demand for breast cancer therapies.

3) Advancements in R&D. Higher investments in R&D, advancements in cancer mechanisms and pharmacology have all driven breast cancer therapy development.

4) Medical insurance reimbursement. The size of the breast cancer therapeutics market in the US is due in part to supportive insurance schemes. In China, favourable policies for the breast cancer therapies have been introduced with reforms of the Chinese medical insurance system.

Overview of androgenetic alopecia

Lack of safe and effecitve therapeis for androgenetic alopecia

Androgenetic alopecia is a common form of scalp hair loss that affects both men and women. It is characterised by progressive hair loss, usually in a patterned distribution. The onset of androgenetic alopecia may commence at any age after puberty and the frequency of its occurrence increases with age. The incidence rate for androgenetic alopecia is much higher in Caucasian men than men of Asian or African heritage. Risk factors of developing androgenetic alopecia include excessive smoking, family history, malnutrition, stress and ageing. With people now paying more attention to their appearance, treatment rates of androgenetic alopecia have gradually improved.

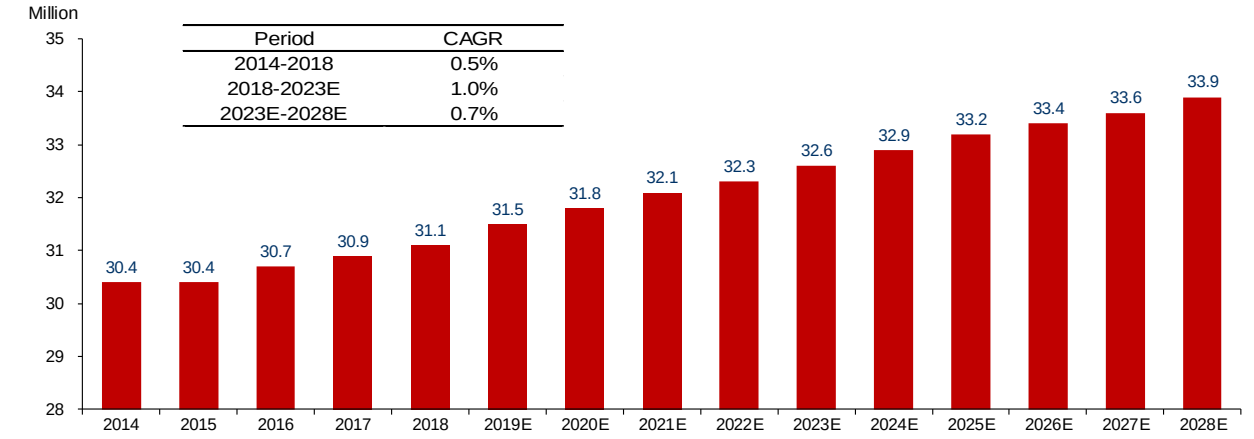
According to the F&S, apart from hair follicles transplantation, Minoxidil and Finasteride are two commonly recommended options for androgenetic alopecia. Minoxidil is the most commonly used treatment, and the percentage of patients that received treatment with Minoxidil in 2018 in the US and China is estimated to be 75% and 70%, respectively, and the percentage of patients that received treatment with Finasteride in 2018 in the US and China is estimated to be 25% and 30%, respectively.

Adverse events arising from Minoxidil include allergy to propylene glycol and orthostatic hypotension if taken along with peripheral vasodilators. Patients using Finasteride may experience sexual adverse effects such as decreased libido, erectile dysfunction and ejaculation disorder, of which incidence rates were 1.8%, 1.3% and 1.2% in clinical trials respectively, leading to a discontinuance of treatment rate of 1.2%. As current therapies produce adverse effects such as impotence, new therapies under development without the adverse effects will create new opportunities in the future.

Androgenetic alopecia market in the US

The total number of males aged from 30 to 70 in the US with androgenetic alopecia was 31.1mn in 2018. This is expected to increase at a CAGR of 1.0% from 2018 to 32.6mn in 2023E and then at a CAGR of 0.7% from 2023E to 33.9mn in 2028E.

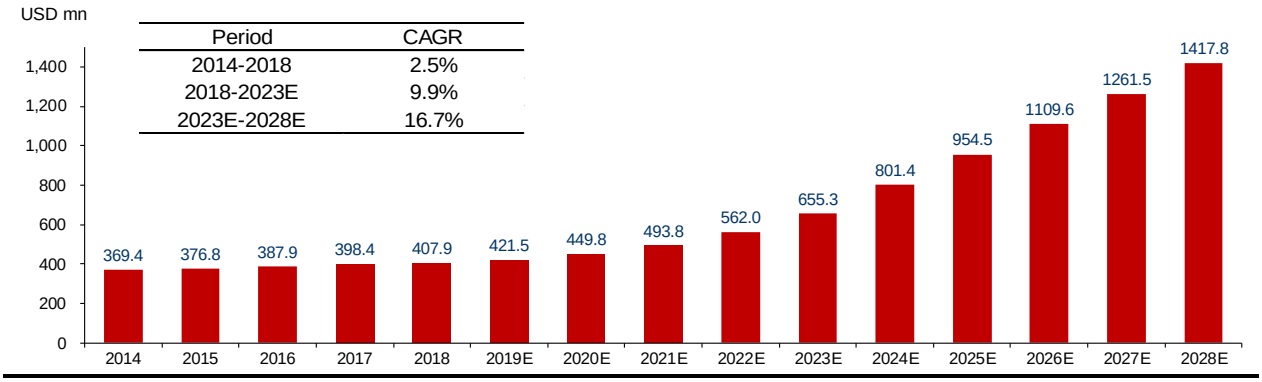
Figure 72: Number of total patients of androgenetic alopecia in the US (2014-2028E)



Source: F&S, CMBIS

In 2018, the market size of drugs for androgenetic alopecia in the US was US$407.9mn. The market size of drugs for androgenetic alopecia in the US is expected to increase at a CAGR of 9.9% from 2018 to US$655.3mn in 2023E and then at a CAGR of 16.7% from 2023E to US$1,417.8mn in 2028E.

Figure 73: Market size of drugs approved for androgenetic alopecia in the US (2014-2028E)



Source: F&S, CMBIS
Note: The historical market size only includes the two drugs that have been approved by the US FDA for the treatment of androgenetic alopecia (Minoxidil and Finasteride). The projected market size includes drugs that are currently undergoing clinical trials and are expected to be approved.

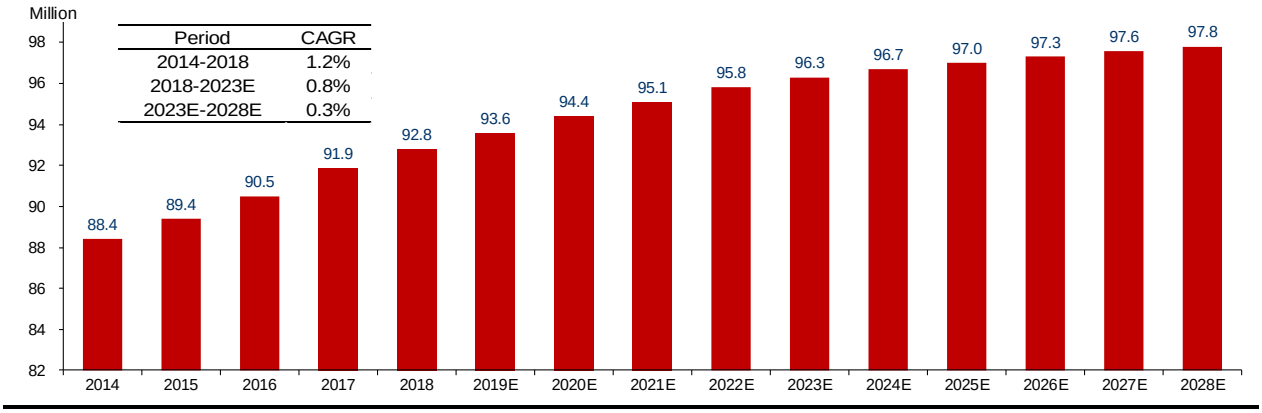
According to F&S, the growth of the androgenetic alopecia drug market globally is driven by the following factors: 1) with the change of lifestyle, the issue of hair loss, especially for male population, is becoming drastically severer than before and the population of androgenetic alopecia patients is expanding; and 2) inclining trend of awareness of individual appearance. The number of pipeline drugs for androgenetic alopecia is also limited, while the demand for effective treatment is increasing with the expansion of the patient pool.

Androgenetic alopecia market in China

According to the Guideline of Chinese androgenetic alopecia, around 21.3% of Chinese male and 6.0% of Chinese female suffers androgenetic alopecia.

According to F&S, in 2018, over 92.8mn males had androgenetic alopecia to different degrees in China. The total number of androgenetic alopecia patients is expected to increase at a CAGR of 0.8% from 2018 to 96.3mn in 2023E and then at a CAGR of 0.3% from 2023E to 97.8mn in 2028E.

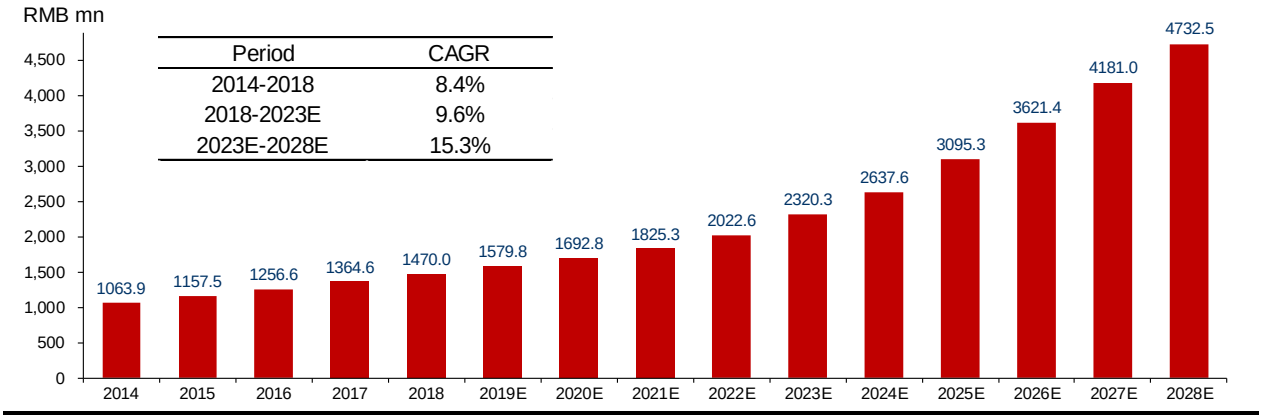
Figure 74: Total patient number of androgenetic alopecia in China male population (2014-2028E)



Source: F&S, CMBIS

In 2018, the market size of drugs for androgenetic alopecia in China was RMB1,470.0mn. The market size of drugs for androgenetic alopecia in China is expected to increase at a CAGR of 9.6% from 2018 to RMB2,320.3mn in 2023E and then at a CAGR of 15.3% from 2023E to RMB4,732.5mn in 2028E.

Figure 75: Androgenetic alopecia market size in China (2014-2028E)



Source: F&S, CMBIS
Note: The historical market size only includes the two drugs that have been approved by NMPA for the treatment of androgenetic alopecia (Minoxidil and Finasteride), and projected market size includes drugs that are currently undergoing clinical trials and are expected to be approved. Traditional Chinese medicine (TCM) is excluded.

Overview of acne vulgaris

Large population suffering acne vulgaris

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

Treatments include use of hormonal agents (anti-androgen treatments), topical therapies, systemic antibiotics and isotretinoin. Androgen plays an important role in pathogenesis of acne vulgaris. Follicular keratinocytes and sebocytes are target cells for androgens. Androgens control cellular functions by binding to androgen receptors, which directly or indirectly, stimulate keratinocyte proliferation and the volume of sebaceous glands as well as the sebum secretion rate. As a result, anti-androgen treatments can target the androgen-metabolising cells of the pilosebaceous unit and lead to sebostasis, which reduces the sebum secretion rate.

The total number of patients aged from 10 to 25 in the US with acne vulgaris was 31.3mn in 2018. This is expected to increase at a CAGR of 0.8% from 2018 to 32.5mn in 2023E and then at a CAGR of 0.7% from 2023E to 33.7mn by 2028E.

In 2018, over 118.9mn patients aged from 10 to 25 had acne vulgaris in China. The total number of acne vulgaris patients is expected to increase at a CAGR of 0.4% from 2018 to 121.3mn in 2023E and then at a CAGR of 0.2% from 2023E to 122.5mn in 2028E.

Overview of liver cancer

Largest patient population in China

Liver cancer can be classified into primary liver cancer and metastatic liver cancer by the origins of tumor cells responsible for the cancer. Primary liver cancer, which starts from the tissues of the liver, is more common in East Asia. Liver cancer is the fourth most frequent cancer and the second leading cause of death from cancer in China in 2018, with the most common type of liver cancer being HCC. There are multiple risk factors that cause primary liver cancer, including hepatitis B virus and hepatitis C virus infections, cirrhosis, alcohol, aflatoxins and tobacco. Chemotherapy dominates the global liver cancer drug market, accounting for more than 50.0% of the market value in 2018.

Liver cancer drug market in China and the US

As of 2018, China had the largest number of liver cancer patients in the world. The total number of liver cancer patients in China reached 561.7 thousand in 2018, and is expected to increase at a CAGR of 8.3% from 2018 to 838.0 thousand in 2023E and then at a CAGR of 7.1% from 2023E to 1.2mn in 2028E. Due to a large number of patients in China who are infected by the hepatitis B virus and the hepatitis C virus, new cases of liver cancer are expected to increase over the next decade. Moreover, with the development of new therapies that are expected to be approved in the future, such as Regorafenib, deaths are expected to decrease, which would lead to the further growth in the number of total patients.

In 2018, the liver cancer drug market in China amounted to RMB4.6bn and grew at a CAGR of 17.1% from 2014 to 2018. The market is expected to grow at a CAGR of 28.1% from 2018 to RMB15.9bn in 2023E and at a CAGR of 12.7% from 2023E to RMB28.9bn in 2028E.

In the US, the total number of liver cancer patients increased at a CAGR of 15.4% from 60.9 thousand in 2014 to 107.9 thousand in 2018. The number of liver cancer patients is expected to grow at a CAGR of 8.7% from 2018 to 163.5 thousand in 2023E and then at a CAGR of 6.8% from 2023E to 227.6 thousand in 2028E. The liver cancer drug market in the US was US$0.9bn in 2018 and it is expected to grow at a CAGR of 24.8% from 2018 to US$2.8bn in 2023E and then at a CAGR of 10.8% from 2023E to US$4.6bn in 2028E.

Financial Analysis

Drugs sales to start from 2021E

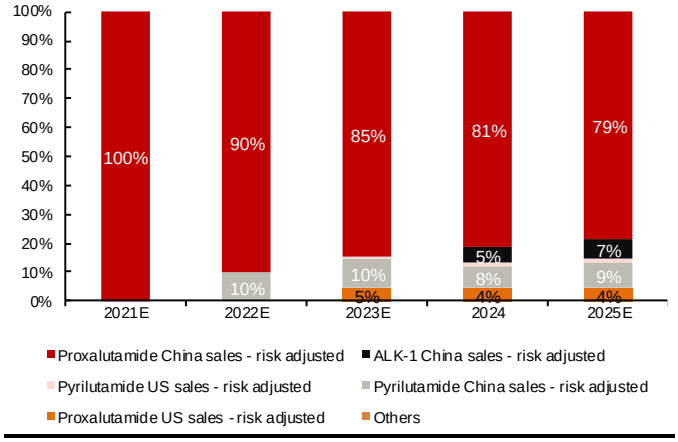
We forecast drug sales to start from 2021E and expect risk-adjusted revenue of RMB104mn/ RMB382mn/ RMB1,006mn in FY2021E/22E/23E. The most advanced drug is Proxalutamide which may be approved by NMPA in 2021E. We also forecast Pyrilutamide and ALK-1 to receive NMPA's approval in 2022E and 2024E, respectively. Furthermore, to factor in the risk in drug development, we apply different probability of success (PoS) to our sales forecasts.

Figure 76: Revenue forecasts (2021-2025E)

(YE 31 Dec) RMB mn	2021E	2022E	2023E	2024E	2025E
Proxalutamide China sales - risk adjusted	104	344	854	1,802	2,758
YoY	*N/A*	*232%*	*148%*	*111%*	*53%*
Proxalutamide US sales - risk adjusted	0	0	47	96	156
YoY	*N/A*	*N/A*	*N/A*	*103%*	*63%*
Pyrilutamide China sales - risk adjusted	0	38	99	176	323
YoY	*N/A*	*N/A*	*161%*	*77%*	*84%*
Pyrilutamide US sales - risk adjusted	0	0	6	22	43
YoY	*N/A*	*N/A*	*N/A*	*280%*	*97%*
ALK-1 China sales - risk adjusted	0	0	0	122	228
YoY	*N/A*	*N/A*	*N/A*	*N/A*	*87%*
Others	0	0	0	0	0
YoY growth	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
Total Revenue	**104**	**382**	**1,006**	**2,217**	**3,509**
YoY	*N/A*	*269%*	*163%*	*120%*	*58%*

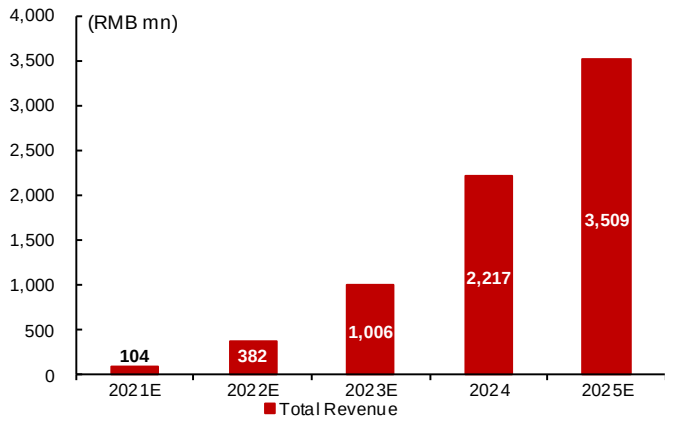
Source: Company data, CMBIS estimates

Figure 77: Revenue breakdown



Source: Company data, CMBIS estimates

Figure 78: Total revenue forecasts



Source: Company data, CMBIS estimates

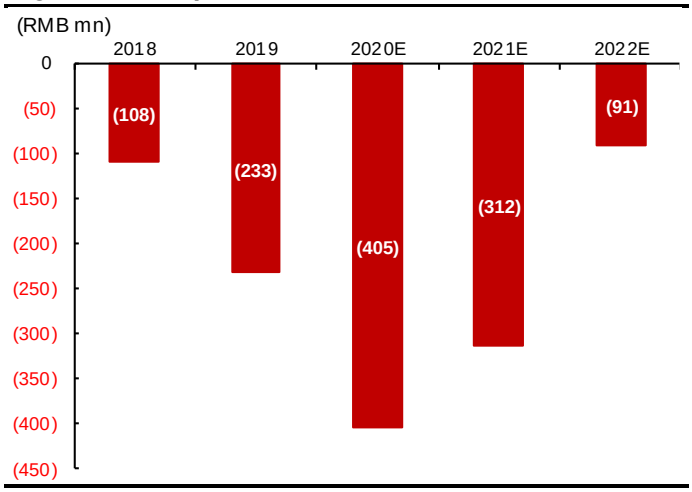
Kintor recorded net losses of RMB108mn/ RMB233mn in FY18A/19A. We forecast net losses of RMB405mn / RMB312mn / RMB91mn in FY20E/21E/22E and expect RMB213mn net profit in 2023E.

Figure 79: P&L forecasts

(YE 31 Dec) RMB mn	2018	2019	2020E	2021E	2022E	2023E	2024E	2025E
Revenue	**1**	**0**	**0**	**104**	**382**	**1,006**	**2,217**	**3,509**
YoY	*N/A*	*N/A*	*N/A*		*269%*	*163%*	*120%*	*58%*
Cost of sales	(1)	0	0	(31)	(76)	(191)	(399)	(596)
% of revenue	*N/A*	*N/A*	*N/A*	*-30%*	*-20%*	*-19%*	*-18%*	*-17%*
Gross profit	**0**	**0**	**0**	**72**	**306**	**815**	**1,818**	**2,912**
GPM	*N/A*	*N/A*	*N/A*	*70%*	*80%*	*81%*	*82%*	*83%*
Other income	12	19	28	32	27	25	29	38
% of revenue	*N/A*	*N/A*	*N/A*	*31%*	*7%*	*3%*	*1%*	*1%*
Administrative expenses	(24)	(33)	(100)	(62)	(76)	(101)	(222)	(351)
% of revenue				*-60%*	*-20%*	*-10%*	*-10%*	*-10%*
Research and development costs	(93)	(214)	(320)	(300)	(210)	(201)	(222)	(351)
% of revenue	*N/A*	*N/A*	*N/A*	*-290%*	*-55%*	*-20%*	*-10%*	*-10%*
Selling expenses	0	0	(10)	(52)	(134)	(286)	(609)	(943)
% of revenue	*N/A*	*N/A*	*N/A*	*-50%*	*-35%*	*-28%*	*-27%*	*-27%*
Other (losses)/gains - net	1	(1)	0	0	0	0	0	0
% of revenue	*N/A*	*N/A*	*N/A*	*0%*	*0%*	*0%*	*0%*	*0%*
Profit from operations	**(104)**	**(229)**	**(402)**	**(310)**	**(88)**	**253**	**795**	**1,305**
% of revenue	*N/A*	*N/A*	*N/A*	*-299%*	*-23%*	*25%*	*36%*	*37%*
Finance costs - net	(4)	(4)	(3)	(3)	(3)	(3)	(3)	(3)
% of revenue	*N/A*	*N/A*	*N/A*	*-2%*	*-1%*	*0%*	*0%*	*0%*
Profit (loss) before tax	**(108)**	**(233)**	**(405)**	**(312)**	**(91)**	**250**	**792**	**1,302**
% of revenue	*N/A*	*N/A*	*N/A*	*-302%*	*-24%*	*25%*	*36%*	*37%*
Income tax expense	0	0	0	0	0	(38)	(119)	(195)
Tax rate	*N/A*	*N/A*	*N/A*	*0%*	*0%*	*-15%*	*-15%*	*-15%*
Profit (loss) for the year	**(108)**	**(233)**	**(405)**	**(312)**	**(91)**	**213**	**673**	**1,107**
Non-controlling interests	0	0	0	0	0	0	0	0
Profit (loss) attributable to shareholders	**(108)**	**(233)**	**(405)**	**(312)**	**(91)**	**213**	**673**	**1,107**
NPM	*N/A*	*N/A*	*N/A*	*-302%*	*-24%*	*21%*	*30%*	*32%*

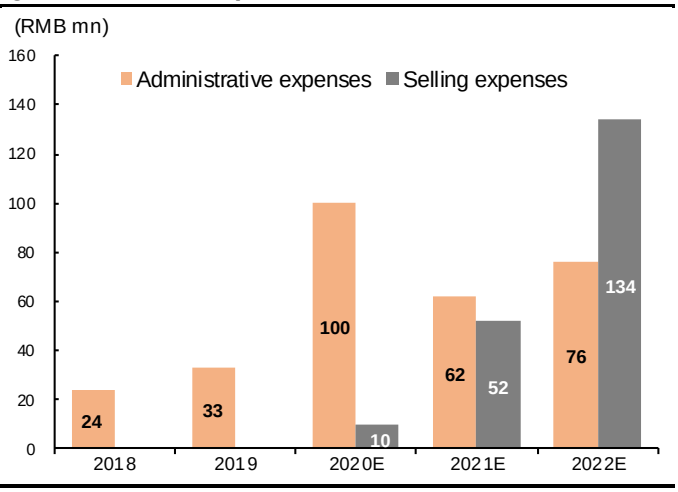
Source: Company data, CMBIS estimates

Figure 80: Net profit forecasts



Source: Company data, CMBIS estimates

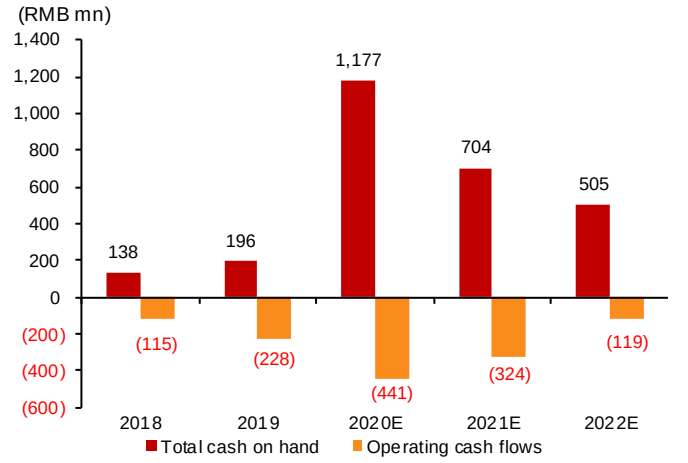
Figure 81: SG&A expenses forecasts



Source: Company data, CMBIS estimates

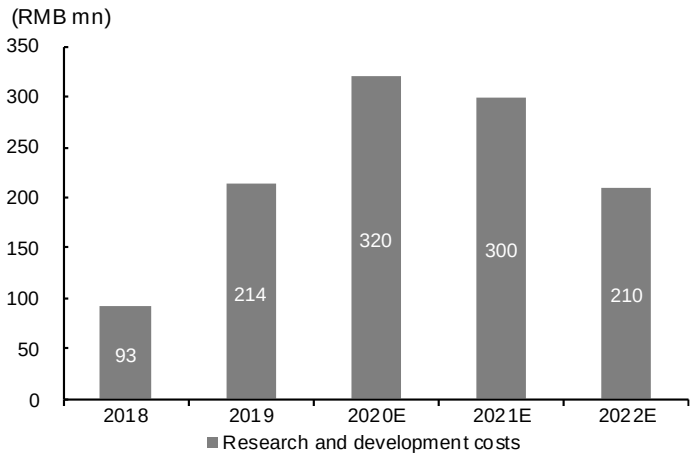
R&D spending to rise. We forecast R&D cost to climb from RMB93mn/ RMB214mn in FY18A/19A to RMB320mn/RMB300mn/RMB210mn in FY20E/21E/22E, mainly due to initiation of new clinical trials and progress of existing clinical trials.

Figure 82: Cash on hand and operating cash flows



Source: Company data, CMBIS estimates

Figure 83: R&D expenses



Source: Company data, CMBIS estimates

Financial Statements

Income statement

YE 31 Dec (RMB mn)	FY18A	FY19A	FY20E	FY21E	FY22E
Revenue	**1**	**0**	**0**	**104**	**382**
Proxalutamide China sales – risk adjusted	0	0	0	104	344
Proxalutamide US sales - risk adjusted	0	0	0	0	0
Pyrilutamide China sales - risk adjusted	0	0	0	0	38
Pyrilutamide US sales - risk adjusted	0	0	0	0	0
ALK-1 China sales - risk adjusted	0	0	0	0	0
Others	0	0	0	0	0
Cost of sales	(1)	0	0	(31)	(76)
Gross profit	**0**	**0**	**0**	**72**	**306**
Other income	12	19	28	32	27
Selling & distribution expenses	(24)	(33)	(100)	(62)	(76)
R&D expenses	(93)	(214)	(320)	(300)	(210)
Administrative expenses	0	0	(10)	(52)	(134)
Other expenses	1	(1)	0	0	0
Operating profit (loss)	**(104)**	**(229)**	**(402)**	**(310)**	**(88)**
Finance costs	(4)	(4)	(3)	(3)	(3)
Pre-tax profit (loss)	**(108)**	**(233)**	**(405)**	**(312)**	**(91)**
Income tax	0	0	0	0	0
Minority interests	0	0	0	0	0
Attributable net profit (loss)	**(108)**	**(233)**	**(405)**	**(312)**	**(91)**

Cash flow summary

YE 31 Dec (RMB mn)	FY18A	FY19A	FY20E	FY21E	FY22E
Profit before tax	**(108)**	**(233)**	**(405)**	**(312)**	**(91)**
Depreciation and amortization, etc.	2	5	9	17	26
Change in working capital	(4)	0	(45)	(29)	(54)
Others	(5)	(0)	0	(0)	0
Net income tax paid	0	0	0	0	0
Operating cash flow	**(115)**	**(228)**	**(441)**	**(324)**	**(119)**
Purchase of PP&E	(5)	(67)	(150)	(150)	(80)
Purchase of land use right	0	0	0	0	0
Purchases of financial assets at FV through profit or loss	(51)	0	0	0	0
Purchases of financial assets measured at amortized cost	(170)	(55)	0	0	0
Others	162	115	0	0	0
Investing cash flow	**(65)**	**(7)**	**(150)**	**(150)**	**(80)**
Proceeds from borrowings	75	59	0	0	0
Repayments of borrowings	(55)	(65)	0	0	0
Capital contribution from equity holders	287	348	1,573	0	0
Others	(3)	(46)	0	0	0
Financing cash flow	**304**	**296**	**1,573**	**0**	**0**
FX changes	0	(3)	0	0	0
Net change in cash	124	61	982	(474)	(199)
Cash at the beginning year	13	138	196	1,177	704
Cash at the end	**138**	**196**	**1,177**	**704**	**505**

Balance sheet

YE 31 Dec (RMB mn)	FY18A	FY19A	FY20E	FY21E	FY22E
Non-current assets	**205**	**333**	**474**	**607**	**661**
PP&E	9	98	242	378	435
Intangible assets	172	179	179	179	179
Right-of-use assets	14	14	12	9	6
Other non-current assets	10	41	41	41	41
Current assets	**218**	**221**	**1,187**	**730**	**596**
Inventories	0	0	0	5	13
Trade receivables	0	0	0	17	63
Other receivables and prepayments	14	25	10	4	16
Financial assets at FV through P&L	0	0	0	0	0
Cash and cash equivalents	138	196	1,177	704	505
Restricted cash	67	0	0	0	0
Non-current liabilities	**64**	**41**	**41**	**41**	**41**
Borrowings	22	0	0	0	0
Lease liabilities	3	2	2	2	2
Deferred income tax liabilities	39	39	39	39	39
Current liabilities	**108**	**143**	**83**	**70**	**81**
Trade and other payables	18	80	20	8	19
Borrowings	43	59	59	59	59
Lease liabilities	2	3	3	3	3
Deferred income	1	1	1	1	1
Amounts due to related parties	44	0	0	0	0
Total net assets	**252**	**370**	**1,538**	**1,225**	**1,135**
Minority interest	0	0	0	0	0
Shareholders' equity	**252**	**370**	**1,538**	**1,225**	**1,135**

Key ratios

YE 31 Dec	FY18A	FY19A	FY20E	FY21E	FY22E
Sales mix (%)					
Proxalutamide China sales adjusted	0	0	0	100	90
Proxalutamide US sales	0	0	0	0	0
Pyrilutamide China sales - adjusted	0	0	0	0	10
Pyrilutamide US sales	0	0	0	0	0
ALK-1 China sales -	0	0	0	0	0
Others	0	0	0	0	0
Total	100	100	100	100	100
Profit & loss ratios (%)					
Gross margin	N/A	N/A	N/A	70	80
EBITDA margin	N/A	N/A	N/A	-296	-19
Pre-tax margin	N/A	N/A	N/A	-302	-24
Net margin	NA	N/A	N/A	-302	-24
Effective tax rate	0	0	0	0	0
Balance sheet ratios					
Current ratio (x)	2	2	14	10	7
Net debt to equity (%)	Net cash	Net cash	Net cash	Net cash	Net cash
Returns (%)					
ROE	-43	-63	-26	-25	-8
ROA	-26	-42	-24	-23	-7
Per share value					
EPS (RMB)	N/A	N/A	(1.10)	(0.85)	(0.25)
DPS (RMB)	N/A	N/A	0.00	0.00	0.00
BVP (RMB)	N/A	N/A	4.16	3.32	3.07

Source: Company data, CMBIS estimates

Valuation

We expect Kintor to commercialize the first product, Proxalutamide in 2021E and its future cash flows will rely on the successful commercialization of pipeline drugs. Therefore, we use DCF method to value the Company and we derive TP of HK$27.6 based on 10-year risk-adjusted DCF model (WACC: 11.8%, terminal growth rate: 2.0%).

Figure 84: Risk-adjusted DCF valuation

DCF Valuation (in Rmb mn)	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E
EBIT	(324)	(97)	245	784	1,285	1,457	1,617	1,762	1,881	1,987
Tax rate	0%	0%	15%	15%	15%	15%	15%	15%	15%	15%
EBIT*(1-tax rate)	(324)	(97)	208	666	1,092	1,238	1,375	1,497	1,599	1,689
+ D&A	17	26	29	32	35	38	41	43	46	48
- Change in working capital	(29)	(54)	(119)	(232)	(249)	(69)	(54)	(61)	(47)	(38)
- Capex	(150)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)	(80)
FCFF	**(485)**	**(205)**	**38**	**386**	**798**	**1,128**	**1,282**	**1,399**	**1,518**	**1,618**
Terminal value										**16,887**
FCF + Terminal value	(485)	(205)	38	386	798	1,128	1,282	1,399	1,518	18,506

Present value of enterprise (RMB mn)	8,511
Net Debt (RMB mn)	(640)
Minorities (RMB mn)	0
Equity value (RMB mn)	9,151
Equity value (HK$ mn)	**10,202**
Equity value (US$ mn)	**1,306**
No. of shares	**369,389,600**
Target price (HK$)	**27.6**

Terminal growth rate	**2.0%**
WACC	**11.8%**
Cost of Equity	15.0%
Cost of Debt	5.0%
Equity Beta	1.2
Risk Free Rate	3.0%
Market Risk Premium	10.0%
Target Debt to Asset ratio	30.0%
Effective Corporate Tax Rate	15.0%

Source: CMBIS estimates

Figure 85: Sensitivity analysis (HK$)

		WACC				
		10.8%	**11.3%**	**11.8%**	**12.3%**	**12.8%**
	3.0%	34.8	32.1	29.7	27.6	25.7
	2.5%	33.3	30.8	28.6	26.6	24.9
Terminal growth rate	**2.0%**	32.0	29.7	**27.6**	25.8	24.1
	1.5%	30.8	28.6	26.7	25.0	23.4
	1.0%	29.7	27.7	25.9	24.3	22.8

Source: Company data, CMBIS estimates

Investment Risks

Having incurred net losses in the past and will continue to incur losses for the foreseeable future

Investment in pharmaceutical drug development is highly speculative. It entails substantial upfront capital expenditures and significant risk that a drug candidate will fail to gain regulatory approval or become commercially viable. Kintor incurred losses in each period since its inception. In 2017 and 2018, Kintor had a loss for the year of RMB45mn and RMB108mn, respectively. If Kintor is unable to maintain adequate working capital, it may default on payment obligations and may not be able to meet capital expenditure requirements.

Failure in obtaining regulatory approval for drug candidates

Kintor's business will depend on the successful development, regulatory approval and commercialization of its drug candidates for the treatment of patients with cancer, all of which are still in clinical or pre-clinical development stage. If Kintor is unable to successfully complete clinical development, obtain regulatory approval and commercialize its drug candidates, or experience significant delays in doing so, its business will be materially harmed.

Clinical drug development involves a lengthy and expensive process with an uncertain outcome, and results of earlier studies and trials may not be predictive of future trial results. If clinical trials of Kintor's drug candidates fail to demonstrate safety and efficacy to the satisfaction of regulatory authorities or do not otherwise produce positive results, the Company may incur additional costs or experience delays in completing, or ultimately be unable to complete, the development and commercialization of drug candidates.

Competition from peers with more competing and successful drugs

The development and commercialization of new drugs is highly competitive. Kintor faces competition from major pharmaceutical companies, specialty pharmaceutical companies and biopharmaceutical companies worldwide. Kintor will face intense and increasing competition as new drugs enter the market and advanced technologies become available.

Failure in protecting intellectual property rights throughout the world

If Kintor is unable to obtain and maintain patent protection for its drug candidates and other intellectual property, or if the scope of such intellectual property rights obtained is not sufficiently broad, third parties could develop and commercialize products and technologies similar or identical to the Company's and compete directly against Kintor, and the Company's ability to successfully commercialize any product or technology may be adversely affected.

Appendix: Company Profile

Figure 86: Management profile (as of Apr 2020)

Name	Age	Date of Joining	Position	Roles and Responsibilities
Dr. Youzhi Tong (童友之博士)	57	24 Mar 2009	Chairman of the Board, Executive Director and Chief Executive Officer	Primarily responsible for the overall management, operations and the charting and reviewing of corporate directions and strategies of the Company
Dr. Chuangxin Guo (郭创新博士)	50	10 Dec 2009	Non-executive Director	Primarily responsible for overseeing the corporate development and strategic
Ms. Yan Lu (卢燕女士)	37	13 Dec 2019	Chief financial officer	Primarily responsible for financial planning, investor relations and internal control of the Company
Dr. Xunwei Dong (董恂瑋博士)	48	1 Nov 2019	Chief medical officer	Primarily responsible for clinical trial management
Dr. Guohao Zhou (周国豪博士)	60	1 Aug 2017	Chief medical officer (USA)	Primarily responsible for clinical trial management
Mr. Mingming Yan (严明明先生)	41	17 Jun 2019	Vice president of sales	Primarily responsible for the Company's sales and marketing including exploring and maintaining commercial distribution channels as well as promoting market access

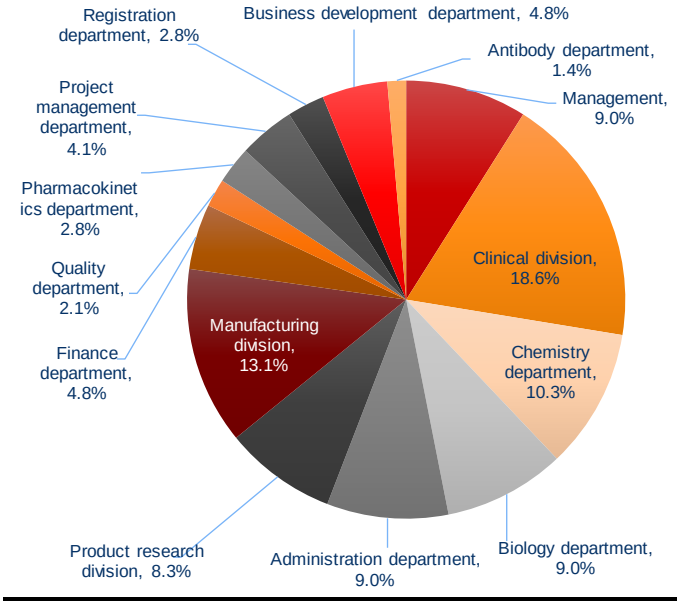
Source: Company data

Figure 87: Employee structure (as of 31 Dec 2019)

Function	# of staff	% of Total
Management	13	9.0%
Clinical division	27	18.6%
Chemistry department	15	10.3%
Biology department	13	9.0%
Administration department	13	9.0%
Product research division	12	8.3%
Manufacturing division	19	13.1%
Finance department	7	4.8%
Quality department	3	2.1%
Pharmacokinetics department	4	2.8%
Project management department	6	4.1%
Registration department	4	2.8%
Business development department	7	4.8%
Antibody department	2	1.4%
Total	**145**	**100%**

Source: Company data

Figure 88: Employee number split (as of 31 Dec 2019)



Source: Company data

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