ABG Sundal Collier acted as Joint Global Coordinator and Joint Bookrunner in the NOK 345 million private placement in Arctic Bioscience AS and subsequent listing on Euronext Growth.

Equity Research – 19 March 2021 07:10 CET

Arctic Bioscience

A great catch

- A strong case with solid support
- Promising clinical results for psoriasis drug HRO350
- We initiate with a BUY recommendation, TP of NOK 57

One technology, two applications

Arctic Bioscience (ABS) is a Norwegian biotech company leveraging its unique herring roe extract technology in two ways: a cash-generating nutraceutical business with premium Omega-3 products and pharmaceutical development focusing on mild-moderate psoriasis. With its global footprint, the nutraceutical business is poised for margin expansion and growth from current levels. However, we see the greatest value in the pharmaceutical asset HRO350. ABS has established barriers to entry by controlling its value chain with a patented and proprietary technology that sustainably sources a by-product from the Norwegian herring industry. We view the Nutra business as a de-risking factor to the case, with cash flows also supporting pharma development.

Addressing unmet needs in mild-moderate psoriasis

Psoriasis is a chronic inflammatory disease causing red, scaly patches on the skin. There are ~125m psoriasis patients globally, and ~19m patients suffer from mild-moderate psoriasis in the US and EU5. There are currently few satisfactory treatments for mild-moderate patients with low adherence, such as steroid creams and phototherapy. KOL feedback suggests there is an unmet medical need for oral, cost-efficient, safe and effective treatments. After a positive pilot study, HRO350 is set to initiate a Phase 2b study (n=519) in mild-moderate psoriasis in Q1'22e. ABS' financial position is strong, and sufficient to support the company beyond HRO350's key value inflection points from Phase 2b study read-outs in '23e. We assume US/EU commercial launches of HRO350 in '27e/'28e.

Initiating coverage with BUY rating and TP of NOK 57

Our stand-alone rNPV valuation of HRO350 indicates NOK 44/share (NOK 232 de-risked), while our stand-alone multiple valuation of the Nutra business indicates NOK 21/share. Our target price of NOK 57 is derived from a SOTP valuation of both business units, indicating upside of ~90%. We see an attractive equity story and beneficial risk-reward profile in ABS and initiate coverage with a BUY recommendation.

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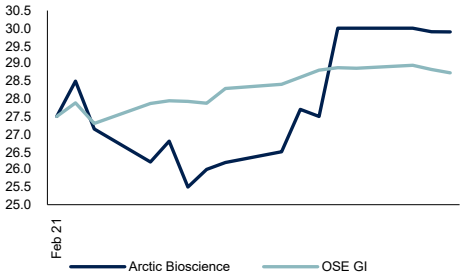
Reason: Initiating coverage

BUY	HOLD	SELL
●	○	○

Share price (NOK)	17/03/2021	29.9
Target price		57.0
Healthcare, Norway		
ABS.OL/ABS NO		
MCap (NOKm)		726
MCap (EURm)		72
Net debt (EURm)		-16
No. of shares (m)		24.3
Free float (%)		*85*
Av. daily volume (k)		189

Performance



	1m	3m	12m
Absolute (%)	*na*	*na*	*na*

Source: FactSet

NOKm	**2019**	**2020**	**2021e**	**2022e**	**2023e**
Sales	30	20	33	46	64
EBITDA	-2	-20	-22	-19	-1
EBITDA margin (%)	*-6.7*	*-99.9*	*-67.8*	*-41.6*	*-1.0*
EBIT adj	-3	-22	-25	-30	-17
EBIT adj margin (%)	*-10.3*	*-105.7*	*-78.3*	*-65.9*	*-26.7*
Pretax profit	-4	-23	-27	-35	-24
EPS rep	-3.09	-16.29	-1.12	-1.45	-0.99
EPS adj	-3.09	-16.29	-1.12	-1.45	-0.99
Sales growth (%)	*20.9*	*-31.8*	*58.6*	*42.0*	*39.0*
EPS growth (%)	*-93.0*	*-426.4*	*93.1*	*-29.4*	*31.8*

Source: ABG Sundal Collier, Company data

	2021e	**2022e**	**2023e**
P/E (x)	-26.7	-20.6	-30.2
P/E adj (x)	-26.7	-20.6	-30.2
P/BVPS (x)	2.16	2.41	2.62
EV/EBITDA (x)	-25.3	-38.7	-1,246.2
EV/EBIT adj (x)	-21.9	-24.5	-46.6
EV/sales (x)	17.16	16.11	12.46
ROE adj (%)	*-13.6*	*-11.0*	*-8.3*
Dividend yield (%)	*3.0*	*3.7*	*4.3*
FCF yield (%)	*-18.6*	*-25.6*	*-7.7*
Lease adj. FCF yld (%)	*-18.6*	*-25.6*	*-7.7*
Net IB debt/EBITDA	7.7	-0.9	-113.8
Lease adj. ND/EBITDA	7.7	-0.9	-113.8

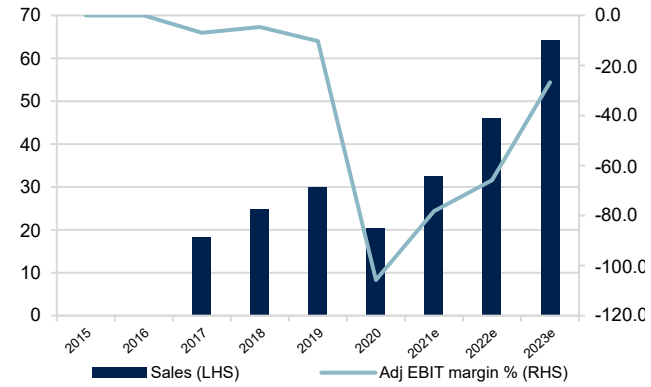
Company description

Arctic Bioscience is a Norwegian biotech company listed on Euronext Growth Oslo. The company leverages its patented and proprietary herring roe extract in two ways£pv£ a cash-generating nutraceutical business and pharmaceutical development for mild-moderate psoriasis. The premium omega-3 products called Romega already have a global footprint, and look set for further expansion. After a positive pilot study, the drug candidate HRO350 is set to enter a Phase 2b study in 2022.

Risks

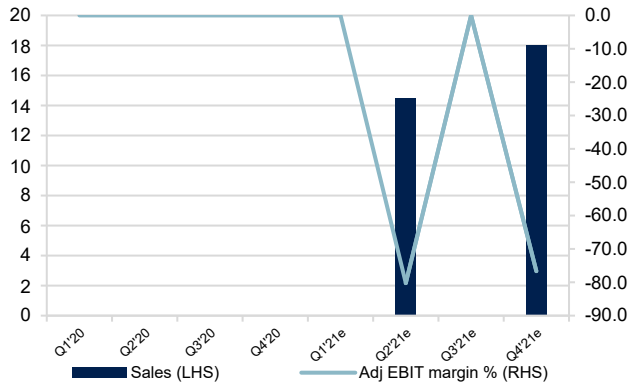
Clinical development failure is the greatest risk to Arctic Bioscience. Regulatory setbacks like requirements for further clinical data also pose risks. Commercial risks include slower-than-expected uptake of approved products, and failures to secure licensing agreements with third parties.

Annual sales and adj. EBIT margin



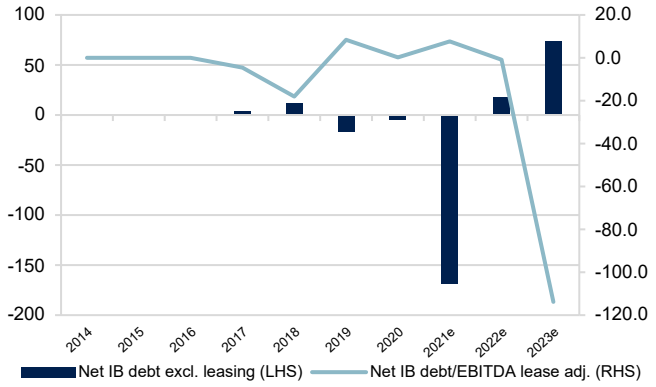
Source: ABG Sundal Collier, Company data

Quarterly sales and adj. EBIT margin



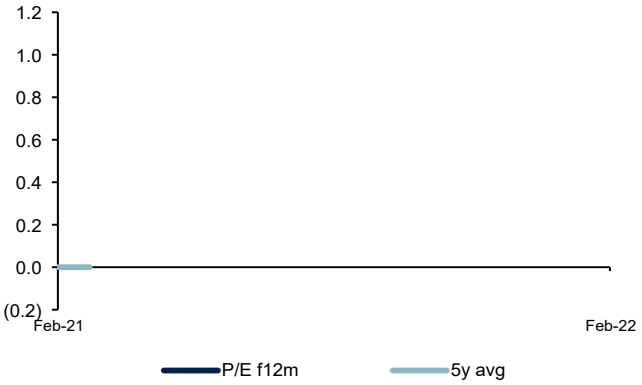
Source: ABG Sundal Collier, Company data

Lease adj. net debt and ND/EBITDA



Source: ABG Sundal Collier, Company data

12-month forward-looking P/E



Source: ABG Sundal Collier, Company data

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Investment case

We initiate coverage on Arctic Bioscience (ABS) with a BUY recommendation and a risk-adj. SOTP-based TP of NOK 57, indicating upside of ~90% from current levels. ABS is a Norwegian biotech company leveraging its unique herring roe extract technology in two ways: a cash-generating nutraceutical business with premium Omega-3 products and pharmaceutical development focusing on mild-moderate psoriasis. We estimate a 42% sales CAGR '20-'25 for the Nutra business, with a factory upgrade and mix improvement driving gross margins from ~35-40% towards >70% by '25e, and reaching EBITDA break-even during '23e. Our stand-alone valuation of Nutra is NOK 21. After its recent successful pilot study, the pharmaceutical asset HRO350 is scheduled for a Phase 2b study in mild-moderate psoriasis in Q1'22e. We estimate US/EU commercial launches of HRO350 in '27e/'28e, supported by a commercial partnership with global tiered royalties of 10-17%, an upfront payment of USD 355m and total other milestones of USD 675m. Our stand-alone rNPV of HRO350 indicates NOK 44 per share, but removing the risk-adj. factor of 17% yields a de-risked equity value of NOK 232 per share.

Nutraceutical Romega – premium Omega-3 from herring roe set to expand
ABS' Nutraceutical business builds on Romega, a premium Omega-3 product sold via B2C, B2B (both finished goods and the bulk sale of ingredients) and partnerships (B2B2C). Romega is carving out a niche in the crowded ~USD 5.6bn (+8% p.a.) Omega-3 supplement market by focusing on niche segments such as prenatal health and strategic marketing. Key differentiating factors are bioavailability, a DHA & EPA ratio of 3:1 and essential nutrients. ABS has established barriers to entry by controlling its value chain with a patented and proprietary technology that sustainably sources a by-product from the Norwegian herring industry. We view the Nutra business as a de-risking factor to the case, with cash flows also supporting pharma development.

HRO350 – addressing unmet needs in mild-moderate psoriasis market
Psoriasis is a chronic inflammatory disease causing red, scaly patches on the skin. There are ~125m psoriasis patients globally, where ~19m patients suffer from mild-moderate psoriasis in the US and EU5. There are currently few satisfactory treatments for mild-moderate patients with low adherence, such as steroid creams and phototherapy. KOL feedback suggests there is a clear unmet medical need for oral, cost-efficient, safe and effective treatments. ABS has developed HRO350, an oral drug based on an optimised herring roe compound for mild-moderate psoriasis.

Pilot trial (n=64) showed positive efficacy signals and outstanding safety
Numerous studies have linked Omega-3 to improvements in inflammatory processes such as cardiovascular disease, but the efficacy data in psoriasis has been less convincing. Backed by a clear-cut scientific rationale of reduced inflammation and anecdotal reports from Romega users of improvements in psoriasis, ABS initiated a pilot study in mild-moderate psoriasis in 2017. HRO350 met its primary endpoint in the randomised, double-blind, placebo-controlled study. Besides a solid safety profile, the improvement versus placebo was statistically significant (p=0.045). The open-label extension data showed a durable response, increasing over time.

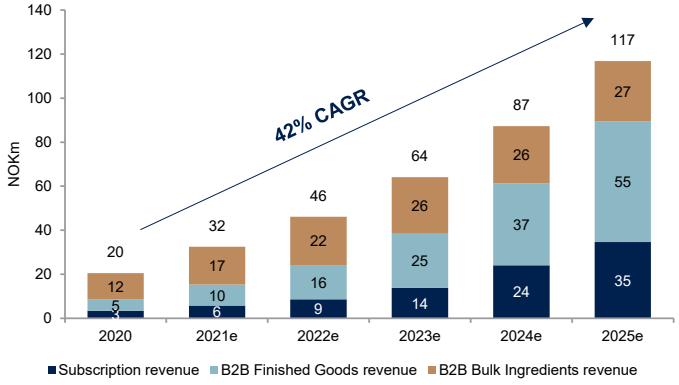
Dose response Phase 2b study set for Q1'22e – potential approval '27e/'28e
Looking at the path forward for HRO350, the development is encouraged by KOLs and supported in scientific advice by the EMA CHMP. The next step will be the initiation of a Phase 2b dose response study (n=519) in Q1'22e, which could be supportive of a potential pivotal Phase 3 study (n=400) starting Q2'24e. We assume

US/EU commercial launches of HRO350 in '27e/'28e, supported by a commercial partnership established in '24e after a positive read-out in the Phase 2b study.

We model a 42% sales CAGR '20-'25e for Nutra, with expanding margins

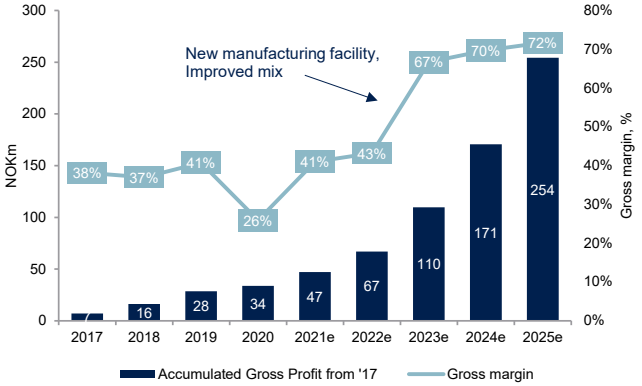
After facing COVID-19 headwinds in 2020, leading to a 32% y-o-y sales decline, we estimate the Nutra business to grow sales at a CAGR of 42% '20-'25e. This is aligned with the financial targets for the Nutra business of achieving a >40% mid-term sales CAGR, moving towards ~20% in the longer term. We estimate that the new factory (set to open Q3'22e), benefits of scale and an improving product mix are set to lift the four-year avg. gross margin of ~35% to ~67% in '23e. We estimate EBITDA break-even in '23e, and that the Nutra business will contribute with ~NOK 221m in aggregated gross profit '21e-'25e, supporting capex plans.

Nutra sales, mix change & internationalisation



Source: ABG Sundal Collier, company data

New manufacturing facility set to raise margins



Source: ABG Sundal Collier, company data

Funded beyond key value inflection points

ABS' financial position is strong, and sufficient to support the company beyond HRO350's key value inflection points from the Phase 2b study read-outs in '23e. For capex, we estimate NOK 185m '21e-'22e for the new manufacturing plant and NOK 285m in total clinical development for HRO350, which we estimate to be roughly 50% below average drug development costs. We expect the recent ~NOK 300m equity raise and ~NOK 144m in unused soft funding and loans could bridge Arctic Bioscience into positive cash flow, but do not rule out a future raise if a potential upfront milestone comes later than '24e.

Pharma forecasts – only modest uptake points to significant potential

For the Pharma business, we estimate US/EU commercial launches of HRO350 in '27e/'28e, supported by a commercial partnership with global tiered royalties of 10-17%, upfront payment of USD 355m and total other milestones of USD 675m. Based on an estimated key addressable population of ~8 million patients in the US and EU5, we model peak sales of USD 1.8bn (USD 300m risk-adj.) for HRO350, based on peak penetration rates of 2.5% in mild and 8.5% in moderate psoriasis in EU5 and 3.5% in mild and 10% in moderate in the US. This leads to a total of ~NOK 8.8bn (~NOK 2bn risk-adj.) in milestones and peak royalty revenue of NOK 2.4bn (NOK 410m risk-adj.) for >70% EBIT margins.

Our SOTP indicates value of NOK 57 per share

We value Arctic Bioscience using a sum-of-the-parts valuation, combining the estimated valuations of the Nutraceutical and Pharmaceutical businesses, respectively. The combined target price of NOK 57 has a discounted EV of NOK 14 per share for the established Nutraceutical business and NOK 36 for the Pharmaceutical business (HRO350). In the valuation for the Pharmaceutical business, we use a '21e-'45e rNPV model with a risk-adjustment factor of 17%.

Based on our estimates, the current share price implies a 4% probability of success for HRO350 in mild-moderate psoriasis.

Valuation overview – Nutra business provides downside protection

SOTP Arctic Bioscience	Value, de-risked (NOKm)	Likelihood of success	Value (NOKm)	Value NOK/share
Net cash '21e	169	100%	169	7
Discounted EV - Nutra	337	100%	337	14
HRO350 EV - Psoriasis	5,107	17%	868	36
Fair value SOTP	**5,613**		**1,374**	**57**

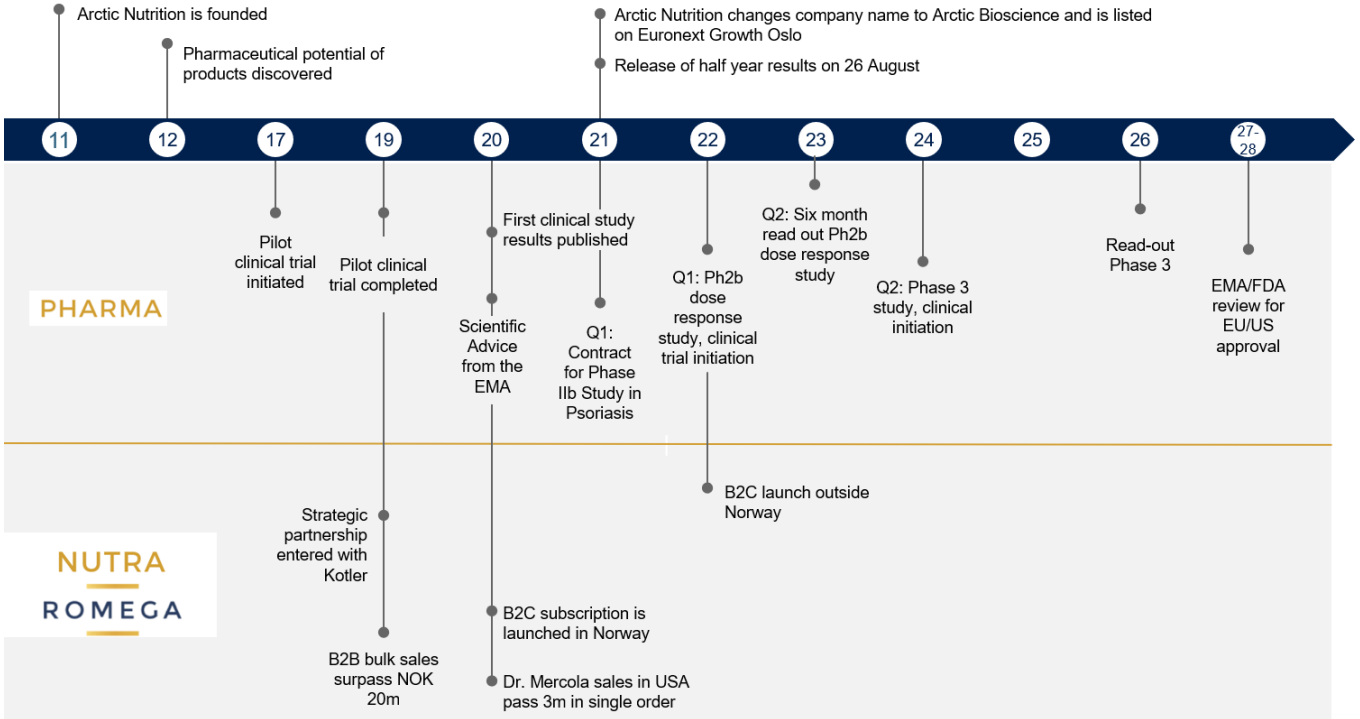
Implied current valuation:				
Current Mcap:			727	
Assuming 0 value for Nutra:				
Net cash '21e			169	7
HRO350 EV - Psoriasis			558	23
Implied fair value/share				**30**
Implied Likelihood of Success HRO350:				
Net cash '21e			169	7
Discounted EV - Nutra	337	100%	337	14
HRO350 EV - Psoriasis	5,107	4%	221	9
Implied fair value/share				**30**

Source: ABG Sundal Collier

Key risks

The primary risks for HRO350 are clinical development setbacks. We are encouraged by the clinical data presented in the Pilot study, but HRO350 still needs to pass pivotal trials and the company needs to file a new drug application (NDA) and marketing authorisation application (MAA) to obtain approval. Other risks lie in the company's dependence on licencing to a commercial partner, patent risks, and delays and higher costs for manufacturing facility upgrades.

Historical timeline and future milestones



Source: ABG Sundal Collier, company data

Arctic Bioscience's frontrunner – premium Omega-3 from herring roe

Source: Arctic Bioscience

Arctic Caviar Protein

Source: Arctic Bioscience

Nutraceutical Romega | Premium Omega-3 from herring roe

The nutraceutical business segment is Arctic Bioscience's only current revenue-generating segment and is represented by its Romega brand. Romega is positioned as a premium Omega-3 brand, and unlike most other Omega-3 sources, it is based on herring roe, which has a series of benefits. Herring roe-based Omega-3 contains a high share of the fatty acid docosahexaenoic (DHA), which positions Romega well in certain niche markets such as pregnancy nutrition. Arctic Bioscience has developed its own patented technology to gently remove the healthy fatty acids (i.e. separating the protein and lipid fractions) from the herring roe in a sustainable way. Unlike many other traditional fish oils, the Romega capsules contain Omega-3 in phospholipid form, which is more efficiently incorporated into the body's cells and may be a better delivery form to the body's organs than other marine oils.

Arctic Bioscience also markets the product Romega Arctic Caviar Protein. While currently a small part of the total nutraceutical sales, it is expected to grow in the coming years. It is a marine herring protein product made from the extraction process that yields a roe extract rich in phospholipid esters of EPA and DHA but also defatted marine protein. The product is made of 90% pure herring protein with a full range of amino acids, nucleotides, vitamins and minerals. We expect further Romega product lines going forward.

Premium Omega-3 products produced and distributed

The Romega product line constitutes the totality of Arctic Bioscience's revenue and has been the key focus since the company's inception (previously called Arctic Nutrition). The product has historically been exclusively marketed through the B2B/partnerships channels until 2020, when 17% of sales went directly through B2C (subscription sales) after a successful launch in Norway. Continued expansion in B2C in markets outside Norway in 2022 will contribute to the targeted 30% subscription-based B2C revenue share in the mid-to-long term.

Three key factors differentiating Romega from traditional fish-oil

Romega targets the USD 5.6bn (2020) global market for Omega-3 supplements, which is a highly dense and competitive market growing by 8% annually[1]. Although competition in this market is high, there are three key factors differentiating Romega from traditional fish-oil based Omega-3: 1) higher bioavailability with Omega-3 in phospholipid form, 2) rich in essential nutrients such as choline and vitamin D, and 3) a DHA-to-EPA ratio of 3:1 (DHA has been shown to reduce inflammatory processes).

Superior absorption of fat-soluble nutrients for improved bioavailability

Like all Omega-3 supplements, Romega contains the marine Omega-3 fatty acids DHA and EPA. The key difference is that it is in phospholipid form rather than triglyceride form, which is the case for most traditional fish-oils. Phospholipids' key trait is that their special structure makes them water-soluble, which leads to the improved absorption of Omega-3 fatty acids. Phospholipids are a class of fats (lipids) that contain phosphoric and constitute the key component of the body's cell membranes. The special properties of phospholipids also mean that products

[1] Grand View Research Omega 3 Supplements Market Size, Share … Region, And Segment Forecasts, 2020 – 2027

containing Omega-3 phospholipids do not cause fish regurgitation when ingested, as the fat mixes better with the aqueous stomach content.

Rich in essential nutrients for 'start of life'
Romega is a true differentiator towards other Omega-3 supplements, as it is rich in docosahexaenoic (DHA) & Eicosapentaenoic (EPA) phospholipids, choline and vitamin D, which are all essential nutrients relevant for the 'start of life' phase. Romega contains a DHA-to-EPA ratio of 3:1, which has been shown to be beneficial during pregnancy.

- **DHA** intake contributes to the maintenance of normal vision and brain development of the foetus and breast-fed infants.
- **EPA** contributes to helping the heart maintain its normal function.
- **Choline** contributes to normal lipid metabolism and is important for the transmission of signals in the nervous system, which means that choline contributes to brain function, memory and vision function.
- **Vitamin D** is known to play an important role in bone metabolism through the regulation of calcium and phosphate equilibrium.

Niche segment – pregnant women
The need for Omega-3 increases during pregnancy because the foetus needs the Omega-3 fatty acid DHA. The DHA fatty acid is long, has a flexible structure and is absorbed into the retina and brain. It is important for the development of the foetus, especially for the structure of the brain and nervous system. Both the brain and the eyes develop rapidly, and an adequate intake of DHA is therefore beneficial for the development of these organs.

The Norwegian Directorate of Health recommends a daily intake of 200 milligrams of DHA for pregnant and breastfeeding women. Maternal DHA levels fall during pregnancy and in the postpartum period, and the high DHA content in Romega will cover the authorities' recommendations for pregnant and breastfeeding women. In addition, the phospholipids in Romega will prevent unpleasant fish regurgitation, a phenomenon that many people experience with traditional fish oil products.

Arctic Bioscience agreement with Kotler Marketing
In 2019, Arctic Bioscience entered into a strategic cooperation agreement with Kotler Marketing Group, which has now established sales and marketing of the dietary supplement Romega in China through an e-commerce platform. The product made from roe/caviar has a special status in Asia, which puts it in in a unique position. Romega has a unique offering towards pregnant women where DHA is important in terms of brain development for the foetus. With 18 million pregnant women in China at any given time, the market is significant.

Other niche segments
As Romega contains DHA, which is a structural component of the photoreceptors' cell membranes and hence important for normal vision function, a natural market is school children, gamers, and other groups spending critical amount of time in front of computers and screens. Arctic Bioscience argues for several health benefits for the body's organs and highlights particularly brain, eyes and heart as key areas for the supplement given the high concentration of DHA.

Romega combines the benefits of high DHA content with a high degree of phospholipids

Product	Romega	SUPERBAKrill	Ultimate omega
Company	**Arctic Bioscience**	**Aker BioMarine**	**Nordic Naturals**
EPA (mg/g)	100	120	325
DHA (mg/g)	320	62.2	225
Total omega-3(mg/g)	420	220	640
DHA:EPA ratio	3:1	1:2	9:13
Phospholipid	340	480	-
Choline	42	50	-

Source: ABG Sundal Collier, company data

Pharmaceutical HRO350 | Targets mild-moderate Psoriasis

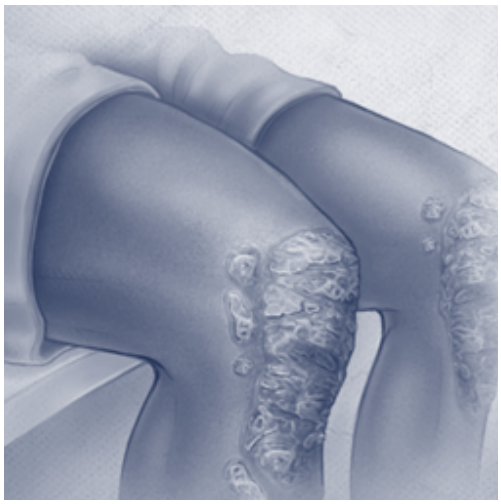
Arctic Bioscience develops HRO350, an oral drug candidate based on an optimised herring roe compound for mild-moderate psoriasis. Today, severely affected patients have several treatment options in the form of advanced biological drugs. However, for mild to slightly moderate psoriasis, there are few satisfactory treatments, including steroid creams and phototherapy. There is a clear unmet medical need for cost-efficient, safe and effective treatments in the mild-moderate category and dermatologists have clearly indicated the need for an oral and non-invasive option for these patients.

Disease overview

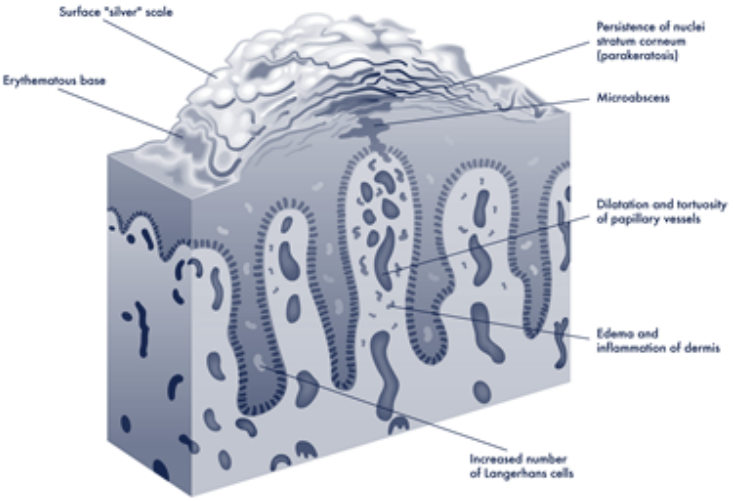
Psoriasis is a chronic inflammatory skin disease, which appears as red, flaky nodules or surfaces on the skin and occurs most commonly on the elbows, knees, scalp and lower back. The pathological change in the skin consists of greatly increased cell division in the epidermis (the surface/ outermost layer of the skin), which causes the epidermis to thicken and the maturation of the epidermal cells to be disturbed such that the epidermis becomes scaly. The increased blood circulation in the skin lesions entails red papules and plaques and is often covered with white or silver scales.

Psoriasis - illustrations

Clinical presentation



Histopathology of Psoriasis

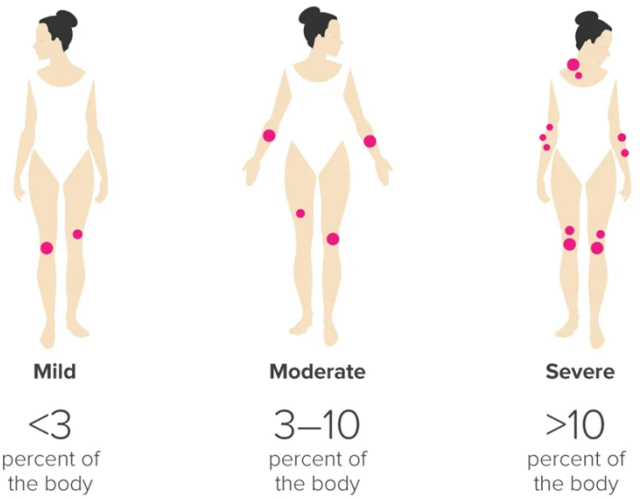


Source: ABG Sundal Collier, Bard et al. 2021

Psoriasis can be limited to a few lesions or involve large areas of the skin. The severity of psoriasis is determined by measuring the size of the body surface area (BSA) occupied by the disease. If less than 3% of the body covered, it will be classified as *mild* psoriasis, *moderate* psoriasis ranges from 3-10% and *severe* is more than 10%. According to the International Federation of Psoriasis Associations (IFPA), over 125m people have some form of psoriasis worldwide[2] implying a global prevalence of ~3%. Arctic Bioscience targets mild-moderate patients, which is approximately 90% of patients, or ~21 million people in EU5 and the US.

[2]Griffiths et al 2017 "The global state of psoriasis disease epidemiology: a workshop report"

Disease severity

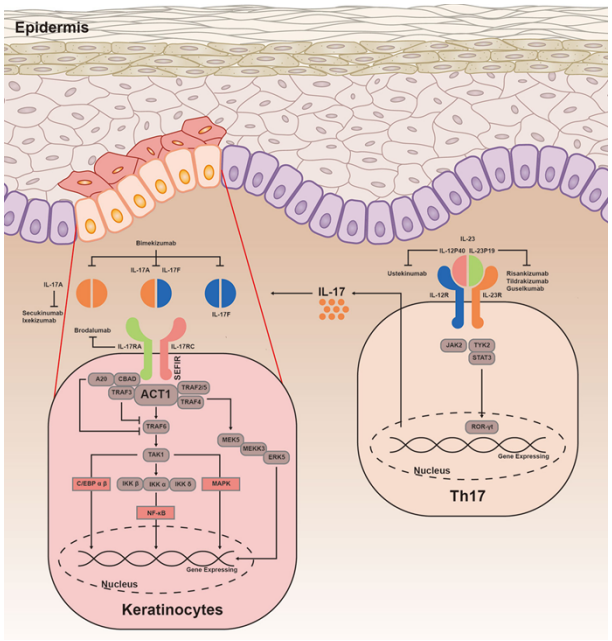


Source: ABG Sundal Collier, Healthline

Pathogenesis of psoriasis

The pathogenesis of psoriasis is not fully understood, but it is believed that excessive activation of the adaptive immune system is the major cause of disease outbreak. In general, inflammation is a helpful and defensive reaction in the body during virus and bacterial attacks, as it helps the body remove harmful stimulus. With psoriasis, however, the immune system is triggered incorrectly, leading to a nonsensical inflammatory reaction that damages the body's own tissues. T lymphocytes play a central role in the pathogenesis of the overactive immune system in psoriasis. The central subtype of T lymphocytes that drive inflammation in psoriasis has been recognised as Th17, which is related to two central cytokines called IL-21/IL-17; together, these are believed to form the IL-23/IL-17 axis that is central to the pathogenesis of psoriasis.[3]

Pathogenesis of psoriasis - illustration



Source: ABG Sundal Collier, Liu et al 2020

[3] Liu et al 2020 "The IL-23/IL-17 Pathway in Inflammatory Skin Diseases: From Bench to Bedside"

This axis of cytokines also drives keratinocyte proliferation, which is a key component of the formation of the plaques that are typical of the disease presentation of psoriasis. They also attract inflammatory cells, which creates a vicious circle of inflammation, skin cell proliferation and neutrophil recruitment resulting in psoriatic plaques.

Types of psoriasis

There are several different subgroups of psoriasis that can affect different areas of the body and present in various ways. Some patients have only one of the forms, while many have a combination of several types. In the following section, we will describe the most common types of psoriasis and their manifestations.

Types of psoriasis and manifestations

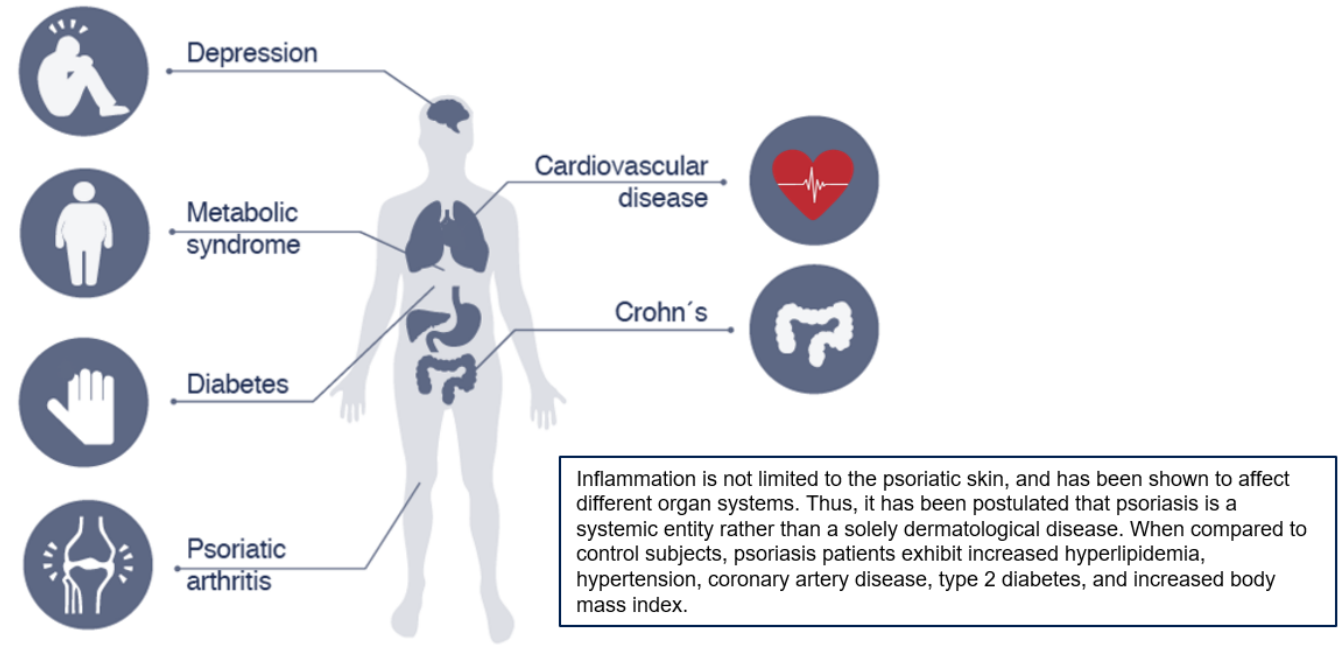
Plaque psoriasis		• The most common form of psoriasis and accounts for 80-90% of all cases • Small spots that gradually grow in size, usually covered by silvery and white scales • Involves the scalp and the area behind the ears, the extensor surfaces of the forearms and shins (especially elbows and knees), trunk, face, palms, sole and nails
Guttate psoriasis		• Affects between 0.6% and 20% of individuals diagnosed with psoriasis and usually occurs in childhood or adolescence • Reddish, drop-like papules and plaques, mainly involving the trunk, arms and legs • Is associated with streptococcal infection of the upper respiratory tract and prior skin symptoms
Inverse psoriasis		• Affects between 12% and 26%% of all cases of psoriasis • Deep-red or white, flat sharply demarcated, wet patches or plaques, scales are usually absent • Affects flexural body sites such as skin folds of the groin, breast, buttocks, and armpits. Inverse psoriasis can worsen with perspiration or friction
Pustular psoriasis		• Affects between 0.4% and 7% of all cases of psoriasis • Pus- or fluid-filled blisters form on the skin, typically surrounded by red, inflamed skin • Localized to small areas of the body such as palms of the hands, fingertips, nails and soles of the feet
Nail psoriasis		• More than half of psoriasis patients have nail changes • Pitting, spotting, and thickening of the nails can also occur, psoriatic nails may crumble or separate from the nailbed • Causes discoloration and abnormal nail growth and can affect the toenails and fingernails
Erythrodermic psoriasis		• One of the rarest forms of psoriasis, affects 1-2% of all cases • Fiery redness and exfoliation of most of the body surface, can cause intense itching and burning • The most serious type of psoriasis, potentially life threatening because it can lead to hypothermia and high output cardiac failure

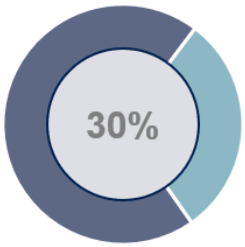
Source: ABG Sundal Collier, WHO

Co-morbidities – a significant concern in psoriasis

Psoriasis has been identified as a systemic chronic inflammatory disorder associated with multiple comorbidities, i.e. the presence of two or more simultaneous independent diseases. Approximately 30% of psoriasis sufferers have a condition called psoriatic arthritis, a systemic rheumatic disease.[4] This is a painful condition where the immune system attacks the joints of the body instead of the skin. The symptoms are stiff, painful joints that become swollen and inflamed. Usually only a few joints are affected, most often fingers or toes. Most people develop psoriasis first and are later diagnosed with psoriatic arthritis, but the joint problems can begin before skin patches appear.

Co-morbidities in psoriasis





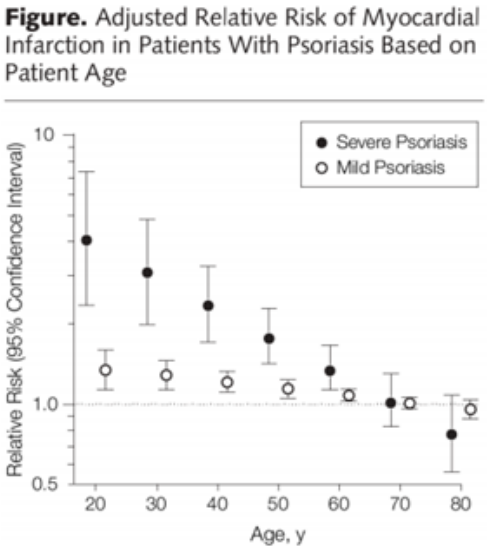
A form of arthritis, called psoriatic arthritis affect approx. 30% of people who have psoriasis

Source: ABG Sundal Collier, Global Psoriasis Coalition

Other comorbidities common in individuals with psoriasis include obesity, diabetes, autoimmune disease, cardiovascular disease, metabolic syndrome, sleep apnoea, liver disease, psychiatric illness and addictive behaviour such as smoking and alcohol abuse. Psoriasis confers an independent risk of heart attack in mild, moderate and severe cases. People with any type of psoriasis have a risk of heart attack that is almost three times greater than in people without psoriasis. Since many of these co-morbidities are also present in patients with mild disease, treatment could still be meaningful in patients with benign disease, as they could still be at risk of developing several of the co-morbidities associated psoriasis.

[4] Boutet et al 2018 "Role of the IL-23/IL-17 Axis in Psoriasis and Psoriatic Arthritis: The Clinical Importance of Its Divergence in Skin and Joints"

High relative risk of heart attack in young Psoriatics
Mild psoriasis (127,139 patients), severe (3,837 patients), and controls (556,995)



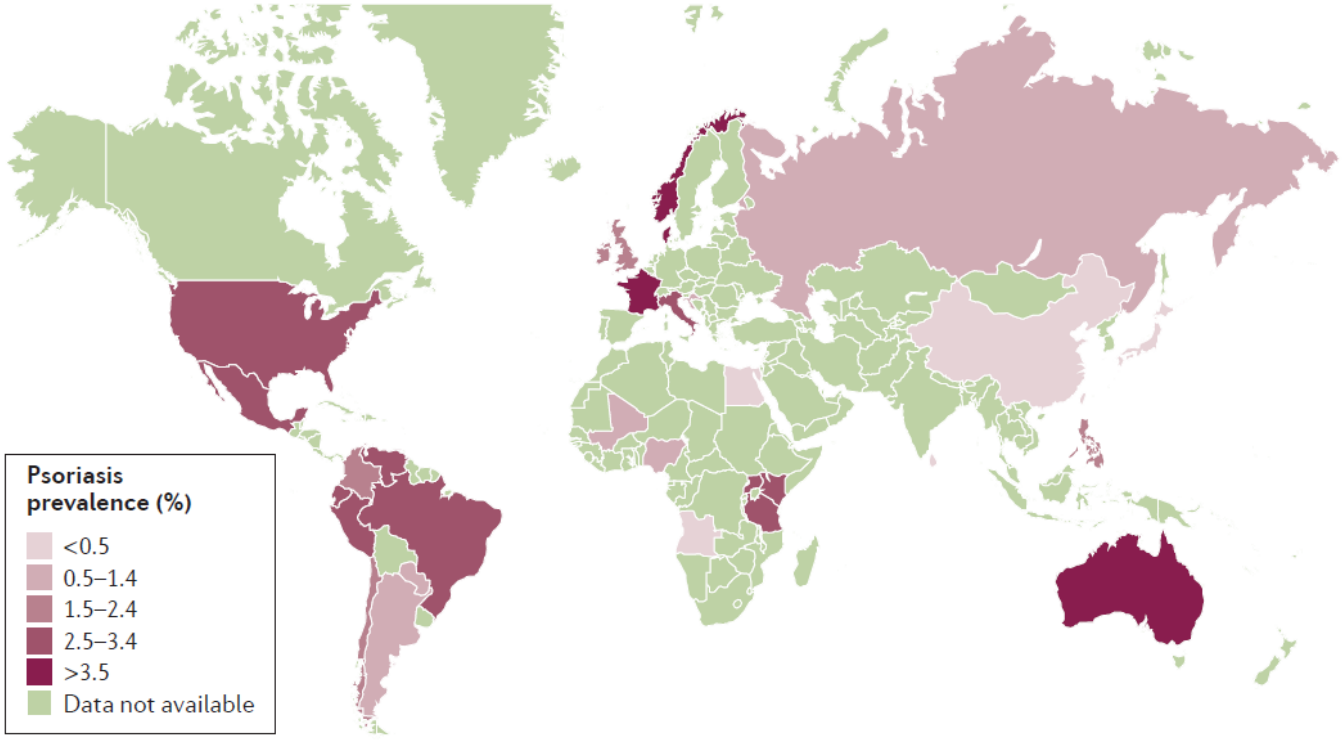
Source: Source: Gelfand et al, JAMA, 2006;296(14):1735-41

Epidemiology
Psoriasis affects >125 million people worldwide and tends to occur more frequently in adults between 18 and 39 years of age and 50 and 69 years of age. Women and men are affected equally. Incidence in adults varied from 78.9 per 100,000 person-years in the US to 230 per 100,000 person-years in Italy[5]. Historical growth shows that the incidence of Psoriasis seems to be increasing over time. From 1970 to 1974, the incidence in adults increased from 50.8 cases per 100,000 individuals to 100.5 cases per 100,000 between 1995 and 1999.

A systematic review of international, population-based studies demonstrated a global prevalence of psoriasis in adults ranging from 2.7% in the US to 8.5% in Norway[6]. A study of 22 population-based surveys, case-control studies and reviews from around the world found a weak positive correlation between higher latitude and greater psoriasis prevalence; this is possibly due to the level of ultraviolet exposure. The lowest prevalence rates were observed in Latin America, Africa and Asia, whereas the highest rates were reported in Europe. Even within Asia, prevalence ranged from as low as 0.3% in Hong Kong, Sendai (Japan) and five major cities in China to as high as 2.4% in the Philippines. The highest prevalence reported has been in Norway with 8% of the population believed to be affected by psoriasis.[7]

[5] *Greb, Goldminz, Elder et al., Psoriasis review, 2016: 16082*
[6] *Greb, Goldminz, Elder et al., Psoriasis review, 2016: 16082*
[7] *Armstrong et al 2020 "Pathophysiology, Clinical Presentation, and Treatment of Psoriasis"*

Global prevalence of psoriasis



Source: Greb, Goldminz, Elder et al., Psoriasis review, 2016: 16082

There are many unmet research needs for psoriasis, including epidemiology and aetiology. It is known that it can be triggered by strains on the body after stress, infections, alcohol intake and external irritation of the skin, and it can also be genetically inherited. People with psoriasis may have mutations or changes in specific genes, suggesting a genetic involvement in its development. Results from previous family and twin studies have shown that psoriasis may run in families.

Prognosis

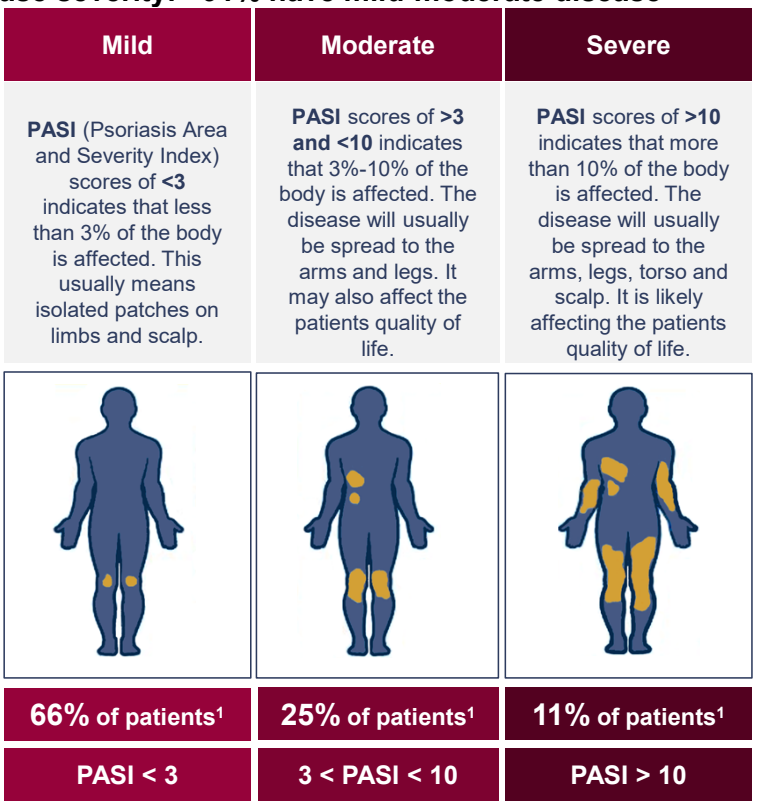
Psoriasis has a fluctuating course with periods of increased and milder ailments. Some treatments can provide long-term symptom relief., but the disease usually returns. Early diagnosis and treatment improve the long-term outlook. The most commonly used measures for calculating the severity of psoriasis include the Psoriasis Area and Severity Index (PASI), which measures the size of the BSA occupied by psoriasis based on the degree of scaling, redness and thickness of the skin lesions. The score ranges from 0 to 72. In general, a PASI score of 3 to 10 is considered moderate disease, and a score over 10 is considered severe**.**

To calculate the PASI score, psoriasis lesions on four different body regions are performed and assessed: head, upper extremities, trunk and lower extremities. The severity of the plaques in each region is rated on a scale from 0 to 4 (0= no involvement, 4=severe involvement) for erythema, induration and scaling. Next, the surface area of each body region covered by the plaques is rated from 0 to 6 (0=no involvement, 6=more than 90% of region covered in plagues). These grades are then fed into an equation to determine the patient's PASI score, which weights each body region (10%, 20%, 30% and 40% of the body surface area).

Mild psoriasis is determined by a PASI score of less than 3, indicating that less than 3% of the body is affected. This usually means isolated patches on limbs and scalp. Moderate psoriasis patients have a PASI score of more than >3 and less than <10, indicating that 3%-10% of the body is affected. The disease will usually be spread to the arms and legs, and may also affect the patient's quality of life. An outline of the

severity of psoriasis in the EU's five largest countries shows that 66% of patients have mild psoriasis and 25% have moderate psoriasis, which are the groups that Arctic Bioscience is targeting

Disease severity: ~91% have mild-moderate disease



[1]EU5
Source: ABG Sundal Collier, WHO

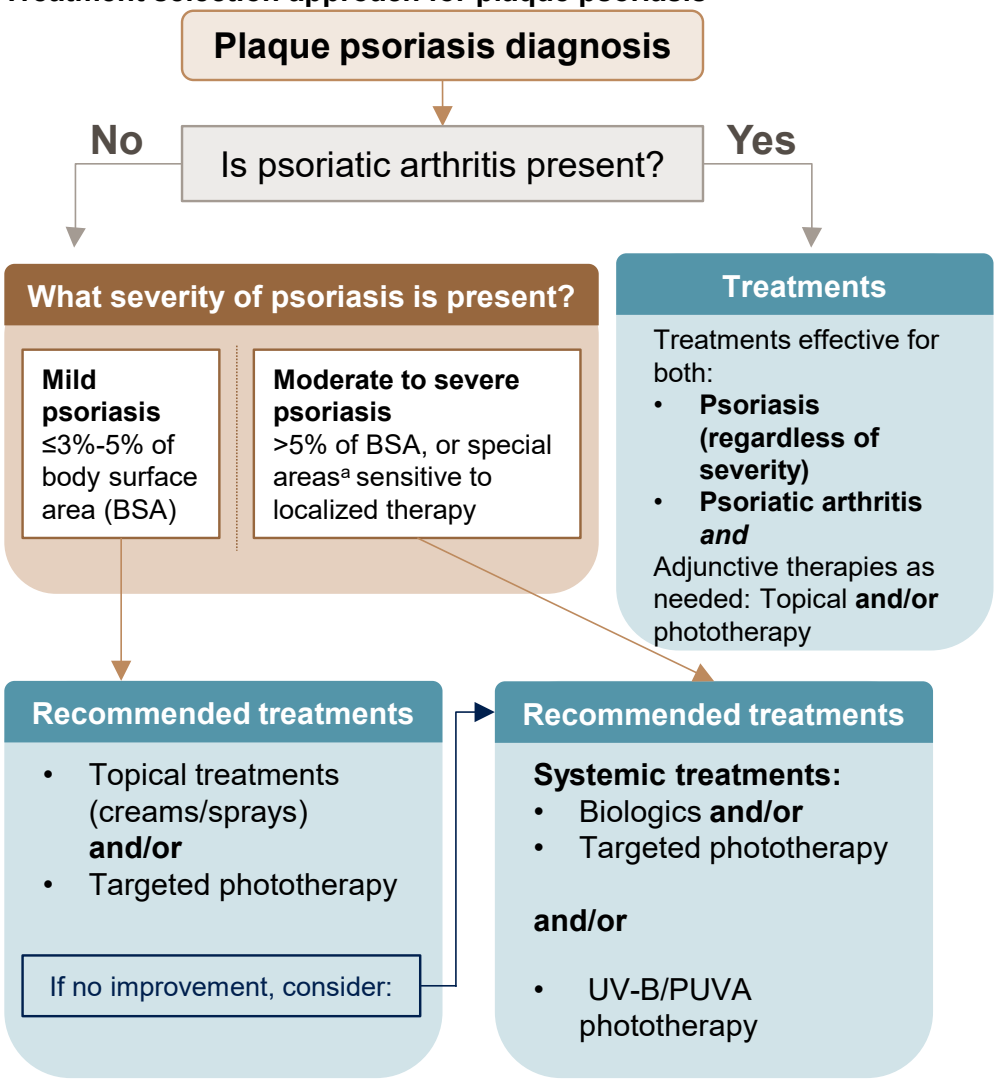
Management of psoriasis

The management of psoriasis patients involves addressing both the psychosocial and physical aspects of the disease. as the disease can have a significant effect on patients' quality of life. Psoriasis is by nature a chronic, incurable disease, and treatment is only available to control symptoms, meaning that patients are never fully cured. The therapy is used to relieve skin inflammation, reduce the production of skin cells and/or suppress the immune system.

Topical therapy, phototherapy and systemic therapy are the most common forms of treatment for psoriasis and are based on severity at the time of presentation/diagnosis (see figure below). Topical therapy consists of e.g. gels, creams, ointments or liniments applied to a particular place on or in the body, while phototherapy is ultraviolet (UV) light that has a relieving effect on the disease. Systemic therapy is either injected or taken as a tablet.

Since Arctic Bioscience will target the mild-to-moderate patient group with its treatment, we will not delve into the different biological treatments and their data, but more details can be found in the Appendix.

Treatment selection approach for plaque psoriasis



[a]Special areas include the scalp, palms, soles, genitalia, and nails.

Note: Psoriatic arthritis is a form of arthritis that affects ~1/3 of psoriasis patients. Most people develop psoriasis first and are later diagnosed with psoriatic arthritis, but the joint problems can begin before skin patches appear.

Source: ABG Sundal Collier, Armstrong et al. 2020

Topical Therapy

Topical treatments are medications applied to the skin. Mild (PASI < 3) to moderate (3< PASI <10) patients pursuing treatments mostly use various topical therapies. The most common treatment modality is topical corticosteroids, which are prescribed to approximately 80% of patients across mild-to-severe disease.

Topical treatment of psoriasis

Name	Description	Advantages and Disadvantages of treatment
Corticosteroids	Most frequently prescribed medications for treating mild to moderate psoriasis. Synthetically produced hormones available in different varieties, strengths and combinations	✚ It can control the inflammatory reaction ▬ Long-term use or overuse of strong corticosteroids can thin the skin. The condition may get worse once the use of corticosteroids stops. Over time, topical corticosteroids may stop working
Vitamin D analogues	Synthetic forms of vitamin D, such as calcipotriol and calcitriol help regulate the immune system in the skin and slow skin cell growth. Used as monotherapy or in combination with corticosteroids	✚ May cause less irritation in sensitive areas ▬ Calcipotriol used as monotherapy has a later onset of action than corticosteroids. Usually more expensive than topical corticosteroids
Retinoids	Synthetic form of vitamin A that can slow the growth of skin cells. Often used in combination with corticosteroids. Tazorac (tazarotene) is indicated for mild to moderate psoriasis and applied topically as a cream, gel or foam	✚ Can reduce the size and thickness of skin plaques ▬ Skin irritation as desquamation and drying of mucous membranes. Increased sensitivity to light and retinoids are contraindicated for use in pregnancy
Calcineurin inhibitors	Two types of topical calcineurin inhibitors called tacrolimus (Protopic) ointment and pimecrolimus (Elidel) cream, which reduce inflammation and plaque build-up	✚ Can be helpful in areas of thin skin (around the eyes) where steroid creams and retinoids may cause harmful effects ▬ Long-term use can increase the risk of skin cancer and lymphoma
Coal Tar	Can help slow the rapid growth of skin cells and restore the skin's smooth appearance. Available over-the-counter or by prescription in various forms, such as shampoo, cream and oil	✚ Reduces scaling, itching and inflammation ▬ Can irritate the skin and are messy, stain clothing and can have a strong odor
Anthralin	Another tar product, a cream used to slow skin cell growth	✚ Can remove scales and make skin smoother ▬ Can irritate skin and should not be used on the face or genitals. For short-time use, and it stains almost anything it touches

Source: ABG Sundal Collier, WHO

We note that the FDA has recently approved three topical treatments: Enstilar Foam, Lexette Foam and Taclonext. We believe that these products will be key competitors to a benign oral treatment for mild-to-moderate psoriasis. Most products were approved by looking at the Investigator Global Assessment (IGA) scale endpoint, which is the most common endpoint for topical treatments. The IGA scale is a visual assessment that consists of a score ranging from 0 (clear) to 4 (severe). Skin rated a 4 is bright red in colour with marked plaque elevation, and is dominated by thick, non-tenacious scale. For a treatment to be considered successful, the affected area must receive a score of 0 or 1 and experience a two-point improvement from baseline.

Current approved topical treatments that could be used in mild-moderate psoriasis

Topicals	Approved	Mechanism of action	Administration, Advantage & Indication	Side effects
Betamethasone dipropriate (Sernivo)	2016	Topically applied corticosteroid	Lotion or cream. Generally reserved for thick plaques. First line therapy for mild-moderate disease.	Pruritus, erythema, thinning of skin
Plant-based solution (MetaDerm)	2019	Various botanical substances used with anti-inflammatory effects	Lotion or cream. Non-steroid based treatment. First line therapy for mild-moderate disease.	Pruritus, erythema, hair loss, irritation, thinning of skin
Calcipotriene/ betamethasone dipropionate (Taclonex)	2006	Combo Vit. D analog (Calcipotriene) + corticosteroid (Betamethasone)	Ointment, suspension. Combination therapy shown to be more efficacious than either used as monotherapy. Preferred for thicker plaques. Potentially less irritating than Calcitriol.	Pruritus, burning, erythema, irritation, skin thinning, folliculitis, worsening of psoriasis
Halobetasol propionate (Lexette, Ultravate)	2019	Topically applied corticosteroid	Ointment or cream. Highly potent steroid.	Burning, irritation, erythema, dryness, folliculitis, thinning of skin, stretch marks
Halobetasol propionate/ tazarotene (Duobrii)	2019	Combo corticosteroid (Halobetasol) + retinoid prodrug (Tazarotene)	Lotion. Combination therapy shown to help mitigate steroid induced atrophy and prevent tachyphylaxis.	Contact dermatitis, application site pain, folliculitis, skin atrophy, excoriation
Calcipotriene/betamethasone (Enstilar)	2015	Combo Vit. D analog (Calcipotriene) + corticosteroid (Betamethasone)	Spray foam. Similar indication to Taclonex. Similar side effect profile.	Application site irritation and/or pruritus, folliculitis, skin hypopigmentation, hypercalcemia, urticaria, exacerbation of psoriasis
Tazarotene (Tazorac)	1997	Receptor-selective retinoid	Gel or cream. Rarely used as monotherapy. Combo therapy helps alleviate side effects of topical steroids.	Application site irritation and/or pruritus, blistered skin

Source: ABG Sundal Collier, Modified from National Psoriasis Foundation

Data from recent FDA-approved topical treatments in psoriasis

Enstilar Foam – FDA approved 2015

Two multicentre randomised double-blind clinical trials led to the approval of Enstilar Foam in 2015. In Trial One, 302 subjects were randomised to 1 of 3 treatment groups. Enstilar Foam, betamethasone dipropionate or calcipotriene hydrate. Baseline disease severity was graded using a five-point Investigator's Global Assessment (IGA). At baseline subjects scored "Mild", "Moderate", or "Severe". The majority of subjects in both trials (76% and 75%) had disease of "Moderate" severity at baseline, 14% and 15% of subjects had disease of "Mild" severity at baseline and 10% of subjects had "Severe" disease at baseline in both trials. The extent of disease involvement assessed by mean body surface area was 7.1% (range 2 to 28%) and 7.5% (range 2 to 30%). In both trials, subjects were treated once daily for up to four weeks. Efficacy was assessed with treatment success defined as the proportion of subjects at Week 4 who were "Clear" or "Almost Clear" according to the IGA. Subjects with "Mild" disease at baseline were required to be "Clear" to be considered a treatment success.

Enstilar Foam – clinical data

	Enstilar foam	Betamethasone diprpionate	Calcipotriene	Vehicle
Trial One Week 4	(N=100)	(N=101)	(N=101)	
	45.0%	30.70%	14.90%	
Trial Two Week 4	N=323	-	-	(N=103)
	53.3%	-	-	4.80%

Source: ABG Sundal Collier, Medical review FDA

Around 40% of subjects achieved "Clear or almost clear skin" in the Enstilar trial. We believe this can serve as a benchmark for a good trial outcome for HRO350 when looking at mild-moderate patients in psoriasis in terms of the percentage of patients that achieve "Clear or almost clear skin", even though HRO350 will use the SPGA endpoint.

Lexette (halobetasol foam) – FDA approved 2019
Lexette was evaluated for the treatment of moderate to severe plaque psoriasis in two multicenter, randomised, double-blind, vehicle-controlled studies. These studies were conducted in 560 subjects 18 years of age and older with plaque psoriasis involving between 2% and 12% body surface area. Baseline disease severity was determined using a static, five-level Investigator's Global Assessment (IGA) scale, on which a subject scored either moderate or severe. The primary measure of efficacy was Overall Treatment Success, defined as the proportion of subjects who were cleared or almost cleared with at least a two-grade improvement from baseline at Week 2 (end of treatment) based on the IGA.

Lexette

	Study 1			Study 2	
	Lexette N=75	Vehicle Foam	N=76	Lexette N=205	Vehicle Foam N=204
Overall treatment success	19 (25%)	3(4%)		63 (31%)	15 (7%)
Plaque Elevation	20/75 (27%)	3/76 (4%)		71/202 (35%)	20/203 (10%)
Scaling	21/75 (28%)	4/76 (5%)		68/201 (34%)	20/204 (10%)
Erythema	16/75 (21%)	2/76 (3%)		59/205 (29%)	17/204 (8%)

Source: ABG Sundal Collier, FDA medical review

The studies on Lexette concluded that around 25% of patients achieved "Clear or almost clear skin" in Study 1, but that was improved to 31% in Study 2, which was the larger of the two studies.

Taclonext Ointment – FDA approved 2006
Taclonext Ointment was evaluated in an international, multi-centre, double-blind, controlled, parallel group study in 1,603 patients with mild to severe psoriasis. They were treated once daily for four weeks. Patients were randomized to four treatment arms: Taclonext ointment, calcipotriene, bethametasone dipropionate and vehicle. Most patients had moderate disease severity at baseline.

Taclonext Ointment – clinical data

	Taclonext Ointment N=490	Calcipotriene N=480	Bethametasone dipropionate N=476	Vehicle N=157
Absent or very mild disease	48%	16.5%	26.3%	7.6%

Source: ABG Sundal Collier, FDA medical reviews

In the clinical trials evaluating Taclonext, 48% of patients achieved “Clear or almost clear skin” at four weeks. We note that steroids alone achieved 26.3% “Clear to almost clear skin” in this trial.

In addition to the aforementioned treatments, there are a number of corticosteroids that are used to treat mild to moderate psoriasis. They are typically dosed one to two times daily. The more potent steroids should be used for no longer than four weeks, with a gradual tapering off. The more potent steroids have a higher efficacy.

Topical corticosteroids: the mainstay treatment in psoriasis

Table 2. Selected Topical Corticosteroids for the Treatment of Plaque Psoriasis

Drug	Dosing	Dosage Form	Clinical Pearls
Class I: Very High Potency			
Clobetasol propionate (Clobex, Olux, Temovate)	qd to tid	0.05% cream, gel	Treatment should not exceed 2-4 wk owing to the risk of potential systemic effects Total dose should not exceed 50 g wk owing to the risk of adrenal suppression May cause adrenal suppression at doses as low as 2 g-day Avoid abrupt discontinuation; consider taper or switch to lower-potency agent
Fluocinonide (Vanos)	qd to bid	0.1% cream	Avoid abrupt discontinuation; consider taper or switch to lower-potency agent Occlusive dressings can be used with caution with fluocinonide
Halobetasol propionate (Ultravate)	qd to bid	0.05% cream, ointment	Avoid abrupt discontinuation; consider taper or switch to lower-potency agent
Class II: High Potency			
Betamethasone dipropionate (reserved for thick plaques)	qd to bid	0.05% ointment	Preferred for the face, groin, armpits, or skin folds Occlusive dressings should be avoided with betamethasone dipropionate
Fluocinonide	bid to qid	0.05% cream, gel, ointment, solution	Preferred for the face, groin, armpits, or skin folds
Triamcinolone acetonide	bid to qid	0.5% ointment	Preferred for the face, groin, armpits, or skin folds
Drug	**Dosing**	**Dosage Form**	**Clinical Pearls**
Class III-V: Medium Potency			
Betamethasone dipropionate	qd to bid (cream) bid (lotion)	0.05% cream 0.05% lotion	Preferred when a large area requires treatment Well tolerated when used for ≤3 mo Occlusive dressings should be avoided with betamethasone dipropionate and fluticasone propionate 0.05% cream
Betamethasone valerate (Luxiq)	qd to tid bid (Luxiq)	0.1% cream, ointment, lotion 0.12% foam	Preferred when a large area requires treatment Well tolerated when used for ≤3 mo
Clocortolone pivalate (Cloderm)	tid	0.1% cream	Preferred when a large area requires treatment Well tolerated when used for ≤3 mo
Desoximetasone (Topicort)	bid	0.05% cream	Preferred when a large area requires treatment Well tolerated when used for ≤3 mo
Fluocinonide	bid to qid	0.05% cream	Preferred when a large area requires treatment Well tolerated when used for≤3 mo
Fluticasone propionate (Cutivate)	qd to bid bid qd	0.05% cream 0.05% ointment 0.05% lotion	Preferred when a large area requires treatment Well tolerated when used for ≤3 mo Occlusive dressings should be avoided with betamethasone dipropionate and fluticasone propionate 0.05% cream
Hydrocortisone valerate (Westcort)	bid to tid	0.2% cream, ointment	Preferred when a large area requires treatment Well tolerated when used for ≤3 mo
Mometasone furoate (Elocon)	qd	0.1% cream, ointment, lotion	Preferred when a large area requires treatment Well tolerated when used for ≤3 mo
Triamcinolone acetonide (Kenalog)	bid to qid tid to qid (spray) bid to tid (0.1% lotion)	0.025% cream, lotion, ointment 0.147% spray 0.1% lotion	Preferred when a large area requires treatment Well tolerated when used for ≤3 mo
Class VI and VII: Low Potency			
Alclometasone dipropionate (Aclovate)	bid to tid	0.05% cream, ointment	Preferred agents for the face, groin, armpits, and skin folds Consider these agents for children, pregnant women and elderly Preferred when a large area requires treatment
Desonide (Desonate, DesOwen, Verdeso)	bid to tid bid (foam, gel)	0.05% cream, ointment, lotion	Preferred agents for the face, groin, armpits, and skin folds Consider these agents for children, pregnant women, and elderly Preferred when a large area requires treatment
Fluocinolone acetonide (Capex, Derma-Smoothe)	qd (shampoo) tid to qid (cream, solution) tid (oil)	0.01% cream, oil, shampoo, solution	Preferred agents for the face, groin, armpits, and skin folds Consider these agents for children, pregnant women, and elderly Preferred when a large area requires treatment
Hydrocortisone OTC	up to qid ointment	0.5% cream,	Preferred agents for the face, groin, armpits, and skin folds Consider these agents for children, pregnant women, and elderly Preferred when a large area requires treatment
Hydrocortisone (Cortaid, Cortizone-10)	up to qid	1% cream, ointment 2.5% cream, ointment, lotion (prescription strength)	Preferred agents for the face, groin, armpits, and skin folds Consider these agents for children, pregnant women, and elderly Preferred when a large area requires treatment

Source: References 10, 31-33.

Source: ABG Sundal Collier, Menter A et al 2009, Canadian psoriasis guidelines, Guenther et al 2010, Kim et al 2010.

However, side effects are common with steroids, and dermatologists are especially concerned with systemic side effects that are more likely to develop when highly potent corticosteroids are used for prolonged periods on thin skin (e.g. the face) or on raw/inflamed surfaces. Rare side effects from prolonged exposure of corticosteroids include Cushing disease, obesity, glucose intolerance, reduced bone mineral density, oedema and hypertension.[8]

Phototherapy

Phototherapy is generally a second-line treatment, and is used in dermatology departments when first-line topical treatments fail to improve symptoms. Phototherapy has been in place since the early 1990s. The mechanism of action is dependent on whether UVA or UVB is used, but it is thought to induce apoptosis in immune cells such as T lymphocytes, reducing inflammation and scaling in patients with psoriasis. The treatment is given alone or in combination with medications.

Name	Description	Advantages and Disadvantages of treatment
Sunlight	Natural light for psoriasis treatment	+ Brief daily exposures to sunlight (heliotherapy) might improve psoriasis symptoms - Combination with other medications may increase photosensitivity, which can heighten risk of sunburn and skin cancer
UVB	Controlled doses of UVB from an artificial light source can treat single patches, widespread psoriasis and psoriasis that does not improve with topical treatments. The best effect is obtained at wavelengths around 313 nm	+ Penetrates the skin and slows the growth of affected skin cells - Short-term adverse effects include redness, itching and dry skin. Long-term adverse effects include the possibility of photocarcinogenesis (can lead to occurrence of skin cancer). Inconvenient to patients in areas lacking local availability of treatment facilities
PUVA	Often used for more severe cases of psoriasis. The treatment takes place by the patients taking psoralen as tablets (light-sensitizing medication) before exposure to UVA light	+ Effective where the cells in the epidermis divide very quickly - Short-term side effects include nausea, headache, burning and itching. The risk of skin cancer increases with the number of treatments
Excimer Laser	Light therapy, a strong form of UVB lights targets only the affected skin	+ Requires fewer sessions because of the powerful UVB light - Redness and blistering

Source: ABG Sundal Collier, WHO

[8] Coondoo et al 2014 "Side-effects of topical steroids: A long overdue revisit"

Systemic therapy

Systemic therapies are oral or injected (systemic) drugs used by patients with moderate (3< PASI <10) to severe (PASI >10) psoriasis, or where a satisfactory effect has not been achieved with the other forms of treatment.

Name	Description	Advantages and Disadvantages of treatment
Retinoids	Synthetic forms of vitamin A. Soriatane (acitretin) is an oral retinoid in gelcap form for severe psoriasis	+ Reduce the production of skin cells - Side effects might include dry skin and muscle soreness. It takes a long time before the body is able to excrete the retinoids and is therefore unsuitable for women of childbearing age
Methotrexate	Methotrexate binds to and inhibits an enzyme involved in the rapid growth of skin cells and slows down their growth rate. Taken as tablets once a week	+ If the medicine is tolerated, this can be a relatively easy way to control the disease - It might cause upset stomach and fatigue. Long-term use can damage the liver cells and inhibit blood production in the bone marrow
Cyclosporine	Immunosuppressant drug, taken orally for severe psoriasis	+ Has in most cases a very good and fast onset effect - May be harmful for the kidneys, cause high blood pressure and should therefore only be used periodically
Apremilast	Apremilast (Otezla) is a type of disease-modifying anti-rheumatic drug and works by targeting enzymes involved in the inflammatory process that cause the symptoms of psoriatic arthritis. Also used for moderate to severe plaque psoriasis	+ Improvement of swollen and painful joints. Reduction of psoriasis skin plaque - Side effects include diarrhoea, headache, nausea, fatigue, depression or suicidal thoughts. Long-term treatment, so it may be up to four months before the patients start to notice the benefits
Dimethyl fumarate	Dimethyl fumarate is an oral immunomodulator indicated for the treatment of adults with moderate to severe plaque psoriasis who need systemic therapy	+ Decreasing inflammation - Diarrhoea, abdominal pain, vomiting, decrease in white blood cells, rash and increased levels of liver enzymes
Biologics	Usually administered by injection. Several of these drugs are approved for the treatment of moderate to severe psoriasis in people who haven't responded to first-line therapies, and psoriasis Arthritis	+ Prevent and decrease inflammation that damages the joints. Alter the immune system in a way that disrupts the disease cycle and improves symptoms and signs of disease within weeks - Biological drugs often consist of large and complex molecules, and are very expensive, limited to severe patients and contraindicated for many patients due to safety profile. Can carry the risk of suppressing your immune system in ways that increase your risk of serious infections

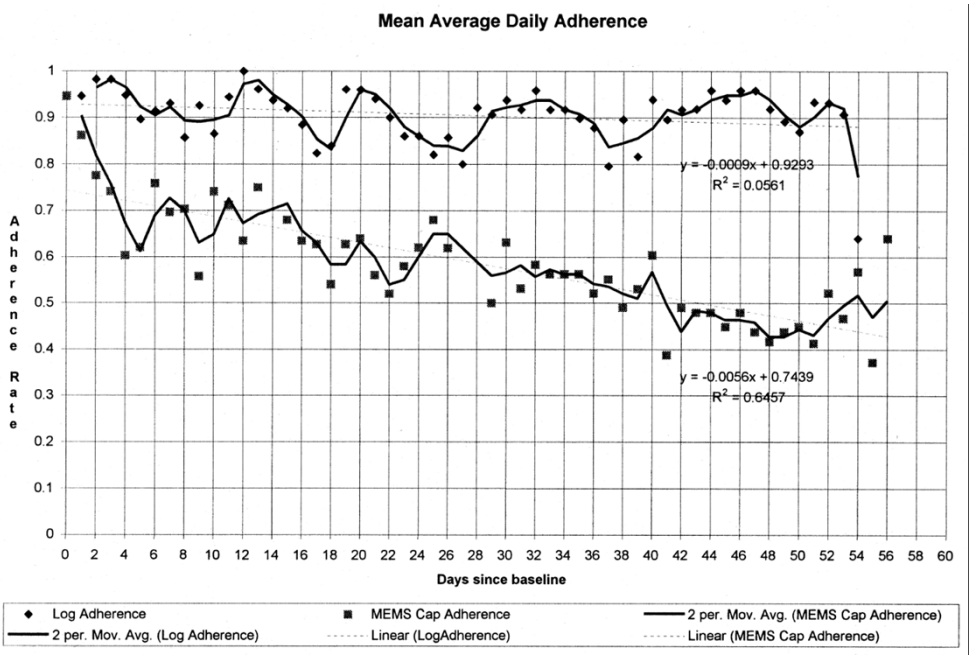
Source: ABG Sundal Collier, WHO

Unmet medical need with current treatments

The intention of all treatments is to alleviate the aliments, keep the disease under control over time and prevent it from affecting the patients' quality of life. Unfortunately, there are several safety concerns with long-term continuous use of today's treatments. Topical therapy can lead to adverse side-effects, especially with long-term use, and the most frequently prescribed medications for mild (PASI < 3) to moderate (3< PASI <10) disease are corticosteroids. Patients generally find these treatments inconvenient and their efficacy tends to decrease over time, which leads to lower treatment adherence.

Knowledge about topical medication adherence is limited. A clinical trial of 30 patients with psoriasis received topical therapy and were followed up for eight weeks. The result indicated that adherence to topical therapy decreased during the course of the eight weeks. Commonly used methods of measuring adherence to topical therapy overestimate actual use.

~50% adherence after eight-week trial with topical psoriasis therapy

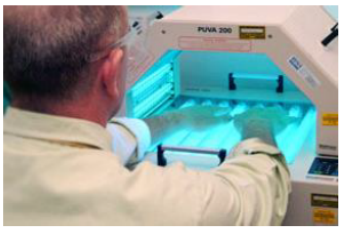


Source: Carroll et al. JAAD, 2004:51(2)212-16

UVB phototherapy can be effective, but it is inconvenient for patients in areas lacking local treatment facilities. In addition, whole body treatment cabins present a higher potential hazard because of the greater UV irradiances they generate and the exposure of large skin areas. Excessive use of phototherapy can increase the risk of squamous cell skin cancer, genital skin cancer, ocular toxicity and photocarcinogenesis.

Phototherapy equipment

NB UVB Cabinet



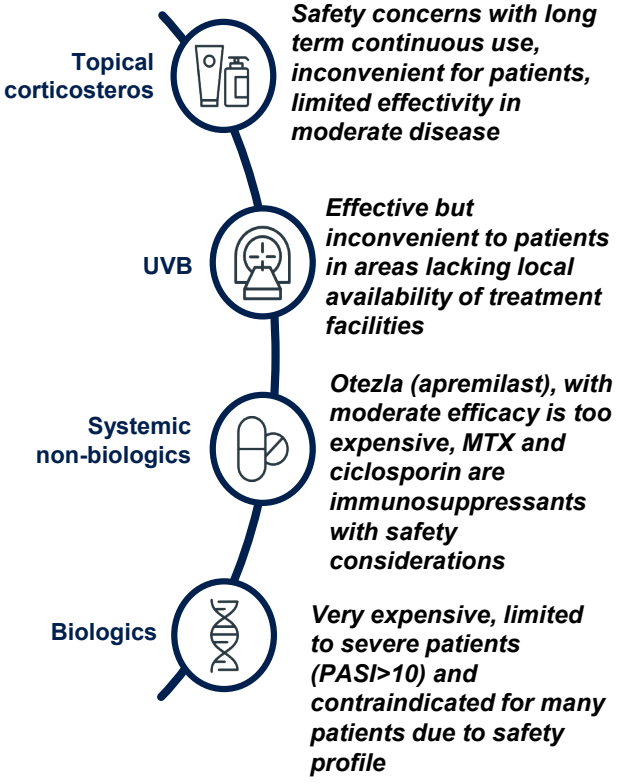
UVA Hand Unit

UV Nail Lamp

Source: IQvia report prepared for Arctic Bioscience

There are a lot of risks involved with systemic non-biologics. Cyclosporine is an immunosuppressant and can cause nephrotoxicity and hypertension. Methotrexate can cause liver fibrosis and hepatotoxicity, and the oral retinoid Acretin is contraindicated in pregnancy. Using Apremilast (oral tablet) involves a risk of nausea, upper respiratory tract infections, headache and a quick rebound of the condition. Systemic biologics are limited to severe (PASI>10) psoriasis patients, and are very expensive. Biological drugs are limited to moderate-severe patients due to high toxicity and price.

Unmet need with current treatments

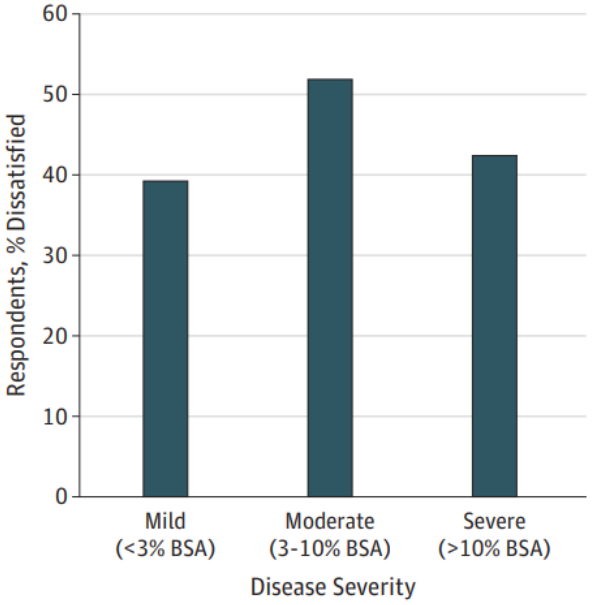


Source: ABG Sundal Collier, IQVIA

High treatment dissatisfaction

A US survey of 5,604 patients with psoriasis between 2003-2011 indicated that 52.3% were dissatisfied with their treatment. Among those receiving treatment, 29.5% of patients with moderate psoriasis and 21.5% of patients with severe psoriasis were treated with topical agents alone. The survey also showed an increase in patients not seeking treatment that ranged from 36.6%-49.2% in mild disease to 23.6-35.5% in moderate disease, and 9.4-29.7**%** in severe.

Current alternatives have high treatment dissatisfaction (39-52%)

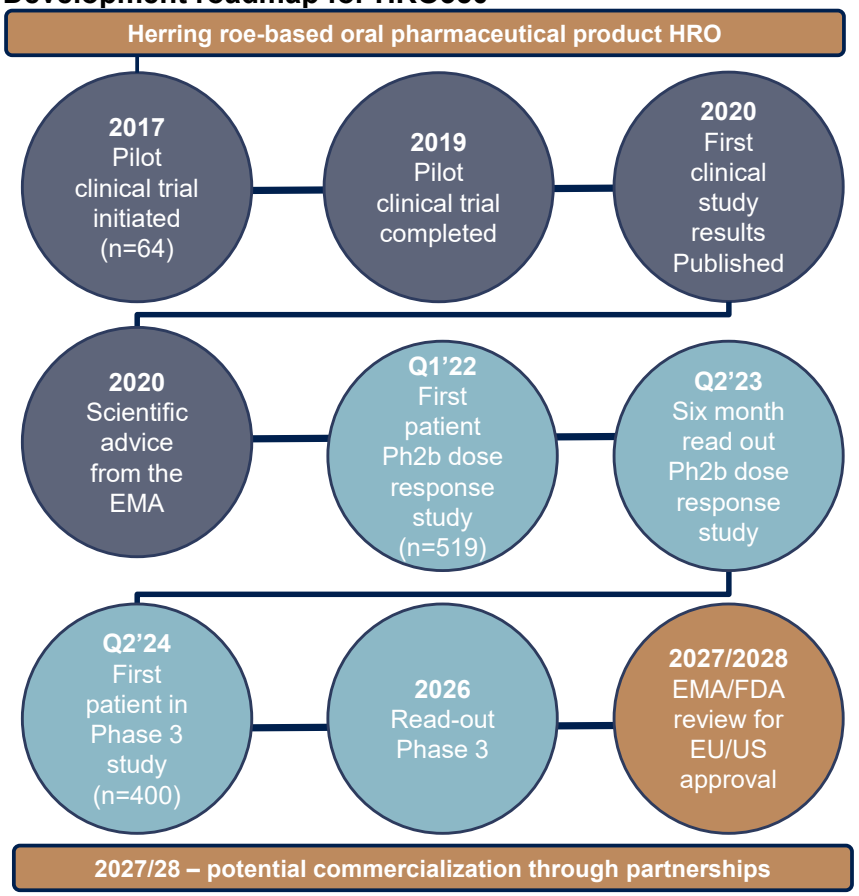


Source: Armstrong et al., JAMA Derm, 2013;149(10):1180-5

HRO350 – oral treatment for mild-moderate psoriasis

The foundation for the drug candidate HRO350 is built on the development of the nutraceutical product Romega, which is based on herring roe. Romega and HRO350 build on the same technology, but HRO350 is an extract of a specific combination of complex phospholipid esters. This is extracted in a different way, and is produced according to GMP (pharmaceutical grade production) parameters. HRO350 may have a composite effect from different lipid classes and their significant metabolites that can lead to clinically relevant immunomodulating properties. A clinical Phase 2b study for mild-to-moderate psoriasis patients is designed in line with recommendations received from the European Medicines Agency, and scheduled to be initiated in the first quarter of 2022.

Development roadmap for HRO350

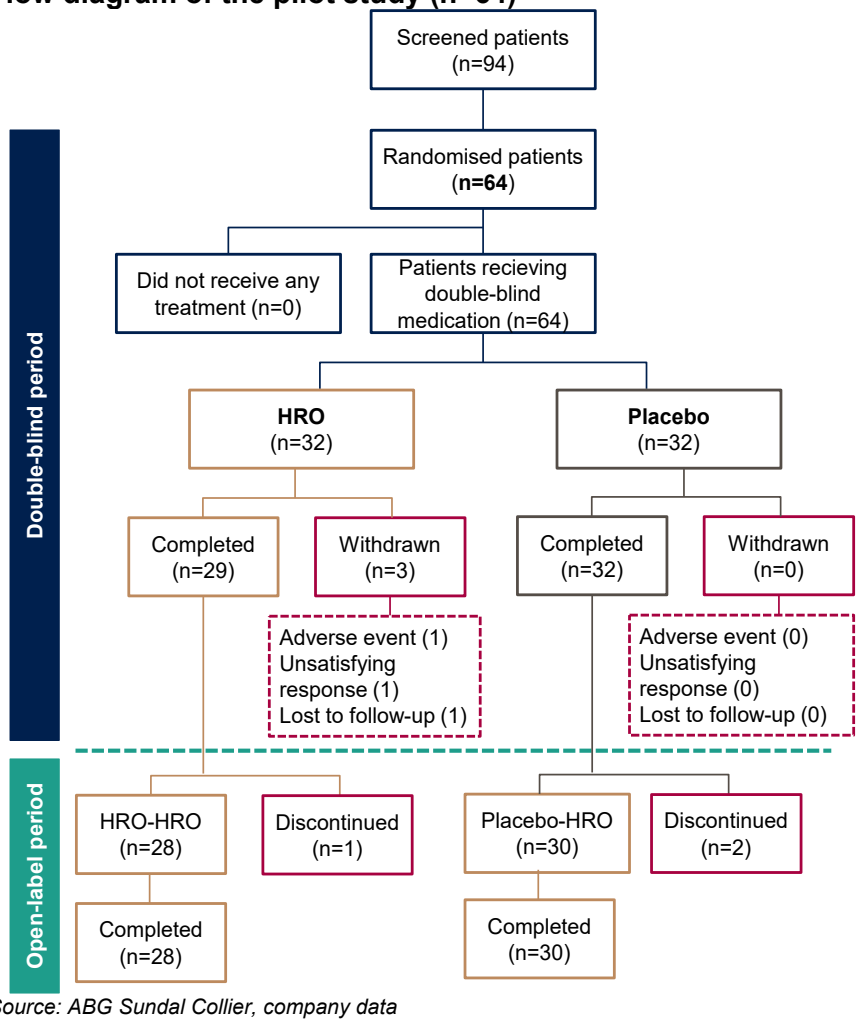


Source: ABG Sundal Collier, company data

HRO350 – Clinical data so far

The pilot clinical trial for HRO was a randomised, double blind, placebo-controlled clinical study to investigate the efficacy of herring roe oil extract for treatment of patients with psoriasis. The trial consisted of 64 patients (n=64) with mild-moderate (PASI < 10) plaque psoriasis; patients were recruited at the Department of Dermatology at Haukeland University Hospital in Bergen, Norway. The patients was randomised into two different groups: 32 patients received a capsule dose concentration of HRO containing 22% EPA and 66% DHA where approximately 35% of both was bound to phospholipids, including phosphatidylcholine. The placebo group included 32 patients given capsules containing coconut oil (medium chain triglycerides). In both groups, patients received 10 capsules daily – five in the morning and five in the evening.

Flow diagram of the pilot study (n=64)



Source: ABG Sundal Collier, company data

The flow diagram shows that three patients discontinued, with one patient withdrawing due to an adverse event (gastritis). One did not receive a satisfying response and the third was lost to follow-up. All patients in the placebo group completed the study. After a double-blind, placebo-controlled period of 26 weeks, patients could continue on the study in an open label extension period for up to 60 weeks.

Baseline characteristics were similar between the groups. However, it is worth noting that around half of patients in both groups also received local steroids while being enrolled in the HRO study. PASI scores varied between 3.4-9.9 at inclusion. The authors of the paper also point to the C-reactive protein levels (a marker of inflammation) being higher in the HRO group compared to placebo, albeit with a large standard deviation.

Patient demographics and baseline data

Open-label extension

Parameter	Measure	HRO	Placebo	Total
Number of subjects	Number	28	30	58
Age	Mean (SD)	46.8 (13.6)	51.6 (13.7)	49.3 (13.8)
Body weight	Mean (SD)	91.8 (17.6)	89.0 (21.3)	90.4 (19.5)
PASI	Mean (SD)	6.2 (1.9)	5.9 (1.7)	6.1 (1.8)
PSGA, most frequent score	Score (%)	2 (82.1)	2 (96.7)	2 (89.7)
BSA	Mean (SD)	7.4 (4.8)	5.5 (2.6)	6.4 (3.9)
DLQI	Mean (SD)	9.1 (6.3)	8.6 (5.3)	8.8 (5.7)
Subjects using local steroids during study	Number (%)	17 (61)	15 (50)	32 (55)

26W study

Parameter	Measure	HRO	Placebo	Total
Number of subjects	Number	32	32	64
Age	Mean (SD)	47.0 (12.8)	51.0 (14.2)	49.0 (13.6)
Body weight	Mean (SD)	89.8 (17.9)	88.4 (20.8)	89.1 (19.2)
Subjects using local steroids during study	Number (%)	18 (56)	16 (50)	34 (53)

Source: ABG Sundal Collier, company data

After 26 weeks, the study concluded that HRO reached a statistically significant PASI score reduction of -1.1 points with a 95% confidence interval of -2.2 to -0.025. However, no statistical effects were measured for other endpoints such as PASI50, PSGA, DLQI or VAS. When performing a post-hoc analysis, looking at patients with a PASI score of >5.5 at inclusions, the measured statistical effect on the PASI score was -2.4 [-1.2,-0.5] with a p value of 0.0157, but no significant difference was found for patients with a PASI score <5.5. We believe that this could be somewhat expected given the small sample size, and that a further study with more patients could yield a stronger signal in the mild population.

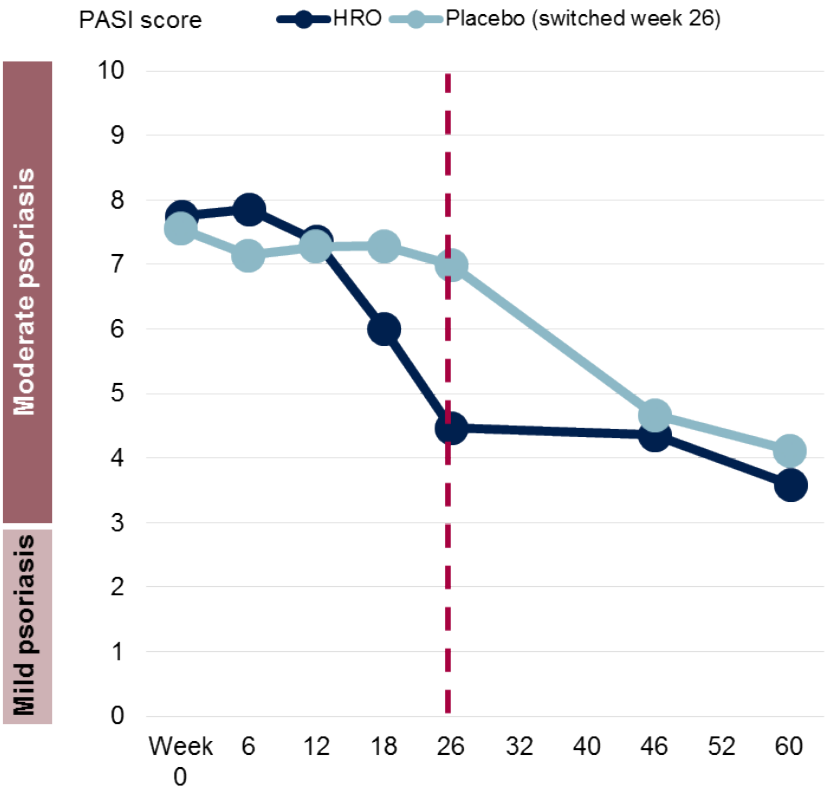
Efficacy table

	Herring roe oil (HRO)			Placebo			HRO vs. Placebo		
Visit	n	Mean (SD)	95%, CI	n	Mean (SD)	95%, CI	Estimate	p-value	95%, CI
DLQI									
Week 0	32	8.7 (6.0)	6.6, 11	32	8.6 (5.2)	6.7, 11	-	-	-
Week 26	32	6.8 (5.2	5.0, 8.7	32	7.6 (6.0)	5.5, 9.8	-	-	-
Change		-1.9 (6.0)	–4.1, 0.3		–1.0 (4.2)	–2.5, 0.6	-0.9	0.47	–3.2, 1.5
PASI									
Week 0	32	6.1 (1.9)	5.4, 6.8	32	6.0 (1.7)	5.4, 6.6	-	-	-
Week 26	32	4.4 (2.4)	3.5, 5.2	32	5.4 (2.7)	4.5, 6.4	-	-	-
Change		-1.8 (2.6)	–2.7, –0.8		–0.6 (1.8)	–1.3, 0.06	–1.1	0.045	-2.2, –0.03
BSA									
Week 0	32	7.3 (4.6)	5.6, 9.0	32	5.9 (3.1)	4.8, 7.0	-	-	-
Week 26	32	5.8 (4.4)	4.2, 7.4	32	5.6 (4.2)	4.1, 7.2	-	-	-
Change		–1.6 (4.5)	–3.2, 0.09		–0.3 (3.3)	–1.5, 0.89	–0.5	0.57	–2.2, 1.2
PSGA									
Week 0	32	2.2 (0.5)	2.0, 2.4	32	2.1 (0.3)	2.0, 2.2	-	-	-
Week 26	32	2.1 (0.7)	1.8, 2.3	32	2.1 (0.7)	1.8, 2.3	-	-	-
Change		–0.2 (0.7)	–0.4, 0.1		–0.0 (0.7)	–0.3, 0.2	-	0.70**	-
C-reactive protein									
Week 0	29	6.1 (13.1)	-	32	2.5 (2.3)	-	-	-	-
Week 26	29	2.8 (2.9)	-	32	2.4 (1.9)	-	-	-	-
Change		–3.3 (12.4)	-		–0.1 (1.9)	-	–0.03*	0.69	-0.19, 0.12

**Difference between herring roe oil and placebo in terms of log10 transformed C-reactive protein (CRP). **p-value from logistic regression model. DLQI: Dermatological Life Quality Index; PASI: Psoriasis Area Severity Index; BSA: body surface area; PSGA: Physician's Static Global Assessment; SD: standard deviation; CI: confidence interval. Tvet et al 2020*

Summarising the efficacy for patients with a PASI score >5.5 at baseline
Week 26: Of all patients who received HRO, (n=32) had a mean PASI reduction of 28% with 10% in the placebo group (n=32). The greatest reduction was observed in the HRO group with moderate (PASI >5.5) psoriasis at baseline (n=15); they had an average reduction of 38% vs. 7% in the placebo group.
Week 60: 58 of the 64 patients continued the treatment, as the placebo group was offered HRO at week 26. The HRO treatment showed further improvement in the patient population over time, with a 55% reduction in PASI.

Subgroup analysis: subjects with 5.5 > PASI at baseline



Mean change in PASI score at week 26 estimated to -2.4 (95% CI <-4.3, - 0.5>, p = 0.0157 (n=31 with PASI>5.5; 15 HRO group and 16 in placebo group). Week 26 – 60 was an open label extension with no placebo-control (n=28 with PASI>5.5)

Source: ABG Sundal Collier, company data

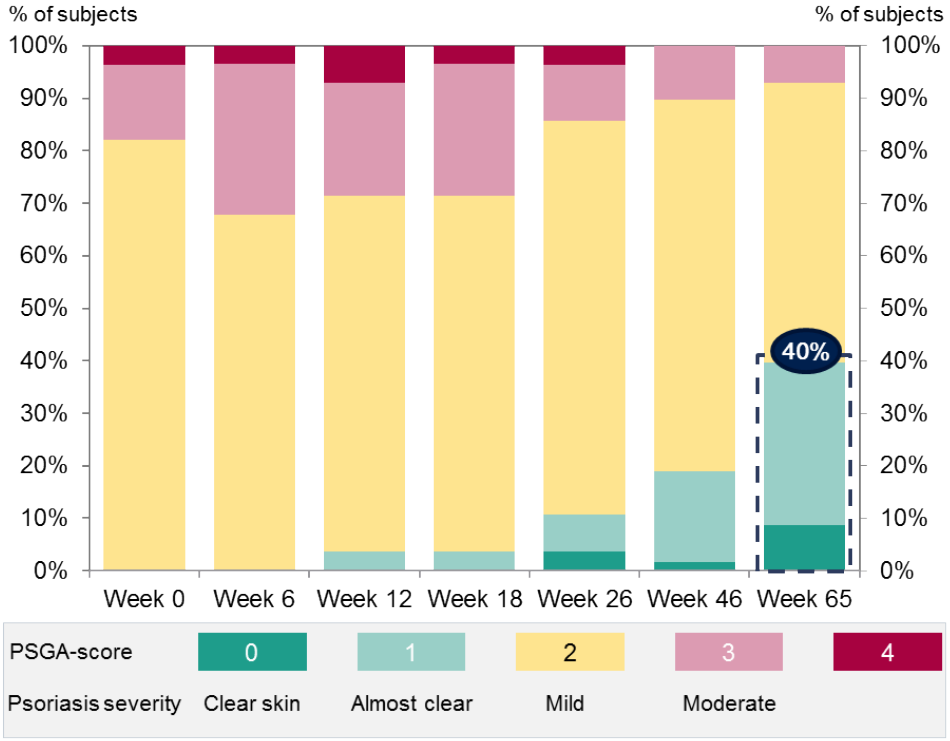
In addition, the side effect profile looks to be exceptionally good compared to current treatments on the market. After 26 weeks of treatment, no serious side effects related to HRO or placebo were seen in the study. The most common were mild gastrointestinal side effects, which occurred slightly more frequently in HRO than in placebo.

Physician´s Static Global Assessment (PSGA)[9]
A secondary variable called PSGA was used to measure patients' disease severity after 65 weeks. All patients (n=58) had PSGA scores from ≥2 (mild severity) to ≤4 (moderate/severe severity) at inclusion. After 65 weeks, 40% of the patients achieved clear or almost clear skin, and none of the patients had a PSGA score

[9] PSGA = Physician´s Static Global Assessment, measures physician's impression of disease severity at a single point

higher than 3 (moderate severity). In total, 46% of the patients had a reduction in their PSGA score.

Relative change in PSGA score from baseline (n=58)



PSGA = Physician´s Static Global Assessment, measures physician's impression of disease severity at a single point

Source: Tveit et al., 2021

IL17 and IL23 data suggest support for the mechanism of action of HRO350

We note from the study that statistically significant reductions of IL17A and IL-23 in plasma were not observed during the 26-week study period. However, a clear numerical advantage for the HRO arm was seen for the cytokine IL-23, with significantly more patients reporting a decrease in plasma levels (n=10) than an increase (n=2) at week 26, indicating that IL-23 might be responsible for the early efficacy signals in this study. IL-23 inhibition has also been associated with DHA[10], supporting the hypothesis that the strong DHA to EPA ratio (3:1) in HRO350 could be especially beneficial in psoriasis.

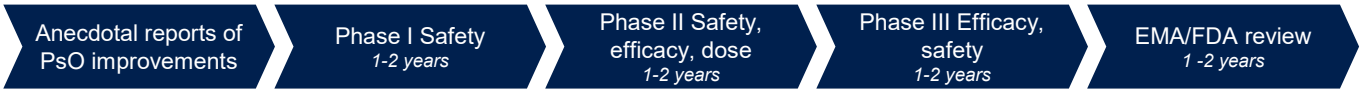
Data on IL17A and IL-23 gives support to HRO350's MoA

	IL-17A			IL-23		
	Decrease n (%)	No change n (%)	Increase n (%)	Decrease n (%)	No change n (%)	Increase n (%)
Herring roe oil, week 26, n = 29	16 (55)	0 (0)	13 (45)	10 (34)	17 (59)	2 (7)
Placebo, week 26, n = 32	13 (41)	1 (3)	18 (56)	8 (25)	17 (53)	7 (22)

Source: ABG Sundal Collier, Tveit et al 2020

[10] Kong et al 2009 "Anti-inflammatory properties of docosahexaenoic acid (DHA) in bone marrow-derived dendritic cells (98.11)"

HRO350 clinical development plan and path to registration – Phase IIb dose response study next



	Pilot clinical trial 2017-2019	Phase IIb 2022-2024	Phase III 2024-2026
# Patients (Mild/moderate psoriasis)	**64**	**519**	**400**
Duration	26 Weeks 15 Months with OLE[2]	60 Weeks Primary endpoint: 26 weeks	72 Weeks Primary endpoint: 26 weeks
Study design	32 patients 6g HRO 32 patients Placebo	173 patients 6g HRO350 173 patients 3g HRO350 173 patients Placebo	267 patients HRO350 133 patients Placebo
Milestones	Publication 1 (2020) Publication 2 (2021) EMA scientific advice Q4 2020	Phase IIb initiation Q1 2022e Phase IIb results Primary endpoint Q2 2023e	Phase III initiation Q2 2024e Phase III results Q2 2026e

Source: ABG Sundal Collier, company data

Intellectual property and barriers to entry

Arctic Bioscience has a broad patent portfolio related to lipid compositions with a high DHA content and the extraction of phospholipids from herring roe. The company has developed a proprietary “black box” technology to gently remove healthy fatty acids (lipids), i.e. separating the protein and lipid fractions from the herring roe. It has secured access to raw materials (immature roe) through geographical proximity to Norwegian herring fisheries, which are sustainable. Via contracts, Arctic Bioscience currently has access to more than 50% of all immature herring roe in Norway, with further expansion potential if required.

The patents for lipid compositions were filed on 3 October 2016 and expire in 2032. Below is an overview of the different types of patents that Arctic Bioscience have issued and pending. The company has indicated that it seeks to continue to expand its patent portfolio.

Current patent portfolio

Attorney Ref	Title	Type	Status	Application No.	Filing Date	Anticipated expiration
517.002US1	LIPID COMPOSITIONS WITH HIGH DHA CONTENT	Utility: Non-Provisional	Issued	13/601,626 US 8,846,604	8/31/2012	31/8/2032
517.002US2	LIPID COMPOSITIONS WITH HIGH DHA CONTENT	Utility: Continuation	Issued	14/498,548 US 9,458,409	9/26/2014	31/8/2032
517.002US3	LIPID COMPOSITIONS WITH HIGH DHA CONTENT	Utility: Continuation	Issued	15/283,971 US 10,076,530	10/3/2016	31/8/2032
517.002US4	LIPID COMPOSITIONS WITH HIGH DHA CONTENT	Utility: Continuation	Pending	16/133,185	9/17/2018	n.a.
517.012CAT	ROMEGA	Trademark	Issued	1664152	2/17/2014	26/06/2028
517.012EUT	ROMEGA	Trademark	Issued	12632394	2/25/2014	26/06/2028
517.012UST	ROMEGA	Trademark	Issued	86051594	8/29/2013	n.a.
517.014CA1	METHODS FOR OBTAINING PHOSPHOLIPIDS…	Utility: Foreign	Pending	2980043	9/15/2017	n.a.
517.014EP1	METHODS FOR OBTAINING PHOSPHOLIPIDS…	Utility: Foreign	Pending	16765894.7	10/16/2017	n.a.
517.014HK1	METHODS FOR OBTAINING PHOSPHOLIPIDS…	Utility: Foreign	Pending	18109476.4	7/20/2018	n.a.
517.014US1	METHODS FOR OBTAINING PHOSPHOLIPIDS…	Utility: Non-Provisional	Pending	15/559,705	9/19/2017	n.a.
517.015PV1-3	LYSOPHOSPHOLIPID COMPOSITIONS	Utility: Provisional	Pending	62/848,855	5/16/2019	n.a.
517.016PV1-2	PHOSPHOLIPID COMPOSITIONS FOR AUTOIMMUNE DISEASES	Utility: Provisional	Pending	62/891,307	8/24/2019	n.a.

Source: ABG Sundal Collier, Arctic Bioscience

Generics case study of Amarin Corporation's Vascepa and EPADEL in Japan

Omega 3-based drug Vascepa was first approved in Q1'13 as an adjunct to diet for high triglyceride levels, and received label expansion in late 2019 as add-on therapy to statins. Since launch, Vascepa has seen growth amounting to a CAGR of 136% in value sales and 119% in volume sales; with the label expansion, Vascepa is on its way to reach blockbuster status. During 2020, the FDA approved the first generic of Vascepa from Hikma Pharmaceuticals. However, generic supply has been limited due to manufacturing complexities, costs and long lead times, making it difficult to deliver orders. Furthermore, the generic has a "skinny label", meaning it is indicated only for ~7% of Vascepa's market. Hence, Vascepa has continued to grow without significant price pressure.

Another interesting case study relates to Omega-3 drug EPADEL (from Mochida Pharmacal) in Japan, which has maintained a ~60% branded share despite generic competition for >10 years.

While potential generic competition could be an obstacle for the commercialisation of HRO350 in the future, we believe a combination of a proprietary sourcing and production set-up and a broad patent portfolio should create significant hurdles for potential generic manufacturers.

Effects of Omega-3 in psoriasis – historical studies

Several studies have been performed to study the efficacy of Omega-3 in psoriasis. According to a systematic review from 2017, the previous studies show inconclusive results on whether the use of Omega-3 improves disease severity. However, data from 12 studies were extracted, and 10 had a treatment duration <26 weeks. Furthermore, the DHA:EPA ratio was usually either 1:1 or contained more EPA than DHA. As mentioned, herring roe oil has a 3:1 DHA to EPA ratio, which is hypothesised to carry significant advantages in reducing inflammatory processes.

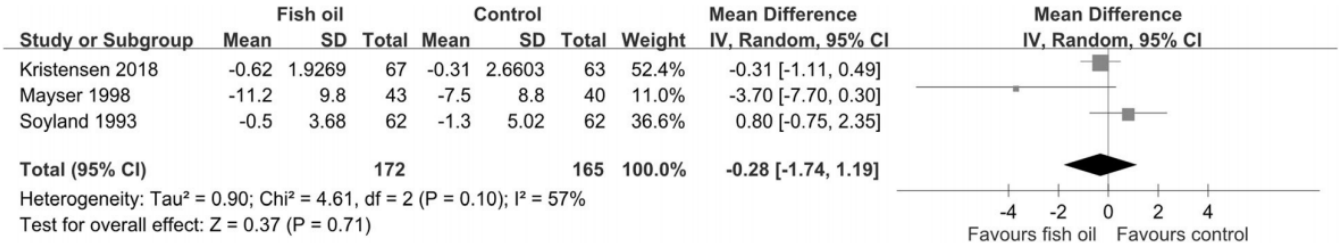
Psoriasis improvement with use of Omega-3 inconclusive; systematic review by Upala et al. 2017

Study	PASI		VAS		DLQI		Itching		Erythema		Scaling		%TBSA	
	I	C	I	C	I	C	I	C	I	C	I	C	I	C
Bittiner 1988							-1.3	-0.3	**-1.1***	-0.2	-0.8	-0.1	-3%	0.2%
Bjorneboe 1988									-0.1	-0.1	0.3	-1.3	1%	-3%
Guida 2014	**-5.1***	**-1.1%***	**-13.6***	**-25.8***	**-14.4***	**-2.2***								
Gupta 1989									1.5	0	**-1.1***	0.1	-19%	9%
Mayser 1998	**-11.2***	**-7.5***	-17.5	-10.4										
Strong & Hamill 1993 (male)													18%	25%
Strong & Hamill 1993 (female)													6%	3%
Veale 1994							-4	**-4.5***						
Madland 2006			**-14***	-5										
Balbas 2011	**-6.8***	-3.53			**-6.67***	-3.03	**-80%***	-40%	**-1.8***	-1.073	**2.14***	-1.4		

**P < 0.05 versus baseline. Negative signs represent improvement. PASI, Psoriasis Area Severity Index; VAS, visual analogue scale; TBSA, total body surface area affected; DLQI, Dermatology Life Quality Index; I, intervention group; C, control group.*
Source: ABG Sundal Collier, Upala et al 2017

A meta-analysis from 2019 containing only three studies on the effect of fish oil supplements on psoriasis (two of three studies done in the 1990s) found that fish oil did not produce a significantly greater improvement in the PASI score than the control group.

Meta-analysis of efficacy of fish oil supplement in treating psoriasis assessed by PASI score



Source: ABG Sundal Collier, Yang et al. 2019

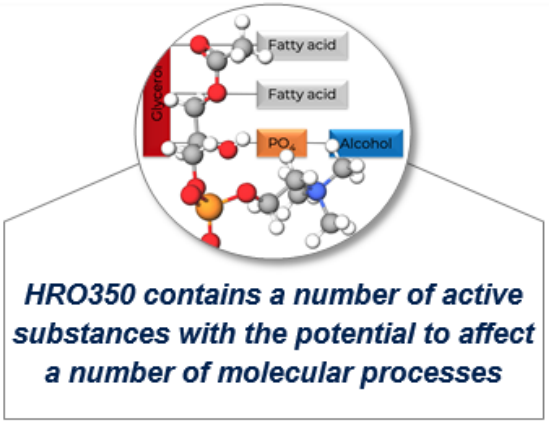
Why would HRO350 be different?

We argue that the results from the historical studies of Omega-3 are poor predictors for the clinical outcomes of HRO350 in psoriasis. Most studies suffer from being short in duration (<26 weeks) and having poor or outdated study protocols and limited sample sizes. Moreover, the compounds studied were generally traditional fish oil with Omega-3 fatty acids in triglyceride form, with poor bioavailability and a DHA to EPA ratio of 1:1 (more EPA than DHA). We believe HRO350 derived from herring roe, which contains phospholipids where the phospholipid esters are bound to DHA and EPA, is clearly differentiated by better bioavailability, and a more favourable 3:1 DHA to EPA ratio, as well as a more robust end extended study protocol.

Early evidence supporting HRO350's relevance across inflammatory diseases
The Omega-3 fatty acid EPA has been found to cause a switch in production of eicosanoids from proinflammatory prostaglandins (hormones) and leukotrienes (metabolites) in the 2 and 4 series, respectively, to the less inflammatory 3 and 5 series. DHA is metabolised to Specialised Pro-Resolving Lipid Mediators (protectins, resolvins and maresins), which reduce inflammatory processes. Since DHA has been shown (in vitro and in vivo) to reduce inflammatory markers such as IL-23 (a target for currently approved biologics) it has been hypothesised that a better DHA/EPA ratio could drive better responses in psoriasis patients.

Arctic Bioscience is currently evaluating the mechanism of action of HRO350, as well as its potential in additional indications such as Mild Cognitive Impairment (MCI, an early stage of Alzheimer's disease), pre-term infants and additional inflammatory diseases beyond psoriasis.

Shared fundamental mechanism in inflammatory diseases



Source: Arctic Bioscience

Why is there a "commercial whitespace" in mild-moderate?

A key takeaway from a recent round-table discussion with key opinion leaders in the International Psoriasis Council (IPC) was that "…the majority of recent innovation have been targeted to the moderate-to-severe patient population, with little new successful development for those psoriasis patients with mild and moderate disease".[11]

Over the years, we have seen an overwhelming focus in drug development targeting moderate-to-severe psoriasis due to higher potential pricing, higher unmet medical need, higher tolerance for side effects and monitoring, greater tendency to seek treatment and a more well-defined patient population.

This has reduced incentives for pharmaceutical development for the mild-moderate patient population, as there are plenty of "low-hanging fruit" in the more severe patient population. On the other side of the spectrum, many mild psoriasis patients have seen adequate efficacy with topical treatments and phototherapy. This has left a commercial "whitespace" for mild-moderate patients – a significant part of the total patient population (we estimate ~30-40%).

Some have tried and failed to develop oral therapies for mild-moderate…
Mild-moderate patients can be a challenging population in a clinical trial setting, as the lower disease activity generally means that it becomes harder to prove a statistically significant and clinically meaningful reduction in disease activity (e.g. PASI score, PGA 0/1). For example, GSK conducted a 12-week Phase 2a study

[11] Strober et al. Dermatol Ther 2019;9:5-18

(n=65) for its oral compound GSK-2982772 in patients with mild-to-moderate psoriasis. The drug failed to show a statistically significant improvement in disease activity, and has now been re-positioned towards moderate-to-severe psoriasis (Phase 1). The study investigators concluded that “Because this study was conducted with mild-to-moderate disease activity, the ability to detect a difference in clinical improvement between active treatment vs. placebo may have been limited”.

Another oral compound, LYC-30937 (Parimifasor) by Lycera Corp, failed its Phase 2 trial in 33 moderate psoriasis patients. LYC-30937 appears to be on clinical hold and is not featured on the company’s webpage.

We see limited competition for oral therapies in mild-moderate psoriasis
Looking at potential direct orally administrated competitors for HRO350, we have only been able to identify two – Otezla (apremilast) from Amgen and EDP1815 from Evelo Biosciences.

Otezla has been approved for moderate-to-severe psoriasis in the US since 2014 and the EU since 2015. It has proven “modest efficacy”, where a key advantage beyond its oral administration is that it does not require laboratory monitoring due to a more beneficial side effect profile. In May 2020, Amgen announced positive top-line results from Phase 3 ADVANCE study (n=595), with an unspecified “significant improvement” in sPGA versus placebo in mild-moderate Psoriasis patients. Amgen now aims to expand Otezla’s label to mild-moderate patients during 2021.

With no public efficacy data available from the trial, it becomes difficult to assess Otezla’s potential in the mild-moderate setting if the label is expanded. However, KOL feedback suggests that its current price point of USD 20-30k per year in the US and ~USD 17k per year in Europe would likely be a major hurdle to achieve any meaningful uptake in this patient group.

EDP1815 has been studied in a six-week placebo-controlled Phase 1b study (n=30) in mild-moderate psoriasis. The compound was well tolerated and the high dose treatment arm (n=12) showed a 21% reduction in PASI score at week 6. The study was not powered to detect statistical significance, but Evelo Biosciences has proceeded with a Phase 2a dose finding study (n=225) set to read out in Q3’21.

We are cautious to interpret the findings from the Phase 1b study. Firstly, the short six-week study duration does not adequately capture potential safety risks of a novel compound. Secondly, the small sample size makes it challenging to draw any conclusions from the data, although the efficacy signal means that we will follow its development.

We only found three potential oral entrants in mild-moderate psoriasis

	Active substance	Administration	Safety profile	Data highlights	Earliest approval	Other	ABGSC Comment:
ARCTIC HRO350	Phospholipid esters from herring roe	Oral ✓	No SAEs (well-known compound) ✓	Pilot trial: majority of moderate patients -> mild; 40% PGA 0/1 w.60 ✓	2026e	Natural raw material with long exposure as supplement.	Safe with promising signals of efficacy – atttractive price point (ABGSCe 3.5-6.5k/year)
AMGEN Apremilast (Otezla)	Phosphodi-esterase-4 inhibitor,	Oral ✓	Generally well-tolerated ✓	"Significantly better than placebo" No numeric given ?	Approved for moderate-severe	Expanding into mild-moderate '21e; *expensive* at up to ~USD30k/year	Efficacy in mild-moderate unknown; prohibitively expensive at current rates
EVELO BIOSCIENCES EDP1815	Monoclonal microbial (bacteria), anti-inflammatory	Oral ✓	Generally well-tolerated in Ph1b (small sample; n=30) ✓	Phase 1b 21% reduction of PASI in high dose 42d (n=18) (not powered) ?	2027e	Dose-finding Ph2a read-out Q3'21 (n=225)	Efficacy and safety too early to establish; pricing unknown

Severe (Moderate)

Biologics on the market:

Cimzia (certolizumab pegol)
Enbrel (etanercept)
Humira (adalimumab)
Remicade (infliximab)
Simponi (golimumab)
Simponi Aria (golimumab)
Stelara (ustekinumab)
Cosentyx (secukinumab)
Siliq (brodalumab)
Taltz (ixekizumab)
Orencia (abatacept)
Ilumya (tildrakizumab-asmn)
Skyrizi (risankizumab-rzaa)
Tremfya (guselkumab)

Moderate-to-severe

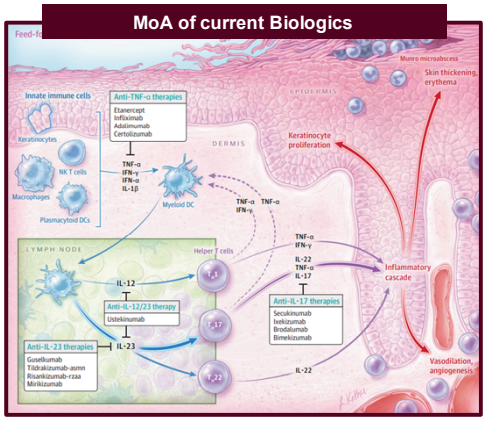
Oral treatments on the market:

Soriatane (acitretin)
Cyclosporine
Methotrexate
Off-Label Systemics
NSAIDs
Xeljan/Xeljanz XR

Limitations of topical therapy

- Inconvenient
- Poor adherence
- Topical glucocorticoids are effective but use is limited to no more than 2-8 weeks (need for continuous use)
- Side effects (especially with longer-term use)
- *Does not address systemic inflammation*

MoA of current Biologics



Source: ABG Sundal Collier, Armstrong et al 2020, JAMA

Financial forecasts

After COVID-19 headwinds in 2020 led to a 32% y-o-y sales decline, we estimate the Nutra business will grow sales at a CAGR of 42% '20-'25e. This is aligned with company targets for the Nutra business of achieving a >40% mid-term sales CAGR, moving towards ~20% in the longer term. We estimate that the new factory (set to open Q1'23e), benefits of scale and an improving product mix are set to lift the four-year avg. gross margin of ~35% to ~67% in '23e. We estimate EBITDA break-even in '23e, and that the Nutra business will contribute with ~NOK 221m in aggregated gross profit '21e-'25e, supporting capex plans. For capex, we estimate NOK 185m '21e-'22e for the new manufacturing plant and NOK 285m in total clinical development for HRO350. We expect that the recent ~NOK 300m equity raise and ~NOK 144m in unused soft funding and loans could bridge Arctic Bioscience into positive cash flow, but do not rule out a future raise. For the Pharma business, we estimate US/EU commercial launches of HRO350 in '27e/'28e, supported by a commercial partnership with global tiered royalties of 10-17%, upfront payment of USD 355m and total other milestones of USD 675m. We model peak sales of USD 1.8bn (USD 300m risk-adj.) for HRO350 based on peak penetration rates of 2.5% in mild and 8.5% in moderate psoriasis in EU5 and 3.5% in mild and 10% in moderate in the US. This leads to a total of ~NOK 8.8bn (~NOK 2bn risk-adj.) in milestones, and peak royalty revenue of NOK 2.4bn (NOK 410m risk-adj.) for >70% EBIT margins.

42% sales CAGR expected until 2025 for Nutra business

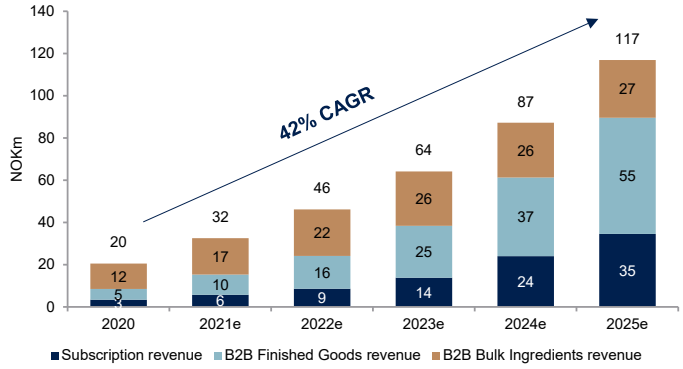
Arctic Bioscience's Nutraceutical business builds on Romega, a premium Omega-3 product sold via B2C, B2B (both finished goods and bulk sale of ingredients) and partnerships (B2B2C). In the B2C vertical, Romega is currently sold on a subscription basis in Norway and constituted ~17% of sales in 2020. The company aims to launch B2C subscription sales in US and UK during 2021 with further potential launches in selected European markets, and we expect the B2C vertical to reach ~30% of sales by '25e.

Shifting mix in the B2B segment and international focus set to drive growth

Another key driver for the Nutra business will be an ongoing shift from B2B bulk ingredients towards sales of higher margin products in the B2B channels. This relies on continued strategic partnerships with B2B2C sales of finished goods and white label products, similar to the Kotler Marketing Group's launch of prenatal supplements in China. We also see potential for new product lines in new niche segments (e.g. elderly care women's health) by combining Romega with other supplements. In 2020, we estimate that the share of B2B finished goods was ~25%, which expect to be ~47% by '25e with a gradual increase towards ~70% in the long term.

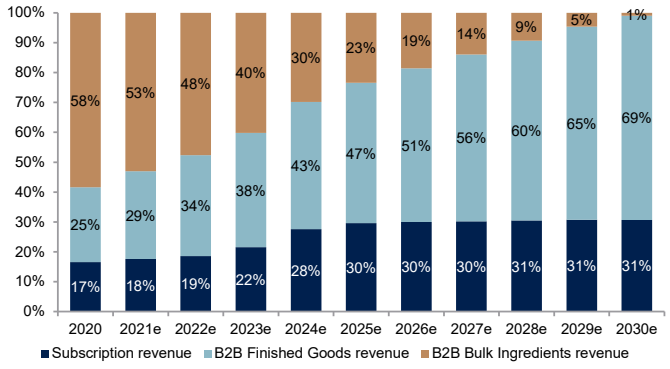
In our view, the most important long-term revenue driver for the Nutra Business builds on internationalisation. In 2020, ~28% of group sales came from Norway, a small yet well-developed and high-value market. In the long-term, we expect that ~15% of group sales will come from Norway, ~35% from Europe, ~30% from the US and ~20% from China.

Nutraceutical sales by sales channel



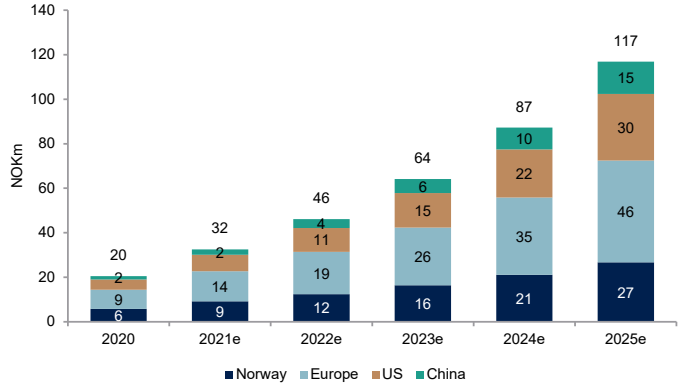
Source: ABG Sundal Collier, company data

Nutraceutical sales by sales channel, % split



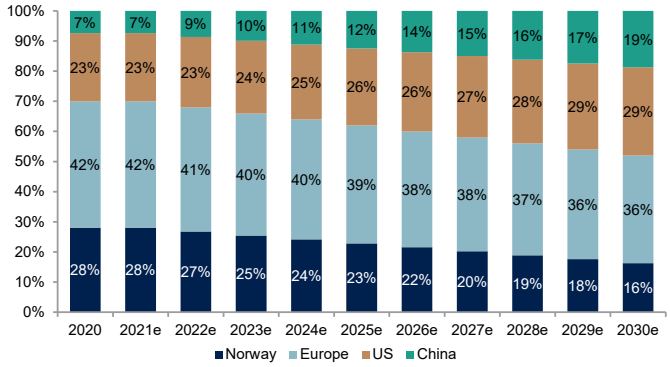
Source: ABG Sundal Collier, company data

Nutraceutical sales by geography



Source: ABG Sundal Collier, company data

Nutraceutical sales by geography, % split

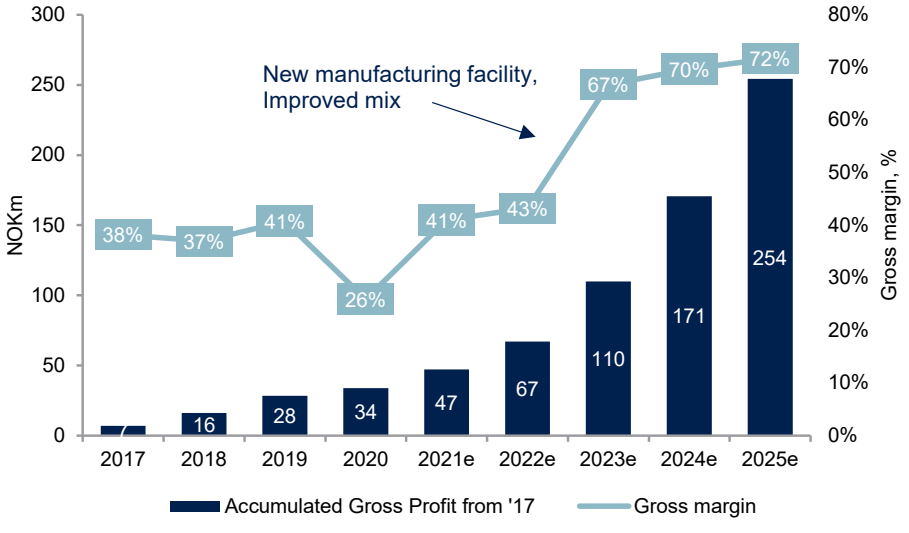


Source: ABG Sundal Collier, company data

Nutraceutical's journey towards >70% gross margins

The Nutraceutical segment has historically generated gross margins around 40%, with a dip to ~26% in 2020 following COVID-19 disruptions. Gross margins have been running below their potential, primarily due to a sub-scale production process and an unfavourable product mix with Bulk Ingredients. In line with the company's ambitions to improve gross margins, we estimate gross margins shifting to 67% in '23e and >70% beyond '24e. This is driven by a higher gross margin product mix, improvements due to the new factory (planned to open Q1'23e), benefits of scale and a mix change towards higher-margin B2C/B2B finished products.

Improving gross margins supporting cash needs



Source: ABG Sundal Collier, company data

Nutra cash flows also support pharma development

The planned manufacturing facility set to start construction in Q3'21 will not only improve Nutraceuticals' gross margins by ~30-40%, but it will also allow for GMP[12] production of HRO350. The estimated capex of NOK 185m for the project will cover a manufacturing facility and technical equipment utilised for production within both business areas.

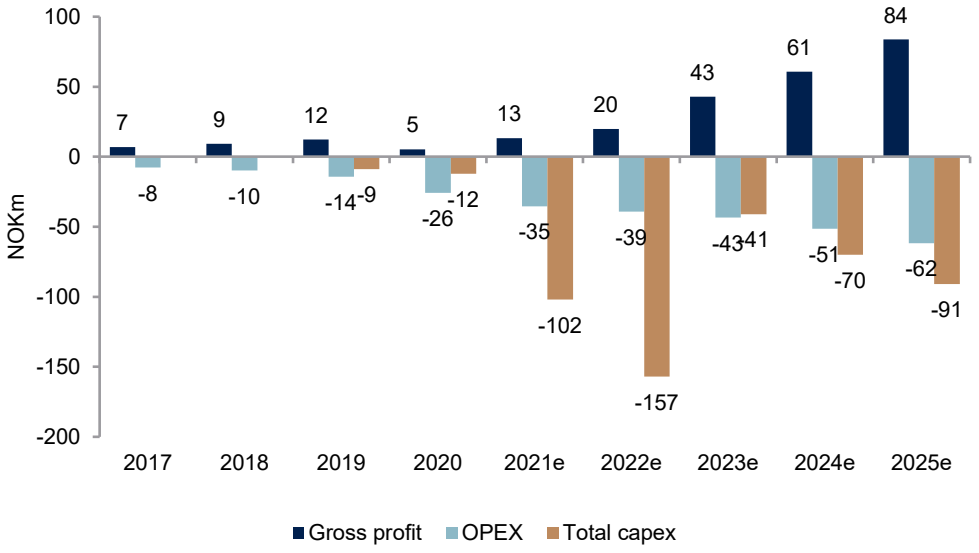
The plant will significantly reduce costs, enabling a full control process, which is important for clinical trial GMP. Some 70-75% of the funding of the plant has already been secured via grants and loans, and it will be built with optionality for sequential capacity expansion from an initial HRO (MT) of 200,000 up to 1,000,000. The plant is planned to open in Q1'23e.

Roughly 85% of the recent ~NOK 300m equity raise will go into the Pharma business. However, we note that cash flows from the Nutra business will also support the upcoming study program for HRO350 in mild-moderate psoriasis (Phase 2b and Phase 3) ranging between 2022-2026, as well as potential new indications such as Alzheimer's and pre-term infants.

We estimate NOK 285m in total clinical development capex for the HRO350 study program going forward. To put this in perspective, a recent study estimated a median cost per trial of USD 19m (~NOK 162m), and the median cost of a pivotal trial supporting US approval at USD 41m (~NOK 350m)[13].

By these rough estimates, we believe the HRO350 clinical development programme is set to cost ~50% less than average due to a cost-efficient trial design and indication (no expensive drug in comparator arm, limited hospital visits etc.). We also foresee limited ramp-up in opex, with 1-2 regulatory hires, some administrative personnel, a few local country sales managers and local manufacturing staff.

Significant upcoming investments supported by Nutra cash flows



Source: ABG Sundal Collier, company data

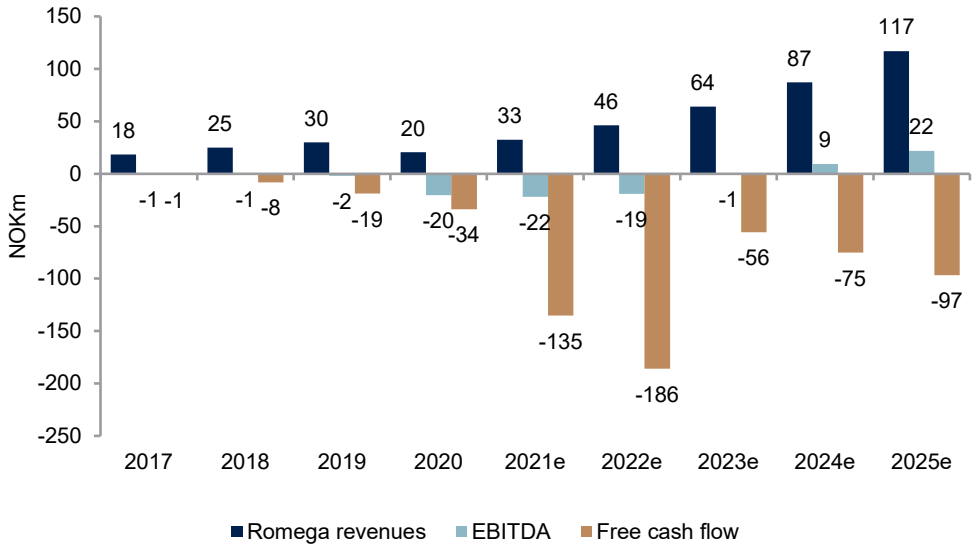
[12] Good manufacturing practices (GMP) are the practices required in order to conform to the guidelines recommended by agencies that control the authorisation and licensing of the manufacture and sale of pharmaceutical products

[13] Moore et al; *BMJ Open;* 2020; doi: 10.1136/bmjopen-2020-038863

We expect break-even EBITDA during ‘23e

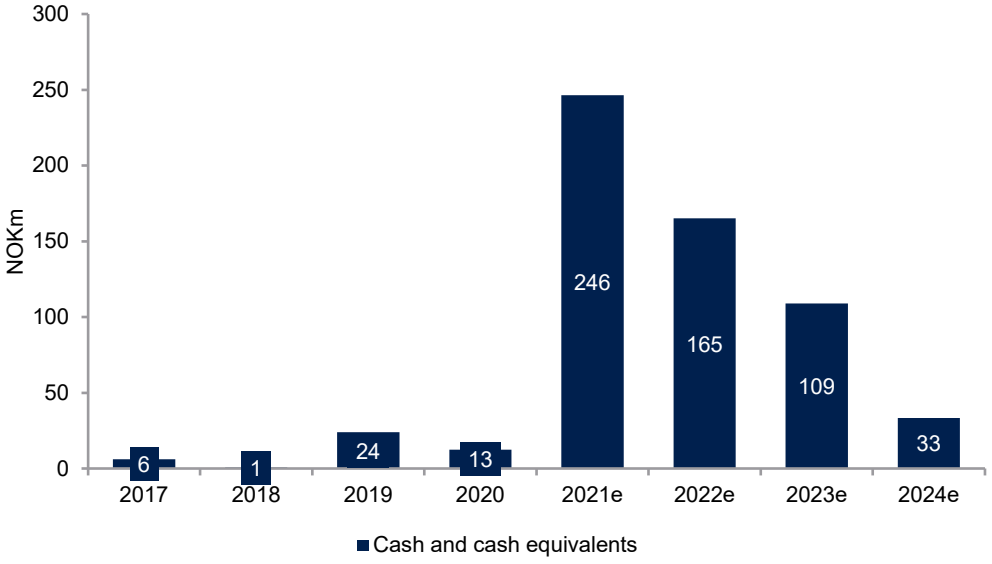
We expect Arctic Bioscience to unlock significant operating leverage in the coming years, which we see supporting the attainment of operational break-even during ‘23e. We also note the solid balance sheet, where the recent equity raise (~NOK 300m and ~NOK 144m in unused soft funding and loans) could support the company’s move into positive cash flows. However, this will likely depend on whether the company receives a significant upfront payment for commercialisation of the HRO350 asset. Adjusting for any impact from upfront payments, our current estimates have Arctic Bioscience reaching a ‘critically low’ cash position of ~NOK 33m in ‘24e, which would make an additional round of equity financing likely. We note that Arctic Nutrition is now financed beyond the final read-out of the Phase 2b study (late Q4’23) with an additional 9-12 month buffer. We note that Arctic Bioscience ended 2020 with accumulated carry-on tax deficits of NOK 65m, which we estimate will offset any major tax expenses in our forecast period.

EBITDA break-even in ‘23e but continued capex needs



Source: ABG Sundal Collier, company data

Cash and equivalents, NOKm



Source: ABG Sundal Collier, company data

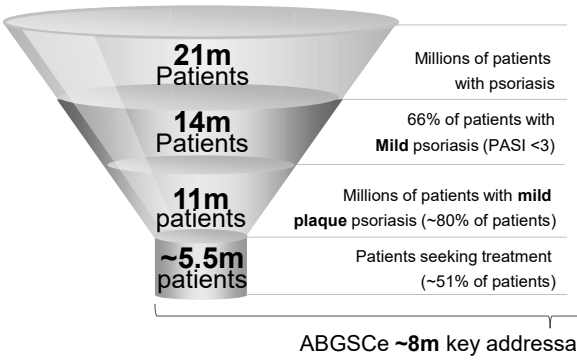
We estimate ~8m key addressable patients for HRO350

We limit the HRO350 opportunity to mild-moderate psoriasis in the US/EU5

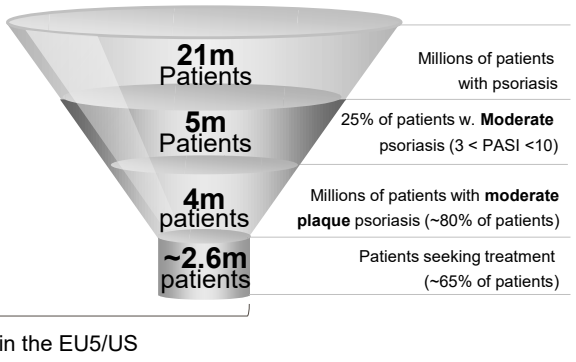
We let the US and EU5 represent the target markets in our forecasts for HRO350, but note the significant additional market potential across Asia and the rest of Europe. The WHO estimates a ~3% global prevalence of psoriasis, equating to ~230m patients, even if many patients go undiagnosed. Roughly 21 million of these patients reside in the US and EU5, where it is estimated that ~19 million (91%) suffer from mild (66%) to moderate (25%) disease. Arctic Nutrition has so far only focused on patients with plaque psoriasis, which represents 80-90% of all psoriasis patients.

To remain conservative, we focus only on the mild-moderate plaque psoriasis patients who pursue treatment. An US survey of 5,604 patients between 2003-2011 indicated that patients untreated for psoriasis ranged from 37%-49% with mild disease, 24-36% with moderate disease and 9-30% with severe[14]. This would indicate that only 51-63% of mild patients, and 65-76% of moderate, seek treatment. We conservatively choose the lower ends of the ranges, leading us to estimate a key addressable market population of ~5.5m mild psoriasis patients in the EU 5 and US, and ~2.6m moderate patients.

Estimated market opportunity in mild psoriasis EU5/US



Estimated market opportunity in moderate psoriasis EU5/US



ABGSCe **~8m** key addressable patients in the EU5/US

Source: ABG Sundal Collier

High-priced topicals & phototherapy guides price estimates

HRO350 covers a commercial "whitespace" in the treatment of psoriasis given the current lack of oral alternatives in the mild-moderate patient group. In the severe space, systemic biologics can cost >USD 80k per year. Systemic non-biologics such as Otezla (apremilast) – a drug that is set to expand in the the mild-moderate patient group – can cost >USD 30k per year. Most mild-moderate patients use topical treatments (e.g. creams, sprays and foams) and phototherapy.

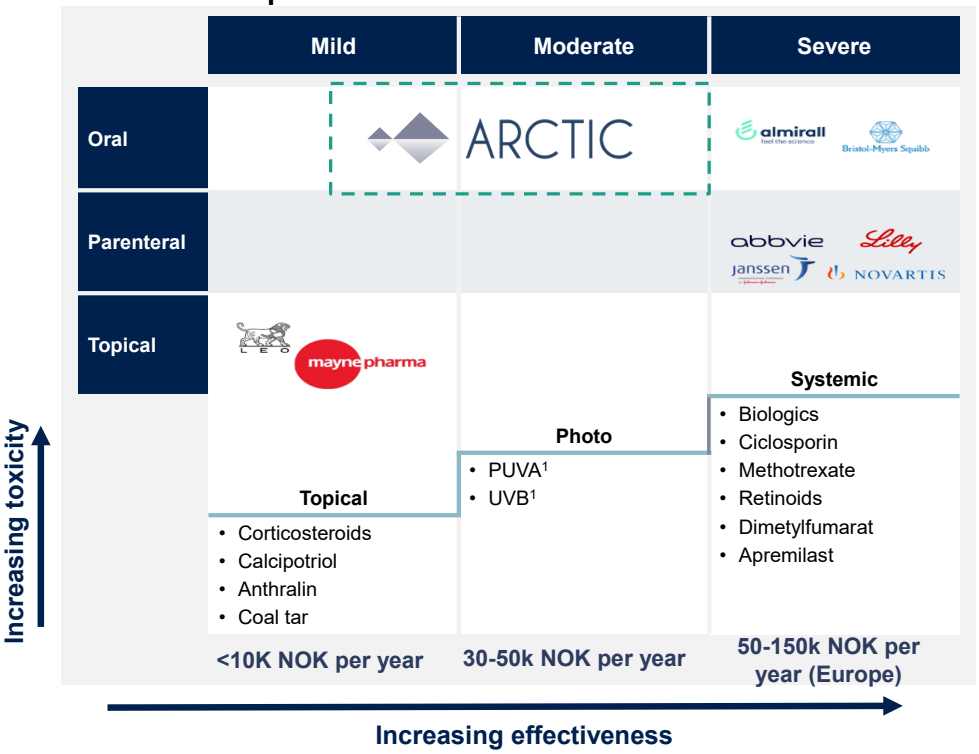
According to IQVIA US pricing data, high-priced topical treatment Enstilar is priced at USD 6.6k per year, UVB therapy at USD 3.6-4.6k and Methotrexate (MTX) USD 5.2k per year. With HRO350's potential to be used as a chronic, adjunct therapy (combined with other treatments) in a broad patient population, we view a pricing range in line with phototherapy and expensive topicals as feasible.

For the US, we assume an annual gross price of USD 6.5k per patient per year, with a gross-to-net discount of 54% leading to a net price of USD 3.5k per year. For the EU5, we assume a 45% discount to the US, with an 80% gross-to-net discount leading to a net price of USD 2.7k per patient per year. We note that HRO350 could

[14] Armstrong et al., JAMA Derm, 2013;149(10):1180-5

require head-to-head comparison data with SoC such as Otezla (apremilast) or MTX to achieve broad-based reimbursement.

Commercial "whitespace" for HRO350



Note: 1) PUVA=Psoralen Ultraviolet A light, UVB=ultraviolet B light
Source: ABG Sundal Collier, company data

We expect a partner launch after approval in '27e

For HRO350 in mild-moderate psoriasis, we forecast approval and a subsequent product launch in '27e in the US and '28e in the EU5. Given the significant commercial infrastructure we expect to be required to market a volume product such as HRO350, we assume HRO350 will be out-licensed after a potentially successful Phase 2b read-out during '23e. We believe that the resources of a large pharmaceutical player would be required to take HRO350 from clinical trials to commercialisation. We base our risk-adjustment factor of 17% on the historical likelihood of approval for autoimmunity assets from Phase 2 to approval[15]. In our view, the encouraging safety profile lowers the development risk of HRO350, but this is offset by including mild psoriasis patients, where achieving a statistically significant disease improvement can be more challenging.

Efficacy and label are key sensitivities to our peak market share assumptions

Two major points of sensitivity for HRO350's potential market share are its efficacy in mild plaque psoriasis patients and by extension its label. As we saw in the pilot study of HRO350, the "delta" in clinical improvement for mild psoriasis patients is lower, making it more difficult to show statistically significant improvements. As such, we model peak market share of only 2.5% in EU5 and 3.5% in the US for mild psoriasis. We view the bar to provide convincing clinical data in the moderate setting as lower, with a higher degree of patients pursuing prescription treatments, supporting our peak market share estimates of 8.5% in the EU5 and 10% in the US in the moderate setting. This implies a total of ~565k peak treated patients in '38e. We expect clinical efficacy and safety will correlate positively with pricing and uptake potential, leaving upside to our estimates if the clinical data improve.

[15] Thomas et al., 2016

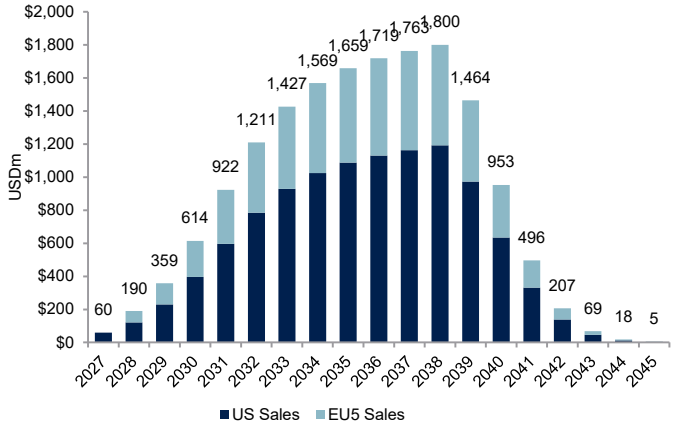
HRO350 revenue model; risk-adj. peak sales of USD 300m

With an annual net price of USD 3.5K in the US and USD 2.7K in EU5, we forecast peak sales of USD 1.2bn (USD 200m risk-adj.) in the US and USD 600m (USD 100m risk-adj.) in EU5. This results in ~NOK 15.4bn in peak sales (NOK 2.6bn risk-adj.). We assume a tiered royalty structure of 10% to 17% on global net sales, tied to sales thresholds of ~USD 100m. This yields peak royalties of USD 193m (USD 33m risk-adj.) in the US and USD 88m (USD 15m risk-adj.) in EU5, with an implied peak royalty rate of 15.6%. In summary, this would leave ~NOK 2.4bn (~NOK 410m risk-adj.) in peak royalties for Arctic Bioscience, for a 100% gross margin.

While Arctic Bioscience's current patent portfolio provides protection until 2034, we believe recently filed patents could provide extended protection into 2039, and consequently assume patent expiry and sales erosion in '39e. However, we note that Omega 3-based drugs such as Vascepa (from Amarin Corp) and Epadel (from Mochida in Japan) have been able to maintain strong branded market shares despite generic competition.

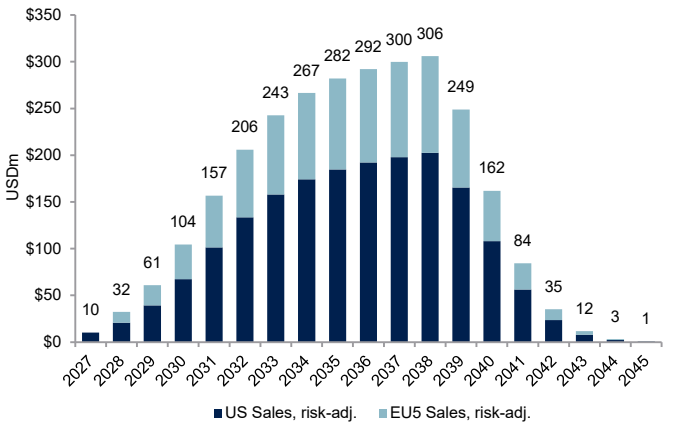
Based on an average of the upfront payments from the AbbVie-Boehringer Ingelheim deal in psoriasis (USD 595m) and the AstraZeneca-LEO Pharma deal in atopic dermatitis (USD 115m), we forecast an upfront milestone of USD 355m (USD 121m with 34% risk-adj.) before the start of the anticipated Phase 3 trial in '24e. We also assume sales-related milestones totalling USD 675m (USD 115m with 17% risk-adj.) between '30e-'35e. In summary, this would imply a total of ~NOK 8.8bn (~NOK 2bn) in aggregated milestones for Arctic Bioscience.

HRO350 peak sales '27e-'45e (USDm)



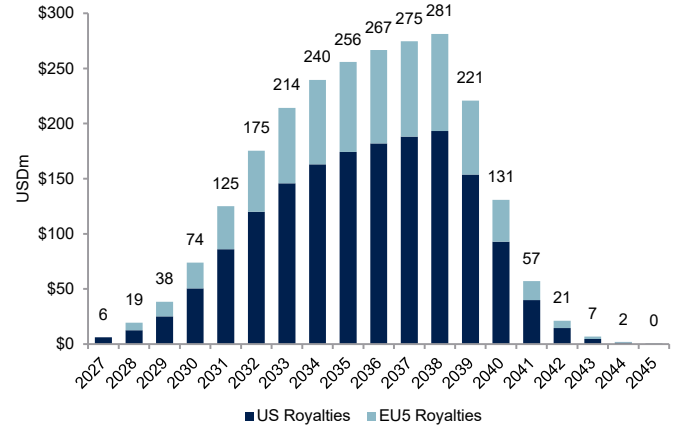
Source: ABG Sundal Collier

HRO350 risk-adj. peak sales '27e-'45e (USDm)



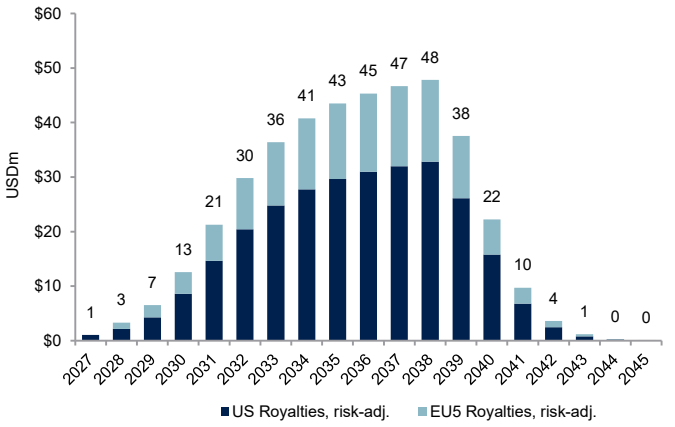
Source: ABG Sundal Collier

HRO350 royalties '27e-'45e (USDm)



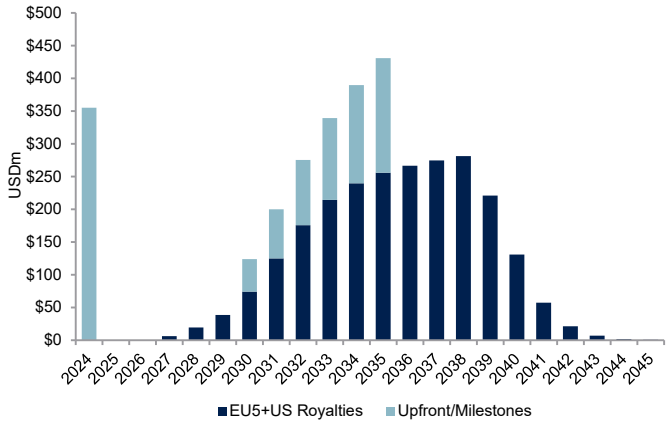
Source: ABG Sundal Collier

HRO350 risk-adj. royalties '27e-'45e (USDm)



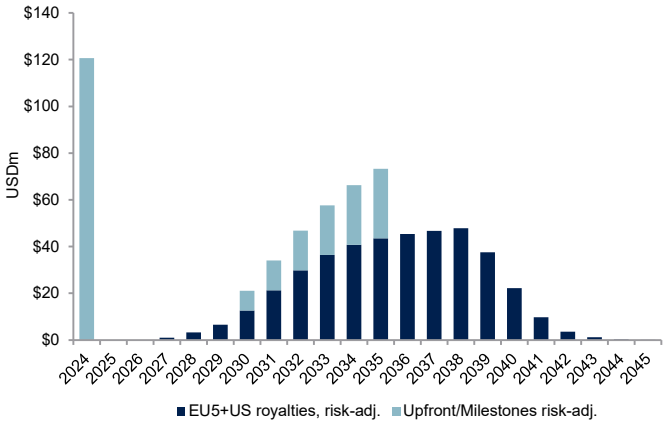
Source: ABG Sundal Collier

HRO350 royalties & milestones (USDm)



Source: ABG Sundal Collier

HRO350 risk-adj. royalties & milestones (USDm)



Source: ABG Sundal Collier

Peak sales sensitivities, penetration (USDm)

Peak-penetration EU	Peak-penetration US 4.6%	5.1%	5.6%	6.1%	6.6%
1.9%	1,246	1,352	1,458	1,565	1,671
2.4%	1,314	1,421	1,527	1,633	1,739
2.9%	1,383	1,489	1,595	1,701	1,808
3.4%	1,451	1,557	1,664	1,770	1,876
3.9%	1,519	1,626	1,732	1,838	1,944
4.4%	1,588	1,694	1,800	1,906	2,013
4.9%	1,656	1,762	1,869	1,975	2,081
5.4%	1,725	1,831	1,937	2,043	2,149
5.9%	1,793	1,899	2,005	2,112	2,218
6.4%	1,861	1,967	2,074	2,180	2,286
6.9%	1,930	2,036	2,142	2,248	2,355

Note: Penetration includes both mild and moderate plaque psoriasis patients

Source: ABG Sundal Collier

Peak sales sensitivities, price/penetr. (USDm)

Peak-penetration US	Gross US pricing (USD/patient/month) 342	442	542	642	742
3.1%	1,025	1,147	1,269	1,391	1,513
3.6%	1,092	1,234	1,375	1,517	1,659
4.1%	1,159	1,320	1,482	1,643	1,804
4.6%	1,226	1,407	1,588	1,769	1,949
5.1%	1,293	1,494	1,694	1,894	2,095
5.6%	1,360	1,580	1,800	2,020	2,240
6.1%	1,427	1,667	1,906	2,146	2,386
6.6%	1,494	1,753	2,013	2,272	2,531
7.1%	1,561	1,840	2,119	2,398	2,677
7.6%	1,628	1,927	2,225	2,524	2,822
8.1%	1,695	2,013	2,331	2,649	2,968

Note: Penetration includes both mild and moderate plaque psoriasis patients

Source: ABG Sundal Collier

Summary of US and EU5 revenue and royalty model for HRO350 '21e-'45e

Mild-moderate plaque psoriasis		2027e	2028e	2029e	2030e	2031e	2032e	2033e	2034e	2035e
US market	Assumptions									
Prevalence mild psoriasis (m)		8.1	8.3	8.4	8.6	8.8	9.0	9.1	9.3	9.5
Prevalence moderate psoriasis (m)		3.1	3.1	3.2	3.3	3.3	3.4	3.5	3.5	3.6
Patient growth, y-o-y	*2%*									
Mild plaque psoriasis (m)		6.5	6.6	6.8	6.9	7.0	7.2	7.3	7.5	7.6
Moderate plaque psoriasis (m)		2.5	2.5	2.6	2.6	2.7	2.7	2.8	2.8	2.9
% population		80%	80%	80%	80%	80%	80%	80%	80%	80%
Mild patients seeking treatment	*51%*	3.3	3.4	3.4	3.5	3.6	3.6	3.7	3.8	3.9
Moderate patients seeking trea	*65%*	1.6	1.6	1.7	1.7	1.7	1.8	1.8	1.8	1.9
HRO350 Treated Patients, mild		7,218	14,570	27,642	47,487	71,567	94,262	111,487	122,985	130,468
% of mild plaque psoriasis patients		*0.2%*	*0.4%*	*0.8%*	*1.4%*	*2.0%*	*2.6%*	*3.0%*	*3.2%*	*3.4%*
HRO350 Treated Patients, moderate		9,919	20,020	37,984	65,252	98,341	129,526	153,196	168,996	179,278
% of moderate plaque psoriasis patients		*0.6%*	*1.2%*	*2.3%*	*3.9%*	*5.7%*	*7.4%*	*8.6%*	*9.3%*	*9.6%*
HRO350 Treated Patients		**17,137**	**34,590**	**65,626**	**112,739**	**169,908**	**223,788**	**264,682**	**291,981**	**309,746**
% of mild-moderate plaque psoriasis pats		*0.4%*	*0.7%*	*1.3%*	*2.2%*	*3.2%*	*4.1%*	*4.8%*	*5.2%*	*5.4%*
Gross monthly cost, USD		542	542	542	542	542	542	542	542	542
Duration of treatment		12	12	12	12	12	12	12	12	12
Gross-to-net	*54%*									
Net revenue per patient / year, USD		**3,510**	**3,510**	**3,510**	**3,510**	**3,510**	**3,510**	**3,510**	**3,510**	**3,510**
Probability of Success	*17%*									
US sales, USDm		**$60**	**$121**	**$230**	**$396**	**$596**	**$785**	**$929**	**$1,025**	**$1,087**
Risk-adj. US sales, USDm		**$10**	**$21**	**$39**	**$67**	**$101**	**$134**	**$158**	**$174**	**$185**
Royalty rate		**10.0%**	**10.3%**	**10.9%**	**12.7%**	**14.4%**	**15.3%**	**15.7%**	**15.9%**	**16.0%**
US royalties, USDm		**$6**	**$13**	**$25**	**$50**	**$86**	**$120**	**$146**	**$163**	**$174**
Risk-adj. US royalties, USDm		**$1**	**$2**	**$4**	**$9**	**$15**	**$20**	**$25**	**$28**	**$30**
EU5 market	Assumptions	**2027e**	**2028e**	**2029e**	**2030e**	**2031e**	**2032e**	**2033e**	**2034e**	**2035e**
Prevalence mild psoriasis (m)		7.6	7.6	7.7	7.8	7.9	8.0	8.0	8.1	8.2
Prevalence moderate psoriasis (m)		2.9	2.9	2.9	3.0	3.0	3.0	3.0	3.1	3.1
Patient growth, y-o-y	*1%*									
Mild plaque psoriasis (m)		6.1	6.1	6.2	6.2	6.3	6.4	6.4	6.5	6.6
Moderate plaque psoriasis (m)		2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.5	2.5
% population		80%	80%	80%	80%	80%	80%	80%	80%	80%
Mild patients seeking treatment	*51%*	3.1	3.1	3.1	3.2	3.2	3.2	3.3	3.3	3.3
Moderate patients seeking trea	*65%*	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6
HRO350 Treated Patients, mild		0	9,609	18,052	30,708	45,826	59,766	69,995	76,457	80,313
% of mild plaque psoriasis patients		0%	0.3%	0.6%	1.0%	1.4%	1.8%	2.1%	2.3%	2.4%
HRO350 Treated Patients, moderate		0	15,713	29,519	50,213	74,935	97,730	114,455	125,022	131,328
% of moderate plaque psoriasis patients		0%	1.1%	2.0%	3.3%	4.9%	6.3%	7.3%	7.9%	8.2%
HRO350 Treated Patients		**0**	**25,322**	**47,571**	**80,921**	**120,761**	**157,496**	**184,450**	**201,478**	**211,642**
% of mild-moderate plaque psoriasis pats		0%	0.6%	1.0%	1.7%	2.5%	3.3%	3.8%	4.1%	4.3%
Net monthly cost, USD			225.0	225.0	225.0	225.0	225.0	225.0	225.0	225.0
Duration of treatment			12	12	12	12	12	12	12	12
Net revenue per patient / year, USD			2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700
Probability of Success	*17%*									
EU5 sales, USD			**$68**	**$128**	**$218**	**$326**	**$425**	**$498**	**$544**	**$571**
Risk-adj. EU5 sales, USD			**$12**	**$22**	**$37**	**$55**	**$72**	**$85**	**$92**	**$97**
Royalty rate		**0.0%**	**10.0%**	**10.3%**	**10.8%**	**12.0%**	**13.0%**	**13.7%**	**14.1%**	**14.3%**
EU5 royalties, USDm		**$0**	**$7**	**$13**	**$24**	**$39**	**$55**	**$68**	**$77**	**$82**
Risk-adj. EU5 royalties, USDm		**$0**	**$1**	**$2**	**$4**	**$7**	**$9**	**$12**	**$13**	**$14**

Source: ABG Sundal Collier

Selection of license deals in dermatology

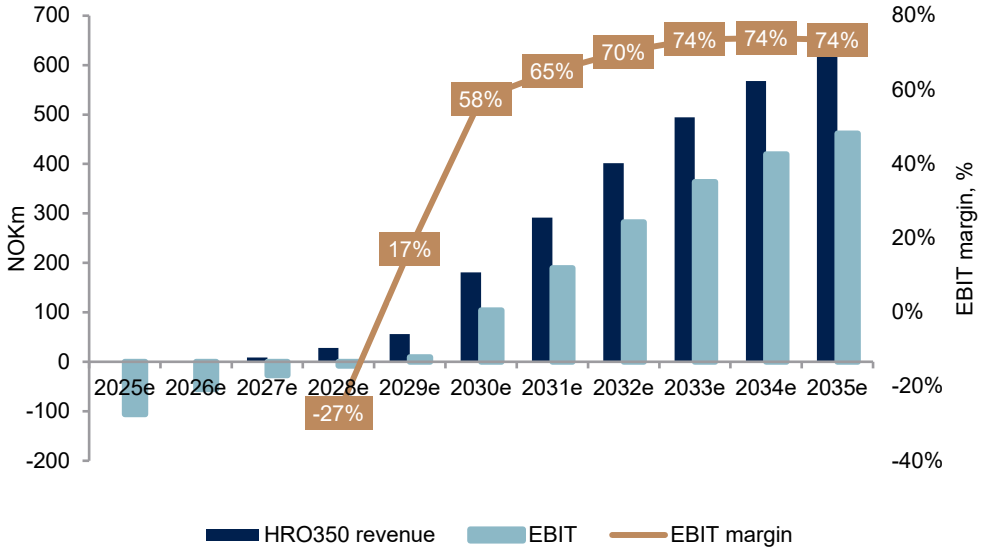
Date	Companies	Indication	Value	Deal Summary
May-15	LEO Pharma, arGEN-X	"Skin conditions"	USD 116m (including USD 5m in pre–investigational new drug (IND) and up-front payments)	LEO Pharma signs a deal with arGEN-X to develop its mAbtherapeutic for skin conditions.
Jun-15	Allergan, Kythera Biopharma	Double chin	USD 2.1bn	Allergan acquires Kythera Biopharmaceuticals, including its double-chin drug Kybella (deoxycholic acid)
Nov-15	LEO Pharma. Astellas Pharma	Acne, atopic dermatitis and skin infection	USD 725m	LEO Pharma signs an asset purchase agreement for Astellas' dermatology business, including the marketed atopic dermatitis drug Protopic (tacrolimus), a topical immunosuppressant.
Mar-16	Dr Reddy's Laboratories, XenoPort	Psoriasis	USD 490m (including a USD 47.5m up-front fee)	Dr Reddy's enters into an agreement with Xenoport to gain exclusive rights to XP 23829, an oral prodrug of monomethyl fumarate
Mar-16	**AbbVie, Boehringer Ingelheim**	**Psoriasis**	**USD 595m up front and undisclosed milestone and royalty payments from AbbVie**	**AbbVie teams up with Boehringer Ingelheim to develop amd commercialize BI 655066, an anti-IL-23 mAb**
May-16	Pfizer, Anacor Pharmaceuticals	Atopic dermatitis	USD 5.2bn	Pfizer to acquire Anacor Pharmaceuticals, including its lead compound crisaborole, a topical PDE4 inhibitor
Jul-16	Galderma Pharmaceuticals, Chugai Pharmaceutical Company	Atopic dermatitis, pruritus	Undisclosed; Galderma to pay up-front, milestone and royalty payments to Chugai	Galderma licenses the mAb nemolizumab, which targets IL-31 receptor A, from Chugai Pharmaceutical. If the mAb is approved, Galderma will gain the rights to develop and market it globally excluding Japan and Taiwan.
Jul-16	**LEO Pharma, AstraZeneca**	**Atopic dermatitis**	**USD 115m up front and up to USD 1bn in commercially related milestones and product royalty sales**	**LEO Pharma gains an exclusive licence to tralokinumab from AstraZeneca.**
Jul-16	LEO Pharma, AstraZeneca	Psoriasis	Undisclosed	LEO Pharma will gain the European rights to brodalumab, an IL-17-receptor-targeted mAb from AstraZeneca
Jul-16	Almirall, Sun Pharmaceutical Industries Ltd	Psoriasis	Almirall will pay Sun Pharma an initial up-front payment of USD 50m. Sun will be eligible to receive development and regulatory milestone payments.	Sun Pharma and Almirall partner to develop and commercialize tildrakizumab in Europe. The anti-IL-23 mAb has completed phase 3 trials.
Sep-16	Allergan, Vitae Pharmaceuticals	Atopic dermatitis, psoriasis	USD 639m	Allergan to acquire Vitae Pharmaceuticals, including VTP-43742, an orally active RORγt-selective antagonist that has reached phase 2 trials for psoriasis, and a topical LXRβ-selective agonist
Nov-16	LEO Pharma, MorphoSys	Skin diseases	Potential USD 120m milestone payments per program	LEO Pharma partners with MorphoSys to develop antibody therapeutics for dermatological diseases.
Dec-16	Novartis, Ziarco Group Limited	Atopic dermatitis	Undisclosed	Novartis agrees to acquire dermatology-focused Ziarco Group Limited, including its orally available histamine H4 receptor antagonist ZPL-389
Dec-16	Purdue Pharma, Exicure	Psoriasis	Exicure could receive up to USD 790m, including an up-front payment, regulatory and commercial milestones and equity investment	Purdue Pharma to collaborate with Exicure to develop treatments for psoriasis and other diseases using Exicure's SNA technology.
Nov-19	Amgen, Celgene	Psoriasis	USD 13.4bn in cash	Amgen acquired Celgene's Otezla (apremilast), a drug for treating moderate-to-severe plaque psoriasis and psoriatic arthritis. It is now set to expand into mild-to-moderate psoriasis following a successful Phase 3 trial
Jul-20	UNION therapeutics, LEO pharma	Psoriasis (oral) /Atopic dermatitis (topical)	UNION will pay up-front, development and commercial milestones of up to USD 200m, plus low single-digit royalties on sales	UNION therapeutics acquired the global rights for the LEO PDE4 inhibitor compound series (re-named to UNI500).

Source: ABG Sundal Collier, company data

Licensing could allow for >70% HRO350 EBIT margins

With royalties and milestones from licensing deals generating 100% gross margins for Arctic Bioscience, we believe licensing could generate >70% EBIT margins for the HRO350 asset.

Risk-adj. profitability profile of HRO350, '25e-'35e



Source: ABG Sundal Collier

Annual P&L '17-'25e

(NOKm)	2017	2018	2019	2020	2021e	2022e	2023e	2024e	2025e
Romega sales	18	25	30	20	33	46	64	87	117
y-o-y %		*35%*	*21%*	*-32%*	*59%*	*42%*	*39%*	*36%*	*34%*
COGS	-11	-16	-18	-15	-19	-26	-21	-26	-33
Gross profit	7	9	12	5	13	20	43	61	84
Gross margin	*38.2%*	*37.0%*	*40.7%*	*25.9%*	*41.0%*	*43.2%*	*66.7%*	*69.7%*	*71.7%*
Other operating expenses	-3	-4	-9	-15	-18	-20	-21	-28	-36
Growth		*20.8%*	*135.9%*	*72.6%*	*15.7%*	*13.4%*	*7.3%*	*31.1%*	*29.8%*
% of sales	*17%*	*15%*	*29%*	*74%*	*54%*	*43%*	*33%*	*32%*	*31%*
Personnel expense	-5	-6	-6	-11	-18	-19	-22	-24	-26
Growth		*31.4%*	*-9.9%*	*93.4%*	*66.3%*	*8.3%*	*15.8%*	*4.9%*	*9.2%*
% of sales	*26%*	*25%*	*19%*	*53%*	*55%*	*42%*	*35%*	*27%*	*22%*
Net other opex	0	0	0	0	0	0	0	0	0
Growth		*0.0%*	*10.1%*	*3.0%*	*-58.4%*	*130.8%*	*247.5%*	*-72.8%*	*34.0%*
% of sales	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*-1%*	*0%*	*0%*
EBITDA	**-1**	**-1**	**-2**	**-20**	**-22**	**-19**	**-1**	**9**	**22**
EBITDA margin	*nm*	*nm*	*nm*	*nm*	*nm*	*nm*	*nm*	*10.8%*	*18.8%*
Depr/amort. (included in opex)	-0.6	-0.5	-1.1	-1.2	-3.4	-11.2	-16.5	-17.0	-19.7
Adj. EBIT	**-1**	**-1**	**-3**	**-22**	**-25**	**-30**	**-17**	**-8**	**2**
Adj. EBIT margin	*nm*	*nm*	*nm*	*nm*	*nm*	*nm*	*nm*	*nm*	*nm*
Net financials	-0.5	-0.6	-0.9	-0.9	-1.8	-4.8	-6.9	-7.3	-8.6
Pretax profit	**-2**	**-2**	**-4**	**-23**	**-27**	**-35**	**-24**	**-15**	**-6**
Tax	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net profit	**-1.7**	**-1.7**	**-4.0**	**-22.6**	**-27.2**	**-35.2**	**-24.0**	**-14.9**	**-6.3**
Segment estimates	**2017**	**2018**	**2019**	**2020**	**2021e**	**2022e**	**2023e**	**2024e**	**2025e**
Subscription revenue				**3.40**	**5.72**	**8.58**	**13.85**	**24.07**	**34.59**
% of sales				*17%*	*18%*	*19%*	*22%*	*28%*	*30%*
B2B Finished Goods revenue				**5.12**	**9.56**	**15.60**	**24.50**	**37.17**	**54.94**
% of sales				*25%*	*29%*	*34%*	*38%*	*43%*	*47%*
B2B Bulk Ingredients revenue				**11.97**	**17.23**	**21.97**	**25.80**	**26.01**	**27.37**
% of sales				*58%*	*53%*	*48%*	*40%*	*30%*	*23%*
Geographical split, %									
Norway				28%	28%	27%	25%	24%	23%
Europe				42%	42%	41%	40%	40%	39%
US				23%	23%	23%	24%	25%	26%
China				7%	7%	9%	10%	11%	12%

Source: ABG Sundal Collier, company data

Valuation

We value Arctic Bioscience using a SOTP approach that combines the estimated valuations of the Nutraceutical and Pharmaceutical businesses. For the Nutraceutical business, we apply a 5.5x EV/GP multiple on '25e gross profit, which with an 11% WACC leads to a discounted EV of NOK 14 per share and a discounted equity value of NOK 21 per share. For the Pharmaceutical business (HRO350), we use a '21e-'45e rNPV model, which indicates a risk-adj. EV of NOK 36 per share and a risk-adj. equity value of NOK 44 per share. Removing the risk-adj. factor of 17% for HRO350 yields a de-risked equity value of NOK 232 per share. Our combined TP of NOK 57 per share indicates an upside of ~90% from current levels, and we initiate coverage with a BUY recommendation. We exclude potential indications beyond Psoriasis from our valuation model.

Peer multiples supports our NOK 21 valuation of Nutra

We view the Nutraceutical business as a rapidly growing, self-sustaining business that also supports pharmaceutical development. As such, the gross profit it generates to support Arctic Bioscience's expansion plan is a key aspect of the mid-term valuation of the Nutra business. Below we have selected a list of nutraceutical and Omega-3 peers to guide our valuation of the Nutraceutical business. Arctic Bioscience has far higher growth ambitions (>40% sales CAGR '20-'23e) vs. its Nutraceutical/Omega-3 peers at ~10%, but unproven profitability.

Among the peers, Hofseth Biocare appears to be the most similar due to its focus on clinically validated Omega-3 products, high growth, its pre-profitability phase and a global addressable market. We note that Hofseth Biocare currently trades at EV/sales of ~54x '20 vs. Arctic Bioscience's ~35x. While consensus estimates are limited, peer average EV/Gross Profit '23e is ~10x. We conservatively apply a 5.5x EV/GP multiple on Arctic Bioscience's gross profit '25e despite a higher-than-average gross margin (67% vs. peer avg. 49% '23e). Discounted back using a 11% WACC, we find a discounted EV per share of NOK 14 for our SOTP, and discounted equity value per share of NOK 21 for a stand-alone valuation of the Nutra business.

Nutraceutical peers

	EV/Sales			EV/Gross Profit				Historic growth			CAGR '20-'23e	Sales (NOKm)	Gross margin	
	2020	2021e	2022e	2020	2021e	2022e	2023e	5y CAGR	3y CAGR	2020		2020	2020	2023
Nutraceutical/Omega-3 companies														
Aker BioMarine	4.1x	3.9x	3.1x	11.5x	7.7x	5.9x	4.7x	n.a.	n.a.	25%	16%	2,717	38%	51%
BioGaia	9.5x	9.4x	8.3x	11.2x	10.9x	9.8x	9.2x	9%	7%	-3%	8%	764	73%	73%
Biosearch S.A.	4.7x	4.1x	3.5x	*n.m.*	7.0x	5.3x	*n.m.*	6%	1%	13%	n.a.	277	27%	n.a.
Croda	6.3x	5.3x	5.0x	14.1x	12.1x	11.3x	*10.1x*	5%	0%	1%	10%	16,783	45%	47%
DSM	3.4x	3.1x	2.9x	9.8x	8.3x	7.8x	*7.6x*	1%	-2%	1%	6%	86,987	34%	37%
Hofseth Biocare	54.4x	n.m.	n.m.	176.8x	n.m.	n.m.	*n.m.*	11%	-6%	-19%	n.a.	55	28%	n.a.
Lonza Group	9.9x	8.4x	7.6x	23.8x	19.7x	17.5x	*15.6x*	3%	0%	-24%	12%	45,211	41%	45%
MedicaNatumin	0.8x	n.m.	n.m.	1.6x	n.m.	n.m.	*n.m.*	20%	18%	42%	n.a.	216	46%	n.a.
New Nordic Healthbrands	0.8x	n.m.	n.m.	1.2x	n.m.	n.m.	*n.m.*	9%	9%	-1%	n.a.	460	69%	n.a.
Probi	6.8x	6.4x	5.6x	15.8x	14.9x	13.5x	*11.8x*	27%	5%	15%	9%	733	43%	44%
Simris Alg	35.2x	*n.m.*	*n.m.*	neg	*n.m.*	*n.m.*	*n.m.*	n.a.	n.a.	n.a.	n.a.	2,215	neg	n.a.
Average	**12.3x**	**5.8x**	**5.1x**	**29.5x**	**11.5x**	**10.2x**	**9.8x**	**10%**	**4%**	**5%**	**10%**		**45%**	**50%**
Median	**6.3x**	**5.3x**	**5.0x**	**11.5x**	**10.9x**	**9.8x**	**9.6x**	**9%**	**1%**	**1%**	**10%**		**42%**	**46%**
Arctic Bioscience (ABGSCe)	**35.2x**	**17.2x**	**16.2x**	**135.9x**	**42.0x**	**37.4x**	**18.7x**		**4%**	**-32%**	**46%**	**20**	**26%**	**67%**
vs peer average											*36pp*		*-19pp*	*17pp*
vs peer median											*37pp*		*-16pp*	*21pp*

Source: ABG Sundal Collier, company data, FactSet

Nutraceutical business provides ample downside protection in our view

NOKm	2017	2018	2019	2020	2021e	2022e	2023e	2024e
Sales	18	25	30	20	33	46	64	87
EBITDA adj.	-1	-1	-2	-20	-22	-19	-1	9
EBIT adj.	-1	-1	-3	-22	-25	-30	-17	-8
FCF	-1	-8	-19	-34	-135	-186	-56	-75
Share price	30							
Shares	24							
Market Cap	727							
Net debt		11	-17	-4	-169	17	73	148
EV		738	710	722	558	744	800	875
Current valuation			2019	2020	2021e	2022e	2023e	2024e
EV/Sales				35.2x	17.2x	16.1x	12.5x	10.0x
EV/EBITDA adj.				-35.3x	-25.3x	-38.7x	-1246.4x	92.8x
EV/EBIT adj.				-33.3x	-21.9x	-24.5x	-46.6x	-115.4x
FCF yield				-4.7%	-18.6%	-25.6%	-7.7%	-10.4%
Target price (NOK)		57						
Implied valuation at TP				2020	2021	2022	2023	2024
EV/Sales				67.4x	37.4x	30.4x	22.7x	17.6x
EV/EBITDA adj.				-67.4x	-55.2x	-73.0x	-2273.0x	162.7x
EV/EBIT adj.				-63.7x	-47.8x	-46.1x	-85.1x	-202.3x
FCF yield				-59.6%	-237.4%	-326.4%	-97.8%	-131.9%

Nutraceuticals valuation on 2025 sales (NOKm)			
2025 sales	105	117	129
Gross profit	74	84	95
Gross margin	71%	72%	74%
2025 EV/GP	5.0x	5.5x	6.0x
2025 EV	372	461	569
No of shares	24	24	24
EV/share	15	19	23
Disc. EV/share	11	14	17
11% WACC			
Mcap	618	707	815
Equity value/share	25	29	34
Disc. Equity value/sh	19	21	25

Source: ABG Sundal Collier, company data

Our '21e-'45e rNPV of HRO350 indicates value of NOK 44

Please see the section "Financials and forecasts" for more details regarding the inputs for our valuation of HRO350.

We arrive at our risk-adj. EV of NOK 36/share and risk-adj. equity value of NOK 44/share for HRO350 by using the risk-adjusted net present value (rNPV) of future royalty streams and milestone payments with a WACC of 11%. We assume a 17% likelihood of approval, and note that we see a de-risked equity value per share of NOK 218. We assume a terminal growth rate of 2%, a terminal value of 2% of EV and a USD/NOK exchange rate of 8.57.

rNPV overview indicating risk-adj. stand-alone valuation of NOK 44 per share for HRO350

NOKm	DCF	+	Terminal Value			=	Enterprise Value			Enterprise Value per share		
	Discounted		DTV at a perpetual grow th rate of				Enterprise Value			For group SOTP		
Discount rate	Cash Flow s		1.0%	2.0%	3.0%		1.0%	2.0%	3.0%	1.0%	2.0%	3.0%
10.0%	940		21	24	28		961	964	968	40	40	40
10.5%	894		18	21	24		912	914	917	38	38	38
11.0%	851		16	17	20		866	868	870	36	36	36
11.5%	810		13	15	17		823	825	827	34	34	34
12.0%	772		11	13	14		783	785	786	32	32	32

	-	Net Debt	=	Equity Value			Equity value per Share		
				Equity Value			For stand alone valuation		
Discount rate		Net Debt		1.0%	2.0%	3.0%	1.0%	2.0%	3.0%
10.0%		-193		1,154	1,157	1,161	47	48	48
10.5%		-193		1,105	1,107	1,110	45	46	46
11.0%		-193		1,059	1,061	1,063	44	44	44
11.5%		-193		1,016	1,018	1,020	42	42	42
12.0%		-193		976	978	979	40	40	40

Source: ABG Sundal Collier

Below we illustrate sensitivities in the stand-alone valuation of HRO350 at various probabilities of success and penetration rate assumptions.

HRO350 risk-adj. equity value per share

Peak-penetration US	PoS 13.0%	15.0%	17.0%	19.0%	21.0%
3.1%	26	31	36	42	47
3.6%	27	32	38	43	49
4.1%	28	34	39	45	50
4.6%	29	35	41	46	52
5.1%	30	36	42	48	54
5.6%	31	37	44	50	56
6.1%	32	39	45	51	58
6.6%	34	40	47	53	60
7.1%	35	41	48	55	61
7.6%	36	43	50	56	63
8.1%	37	44	51	58	65

Source: ABG Sundal Collier

HRO350 risk-adj. equity value per share

Peak-penetration EU	PoS 13.0%	15.0%	17.0%	19.0%	21.0%
1.9%	28	34	39	45	51
2.4%	29	34	40	46	52
2.9%	29	35	41	47	53
3.4%	30	36	42	48	54
3.9%	31	37	43	49	55
4.4%	31	37	44	50	56
4.9%	32	38	45	51	57
5.4%	33	39	45	52	58
5.9%	33	40	46	53	59
6.4%	34	41	47	54	61
6.9%	35	42	48	55	62

Source: ABG Sundal Collier

Combined SOTP of NOK 57/share indicating ~90% upside

Below we illustrate our combined valuation of the Nutraceutical business and the Pharmaceutical business consisting of HRO350 in psoriasis. We include group-wide expenses and tax NPV in our rNPV valuation of HRO350. Below our SOTP, we illustrate the implied current valuation of the Pharmaceutical segment if we place no value in the Nutra business (NOK 23 per share). We also illustrate the implied likelihood of success for HRO350 at the current valuation holding all of our assumptions equal, a mere ~4%.

Arctic Bioscience – fair share price of NOK 57 per share

SOTP Arctic Bioscience	Value, de-risked (NOKm)	Likelihood of success	Value (NOKm)	Value NOK/share
Net cash '21e	169	100%	169	7
Discounted EV - Nutra	337	100%	337	14
HRO350 EV - Psoriasis	5,107	17%	868	36
Fair value SOTP	**5,613**		**1,374**	**57**

Implied current valuation:				
Current Mcap:			727	
Assuming 0 value for Nutra:				
Net cash '21e			169	7
HRO350 EV - Psoriasis			558	23
Implied fair value/share				**30**
Implied Likelihood of Success HRO350:				
Net cash '21e			169	7
Discounted EV - Nutra	337	100%	337	14
HRO350 EV - Psoriasis	5,107	4%	221	9
Implied fair value/share				**30**

Source: ABG Sundal Collier

Key risks

Clinical development risk for HRO350

While we are encouraged by the clinical data presented in the Pilot study, HRO350 still needs to pass pivotal trials, and the company needs to file a new drug application (NDA) and marketing authorisation application (MAA) in order to obtain approval. The process is precarious, with no guarantee that the products will ever reach the market. Regulators have become stricter and demand a higher level of proof for the safety and efficacy of pharmaceutical products.

Commercialisation risks for HRO350

A key underlying assumption for our estimates for HRO350 relates to the product being out-licensed to a commercial partner in order to execute on its potential global commercialisation. We believe that the resources of a large pharmaceutical player would be required to take HRO350 from clinical trials to commercialisation. We see risks and sensitivities to the timing and structure of a potential deal, which could impact the value of the asset. If Arctic Bioscience fails to establish a commercial partnership, it would require significant resources to build a commercial organisation to support a product launch.

Patent risks

We assume a rapid sales erosion of HRO350 after potential patent expiry in 2039, but note that the Omega-3 pharmaceutical EPADEL in Japan maintains a ~60% branded market share despite >10 years of generic competition. Another Omega 3-based pharmaceutical, Vascepa by Amarin, has faced generic competition, but this has been held back by limited supply (manufacturing complexities, costs, lead times) as well as a “skinny label” that sees generics indicated for just ~7% of the Vascepa market. Arctic Bioscience also creates a natural barrier to entry via its “black box” technology and its fully owned, proprietary production methods.

Delays and higher costs for manufacturing facility upgrade

Arctic Bioscience is in the process of planning a new manufacturing facility for both Pharma and Nutra in Norway, with the opening planned for Q1’23e. Capex is expected to be NOK 185m and the company expects it to improve gross margins by ~30-40%. This project could be delayed and/or incur higher-than-expected costs. This could not only lead to a potential need for additional external financing, but it could also impact the expected near-term gross margin improvements for the Nutra business.

Appendix – Executive management

Ole Arne Eiksund, *MSc, MBA*
CEO
+30 years experience
Former positions include Commercial Director in GSK and VP Global Sales in Hofseth Biocare and EVP Rimfrost.

Danielle Glenn, *BA*
CFO
+20 years experience
Harvard educated, former hedge fund manager at Goldman Sachs and Caxton, CEO, CFO and CSO of multiple startups in US, UK and Norway

Hogne Hallaråker, *MSc*
CSO
+15 years experience
Founder of Arctic Bioscience and more than 15 years of experience from nutra industries

Per Christian Sæbø, *MSc*
COO
+20 years experience
Former positions include Lipid Development Director in Natural ASA and Site Manager at EPAX, Hovdebygda

Runhild Gammelsæter, *PhD*
Global Medical Director
+15 years experience
Former positions include medical leadership roles in GSK, Abbvie and Abbott, as well as experience from start-up biotech

Lauren Jensen, *MBA*
SVP Sales and Marketing
+15 years experience
Former positions within global marketing, branding and communications

Daniele Mancinelli, *MSc*
CTO
+20 years experience
R&D specialist in omega -3 fatty acids and responsible for concept testing, verification and up-scaling

Yuming Feng, *PhD*
EVP Global Business Dev
+30 years experience
Former positions include Procurement Manager at Campbell's, EVP at Zoneco and CEO at Holley Int.

Source: ABG Sundal Collier, company data

Appendix – Board of Directors

Harald Nordal
Chairman
Co-founder Arctic Nutrition AS
Capra Invest AS

Jostein Dalland
Board member since 2020
Independent board member

Asbjørn Solvågseide
Board member since 2019
PIR IV Invest AS

Jan Endre Vartdal
Board member since 2016
Vartdal Holding AS and Nye Brødrene Vartdal AS

Per Magne Eggesbø
Board member since 2016
Eggesbø Eiendom AS and Eros AS

Tore Andreas Frøysa Tønseth
Board member since 2021
Ronja Capital AS

Hu Cao
Board member since 2021
Kotler Marketing Group (KMG)

Source: ABG Sundal Collier, company data

Appendix – Ownership data

Ownership data, Arctic Bioscience

#	Owner	Holding	Value (NOKm)	Capital	Votes	Country
1	PIR IV Invest AS	2,188,250	65.0	9.01%	9.01%	NOR
2	Capra Invest AS	1,313,960	39.0	5.41%	5.41%	NOR
3	Møre & Romsdal Såkornfond AS	1,198,991	35.6	4.93%	4.93%	GBR
4	Fjärde AP-fonden	1,145,450	34.0	4.71%	4.71%	NOR
5	Hawk Invest AS	1,107,853	32.9	4.56%	4.56%	NOR
6	Delphi Fondsforvaltning AS	1,098,565	32.6	4.52%	4.52%	NOR
7	Ronja Capital AS	988,543	29.4	4.07%	4.07%	NOR
8	Vartdal Holding AS	848,347	25.2	3.49%	3.49%	GBR
9	Brødrene Vartdal AS	818,644	24.3	3.37%	3.37%	NOR
10	Arctic Bioscience AS	803,601	23.9	3.31%	3.31%	NOR
11	Kotler Equity Investment Ltd.	725,000	21.5	2.98%	2.98%	NOR
12	Life Capitol AS	667,330	19.8	2.75%	2.75%	NOR
13	Kristofer Reiten	655,420	19.5	2.70%	2.70%	NOR
14	Eggesbø Eiendom AS	580,053	17.2	2.39%	2.39%	NOR
15	Eros AS	520,240	15.5	2.14%	2.14%	NOR
16	Hogne Hallaråker	520,240	15.5	2.14%	2.14%	NOR
17	Triplenine Vedde AS	492,957	14.6	2.03%	2.03%	LUX
18	Stette Invest AS	450,000	13.4	1.85%	1.85%	NOR
19	Frode Kjølås	340,000	10.1	1.40%	1.40%	NOR
20	Asbjørn Solevågseide	322,580	9.6	1.33%	1.33%	NOR
	Top 20 largest shareholders	*16,786,024*		*69%*	*69%*	
	Total other shareholders	*7,513,515*		*31%*	*31%*	
	Total number of shares	*24,299,539*		*100%*	*100%*	

Source: ABG Sundal Collier, VPS as of 15.03.2021

Appendix – Biologics clinical data

Approved oral treatments and biologics

Table 2. US Food and Drug Administration–Approved Biologic and Oral Systemic Treatments for Psoriasis

Systemic treatment	Structure of biologic or target of oral systemic	Dosing for plaque psoriasis[a]	Efficacy at primary end point[b]	Safety considerations
Biologics				
Anti-TNF-α				
Etanercept	Fusion protein between a TNF-α receptor protein and the crystallizable fragment portion of IgG1	Loading/induction dose: 50 mg twice weekly for 12 weeks Maintenance dose: 50 mg once weekly Recommended escalated maintenance dose: 50 mg twice weekly Pediatric dose: 0.8 mg/kg once weekly; maximum dose, 50 mg weekly	Adults: 49% achieve PASI 75 at week 12 (placebo, 3%)[62] Children (aged 4-17 years): 57% achieve PASI 75 at week 12 (placebo, 11%)[63]	Avoid use in patients with demyelinating diseases or hepatitis B Use is not preferred in patients with a history of latent tuberculosis or advanced congestive heart failure Discontinue during serious infection until the infection resolves
Adalimumab	Human monoclonal IgG1 antibody	Loading/induction dose: 80 mg at week 0; 40 mg at week 1 Maintenance dose: 40 mg every 2 weeks	Adults: 71% achieve PASI 75 at week 16 (placebo, 7%)[64] Superior to methotrexate at 16 weeks[65]	Avoid use in patients with demyelinating diseases or hepatitis B Use is not preferred in patients with a history of latent tuberculosis or advanced congestive heart failure Antiadalimumab antibodies in 6%-50% Discontinue during serious infection until the infection resolves
Certolizumab pegol	Pegylated humanized antibody fragment	Loading/induction dose for patients ≤90 kg: 400 mg at weeks 0, 2, and 4 Maintenance dose: ≤90 kg: 200 mg every 2 weeks >90 kg: 400 mg every 2 weeks	Adults: 83% achieve PASI 75 at week 16 (placebo, 12%)[66]	Preferred in pregnant or breastfeeding women due to minimal placental and breast milk transfer Avoid use in patients with demyelinating diseases or hepatitis B Use is not preferred in patients with a history of latent tuberculosis or advanced congestive heart failure Discontinue during serious infection until the infection resolves
Infliximab	Human chimeric monoclonal IgG1 antibody	Loading/induction dose: 5 mg/kg at weeks 0, 2, and 6 (the only intravenously administered biologic) Maintenance dose: 5 mg/kg every 8 weeks Recommended escalated maintenance dose: 5 mg/kg every 4-8 weeks and/or up to 10 mg/kg	Adults: 80% achieve PASI 75 at week 10 (placebo, 3%)[67]; 55% achieve PASI 75 at week 50 (placebo/infliximab, 77%)[67] Superior to methotrexate at 16 weeks[68]	Avoid use in patients with demyelinating diseases or hepatitis B Use is not preferred in patients with a history of latent tuberculosis or advanced congestive heart failure Discontinue during serious infection until the infection resolves
Anti-IL-17				
Secukinumab	Human monoclonal IL-17A antibody	Loading/induction dose: 300 mg at weeks 0, 1, 2, 3, and 4 Maintenance dose: 300 mg every 4 weeks Recommended escalated maintenance dose: 300 mg every 2 weeks	Adults: 82% achieve PASI 75 at week 12 (placebo: 4%); 65% achieve IGA 0/1 at week 12 (placebo, 2%)[69] Superior to etanercept and ustekinumab at 1 year[69,70] High efficacy for scalp, nail, and palmoplantar psoriasis[71-73]	Avoid use in patients with a history of inflammatory bowel disease Low rates of mild mucocutaneous candidiasis Discontinue during serious infection until the infection resolves
Ixekizumab	Humanized monoclonal IL-17A antibody	Loading/induction dose: 160 mg at week 0; 80 mg at weeks 2, 4, 6, 8, 10, and 12 Maintenance dose: 80 mg every 4 weeks Recommended escalated maintenance dose: 80 mg every 2 weeks	Adults: 90% achieve PASI 75 at week 12 (placebo, 2%); 83% achieve IGA 0/1 at week 12 (placebo, 2%)[60] Superior to etanercept at 12 weeks, ustekinumab at 1 year, and adalimumab at 24 weeks[60,74,75]	Avoid use in patients with a history of inflammatory bowel disease Low rates of mild mucocutaneous candidiasis Discontinue during serious infection until the infection resolves
Brodalumab	Human monoclonal IL-17A receptor antibody	Loading/induction dose: 210 mg at weeks 0, 1, and 2 Maintenance dose: 210 mg every 2 weeks Recommended escalated maintenance dose: 40 mg once weekly	Adults: 86% achieve PASI 75 at week 12 (placebo, 8%); 80% achieve IGA 0/1 at week 12 (placebo, 4%)[76] Superior to ustekinumab at 12 weeks[76]	Avoid use in patients with a history of inflammatory bowel disease Low rates of mild mucocutaneous candidiasis Discontinue during serious infection until the infection resolves Weigh benefit and risks in patients with a history of suicidal ideation or behavior

Source: ABG Sundal Collier, Armstrong et al 2020

Approved oral treatments and biologics

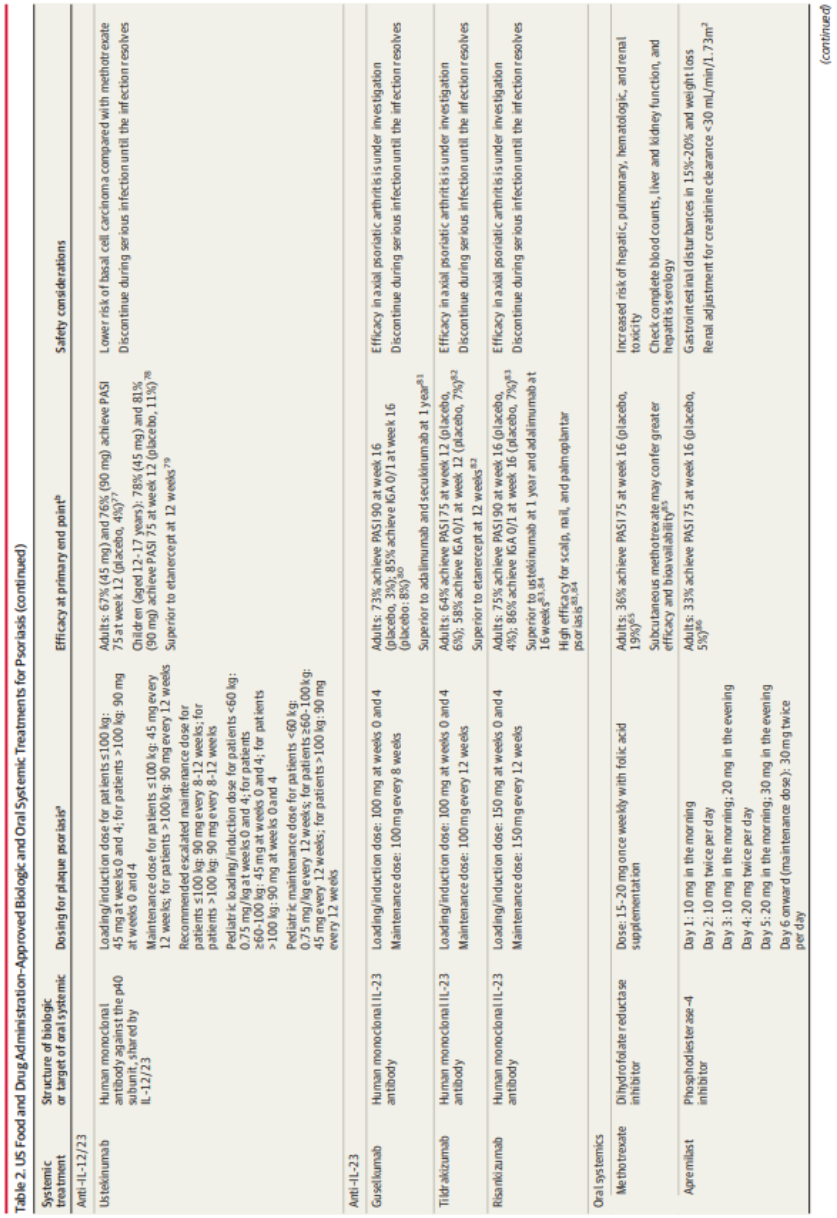


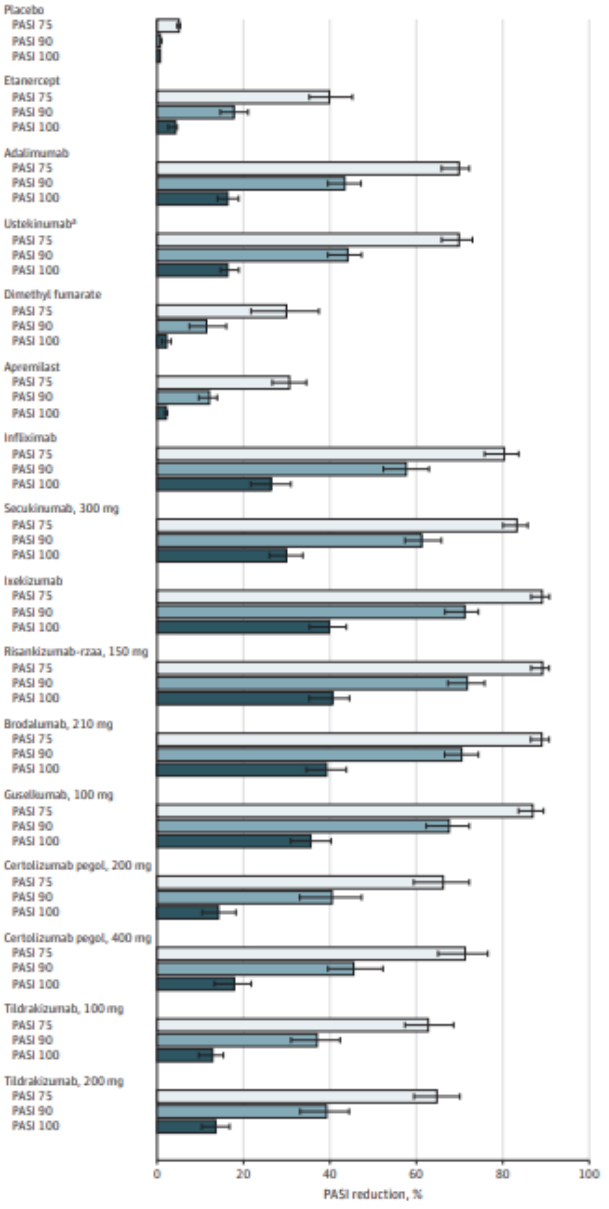
Table 2. US Food and Drug Administration–Approved Biologic and Oral Systemic Treatments for Psoriasis (continued)

Systemic treatment	Structure of biologic or target of oral systemic	Dosing for plaque psoriasis[a]	Efficacy at primary end point[b]	Safety considerations
Anti–IL-12/23				
Ustekinumab	Human monoclonal antibody against the p40 subunit, shared by IL-12/23	Loading/induction dose for patients ≤100 kg: 45 mg at weeks 0 and 4; for patients >100 kg: 90 mg at weeks 0 and 4 Maintenance dose for patients ≤100 kg: 45 mg every 12 weeks; for patients >100 kg: 90 mg every 12 weeks Recommended escalated maintenance dose for patients ≤100 kg: 90 mg every 8-12 weeks; for patients >100 kg: 90 mg every 8-12 weeks Pediatric loading/induction dose for patients <60 kg: 0.75 mg/kg at weeks 0 and 4; for patients ≥60-100 kg : 45 mg at weeks 0 and 4; for patients >100 kg: 90 mg at weeks 0 and 4 Pediatric maintenance dose for patients <60 kg: 0.75 mg/kg every 12 weeks; for patients ≥60-100 kg: 45 mg every 12 weeks; for patients >100 kg: 90 mg every 12 weeks	Adults: 67% (45 mg) and 76% (90 mg) achieve PASI 75 at week 12 (placebo, 4%)[77] Children (aged 12-17 years): 78% (45 mg) and 81% (90 mg) achieve PASI 75 at week 12 (placebo, 11%)[78] Superior to etanercept at 12 weeks[79]	Lower risk of basal cell carcinoma compared with methotrexate Discontinue during serious infection until the infection resolves
Anti–IL-23				
Guselkumab	Human monoclonal IL-23 antibody	Loading/induction dose: 100 mg at weeks 0 and 4 Maintenance dose: 100 mg every 8 weeks	Adults: 73% achieve PASI 90 at week 16 (placebo, 3%); 85% achieve IGA 0/1 at week 16 (placebo: 8%)[80] Superior to adalimumab and secukinumab at 1 year[81]	Efficacy in axial psoriatic arthritis is under investigation Discontinue during serious infection until the infection resolves
Tildrakizumab	Human monoclonal IL-23 antibody	Loading/induction dose: 100 mg at weeks 0 and 4 Maintenance dose: 100 mg every 12 weeks	Adults: 64% achieve PASI 75 at week 12 (placebo, 6%); 58% achieve IGA 0/1 at week 12 (placebo, 7%)[82] Superior to etanercept at 12 weeks[82]	Efficacy in axial psoriatic arthritis is under investigation Discontinue during serious infection until the infection resolves
Risankizumab	Human monoclonal IL-23 antibody	Loading/induction dose: 150 mg at weeks 0 and 4 Maintenance dose: 150 mg every 12 weeks	Adults: 75% achieve PASI 90 at week 16 (placebo, 4%); 86% achieve IGA 0/1 at week 16 (placebo, 7%)[83] Superior to ustekinumab at 1 year and adalimumab at 16 weeks[83,84] High efficacy for scalp, nail, and palmoplantar psoriasis[83,84]	Efficacy in axial psoriatic arthritis is under investigation Discontinue during serious infection until the infection resolves
Oral systemics				
Methotrexate	Dihydrofolate reductase inhibitor	Dose: 15-20 mg once weekly with folic acid supplementation	Adults: 36% achieve PASI 75 at week 16 (placebo, 19%)[85] Subcutaneous methotrexate may confer greater efficacy and bioavailability[85]	Increased risk of hepatic, pulmonary, hematologic, and renal toxicity Check complete blood counts, liver and kidney function, and hepatitis serology
Apremilast	Phosphodiesterase-4 inhibitor	Day 1: 10 mg in the morning Day 2: 10 mg twice per day Day 3: 10 mg in the morning; 20 mg in the evening Day 4: 20 mg twice per day Day 5: 20 mg in the morning; 30 mg in the evening Day 6 onward (maintenance dose): 30 mg twice per day	Adults: 33% achieve PASI 75 at week 16 (placebo, 5%)[86]	Gastrointestinal disturbances in 15%-20% and weight loss Renal adjustment for creatinine clearance <30 mL/min/1.73 m^2

(continued)

Source: ABG Sundal Collier, Armstrong et al 2020

Comparison of PASI 75/90/100 short-term response rates in US FDA-Approved Oral Systemics and Biologics for psoriasis



The Psoriasis Area Severity Index (PASI) is a validated instrument that enables clinicians to assess psoriasis disease severity. It combines the assessment of session severity (erythema, induration, and scale) and the affected areas into a single score between 0 (no disease) and 72 (maximal disease). PASI scores of 75, 90, and 100 indicate a 75%, 90%, and 100% reduction in PASI score compared with baseline. Compared with US Food and Drug Administration (FDA)-approved oral systemic and biologics therapies, risankizumab, brodalumab, ixekizumab, and guselkumab have the highest PASI 75/90/100 response rates at weeks 10 to 16 among assessed treatments. Furthermore, risankizumab has significantly higher PASI 75/90/100 response rates compared with etanercept, adalimumab, ustekinumab, secukinumab, infliximab, dimethyl fumarate, apremilast, certolizumab pegol, and tildrakizumab. Error bars indicate 95% credible intervals.

Source: ABG Sundal Collier, Armstrong et al 2020

Income Statement (NOKm)	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021e	Q2 2021e	Q3 2021e	Q4 2021e
Sales	0	0	0	0	0	15	0	18
COGS	0	0	0	0	0	-9	0	-11
Gross profit	0	0	0	0	0	6	0	7
Other operating items	0	0	0	0	0	-16	0	-19
EBITDA	**0**	**0**	**0**	**0**	**0**	**-10**	**0**	**-12**
Depreciation and amortisation	0	0	0	0	0	-1	0	-2
EBITA	**0**	**0**	**0**	**0**	**0**	**-12**	**0**	**-14**
EO items	0	0	0	0	0	0	0	0
Impairment and PPA amortisation	0	0	0	0	0	0	0	0
EBIT	**0**	**0**	**0**	**0**	**0**	**-12**	**0**	**-14**
Net financial items	0	0	0	0	0	-1	0	-1
Pretax profit	**0**	**0**	**0**	**0**	**0**	**-12**	**0**	**-15**
Tax	0	0	0	0	0	0	0	0
Net profit	**0**	**0**	**0**	**0**	**0**	**-12**	**0**	**-15**
Minority interest	0	0	0	0	0	0	0	0
Net profit discontinued	0	0	0	0	0	0	0	0
Net profit to shareholders	**0**	**0**	**0**	**0**	**0**	**-12**	**0**	**-15**
EPS	0	0	0	0	0	-0.50	0	-0.62
EPS Adj	0	0	0	0	0	-0.50	0	-0.62
Total extraordinary items after tax	0	0	0	0	0	0	0	0
Tax rate (%)	*ns*	*ns*	*ns*	*ns*	*ns*	*0*	*ns*	*0*
Gross margin (%)	*nm*	*nm*	*nm*	*nm*	*nm*	*41.0*	*nm*	*41.0*
EBITDA margin (%)	*nm*	*nm*	*nm*	*nm*	*nm*	*-70.6*	*nm*	*-65.6*
EBITA margin (%)	*nm*	*nm*	*nm*	*nm*	*nm*	*-80.2*	*nm*	*-76.7*
EBIT margin (%)	*nm*	*nm*	*nm*	*nm*	*nm*	*-80.2*	*nm*	*-76.7*
Pretax margin (%)	*nm*	*nm*	*nm*	*nm*	*nm*	*-83.7*	*nm*	*-83.9*
Net margin (%)	*nm*	*nm*	*nm*	*nm*	*nm*	*-83.7*	*nm*	*-83.9*
Growth rates Y/Y	**Q1 2020**	**Q2 2020**	**Q3 2020**	**Q4 2020**	**Q1 2021e**	**Q2 2021e**	**Q3 2021e**	**Q4 2021e**
Sales growth (%)	*na*	*na*	*na*	*na*	*na*	*+chg*	*na*	*+chg*
EBITDA growth (%)	*na*	*na*	*na*	*na*	*na*	*-chg*	*na*	*-chg*
EBIT growth (%)	*na*	*na*	*na*	*na*	*na*	*-chg*	*na*	*-chg*
Net profit growth (%)	*na*	*na*	*na*	*na*	*na*	*-chg*	*na*	*-chg*
EPS growth (%)	*na*	*na*	*na*	*na*	*na*	*-chg*	*na*	*-chg*
Adj earnings numbers	**Q1 2020**	**Q2 2020**	**Q3 2020**	**Q4 2020**	**Q1 2021e**	**Q2 2021e**	**Q3 2021e**	**Q4 2021e**
EBITDA Adj	0	0	0	0	0	-10	0	-12
EBITDA Adj margin (%)	*nm*	*nm*	*nm*	*nm*	*nm*	*-70.6*	*nm*	*-65.6*
EBITA Adj	0	0	0	0	0	-12	0	-14
EBITA Adj margin (%)	*nm*	*nm*	*nm*	*nm*	*nm*	*-80.2*	*nm*	*-76.7*
EBIT Adj	0	0	0	0	0	-12	0	-14
EBIT Adj margin (%)	*nm*	*nm*	*nm*	*nm*	*nm*	*-80.2*	*nm*	*-76.7*
Pretax profit Adj	0	0	0	0	0	-12	0	-15
Net profit Adj	0	0	0	0	0	-12	0	-15
Net profit to shareholders Adj	0	0	0	0	0	-12	0	-15
Net Adj margin (%)	*nm*	*nm*	*nm*	*nm*	*nm*	*-83.7*	*nm*	*-83.9*

Source: ABG Sundal Collier, Company data

Income Statement (NOKm)	2014	2015	2016	2017	2018	2019	2020	2021e	2022e	2023e
Sales	0	0	0	18	25	30	20	33	46	64
COGS	0	0	0	-11	-16	-18	-15	-19	-26	-21
Gross profit	0	0	0	7	9	12	5	13	20	43
Other operating items	0	0	0	-8	-10	-14	-26	-35	-39	-43
EBITDA	**0**	**0**	**0**	**-1**	**-1**	**-2**	**-20**	**-22**	**-19**	**-1**
Depreciation and amortisation	0	0	0	-1	-1	-1	-1	-3	-11	-17
Of which leasing depreciation	0	0	0	0	0	0	0	0	0	0
EBITA	**0**	**0**	**0**	**-1**	**-1**	**-3**	**-22**	**-25**	**-30**	**-17**
EO items	0	0	0	0	0	0	0	0	0	0
Impairment and PPA amortisation	0	0	0	0	0	0	0	0	0	0
EBIT	**0**	**0**	**0**	**-1**	**-1**	**-3**	**-22**	**-25**	**-30**	**-17**
Net financial items	0	0	0	-0	-1	-1	-1	-2	-5	-7
Pretax profit	**0**	**0**	**0**	**-2**	**-2**	**-4**	**-23**	**-27**	**-35**	**-24**
Tax	0	0	0	0	0	0	0	0	0	0
Net profit	**0**	**0**	**0**	**-2**	**-2**	**-4**	**-23**	**-27**	**-35**	**-24**
Minority interest	0	0	0	0	0	0	0	0	0	0
Net profit discontinued	0	0	0	0	0	0	0	0	0	0
Net profit to shareholders	**0**	**0**	**0**	**-2**	**-2**	**-4**	**-23**	**-27**	**-35**	**-24**
EPS	0	0	0	0	-1.60	-3.09	-16.29	-1.12	-1.45	-0.99
EPS Adj	*0*	*0*	*0*	*0*	*-1.60*	*-3.09*	*-16.29*	*-1.12*	*-1.45*	*-0.99*
Total extraordinary items after tax	0	0	0	0	0	0	0	0	0	0
Leasing payments	0	0	0	0	0	0	0	0	0	0
Tax rate (%)	*ns*	*ns*	*ns*	*0*	*0*	*0*	*0.0*	*0*	*0*	*0*
Gross margin (%)	*nm*	*nm*	*nm*	*38.2*	*37.0*	*40.7*	*25.9*	*41.0*	*43.2*	*66.7*
EBITDA margin (%)	*nm*	*nm*	*nm*	*-3.7*	*-2.5*	*-6.7*	*-99.9*	*-67.8*	*-41.6*	*-1.0*
EBITA margin (%)	*nm*	*nm*	*nm*	*-6.9*	*-4.6*	*-10.3*	*-105.7*	*-78.3*	*-65.9*	*-26.7*
EBIT margin (%)	*nm*	*nm*	*nm*	*-6.9*	*-4.6*	*-10.3*	*-105.7*	*-78.3*	*-65.9*	*-26.7*
Pretax margin (%)	*nm*	*nm*	*nm*	*-9.4*	*-6.9*	*-13.3*	*-110.2*	*-83.8*	*-76.4*	*-37.4*
Net margin (%)	*nm*	*nm*	*nm*	*-9.4*	*-6.9*	*-13.3*	*-110.2*	*-83.8*	*-76.4*	*-37.4*
Growth rates Y/Y	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021e**	**2022e**	**2023e**
Sales growth (%)	*na*	*na*	*na*	*na*	*35.3*	*20.9*	*-31.8*	*58.6*	*42.0*	*39.0*
EBITDA growth (%)	*na*	*na*	*na*	*high*	*8.4*	*-221.5*	*-922.3*	*-7.6*	*12.9*	*96.7*
EBIT growth (%)	*na*	*na*	*na*	*high*	*9.8*	*-168.2*	*-602.9*	*-17.3*	*-19.5*	*43.6*
Net profit growth (%)	*na*	*na*	*na*	*high*	*1.1*	*-133.3*	*-466.2*	*-20.6*	*-29.4*	*31.8*
EPS growth (%)	*na*	*na*	*na*	*na*	*high*	*-93.0*	*-426.4*	*93.1*	*-29.4*	*31.8*
Profitability	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021e**	**2022e**	**2023e**
ROE (%)	*nm*	*nm*	*nm*	*-18.6*	*-8.4*	*-9.3*	*-35.3*	*-13.6*	*-11.0*	*-8.3*
ROE Adj (%)	*nm*	*nm*	*nm*	*-18.6*	*-8.4*	*-9.3*	*-35.3*	*-13.6*	*-11.0*	*-8.3*
ROCE (%)	*nm*	*nm*	*nm*	*-9.2*	*-3.7*	*-5.9*	*-30.2*	*-10.5*	*-6.8*	*-3.6*
ROCE Adj(%)	*nm*	*nm*	*nm*	*-9.2*	*-3.7*	*-5.9*	*-30.2*	*-10.5*	*-6.8*	*-3.6*
ROIC (%)	*na*	*na*	*na*	*-11.7*	*-4.2*	*-7.7*	*-40.6*	*-22.3*	*-12.5*	*-5.1*
ROIC Adj (%)	*na*	*na*	*na*	*-11.7*	*-4.2*	*-7.7*	*-40.6*	*-22.3*	*-12.5*	*-5.1*
Adj earnings numbers	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021e**	**2022e**	**2023e**
EBITDA Adj	0	0	0	-1	-1	-2	-20	-22	-19	-1
EBITDA Adj margin (%)	*nm*	*nm*	*nm*	*-3.7*	*-2.5*	*-6.7*	*-99.9*	*-67.8*	*-41.6*	*-1.0*
EBITDA lease Adj	0	0	0	-1	-1	-2	-20	-22	-19	-1
EBITDA lease Adj margin (%)	*nm*	*nm*	*nm*	*-3.7*	*-2.5*	*-6.7*	*-99.9*	*-67.8*	*-41.6*	*-1.0*
EBITA Adj	0	0	0	-1	-1	-3	-22	-25	-30	-17
EBITA Adj margin (%)	*nm*	*nm*	*nm*	*-6.9*	*-4.6*	*-10.3*	*-105.7*	*-78.3*	*-65.9*	*-26.7*
EBIT Adj	0	0	0	-1	-1	-3	-22	-25	-30	-17
EBIT Adj margin (%)	*nm*	*nm*	*nm*	*-6.9*	*-4.6*	*-10.3*	*-105.7*	*-78.3*	*-65.9*	*-26.7*
Pretax profit Adj	0	0	0	-2	-2	-4	-23	-27	-35	-24
Net profit Adj	0	0	0	-2	-2	-4	-23	-27	-35	-24
Net profit to shareholders Adj	0	0	0	-2	-2	-4	-23	-27	-35	-24
Net Adj margin (%)	nm	nm	nm	-9.4	-6.9	-13.3	-110.2	-83.8	-76.4	-37.4

Source: ABG Sundal Collier, Company data

Cash Flow Statement (NOKm)	2014	2015	2016	2017	2018	2019	2020	2021e	2022e	2023e
EBITDA	0	0	0	-1	-1	-2	-20	-22	-19	-1
Net financial items	0	0	0	-0	-1	-1	-1	-2	-5	-7
Paid tax	0	0	0	0	0	0	0	0	0	0
Non-cash items	0	0	0	1	0	0	0	0	0	0
Cash flow before change in WC	0	0	0	0	-1	-3	-21	-24	-24	-8
Change in WC	0	0	0	0	-7	-7	-0	-10	-5	-7
Operating cash flow	**0**	**0**	**0**	**0**	**-8**	**-10**	**-22**	**-33**	**-29**	**-15**
CAPEX tangible fixed assets	0	0	0	0	0	0	0	-74	-111	-1
CAPEX intangible fixed assets	0	0	0	0	0	0	0	-28	-46	-40
Acquisitions and disposals	0	0	0	0	0	0	0	0	0	0
Free cash flow	**0**	**0**	**0**	**0**	**-8**	**-10**	**-22**	**-135**	**-186**	**-56**
Dividend paid	0	0	0	0	0	0	0	0	0	0
Share issues and buybacks	0	0	0	0	0	42	23	300	0	0
Lease liability amortisation	0	0	0	0	0	0	0	0	0	0
Other non cash items	0	0	0	-8	-1	-3	-19	0	0	0
Balance Sheet (NOKm)	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021e**	**2022e**	**2023e**
Goodwill	0	0	0	0	0	0	0	0	0	0
Other intangible assets	0	0	0	14	18	25	34	61	105	140
Tangible fixed assets	0	0	0	3	3	3	6	78	180	169
Right-of-use asset	0	0	0	0	0	0	0	0	0	0
Total other fixed assets	0	0	0	0	0	0	0	0	0	0
Fixed assets	0	0	0	17	21	28	41	139	285	309
Inventories	0	0	0	8	16	17	26	35	40	47
Receivables	0	0	0	2	6	12	11	15	17	16
Other current assets	0	0	0	1	1	1	3	3	3	3
Cash and liquid assets	0	0	0	6	1	24	13	246	165	109
Total assets	**0**	**0**	**0**	**34**	**45**	**82**	**93**	**439**	**510**	**485**
Shareholders equity	0	0	0	19	22	64	64	337	301	277
Minority	0	0	0	0	0	0	0	0	0	0
Total equity	**0**	**0**	**0**	**19**	**22**	**64**	**64**	**337**	**301**	**277**
Long-term debt	0	0	0	9	8	7	7	53	143	143
Pension debt	0	0	0	0	0	0	0	0	0	0
Convertible debt	0	0	0	0	0	0	0	0	0	0
Leasing liability	0	0	0	0	0	0	0	0	0	0
Total other long-term liabilities	0	0	0	0	0	0	0	0	0	0
Short-term debt	0	0	0	0	4	0	2	24	39	39
Accounts payable	0	0	0	2	6	6	10	13	15	15
Other current liabilities	0	0	0	5	6	5	11	11	11	11
Total liabilities and equity	**0**	**0**	**0**	**34**	**45**	**82**	**93**	**439**	**510**	**485**
Net IB debt	0	0	0	3	11	-17	-4	-169	17	73
Net IB debt excl. pension debt	0	0	0	3	11	-17	-4	-169	17	73
Net IB debt excl. leasing	0	0	0	3	11	-17	-4	-169	17	73
Capital invested	0	0	0	22	33	47	60	168	319	350
Working capital	0	0	0	5	12	19	19	29	34	41
EV breakdown	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021e**	**2022e**	**2023e**
Market cap. diluted (m)	na	na	na	na	na	na	na	726	726	726
Net IB debt Adj	0	0	0	3	11	-17	-4	-169	17	73
Market value of minority	0	0	0	0	0	0	0	0	0	0
Reversal of shares and participations	0	0	0	0	0	0	0	0	0	0
Reversal of conv. debt assumed equity	0	0	0	0	0	0	0	0	0	0
EV	**na**	**na**	**na**	**na**	**na**	**na**	**na**	**558**	**744**	**799**
Capital efficiency	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021e**	**2022e**	**2023e**
Total assets turnover (%)	*nm*	*nm*	*nm*	*107.8*	*62.5*	*47.0*	*23.3*	*12.2*	*9.7*	*12.9*
Working capital/sales (%)	*nm*	*nm*	*nm*	*12.6*	*33.0*	*50.8*	*92.6*	*73.8*	*67.7*	*58.2*
Financial risk and debt service	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021e**	**2022e**	**2023e**
Net debt/equity	*nm*	*nm*	*nm*	*0.17*	*0.51*	*-0.26*	*-0.06*	*-0.50*	*0.06*	*0.26*
Net debt/market cap	*na*	*na*	*na*	*na*	*na*	*na*	*na*	*-0.23*	*0.02*	*0.10*
Equity ratio (%)	*nm*	*nm*	*nm*	*54.6*	*48.2*	*77.5*	*68.6*	*76.8*	*59.1*	*57.2*
Net IB debt adj./equity	*nm*	*nm*	*nm*	*0.17*	*0.51*	*-0.26*	*-0.06*	*-0.50*	*0.06*	*0.26*
Current ratio	*nm*	*nm*	*nm*	*2.73*	*1.57*	*4.74*	*2.32*	*6.19*	*3.46*	*2.72*
EBITDA/net interest	*na*	*na*	*na*	*-1.50*	*-1.11*	*-2.21*	*-22.36*	*-12.24*	*-3.96*	*-0.09*
Net IB debt/EBITDA	*nm*	*nm*	*nm*	*-4.57*	*-18.05*	*8.40*	*0.20*	*7.66*	*-0.90*	*-113.82*
Net IB debt/EBITDA lease Adj	*nm*	*nm*	*nm*	*-4.57*	*-18.05*	*8.40*	*0.20*	*7.66*	*-0.90*	*-113.82*
Interest cover	*nm*	*nm*	*nm*	*-2.80*	*-2.05*	*-3.40*	*-23.66*	*-14.13*	*-6.27*	*-2.49*

Source: ABG Sundal Collier, Company data

Valuation and Ratios (NOKm)	2014	2015	2016	2017	2018	2019	2020	2021e	2022e	2023e
Shares outstanding adj.	0	0	0	0	1	1	1	24	24	24
Fully diluted shares Adj	0	0	0	0	1	1	1	24	24	24
EPS	0	0	0	0	-1.60	-3.09	-16.29	-1.12	-1.45	-0.99
Dividend per share Adj	0	0	0	0.3	0	0	0.7	0.9	1.1	1.3
EPS Adj	0	0	0	0	-1.60	-3.09	-16.29	-1.12	-1.45	-0.99
BVPS	0	0	0	0	20.52	49.55	46.10	13.86	12.41	11.42
BVPS Adj	0	0	0	0	3.51	30.02	21.44	11.33	8.10	5.64
Net IB debt / share	na	na	na	na	10.5	-13.1	-3.0	-6.9	0.7	3.0
Share price	na	na	na	na	na	na	na	29.90	29.90	29.90
Market cap. (m)	na	na	na	na	na	na	na	726	726	726
Valuation	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021e**	**2022e**	**2023e**
P/E	na	na	na	na	na	na	na	-26.7	-20.6	-30.2
EV/sales	na	na	na	na	na	na	na	17.16	16.11	12.46
EV/EBITDA	na	na	na	na	na	na	na	-25.3	-38.7	-1,246.2
EV/EBITA	na	na	na	na	na	na	na	-21.9	-24.5	-46.6
EV/EBIT	na	na	na	na	na	na	na	-21.9	-24.5	-46.6
Dividend yield (%)	*na*	*na*	*na*	*na*	*na*	*na*	*na*	*3.0*	*3.7*	*4.3*
FCF yield (%)	*na*	*na*	*na*	*na*	*na*	*na*	*na*	*-18.6*	*-25.6*	*-7.7*
Lease adj. FCF yield (%)	*na*	*na*	*na*	*na*	*na*	*na*	*na*	*-18.6*	*-25.6*	*-7.7*
P/BVPS	na	na	na	na	na	na	na	2.16	2.41	2.62
P/BVPS Adj	na	na	na	na	na	na	na	2.64	3.69	5.30
P/E Adj	na	na	na	na	na	na	na	-26.7	-20.6	-30.2
EV/EBITDA Adj	na	na	na	na	na	na	na	-25.3	-38.7	-1,246.2
EV/EBITA Adj	na	na	na	na	na	na	na	-21.9	-24.5	-46.6
EV/EBIT Adj	na	na	na	na	na	na	na	-21.9	-24.5	-46.6
EV/cap. employed	na	na	na	na	na	na	na	1.3	1.5	1.7
Investment ratios	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021e**	**2022e**	**2023e**
Capex/sales	nm	nm	nm	0	0	0	0	313.8	340.2	63.9
Capex/depreciation	nm	nm	nm	0	0	0	0	3,000.0	1,401.8	248.5
Capex tangibles/tangible fixed assets	nm	nm	nm	0	0	0	0	95.1	61.5	0.6
Capex intangibles/definite intangibles	nm	nm	nm	0	0	0	0	45.6	44.0	28.5
Depreciation on intangibles/definite inta	nm	nm	nm	0	0	0	0	0	0	0
Depreciation on tangibles/tangibles	nm	nm	nm	18.9	16.4	34.3	18.7	4.4	6.2	9.8

Source: ABG Sundal Collier, Company data

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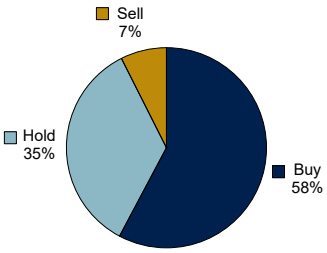

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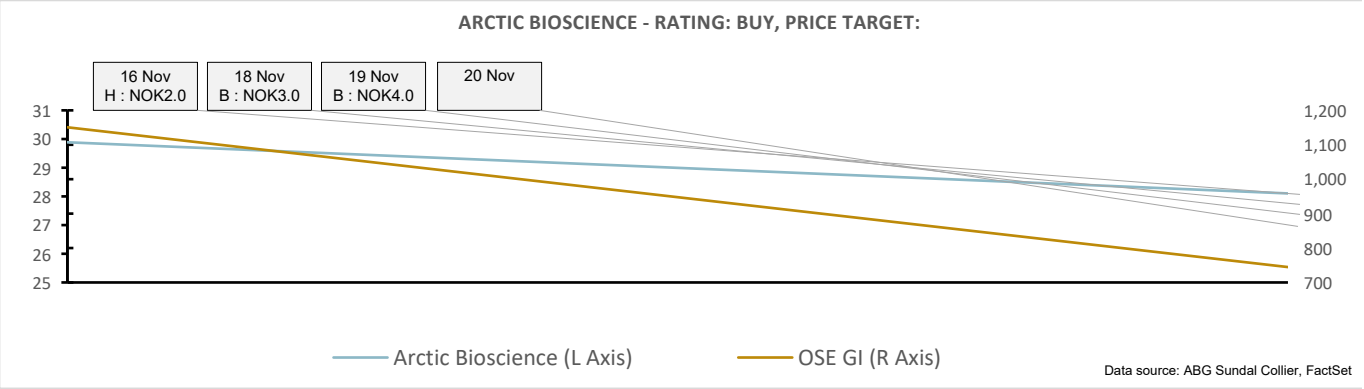
Stock price, company ratings and target price history

Company: Arctic Bioscience **Currency:** NOK **Current Recommendation** BUY

Date: 17/03/2021 **Current Target price:** 57

Current Share price: 29.895



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Production of recommendation: 03/19/2021 07:10 CET.

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