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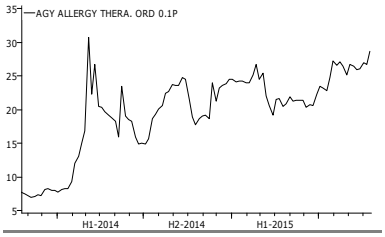
Pharmaceuticals & Biotech



Source: Fidessa

Market data	
EPIC/TKR	AGY
Price (p)	28.7
12m High (p)	29.0
12 Low (p)	17.7
Shares (m)	545.8
Mkt Cap (£m)	156.9
EV (£m)	136.7
Free Float*	99%
Market	AIM

**As defined by AIM Rule 26*

Description

AGY provides information to professionals about prevention, diagnosis and treatment of allergic conditions with special focus on allergy vaccination, a successful treatment that deals with the underlying cause and not just the symptoms!

Company information	
CEO	Manuel Llobet
CFO	Ian Postlethwaite
Chairman	Peter Jensen

01483 685 670
www.allergytherapeutics.com

Next Event	
PQ safety study	1Q 2016
Interim report	1 March 2016
PQ dose selection study	2Q 2016
Final results	Sept 2016

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Allergy Therapeutics

Pollinex Quattro driving US market opportunity

AGY is a long-established specialist in the prevention, diagnosis and treatment of allergies. It has an underlying profitable and cash generative business despite its lead product being available only on a 'Named Patient' basis. However, protocols agreed with EU and US regulators are in place to get Pollinex Quattro approved as a biological. The US opportunity is enormous and only two players have short-course treatments. There is a valuation mis-match between AGY and its peers, which either have no growth or little marketing experience, which provides scope for considerable upside towards our risk-adjusted DCF valuation of 93p per share.

- **Strategy:** AGY is a fully integrated pharmaceutical company focused on the treatment of allergies. There are three parts to its growth strategy: approval of its lead product, particularly in the US; geographical expansion of its product portfolio; active participation in industry consolidation.
- **Key product:** Pollinex Quattro is the only short course allergy vaccine available in the market that has the added benefit of being aluminium-free. The focus is to move the availability of this product from 'Named Patient' in Europe only to full marketing approval in both Europe and the US and open up a $5bn market.
- **Valuation:** Based on our forecasts for market share gains in the US, our risk adjusted DCF valuation is 93p per share. This upside potential is supported by an apparent mis-match between the value of AGY with its peers, which have either limited growth opportunities or little commercial experience.
- **Risks:** AGY must undertake some additional clinical trials in order to achieve regulatory approval. However, given that protocols have been agreed with both EU and US regulators and that Pollinex Quattro has been used in 200,000 patients to date, the risks have been minimised.
- **Investment summary:** AGY is a very promising opportunity. Not only does it have a profitable and cash generative underlying business, regulatory approval of Pollinex Quattro would be a transformational event. The market is valuing AGY similarly to its low-growth peers suggesting that little or no value is being afforded PQ in the US which, given the FDA trial agreement, is unrealistic.

Financial summary and valuation

Year end June (£m)	2013	2014	2015	2016E	2017E	2018E
Sales	39.28	41.96	43.23	46.06	49.26	53.25
R&D investment	-2.54	-2.96	-3.12	-13.00	-12.00	-10.00
Underlying EBIT	0.85	1.39	2.23	-9.36	-7.61	-4.72
Reported EBIT	0.67	1.21	0.72	-9.86	-7.61	-4.72
Underlying PTP	0.62	1.27	2.16	-9.50	-7.86	-5.02
Statutory PTP	0.43	1.08	0.65	-10.00	-7.86	-5.02
Underlying EPS (p)	0.17	0.20	0.34	-1.81	-1.52	-1.01
Statutory EPS (p)	0.13	0.16	0.02	-1.91	-1.52	-1.01
Net (debt)/cash	0.65	2.25	20.19	8.14	-1.50	-9.15
Shares issued	0.15	0.00	20.08	0.25	0.25	0.25
P/E (x)	170.7	140.3	84.6	-15.8	-18.9	-28.5
EV/sales (x)	3.5	3.3	3.2	3.0	2.8	2.6

Source: Hardman & Co Life Sciences Research

Table of Contents

Executive summary

History

Long-established fully integrated allergy specialist

Allergy Therapeutics is a long established company whose roots can be traced back to CL Bencard Ltd in the 1930s. Bencard was acquired by Beecham in 1949 and, through industry consolidation, eventually became part of GlaxoSmithKline. However, this specialist business was not suited to being part of a massive global operation, so Allergy Therapeutics Holdings was formed in 1998 which underwent an MBO. Through organic growth and acquisition, the business evolved to what we know today as Allergy Therapeutics plc, which was floated on AIM in October 2004.

Products

Pollinex technology accounts for 65% of current sales

Currently, AGY has a series of allergy immunotherapy (AIT) products which are sold in Europe with an operating margin of around 30%. The most important of these is Pollinex, a regulatory approved technology platform that allows the subcutaneous administration of various allergens via six injections, which accounts for 15% of sales. An extension of the Pollinex technology platform – in the form of a novel short-course via four injections – is known as Pollinex Quattro, which is only available on a 'Named Patient' basis, but still accounts for a further 49% of sales. Oralvac targets the sublingual market for pollens, house dust mites, moulds and animal hair.

Differentiation of Pollinex and Pollinex Quattro

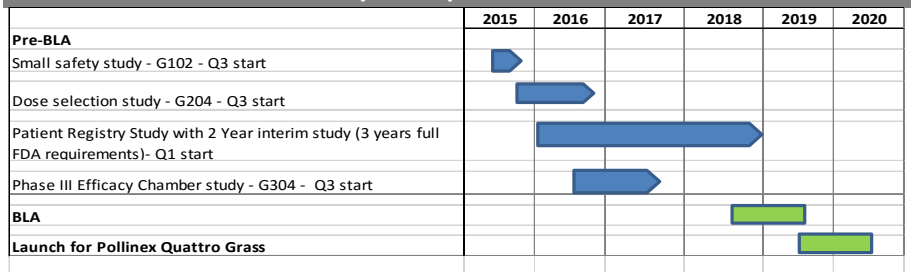
Pollinex	Pollinex Quattro
Registered (several countries)	Unregistered ('Named Patient' basis in EU)
6 injection SCIT	4 injection SCIT (short-course)
Allergoid	Allergoid
Depot MCT	Depot MCT
	Adjuvant MPL

Source: Allergy Therapeutics

Pollinex Quattro will be the only short-course aluminium-free SCIT....

Pollinex Quattro represents a major opportunity for the group. First, it is a novel short-course formulation using the only FDA-approved aluminium-free adjuvant in the market. Secondly, it is well-positioned in European markets when full regulatory approval is achieved (est 2019) and, thirdly, it has an agreed development plan with the FDA to gain US regulatory approval towards the end of the decade.

Pollinex Quattro – US development plan



Source: Allergy Therapeutics; Hardman & Co Life Sciences Research

...when approved by EU and US regulators

Growth strategy

Three strands to management's growth strategy

AGY has a stable, profitable business. However, the plan is to fully develop and commercialise Pollinex Quattro which has the potential to develop into a $1bn product over the 10 years after EU and US regulatory approval. Notwithstanding this, the group also has the opportunity to expand its existing portfolio internationally and to participate in the consolidation process within the large number of small, local companies operating in the allergy immunotherapy (AIT) market.

Allergy Therapeutics – Growth opportunities

Launch in the US	Organic Growth Strategy	Inorganic Growth Strategy
Launch Pollinex Quattro in US ▪ Significant market opportunity ▪ Conduct final clinical trials and seek regulatory approval ▪ Target to launch Pollinex Quattro Grass in 2019 ▪ Will be first seasonal SCIT to market ▪ US$ 2bn market	**Europe** ▪ Increase market share in existing geographies **Emerging markets** **Launch new products**	**In-licensing** ▪ Look for complementary products to leverage sales infrastructure **M&A opportunities** ▪ Product diversification ▪ Enhance margins through synergistic acquisitions

Perennial allergies and Food intolerance
- Look to expand the portfolio
- e.g. Probiotics , Acarovac, Acarovac Quattro

Source: Allergy Therapeutics

Commercial markets

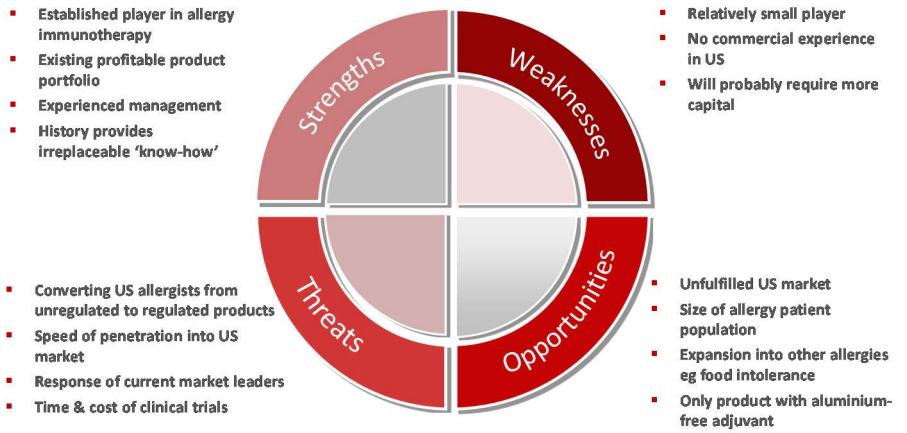
Current Rx market for allergy therapy estimated at $5.3bn....

The current market for prescription allergy products was estimated to be $5.3bn in 2014 (our database does not include OTC products). However, this segment of the respiratory market is dominated by drugs used to relieve the symptoms (symptomatic) rather that treating the underlying condition.

....but dominated by products that only ease the symptoms

Products specifically used to treat the underlying allergy were estimated to have sales of $1.2bn in 2014 of which about 80% were in Europe. The US market, potentially the largest, is an unknown commodity because most products are formulated by allergists on an individual patient basis for which they are remunerated directly by the healthcare payors.

SWOT analysis



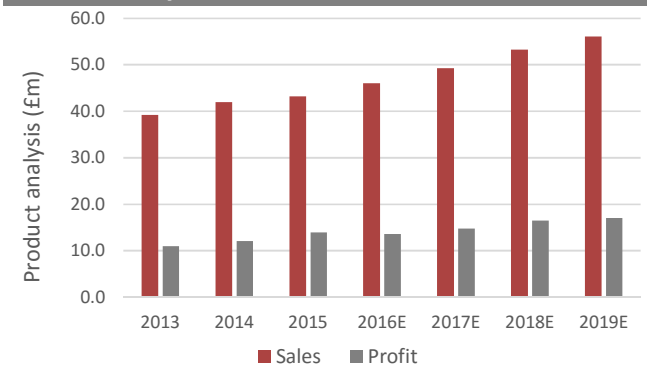
Source: Hardman & Co Life Sciences Research

Investment conclusion

AGY looks undervalued both on risk-adjusted DCF and using peer comparisons

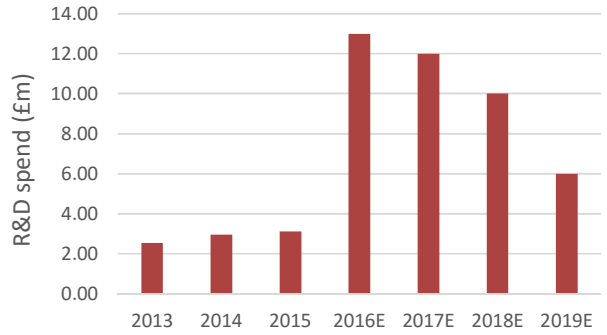
Commercialisation of Pollinex Quattro in the US represents a huge opportunity and has the potential to transform the company. This is reflected in our risk-adjusted DCF valuation which suggests a value of 93p per share. This is supported by a peer comparative valuation which shows a considerable mis-match in the value of AGY versus its immediate peers. This is surprising given that the current market leaders do not offer the same growth opportunities, in contrast to the direct comparator (Circassia), which does not have any market experience compared to AGY.

Product analysis



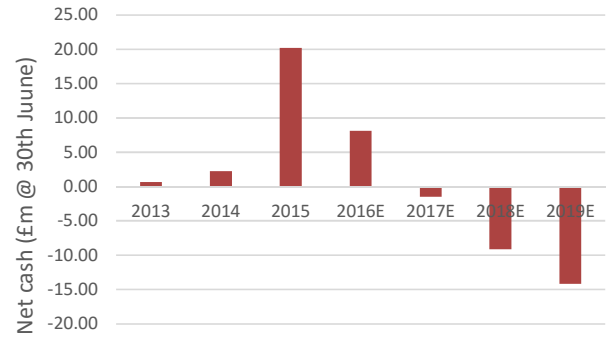
- AGY has a solid existing portfolio of products for allergy immunotherapy
- Products have shown consistent growth over the last four years even though their availability is limited
- After taking account of manufacturing, distribution and marketing costs, in-market products are profitable
- Product margins have risen consistently over the last four years, reaching 32.4% in fiscal 2015

R&D investment



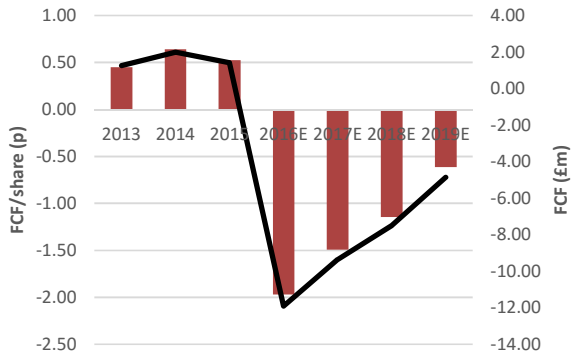
- Cumulative investment in R&D since 2000 has been £80m
- R&D investment is forecast to rise substantially to get Pollinex Quattro onto the market in the US and formally approved in Europe
- Three key US trials will cost ca.£20m over the next three years, but will pave the way to FDA approval
- Smaller trials are required for EU approval, with Germany being the lead country

Net cash



- AGY has consistently generated cash over the last three years, even after R&D investment
- £20m was raised in March 2015 largely to fund the key US trials
- The net cash position is not expected to reach zero prior to launch of Pollinex Quattro in the US
- Should management decide to commercialise Pollinex Quattro in the US by itself, AGY will require working capital for investment in sales infrastructure

Cashflow



- In each of the last three years, AGY has generated free cashflow from operations
- Considerable investment in R&D and marketing will result in two years' of cash burn
- Cash requirement towards the end of this decade will be dependent on commercialisation strategy in US
- In following the inorganic growth strategy, although acquisitions tend to be small, more cash could be required

Source: Company data; Hardman & Co Life Sciences Research

Allergy Therapeutics

Allergy therapeutics is a fully integrated pharmaceutical company which is focused on the treatment and prevention of allergies. The group has manufacturing, marketing and distribution infrastructure and sells its products in a number of countries around the world, but mostly in Europe.

Corporate history

AGY's roots can be traced back to the 1930s

Allergy Therapeutics can be traced back to the 1930s to an allergy company founded in Devon called CL Bencard Ltd. The company became a well-known specialist for the treatment and prevention of allergies, something that has been maintained through to the present day. Through consolidation of the pharmaceutical industry, Bencard became part of GlaxoSmithKline. However, this specialist business was not suited to being part of a global organisation. Allergy Therapeutics Holdings was formed in 1998 to enable a management buy-out. The company grew organically and by acquisition and Allergy Therapeutics plc as we know it today was floated on AIM in October 2004.

Development of the Group

Date	Event
1930s	Establishment of CL Bencard Ltd
1949	Acquisition of Bencard by Beecham Ltd
1989	Merger of Beecham with SmithKline to form SmithKline Beecham (SKB)
1998	Foundation of Allergy Therapeutics Holdings for management buy-out
2000	Acquisition of SKB by GlaxoWellcome to form GlaxoSmithKline (GSK)
2004	IPO of Allergy Therapeutics plc on AIM
2010	Acquisition of Teomed AG
2015	Acquisition of Alerpharma SA

Source: Company reports; Hardman & Co Life Sciences Research

Group structure

Based in Worthing....on GSK's antibiotic manufacturing site

Allergy Therapeutics has its corporate, manufacturing, product development and R&D in three adjacent buildings based in Worthing. Its main building lies within a large site owned by GlaxoSmithKline for the production of its penicillin antibiotics. The company also has marketing operations in a number of European territories and distribution partners in Canada and South Korea.

Subsidiaries of Allergy Therapeutics

Subsidiary	Country	Activity
Bencard Allergie GmbH	Germany	Sales & marketing
Bencard Allergie (Austria) GmbH	Austria	Sales & marketing
Allergy Therapeutics Italia s.r.l.	Italy	Sales & marketing
Allergy Therapeutics Iberica S.L.	Spain	Sales & marketing
Teomed AG	Switzerland	Sales & marketing
Allergy Therapeutics Netherland BV	Netherlands	Sales & marketing
Allergy Therapeutics Argentina SA	Argentina	Marketing
Bencard Allergy Therapeutics Unipessoal LDA	Portugal	Sales & marketing
Alerpharma SA	Spain	Manufacturing, sales & marketing

Source: Company reports; Hardman & Co Life Sciences Research

Alerpharma

Alerpharma adds sales & marketing in Iberia....

....and state-of-art manufacturing

As part of the industry consolidation process, AGY acquired Alerpharma SA, a leading immunotherapy business in Spain, in June 2015, for an initial €3.8m/£2.9m cash and net debt of -£0.37m (debts of £1.67m offset by cash of £1.3m). In addition to the well-established product lines in immunological vaccines, bacteriological vaccines and diagnostics, this acquisition brought with it an associated sales force and newly-built state-of-the-art manufacturing facilities (cost €5m) all of which are complementary to AGY's existing operations.

Strategy

Grow existing portfolio geographically...

Obtain EU & US regulatory approval for Pollinex Quattro....

Inorganic growth through acquisition

The group has a profitable core business of marketed products in the field of allergy treatments. In addition, it has a pipeline of allergy vaccines which, with appropriate regulatory approvals, should enable the company to grow organically at a significant rate. Although its current products are available in a number of countries, particularly in Europe, AGY has the opportunity to expand its reach into a number of major markets, notably the US and China. In addition, there are a large number of small local players in the field of allergy treatments and Allergy Therapeutics intends to be a consolidator when the opportunity arises, as evidenced by the acquisition of the Spanish company, Alerpharma SA, in June 2015.

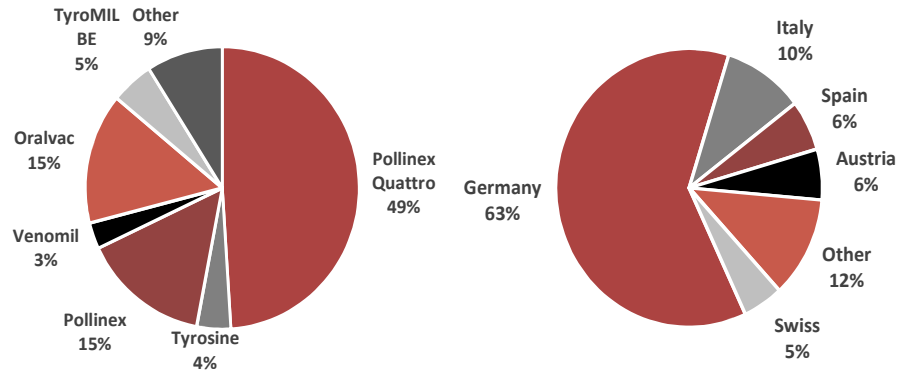
- Organic growth through market penetration
- Organic growth through product development
- Geographical expansion – particularly in the US
- Industry consolidation/acquisition of local players
- License-in or acquire complementary products

2015 sales analysis

Pollinex technology and Germany dominate current sales activity....

Since being spun out of GSK in 1999, AGY has reported a CAGR of 9% in sales. This has been achieved despite its key product, Pollinex Quattro, which accounts for just over 50% of annual sales, only being available on a 'Named Patient' basis and this is only in certain territories, with the US being the notable omission. Germany is AGY's most important market, followed by Italy.

2015 sales analysis



2015 sales: £43.2m

Source: Company reports; Hardman & Co Life Sciences Research

....but the US holds key to future growth

By the end of the decade, we expect the Pollinex Quattro technology platform to be even more dominant in the portfolio and to see the emergence of sales in the US, as the regulators approve this short-course form of therapy with the added advantage of the adjuvant being aluminium-free.

After manufacturing and marketing costs are taken into account, AGY's product portfolio is profitable, with a product profit margin in the order of 30%.

Products

Existing portfolio of profitable products

AGY already has a solid portfolio of products on the market, which have consistently shown growth, despite the fact that availability of the key product Pollinex Quattro is only available on a 'Named Patient' basis and only in Europe. After taking into account the costs of manufacturing, distribution and marketing, this product portfolio is profitable and cash generative, with the product margin reaching 32.4% in fiscal 2015. However, although there is scope to improve COGS further given that the UK manufacturing site is currently running at about 50% capacity, management is investing in marketing to boost market share in preparation for the launch of Pollinex Quattro toward the end of the decade.

Product analysis

Year end June (£m)	2013	2014	2015	2016E	2017E	2018E
Product sales	39.28	41.96	43.23	46.06	49.26	53.25
COGS	-11.95	-11.95	-12.18	28.00	-14.86	-15.85
Gross profit	**27.33**	**30.00**	**31.05**	**74.06**	**34.40**	**37.39**
Gross margin	69.6%	71.5%	71.8%	160.8%	69.8%	70.2%
Marketing	-16.28	-17.92	-17.06	-18.41	-19.59	-20.91
Product profit	**11.05**	**12.08**	**13.99**	**13.62**	**14.81**	**16.49**
Product margin	28.1%	28.8%	32.4%	29.6%	30.1%	31.0%

Source: Company reports; Hardman & Co Life Sciences Research

Short-term investment in market share is likely to have small product margin impact

The company is continuing to invest in marketing in Europe to position the company in preparation for full regulatory approval of Pollinex Quattro. This manifests in two ways. First, increase in market shares in key European markets. Secondly, a slight deterioration in product margin in the current year.

Capital raises

£95m has been raised from capital markets to date....largely invested in R&D

Since Listing on AIM in 2004, Allergy Therapeutics has raised £95m gross funds (£90m net) from the capital markets in five fundraisings. This has largely been used to invest in its R&D programme – cumulative spend of £80m since 2000 – and upgrading the manufacturing facility to ensure that it is regulatory compliant – Certificate of GMPO Compliance received in April 2014 following MHRA inspection. Full details of the funding history can be found on page 38.

£20m raise in 2015 was to fund final push for US regulatory approval

In March 2015 the company raised £20.8m gross (£20.1m net) to fund the clinical trial programme agreed with the US regulators in order to get Pollinex Quattro approved as a Biological Product. Consequently, this cash is being held on deposit in US$ in preparation for this investment. The cost of trials for EU approval is more modest and will be funded from operational cashflows.

Allergies

An allergy is an adverse reaction that the body has to a particular food or substance in the environment. A substance that triggers such a response is called an allergen. Most substances that cause allergies are normally harmless to the human body and have no effect on the vast majority of people that are not allergic.

Common allergens

Source	Comment
Grass, tree and ragweed pollen	Hay fever
Dust mites	Modern environment; use of air conditioning
Animal dander	Tiny flakes of skin or hair
Insects	Bee and wasp stings
Food allergy	Particularly nuts, shellfish and fruits

Source: World Allergy Organisation; Hardman & Co Life Sciences Research

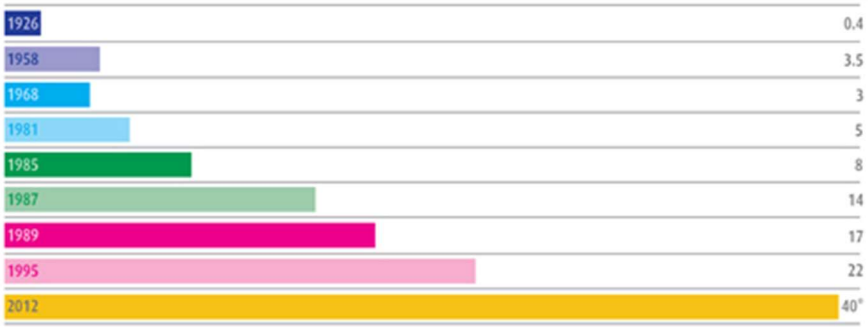
History

The term 'allergy' was first described in the early 1900s, when an Austrian physician described a state of hypersensitivity. This prompted a marked increase in research into potential immunotherapy, culminating in 1911 when Freeman and Noon undertook specific immunotherapy with grass pollen extracts that were described in a *Lancet* article[1], where escalating doses of pollen extract from a low base over 3-4 days were shown to have an improvement on the symptoms of hay fever.

An increasing problem that has developed over the last century

In those days, the incidence of allergy was extremely low, but over the subsequent 100 years it has built up dramatically, particularly in the industrialised world, where an estimated 8-9% of children up to the age of 18 have allergic rhinitis or are allergic to certain foods.

Incidence of allergies in the 20th Century – % of population



Source: WAO White Book on Allergy 2011-2012

Slightly worryingly is the statistic that, on a worldwide basis, in people who experienced a fatal reaction to an allergen, there was no previous record of a reaction in 50% of cases; ie the allergic reaction was so severe and the person was unprepared for it.

[1] Prophylactic inoculation against hay fever. Noon, L. Lancet, 10th June 1911

Large percentage of global population is affected by one or more allergies

Allergy statistics

Condition/allergy	Comment
Allergic rhinitis	Affected between 10 % and 30% of population globally in 2012
Hay fever	In 2012, 9% or 6.6m children in US reported hay fever in previous 12 months
Drug allergy	Adverse drug reactions are estimated to affect up to 10% of the world's population
Food allergy	In 2010, 8% of children in the US were found to have a food allergy
Insect allergy	Globally, in up to 50% of people who experienced a fatal reaction there was no documentation of a previous systemic reaction

Source: American Academy of Allergy, Asthma & Immunology

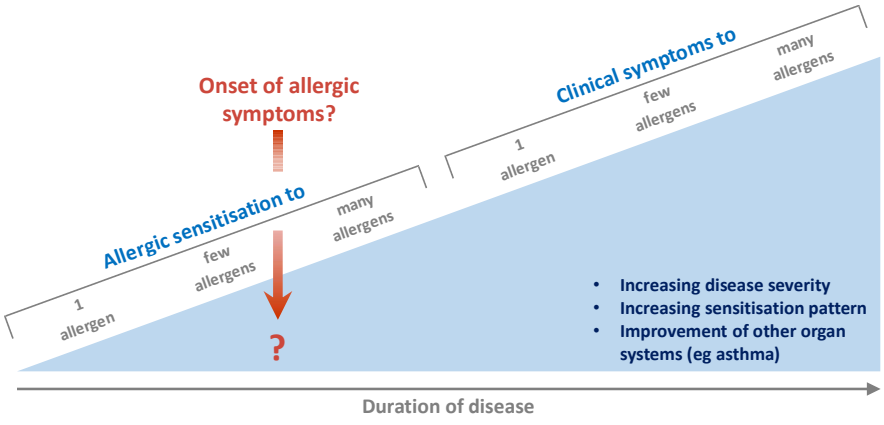
Allergic response

An allergy develops when the immune system reacts to an allergen as if it were a threat, as it does in the case of an infection. It produces antibodies to fight off the allergen in a reaction that is termed an "immune response".

Body become increasingly sensitised each time it is exposed to the allergen

The next time that the person comes into contact with the allergen, the body remembers the previous exposure and produces more antibodies, which in turn release chemicals into the bloodstream that lead to an allergic reaction.

Progression of allergic response



Source: Allergopharma website

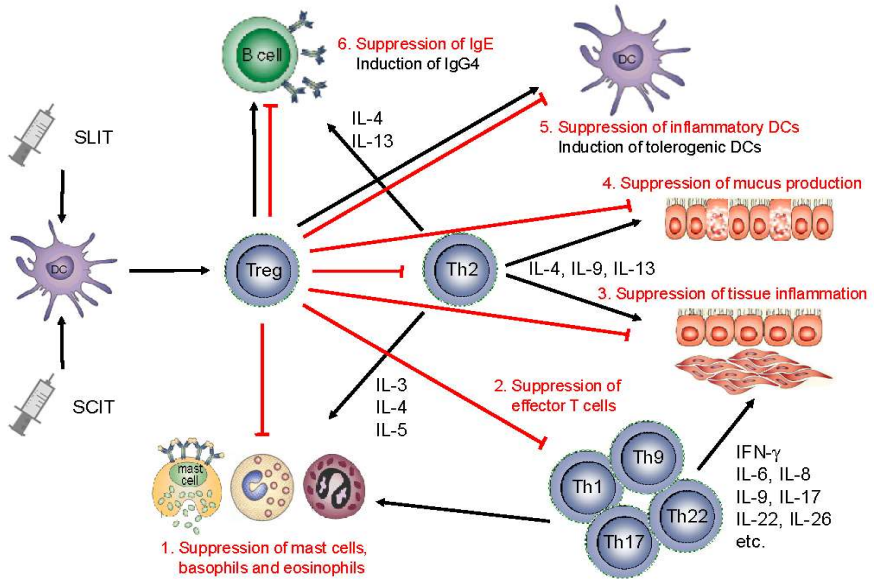
Depending on a patient's genetic predisposition and environmental factors the immune response leads to initial sensitisation to the allergen. Further exposure increases the sensitivity until it reaches the situation where the allergen triggers an allergic reaction and local inflammation. This can lead, over time, to persistent chronic inflammation which could manifest in the form of chronic asthma.

Type I reactions – IgE-mediated allergies

Greater proportion of Th2 helper cells triggers the inflammatory response

In immunoglobulin-E mediated reactions, there is an imbalance between the T-helper (Th) cell sub-populations of Th1 and Th2. These two cell types release different cytokines that are important for the production of antibodies. Under normal circumstances, introduction of an allergen causes Th1 cells to release cytokines which cause B-cells to produce IgG antibodies; in contrast to stimulation of Th2 cells, usually by parasites, which cause increased IgE synthesis. In type I allergy patients there is a greater proportion of Th2 cell stimulation and, therefore, a reduced Th1 reaction. The IgE produced then binds to mast cells and triggers the inflammatory response mechanism.

Inflammatory mechanism and effect of AIT



*Source: Fujita et al. Clinical and Translational Allergy 2012 **2**:2*

Symptoms

Symptoms of an allergic reaction are quite variable and also dependent on which substance (allergen) you are allergic to.

People that are sensitive to air-borne substances such as pollen, animal dander and dust mites tend to have the following:

- Rhinitis – sneezing and a blocked, itchy or runny nose
- Conjunctivitis – itchy, red streaming eyes
- Asthma – wheezing and breathlessness sometimes with a cough

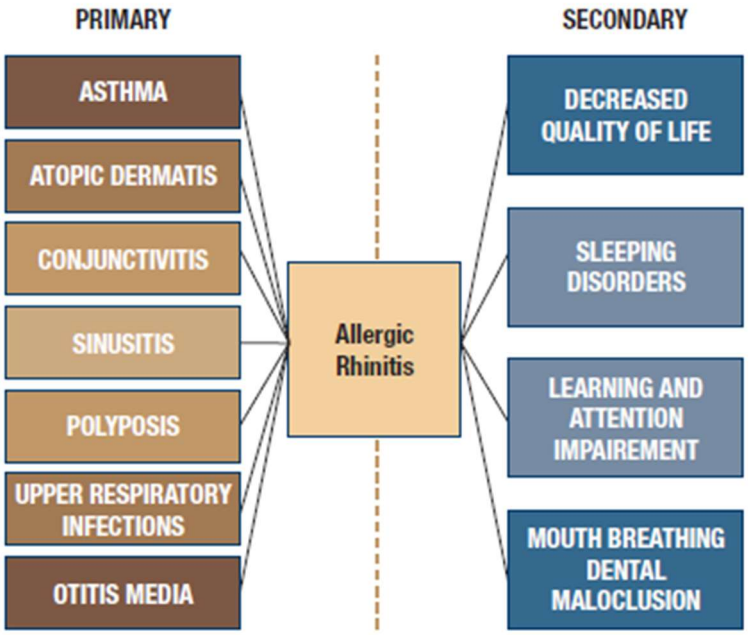
On the other hand, people who are allergic to foodstuffs or have reactions to drugs tend to have the following symptoms:

- Urticaria – raised itchy red rash
- Swelling – usually around the lips, tongue, eyes and face
- Abdominal pain – often associated with vomiting and diarrhoea
- Atopic eczema – dry, red and cracked skin

Some allergies are caused by certain substances coming into direct contact with the skin. This causes a type of eczema called 'contact dermatitis' and is brought on by perfumes, soaps, hair dyes and jewellery.

It is unusual for an allergic reaction to cause symptoms the first time that a person comes into contact with the allergen, because the immune system needs time to build up sensitivity, recognise the allergen and produce antibodies to it. This process is known as sensitisation.

Allergic rhinitis



Source: World Allergy Organisation White Book

Anaphylaxis

In rare cases, exposure to an allergen can lead to a severe reaction called an anaphylactic shock, which can be fatal if not treated quickly with an injection of adrenaline. People known to have severe reactions to certain substances usually carry a rescue injection, in the form of an auto-injector pen, with them at all times.

Prevention

Prevention is the best option....

...but not easy to achieve

The best way of preventing an allergic reaction is to try and avoid contact with the allergen that causes it. However this is not always so easy. For example, people that are sensitive to pollen have little control over the weather and cannot simply avoid going outside. Moreover, even if these sufferers do stay inside with the windows closed, there is a risk that they might also be sensitive to dust mites and these conditions would provide a healthy breeding ground.

It can also be difficult to avoid pets, particularly if they belong to family and friends. However, it is surprising the number of people that are sensitive to cats and dogs do persist in keeping them in their homes.

Treatment

Current medication focuses on alleviation of symptoms....

At present the main medical treatment of an allergy involves medication to alleviate the symptoms, without addressing the underlying disease.

Anti-histamines

When the body believes that it is under attack from an allergen, it releases the chemical, histamine which is the start of the inflammatory cascade process. Therefore, this approach is to take a drug to prevent the actions of histamine. Anti-histamines come in tablet, cream or liquid formulations, or as eye drops and nasal sprays. The latter are used to reduce the swelling and irritation around the nasal passage. These products are readily available OTC, but have limited success.

Decongestants

The aim of decongestants is to relieve a blocked nose, which is often caused by hay fever, dust allergies or pet allergy. They too are readily available OTC in a number of formulations such as tablets, capsules, nasal sprays or liquids. However, these products should not be used long term.

Steroids

Corticosteroids, delivered via nasal sprays, act at the end of the inflammatory process. They are designed to act on the nasal linings thereby suppressing inflammation of the nasal passages. Although the drug is not inhaled, there is concern that regular use might result in systemic absorption and their associated side effects.

Immunotherapy (desensitisation)

....but the new approach is to vaccinate against the particular allergen

Allergy immunotherapy (AIT) is an option for people with severe allergies whose symptoms are not adequately controlled by traditional products for symptomatic relief. This is the approach being taken by Allergy Therapeutics. It involves a course of vaccines that have the potential to last for a number of years. The aim is to reduce the severity of the allergy with a consequential reduction in drugs for symptomatic relief.

Allergy vaccines contain small quantities of the allergen attached to an adjuvant (carrier) molecule. It is best given by injection, but some companies have liquid and tablet formulations for absorption under the tongue. While the latter formulations can be self-administered by patients, the injections can only be given in specialist clinics under the supervision of a doctor. However, although the oral formulations are more accessible they also appear to be less effective due to perceived poor compliance. The next section will focus entirely on this particular approach.

Allergy vaccines

Whole allergen immunotherapy is the only treatment that targets the actual cause of the allergy and attempts to re-educate the immune system to tolerate the allergen.

Patients may need up to 100 injections with existing long-course vaccines

Historically, patients are given increasing quantities of whole allergen, starting from a very low base, in an effort to build tolerance within the immune system to that specific allergen with the aim of diminishing the strength of the immune response over time. This strategy has been shown to be safe and effective, but it is inconvenient for the patient and can involve anywhere between 20 and 100 injections. In an attempt to make allergy vaccines more user friendly, some companies have adopted a needle-free approach where the vaccine is taken orally for absorption under the tongue.

- Subcutaneous injection (SCIT) – inconvenient and in specialist clinics
- Sub-lingual drops (SLITD) or tablets (SLITT) – lengthy process, debatable efficacy

Quantities of the allergen are derived from natural sources, which can result in batch-to-batch variation in potency which leads to varying safety and efficacy. By using whole allergens, there is an increased risk of side effects, principally causing local and systemic allergic reactions which, in extreme cases, could lead to an anaphylactic shock. The side effects, coupled with the length of course of treatment, may cause some patients to stop treatment, although this type of treatment tends to be used in the most severe cases where patients have debilitating allergies.

In an attempt to make the course of treatment more patient-friendly and to improve efficacy, two approaches have been adopted:

- Chemical modification of the allergen to make it less allergenic – termed 'allergoid'
- Absorption of the allergen onto a carrier molecule to provide a slow and prolonged release

Allergoids

Chemically modified allergens with same immunogenicity.....

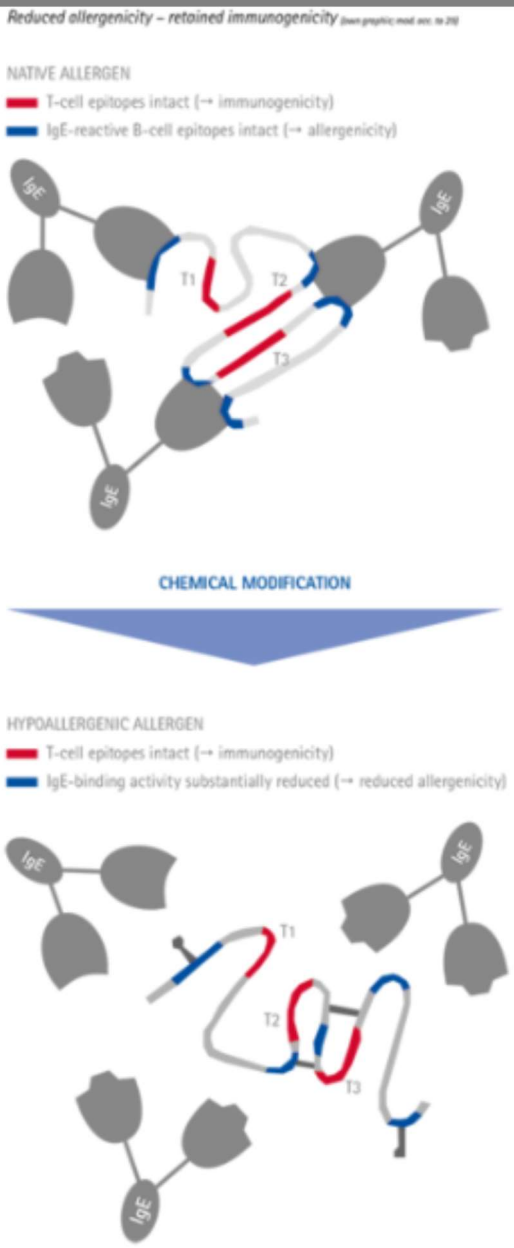
The quantity of extracted allergen that can be given in each dose determines the effectiveness of AIT. However, the concentration of allergen that can be given is limited by the appearance of IgE dependent side effects. In order to achieve the highest possible dose of allergen without causing allergic side effects, the industry has developed a process of chemically modified allergens, or 'allergoids'.

....but reduced allergic reaction

The structure of the allergen is altered using formaldehyde or glutaraldehyde and the resulting allergoid is still recognised by the immune system to produce immunogenicity, but the IgE binding capacity, which cause the allergenic response, is significantly reduced. This allows higher doses of allergen to be administered without the occurrence of allergic side effects. Comparison of native allergen with allergoid (hypoallergenic allergen) is excellently illustrated in the following diagram which is reproduced courtesy of Allergopharma (subsidiary of Merck KGaA).

Coupling allergoids to adjuvants is thought to enhance the immune response even further.

Allergoids



Source: Allergopharma

Role of adjuvants

Adjuvants are added to boost stimulation of the immune system

Vaccine adjuvants are known to be powerful stimulators of the immune system and help to accelerate, prolong or enhance the pharmacological effect of a drug[2]. They are used with allergy vaccines because the miniscule quantities of allergen used might be insufficient to trigger a significant immune response on their own. Adjuvants also act as carriers and provide a method of getting the active ingredients into the body. For most of the last century, salts of aluminium were the only approved adjuvants for use in humans, despite the fact that they affect the T-helper cells and, therefore, the type of antibodies produced. In addition, they are not biodegradable and accumulation can occur if given in multiple doses. More recently, there has been concern that alum particles have neurotoxic effects that might be

[2] Guideline on Adjuvants in Vaccines for Human Use. 2005. The European Medicines Agency.

implicated in brain disorders such as Alzheimer's Disease[3,4]. This has prompted research into newer adjuvants with the aim of:

- Facilitating recognition of the allergen
- Triggering protective Th1-like immune responses and allergen-neutralising antibodies
- Being without toxic or inflammatory side effects
- Being biodegradable

3-O-desacyl-4'-monophosphoryl lipid A (MPL)

MPL is the only non-aluminium adjuvant approved by FDA

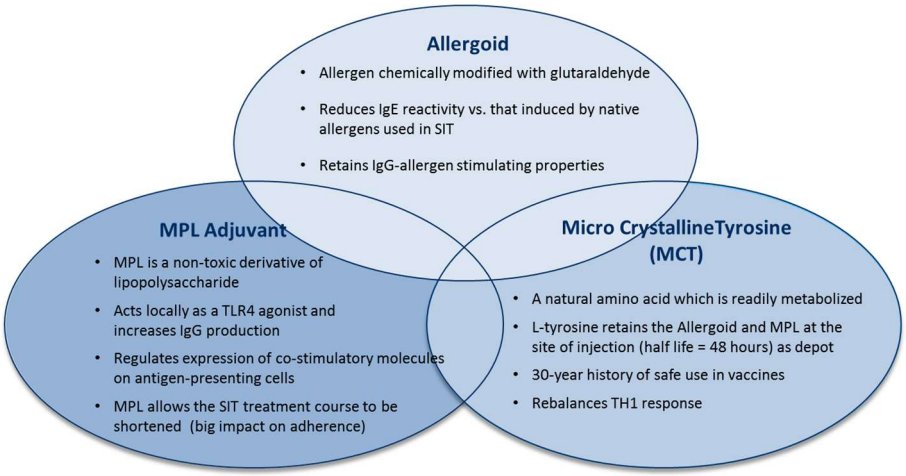
MPL has come to the fore as an adjuvant because of its use, along with aluminium hydroxide, in Cervarix (GlaxoSmithKline) which was approved by the FDA in 2009 for prevention of cervical cancer. The 'dose sparing' arguments of MPL were also enhanced when used in Pandemix (pandemic influenza, GSK) eliciting an enormous antibody response and sero-protection three weeks after vaccination. In these products alone, MPL has been used in patients millions of times, has a good safety record and, importantly, is FDA approved.

L-tyrosine

MCT acts as a carrier for slow release, but might also act as an adjuvant in its own right

L-tyrosine is a naturally occurring amino acid present in a number of foods. Allergy Therapeutics uses a specialised form of tyrosine – Micro Crystalline Tyrosine (MCT) – to mix with its active allergens to produce a slow release after subcutaneous injection. MCT is essentially being used as a carrier, but also satisfies all of the criteria stated above and with a half-life of 48 hours at the injection site, provides a significant benefit for subcutaneous allergy vaccines[5]. Allergy Therapeutics' lead product, Pollinex Quattro, uses a combination of both MCT and MPL.

Interaction between Allergoid and Adjuvant



Source: Allergy Therapeutics

[3] Gherardi RK et al 2015. Biopersistence and brain translocation of aluminium adjuvants of vaccines. http://www.ncbi.nlm.nih.gov/pubmed/25699008

[4] Gerard C, Rollins BJ (Feb 2001). "Chemokines and disease". Nature Immunology 2(2): 108–15.

[5] Bullimore et al., Preclinical Study on the Use of Micro Crystalline Tyrosine (MCT) Adjuvants in Allergy Immunotherapy. Abstract 3127, XXIV World Allergy Congress 14-17 Oct 2015.

Pollinex Quatro

Source: Allergy Therapeutics

Pollinex and Pollinex Quattro (PQ)

Pollinex represents a technology platform which can be targeted at different allergies by altering the attached allergen/allergoid. In the form of Pollinex Quattro, it is administered as a short course of four injections over a three week period and shows efficacy after three weeks which lasts for several years. The launch of Pollinex Quattro in 1999 was the first short-course allergy vaccine for the treatment of severe allergies.

Differentiation of Pollinex and Pollinex Quattro

Pollinex	Pollinex Quattro
Registered (several countries)	Unregistered ('Named Patient' basis in EU)
6 injection SCIT	4 injection SCIT (short-course)
Allergoid	Allergoid
Depot MCT	Depot MCT
	Adjuvant MPL

Source: Allergy Therapeutics

There are essentially three parts to Pollinex Quattro the product that produce its beneficial effects and appear to be working synergistically:

- Allergoid – the allergen is chemically modified by glutaraldehyde
- Adjuvant MPL – helps to promote the immune response and is safe
- Depot MCT – keeps the allergoid and adjuvant near the injection site and also helps to promote the immune response

Clinical trials

AGY has considerable supporting evidence from clinical trials

Since 2005, AGY has completed 14 clinical trials investigating PQ's safety and efficacy in ca.2,800 patients across Europe and North America for its US project. In addition, these studies looked at dosing, assay validation and effect of the adjuvant and will be used to support the regulatory filings in Europe and the US. A further trial in 300 patients in North America is incomplete as it was affected by the clinical hold placed on the product by the FDA (see below).

Pollinex Quattro – Trial summary

Allergy	Trials	Countries	Patients	Completed
Grass	5	US/EU/Canada	1,224	2005-07
Ragweed	5	US/Canada	1,365	2005-08
Tree	4	US/Canada	190	2005
Tree	1	Canada	300	Unfinished

Source: Allergy Therapeutics

Further trials are underway in order to satisfy the European and US regulators for its registration as a Biological Product (BLA).

Clinical advantages

- Pollinex Quattro would be the leading allergy vaccine that is free of aluminium in its adjuvant
- The ultra-short course (4 injections over 3 weeks) compares to the normal 8-25 injections in Europe and protocols in the US that use 50-100 injections.

Regulatory position

PQ currently only available on a 'Named Patient' basis which prevents universal marketing....

Pollinex Quattro was originally approved for use on a 'Named Patient' basis in 1999. Whilst this was positive and allows AGY to make sales and garner experience with the product – it has been used in 200,000 patients to date – this limited approval prevents universal marketing. Therefore, with the backing of more clinical trials, AGY has sought full product approval in Europe and the US. However, this has been a tortuous process for reasons that were mostly out of the company's hands – introduction of Therapeutic Allergen Regulation in Europe and FDA imposed 'clinical hold' in US.

Pollinex Quattro – Regulatory history

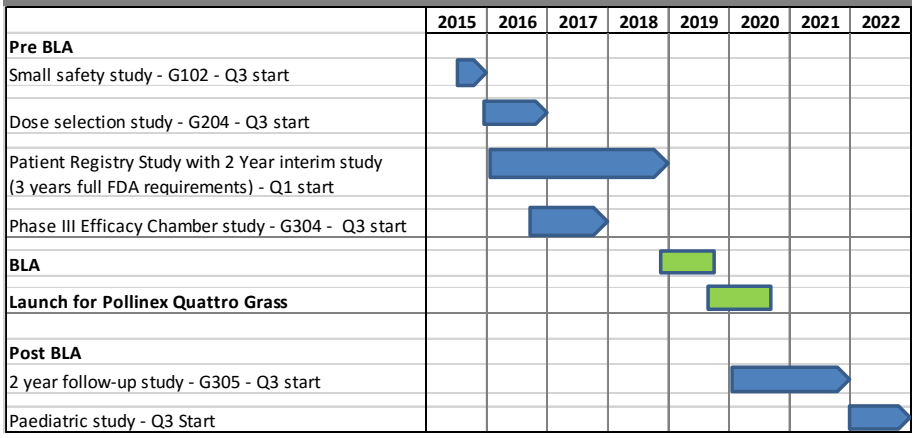
Date	Action
1999	Approval of 1.0ml product by EMEA on 'Named Patient' basis only
July 2007	Placed on clinical hold by FDA
Mar 2009	Submission of Grass dossier (0.5ml) to Paul Ehrlich Institut, Germany
Jun 2009	Implementation of 'Therapeutic Allergen Regulation' by EMEA
Apr 2011	FDA to lift clinical hold to be lifted once clinical protocols agreed
Jun 2011	Complete response to MAA by Paul Ehrlich Institut
Aug 2012	FDA agrees protocols and clinical hold lifted
Nov 2013	Aligned MAA in Germany with US version (1ml product)
Feb 2014	Health Canada approves Clinical Trial Application efficacy study G304
2017E	Marketing Authorisation Application (MAA) in Europe
2018E	Biologics License Application (BLA) in US

Source: Company announcements

....but the way forward to full regulatory approval in EU and the US is now clear

Over the last two years, the regulatory position has been clarified in both Europe and the US providing the company with a clear pathway that will lead to regulatory approval as a biological product in Europe and as a BLA in the US. Following discussion with both the Paul Ehrlich Institut (recognised as the European authority with most expertise in allergy) and the FDA, Allergy Therapeutics will need to initiate and complete five clinical trials investigating safety, dose and an efficacy chamber study. Details of the timetable can be found in the graphic below and the total cost is expected to be in the order of $31m/£20m.

US clinical trial timetable



Source: Allergy Therapeutics; Hardman & Co Life Sciences Research

Small safety study (G102)

US safety study due to report 1Q 2016

First, AGY needs to perform a small safety study in 40 patients. This was scheduled to start in September 2015, run for 3-4 weeks and to report during 1Q 2016. The aim of this study is to compare two doses of Pollinex Quattro with placebo.

Dose selection study (G204)

US dose escalation study expected to report in June 2016

This study is expected to start recruiting in 4Q 2015 and recruit about 250 patients, run for about 4-5 months and report in June 2016. The trial will compare 1-fold, 2-fold and 4-fold doses using grass alone and grass + MPL adjuvant. The aim of this study is to obtain a significant (minimum 20%) reduction in symptoms, which would be the equivalent response to daily doses of steroids. This study is considered by management to be very important in the eyes of the regulators.

Phase III efficacy chamber study (G304)

Large controlled study pivotal to US approval....

This trial is scheduled to start in 3Q 2016 once results of the first two studies are known and after a subsequent meeting with the FDA. It will involve 700 patients, comparing up to 4-fold doses of grass antigen against placebo and is due to report end 2Q 2017. Patients will spend four days in a controlled chamber before and after treatment. The importance of this study is that it will be performed in a controlled environment where there will be constant exposure to grass pollen and provide reliable and directly comparable data points.

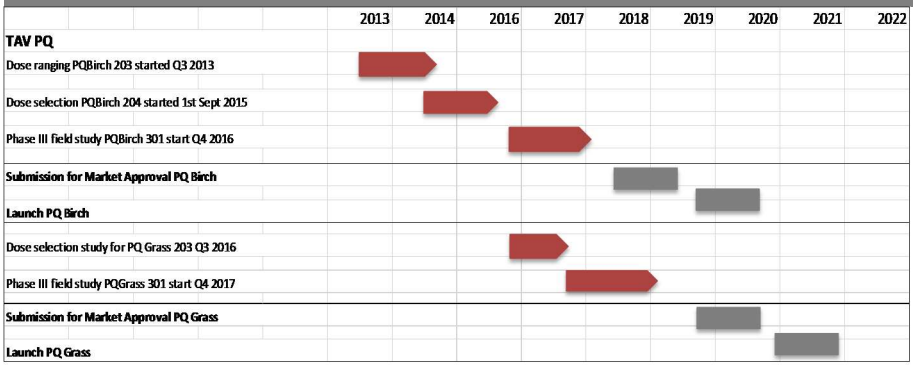
....with lower risks that a traditional field study....

There are a number of important features about this grass efficacy chamber study, which will be the first pivotal Phase III trial performed in a challenge chamber to be accepted by the FDA. First, being undertaken in a controlled chamber, the study can be performed out of season and hence speed up the trial. Secondly, better adherence to the protocol and improved control with no missed data points. Thirdly, much lower risk than a traditional field study.

Patient registry

In addition to these trials, AGY will be required to start a Patient Registry study which will run for three years from January 2016, with interim analysis at two years. Although this database is important, the final outcomes at three years are not required for the BLA.

EU clinical trial timetable



Source: Allergy Therapeutics; Hardman & Co Life Sciences Research

....but a field study is still needed for EU approval

Details of the timetable for EU submission and approval can be seen in the graphic above. The requirements for regulatory approval in Europe are less onerous and will cost considerably less, at an estimated €12m/£9m over three years. Study B204 has just commenced and will investigate three new doses – conventional + 2x, 4x and 6x the conventional dose. It is a conjunctival provocation test. Following this a traditional field study for Pollinex Quattro Birch is expected to commence in 4Q 2016 and report early 2018, allowing the BLA submission in 2H 2018.

Trials for Pollinex Quattro Grass will be running approximately one year behind the Birch studies.

Market opportunity

The WHO estimates that there are 400m people in the world suffer from allergic rhinitis

Allergic rhinitis results from an IgE-mediated inflammation of the nasal mucosa and is thought to affect between 10% and 30% of the global population. Rates, if anything, are increasing and allergic rhinitis is a risk factor for development of asthma. In the 2013 'World Allergy Organisation White Book', the WHO estimated that there were 400 million people in the world suffering from allergic rhinitis and 300 million from asthma, which shows the scale of the problem. The most common allergens found in the US and Europe, together with their prevalence, can be seen in the following table:

Prevalence of allergies

	United States [6]			Europe[7]	
Rank	Allergen	Prevalence	Rank	Allergen	Prevalence
1	House dust mite	28%	1	House dust mite	22%
2	Perennial rye	27%	2	Grass pollen	17%
3	Short ragweed	26%	3	Cat	8-10%
4	Cockroach	26%	4	Birch pollen	6%
5	Bermuda Grass	18%	5	Mould	4%
6	Cat	17%	6	Olive pollen	3%

[6] *J Allergy Clinical Immunology, 2005, 116, 377-83*
[7] *Allergy, 2007, 62, 301-9*
Sources: Circassia Listing Particulars

Patients presenting with allergies are questioned and then tested in an attempt to ascertain exactly what they are allergic to. Once this has been identified, a treatment regime can be put in place. However, the approaches in the US and Europe are quite different, largely because of differences in product availability. The type of product used falls into three categories:

- **Subcutaneous injections (SCIT)**: Treatment protocols involve a number of injections over a prolonged period of time, which is disturbing for patients, often children, and must be performed in a specialist clinic. Pollinex Quattro represents the only short-course SCIT available on the market, but currently only on a 'Named Patient' basis in Europe
- **Sublingual Drops (SLITD)**: Patients put drops of liquid containing the allergen under their tongue to build up tolerance. The advantage is that this is patient friendly and can be done at home. However, there is debate about the effectiveness of this method of treatment
- **Sublingual Tablets (SLITT)**: The benefit of a tablet versus liquid formulation is that the allergen can be released slowly in the same place under the tongue (whereas a liquid can spread more readily). SLIT tablets are readily available for grass and ragweed pollen allergy

Current market

The current market for allergy vaccines is estimated to be $1.2bn

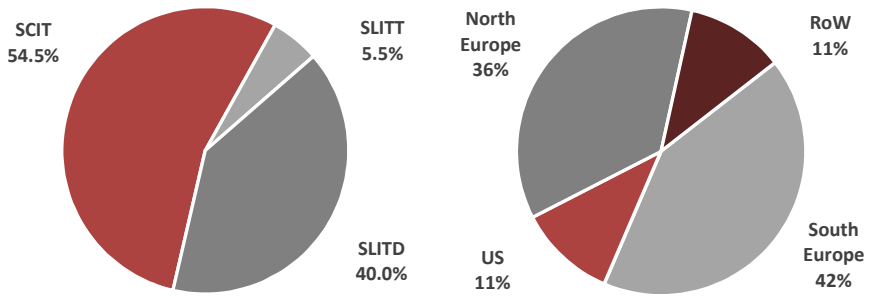
Despite the regulatory hurdles surrounding allergy immunotherapy being more complex than for a traditional pharmaceutical product, we estimate that the current global market for allergy vaccines in 2014 was ca.$1.2bn. About 55% of the market is represented by subcutaneous injections, even though they are only available on a 'Named Patient' basis. However, the overall market figure is massively understated because it only takes account of the bulk supply of allergen extract for the US SCIT market and does not allow for the allergist mark-up of end-user formulations, for which no data is available.

Tablets appear to be cannibalising the Drops

The relative ease of use has allowed the sublingual drops (SLITD) to develop about 40% of the market. The fastest growing segment is sublingual tablets, again due to ease of use. However, we believe that the tablets are essentially cannibalising the liquid drops and not expanding the whole market.

On a global basis, the biggest market is Germany, despite the prevalence figure showing the huge number of sufferers in the US. This is because allergists are paid a 'fee-for-service' for unlicensed products rather than direct reimbursement for prescription products that the market is expected to move to in the future.

2014 Allergy Immunotherapy market



2014 market: $1.2bn

Source: Company reports; Hardman & Co Life Sciences Research

Europe

All forms of treatment are available in Europe. As mentioned above, on a global basis, the leading allergy immunotherapy market is Germany, followed by France, Spain and Italy.

The European market, dominated by Germany, is thought to be around $650m

Although subcutaneous immunotherapy is used in the US, as products are currently unlicensed and, therefore, not reimbursable, this segment of the market is dominated by SCIT products available in Europe from European companies. We believe that it is valued presently at about €580m/$650m. However, the market is restricted because products either require multiple injections or in the case of short-course treatments, only available on a 'Named Patient' basis. Once short-course SCIT is approved as a Biological and readily available, we would expect to see a considerable expansion of the European markets, from which AGY is well placed to benefit.

US

The US market is unregulated currently ....

....and controlled by allergists

However, the main opportunity lies in the US. There are numerous statistics to support the size of the patient population, days of lost work/productivity, missed school days and doctors' visits. Despite this, the market is unregulated and largely controlled by allergy practitioners mixing their own formulations of 'allergy shots' from bulk supply of allergen extracts. These are estimated to generate $2-3bn in annual billing to the healthcare insurers that reimburse AIT.

Drawbacks of conventional SCIT in US
Variability of supply
Variability of quality of formulations
Variability of dose/regimen
Non-GMP manufacturing
Long courses of treatment with slow emergence of clinical benefit
Lack of safety and efficacy data
Low patient compliance

Source: Allergy Therapeutics (adapted); Hardman & Co Life Sciences Research

The challenge in the US will be to change the system

Based on ex-factory sales of products, the current market is estimated to be worth only ca.$130m. This is made up of a combination of sublingual products and the supply of bulk allergen extracts, which are relatively cheap. The physicians then charge a significant mark-up for formulating a unique product to suit an individual's needs and for administering the injections. While this represents an enormous opportunity for companies like Allergy Therapeutics and Circassia once they have satisfied the US regulators, it will also be a challenge to break into such a system where, inevitably, a physician's income would decline in the absence of a high reimbursement code. The speed of penetration of registered products in the allergist community will determine the success of Pollinex Quattro and Cat-SPIRE.

What will drive change?

- Patients demanding latest regulated product
- Health Insurance payors
- FDA demanding compliance with regulated products

Pollinex Quattro has number of advantages over exiting SCIT....

Comparison of current SCIT in US to Pollinex Quattro	
Current US SCIT products	**Pollinex Quattro**
Long course of treatment – 50-100 injections	Short course – 4 injections
Slow to act – 6-12 months	Efficacy seen in 3 weeks
'Home made' formulations	Standardised dose regimen
Un-registered	Biological License Application
Non-GMP manufacturing	GMP manufactured in inspected facilities
No supporting clinical data	Multiple supportive clinical trials
Potentially toxic adjuvant (aluminium based)	Safe and synergistic adjuvant
Low patient compliance	High compliance rates

Source: Allergy Therapeutics (adapted); Hardman & Co Life Sciences Research

....coupled with being a fully regulated biological product....

....with first mover advantage

The first of a series of trials agreed with the US FDA, which pave the way for a BLA, has just commenced. Provided that AGY remains on schedule, these trials will be completed around the middle of 2017. These data, together with the information provided by a patient registry, should see the US launch of Pollinex Quattro in the middle of 2019. This timetable would make Pollinex Quattro the first regulated short-course SCIT on the market, providing it with an important first-mover advantage.

US opportunity for Pollinex Quattro:

- Platform technology with strong IP
- First mover advantage – high barriers to entry
- Marketing advantages – short course, aluminium-free, FDA approved adjuvant
- Strategic fit – First short-course SCIT regulatory approved for a SCIT market
- De-risked opportunity – Already used in over 200,000 patients worldwide
- Much of infrastructure already in place – notably GMP manufacturing

Competition

The current market leaders are not well positioned for the future short-course SCIT market

At present, the main competition comes from the current market leaders, ALK-Abelló and Stallergenes. Not only do they both have subcutaneous injectable products that compete directly with AGY's products, they also have sublingual drops (SLITD) and tablets (SLITD). However, moving forward, these two companies will be at a disadvantage because neither has a short course SCIT product in their portfolio or in development. When AGY is able to properly market a fully approved biological towards the end of the decade, ALK-Abelló and Stallergenes will be disadvantaged.

Competitive position

2014 Rank	Company	SCIT	SLITT	SLITD
1	ALK-Abelló	✓	✓	✓
2	Stallergenes	✓	✓	✓
3	Allergopharma			
4	Allergy Therapeutics	✓*		✓
5	Laboratorios LETI/Novartis	✓		✓
-	Circassia	✓*		

**short-course*

Source: Company reports; Hardman & Co Life Sciences Research

Circassia

In contrast, Circassia (CIR.L) is unranked currently, with no products on the market for allergy immunotherapy – this will still be the case following the recent acquisitions of Aerocrine AB and Prosonix Ltd. However, it will change when the company launches its short-course vaccines for cat and grass. Indeed, Circassia will be the most direct competitor to Allergy Therapeutics, when it launches Grass-SPIRE in the EU and US.

AGY and Circassia both have short-course SCITs….but use different technologies

The product being developed by Circassia uses a different technology to that used by Allergy Therapeutics for Pollinex Quattro, however, the end-products are both short-course SCITs. Synthetic Peptide Immuno-Regulatory Epitopes (SPIREs) represent a new class of allergy therapy. Whereas existing SCITs use extracts of allergen, SPIREs are highly controlled, synthetically produced, simple peptides identified from the allergens, which are expected to have the required immunogenicity without the potential to cause the unwanted allergic responses.

Circassia expects to launch CatSPIRE in the EU and US in 2H 2017

Cat SPIRE is a short-course (4-8 injections) SCIT vaccine for prevention of cat allergies. It is currently in a large 1,409 Phase III trial in US, EU and Russia which is due to report during 1H 2016 to enable the company to prepare US and EU filings towards the end of 2016 for launch in 2H 2017. This product will not be competing with Pollinex Quattro.

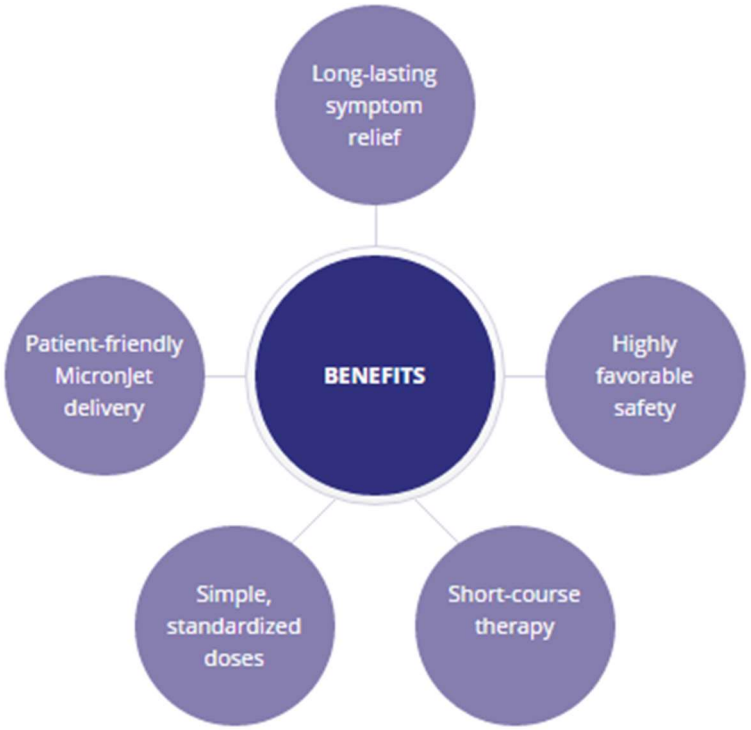
Circassia expects to launch GrassSPIRE in 2020….which will compete with Pollinex Quattro….

…but we expect the two companies to develop and expand the market

Circassia is also due to start a Phase III trial with Grass SPIRE in 1H 2016, which is expected to complete by the end of 2017 for launch in 2019 in both the US and EU. This product would be a direct competitor to Pollinex Quattro. However, we believe that the market place is exceptionally large and that these two companies have an opportunity to change the market dynamics from the unappealing long-course SCIT therapies to novel and effective short-course SCIT, thereby dramatically expanding the commercial market for allergy immunotherapy (see page 28).

Unlike AGY, where all commercial options are being left open, Circassia has already made the decision to sell its products itself, which was part of the rationale for its recent acquisitions. It will still need to build and educate a salesforce, but some of the infrastructure components have been put in place already.

Advantages of short-course SCITs



Source: Circassia website

DBV Technologies

DBV is also developing new technology which will expand the current market. However, there are two important differences to the SCITs being developed by AGY and Circassia. First, DBV is using an epidermal delivery system – Viaskin. Secondly, its main focus is on food allergies. Viaskin is still at a very early stage of development and it will be several years before DBV has a commercial product.

At this stage, neither AGY nor Circassia are working on products for food intolerance.

Commercial market

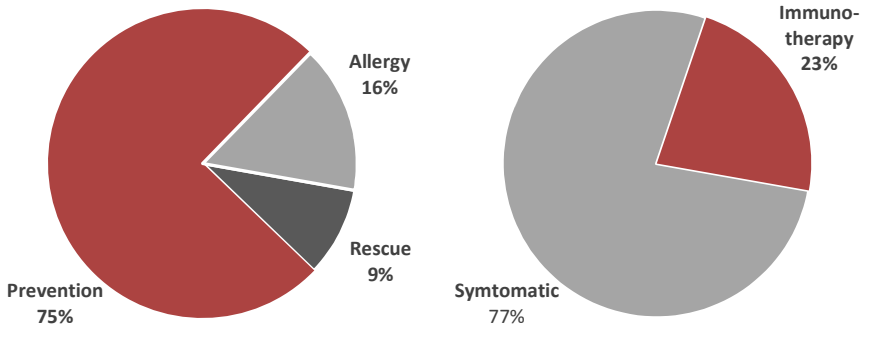
Introduction of short-course SCIT will change market dynamics

The commercial market for prescription respiratory (asthma, COPD, allergy) drugs has altered significantly over the years. It was worth about $7bn 20 years ago, equally split between β-agonists used to treat an asthma attack, inhaled corticosteroids to prevent the attacks and anti-allergy drugs for symptomatic relief from allergic rhinitis. Greater focus on the need to prevent asthma attacks, more acceptance regarding the use of low-dose inhaled corticosteroids, and the loss of patent protection on allergy drugs, has completely changed the market. In addition, the emergence of allergy immunotherapies during this period has added a new dimension. However, it is the introduction of regulated short-course allergy vaccines that are more suited to the US market that is forecast to transform the future market growth rate.

Key Facts

- In 2014, the global market for respiratory drugs was estimated to be worth $34.2bn. This estimate has been increased following the inclusion of allergy immunotherapy
- There has been no growth in the market for three years, largely due to the loss of patent protection recently on major asthma products
- The prescription (Rx) allergic rhinitis market was valued at $5.3bn in 2014, but this is dominated by drugs that only attempt to relieve the symptoms
- Sales of allergy vaccines were $1.2bn in 2014. Underlying growth has been approximately 2-3% over the last four years, but reported numbers are impacted by currency translation
- The major players that dominated the market 20 years ago remain the same today – GlaxoSmithKline (GSK), Boehringer Ingelheim, AstraZeneca (AZN). None of the major players are involved in the allergy immunotherapy market

Global respiratory market



2014 Global market: $34.2bn | 2014 Rx Allergy market: $5.3bn

Source: Hardman & Co Life Sciences Research

Allergy immunotherapy

The current AIT market is estimated to be $1.2bn

This part of the market has been stable at $1.0-1.2bn over the last four years as companies wait for clarity from the regulators about exactly what is required for approval of these drugs, which are considered to be biologicals, rather than traditional NDAs.

ALK-Abelló and Stallergenes are market leaders....

....but neither is well positioned for the future

The market leaders are ALK-Abelló and Stallergenes, largely because they have products targeting all segments of the current market. However, their position will come under threat when the regulators start to approve the short-course SCIT products since they do not have such products in development. Their growth strategies both appear to be along the lines of geographical expansion of their existing sublingual product ranges. Companies like Allergy Therapeutics and Circassia are small, by sales, today, but this looks set to change as they are the only companies with the short-course SCITs that are likely to transform the US market.

Allergy immunotherapy market – by company

Year to Dec ($m)	2011	2012	2013	2014	2015E
ALK-Abelló	354.6	332.0	359.0	407.3	352.3
Stallergenes	319.1	304.7	313.0	318.0	292.1
Allergopharma	115.4	114.4	110.2	120.7	105.3
Allergy Therapeutics	68.5	61.0	63.7	70.8	68.2
Laboratorios LETI	61.2	64.3	58.4	59.7	51.6
Others	197.0	200.0	202.0	220.0	195.0
Allergy immunotherapy	**1,115.8**	**1,076.3**	**1,106.4**	**1,196.5**	**1,064.5**

Source: Company reports; Hardman & Co Life Sciences Research

Underlying market growth is 2-3% per annum

The market appears to ease off in 2015, but this is solely due to weakness of the Euro, the currency in which most sales are made, versus the USD which is the currency in which we research global markets. We believe that the underlying growth in the market is currently about 3%.

Medium-term AIT forecasts

While the above table and comment reflect the AIT commercial market today, it does not portray the likely market in five years' time and beyond when these regulated products will be hitting the EU and US markets. Therefore, we have constructed a model for the market to reflect the likely changes over the next 10 years.

This model assumes that ALK-Abelló, Stallergenes and Allergopharma continue to see modest growth 1-3%, in line with the overall market until the short-course SCITs are launched by Allergy Therapeutics and Circassia. Based on pricing in the range $2,400-2,600 in the US and €500-600 per treatment course in the EU, together with modest market share gains, we see the market rising from an estimated $1.43bn in 2020 to $5.0bn in 2025. The driver of these numbers is the sheer size of the potential US market, which is inadequately serviced today.

Pricing is key

While AGY and CIR agree on US pricing for short-course SCITs....

....they are along way apart on EU pricing....

....therefore, we caution on market estimates....

Key to future market growth is pricing. While both AGY and Circassia believe that the likely reimbursement price for short-term SCIT in the US will be around $2,500-2,600 per course of treatment, the situation in Europe is less clear. Circassia has a working assumption that the price per treatment course in Europe will be in the order of €1,100/$1,500 – assuming a 5% discount to the current €2,500-5,300 cost of Grazax over a 3-year period. However, based on its current market experience, AGY believes that short-course SCITs will achieve an average EU price of €550-600 per treatment course. Both companies cannot be right. Therefore, if the Circassia price is achievable, there would be considerable upside potential for sales of Pollinex Quattro. On the other hand, if the price achieved is closer to AGY's experience, market forecasts for Circassia would be too high.

Long-term AIT forecasts

But still forecast a market of $5.1bn in 2025

Based on these assumption, we see modest market growth until 2020, when allergy vaccine sales are forecast to reach $1.48bn, the impact of short-course SCITs being limited to Circassia's Cat-SPIRE. Thereafter, we see rapid growth of the short-course SCITs driving the market forward, particularly in the US, to reach $5.1bn in 2025, with the two winners being Allergy Therapeutics and Circassia.

Allergy Immunotherapy market forecasts

Year to Dec ($m)	2014	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E
ALK-Abelló	407	352	363	374	385	397	408	421	433	446	460	473
Stallergenes	318	292	298	304	310	316	323	329	336	342	349	356
Allergopharma	121	105	108	112	115	119	122	126	130	133	137	142
Allergy Ther.	71	68	73	78	83	113	196	446	948	1,385	1,632	1,867
Lab. LETI/Novartis	60	52	53	54	55	56	57	58	59	60	62	63
Circassia	0	0	0	11	41	86	172	327	883	1,366	1,589	1,805
DBV	0	0	0	0	0	4	24	55	88	124	161	196
Others	220	195	191	187	184	180	176	173	169	166	163	159
AIT market	**1,196**	**1,065**	**1,086**	**1,120**	**1,173**	**1,269**	**1,478**	**1,934**	**3,046**	**4,023**	**4,552**	**5,062**

Source: Hardman & Co Life Sciences Research

Financials & Investment case

Profit & Loss

Product sales are, and will continue to be profitable and cash generative....

....but near-term P&L will be dominated by R&D and marketing investment

At present, there are two components that contribute to the financial performance of AGY. First, the company has a number of products which are being sold mostly in Europe, which after taking into account the manufacturing and marketing costs, are profitable and cash generative. Secondly, the company has been, and will continue, to invest in Pollinex Quattro in order to get formal approval from EU and US regulators, which will allow the product to be fully marketed. In the short-term, management is continuing to invest in marketing in Europe to gain market share and put the company in a strong position when PQ receives EU regulatory approval. Additionally, the trials agreed with the FDA for US regulatory approval will impact short-term cashflows.

Sales

Underlying sales growth has been consistently high single digit, which is expected to continue until 2019 and 2020, when Pollinex Quattro kicks in in Europe and the US, respectively. However, because most sales are generated in European markets, reported numbers are affected by movements in the Euro.

Weakness in the Euro looks set to have a £2m negative impact on sales in fiscal 2016. Countering this, sales will be boosted by the acquisition of Alerpharma in June 2015, which adds €3-4m.

Marketing

Marketing investment to boost market share

Over the last three years, management has been investing in marketing, which has seen sales rising at a faster rate than the market growth rate which has been estimated at 2-3%. In fiscal 2016, further investment in marketing is anticipated; first, to continue to gain market share and secondly, to prepare the market for the eventual regulated launch of Pollinex Quattro. Fiscal 2016 marketing costs will also be affected by the Alerpharma acquisition.

The consequence of these two investments is that product margins are likely to ease back in 2016.

All options will remain open for commercialisation of Pollinex Quattro in the US

Marketing costs towards the end of the decade are difficult to predict. In Europe, we expect Pollinex Quattro to be launched and marketed by AGY using its existing sales network. However, no decision has been made yet whether Pollinex Quattro will be marketed in the US by AGY itself – with the inherent cost of building a sales force; co-marketed with a partner – thereby sharing costs; or licenced-out completely – and taking a royalty income. Given that no strategic decision has been made or licensing deal completed, our forecasts assume that AGY undertakes the whole process by itself.

R&D

Short-term significant rise in R&D investment to run pivotal US trials

R&D spend over recent years has been consistent at around £3m per annum. However, now that the regulatory pathway for Pollinex Quattro in the EU and US has been cleared, R&D expenditure is forecast to rise substantially over the next three years. We estimate that the total cost of undertaking the necessary clinical trial to be £23-24m – ca.$30m/£20m in the US and €4-5m/£3-4m per annum in the EU. Funding for this was the reason behind the £20m capital increase in March 2015.

R&D forecast to be -£13m, -£12m, -$10m in fiscal 2016, 2017 and 2018 respectively

In fiscal 2016, both the US safety study (G102) and dose selection trial (G204) will be started and completed whilst the key Phase III Efficacy Chamber trial is also expected to start. Also, the birch dose selection study (204) will be performed in Germany. Therefore, the bulk (£12-13m pa) of the anticipated R&D spend will be incurred in both fiscal 2016 and 2017, before easing back to £10m in fiscal 2018.

Profitability

Although the marketed products are expected to remain profitable, investment in R&D and infrastructure will have an impact on reported profitability over the next two years. On an underlying basis, the company is forecast to have a pre-tax loss of -£9.1m in 2016 (-£9.5m after forex) and a -£7.9m loss in 2017. Thereafter, the strategic decision about US marketing of Pollinex Quattro comes into play.

R&D tax credits

Because of AGY's ownership structure – 44% effectively owned by Abbott Labs – it is only entitled to large company tax credits on its R&D investment. Tax payable by the company is the consequence of tax incurred on profits at its European subsidiaries.

Profit & Loss account

Year end June (£m)	2013	2014	2015	2016E	2017E	2018E	2019E	2020E
Sales	**39.28**	**41.96**	**43.23**	**46.06**	**49.26**	**53.25**	**56.05**	**91.51**
COGS	-11.95	-11.95	-12.18	28.00	-14.86	-15.85	-16.58	-21.94
Gross Profit	**27.33**	**30.00**	**31.05**	**74.06**	**34.40**	**37.39**	**39.48**	**69.57**
Marketing	-16.28	-17.92	-17.06	-18.41	-19.59	-20.91	-22.40	-37.48
Product profit	**11.05**	**12.08**	**13.99**	**13.62**	**14.81**	**16.49**	**17.08**	**32.09**
Product margin	28.1%	28.8%	32.4%	29.6%	30.1%	31.0%	30.5%	35.1%
G&A	-7.66	-7.80	-8.71	-9.97	-10.42	-11.21	-12.03	-15.97
R&D	-2.54	-2.96	-3.12	-13.00	-12.00	-10.00	-6.00	-8.00
EBITDA	2.19	2.68	3.52	-8.06	-6.32	-3.43	0.34	9.41
Deprec & Amortis	-1.34	-1.29	-1.29	-1.29	-1.29	-1.29	-1.29	-1.29
Other income	0.00	0.08	0.07	0.00	0.00	0.00	0.00	0.00
Underlying EBIT	**0.85**	**1.39**	**2.23**	**-9.36**	**-7.61**	**-4.72**	**-0.95**	**8.12**
Share based costs	-0.18	-0.18	-0.41	-0.50	0.00	0.00	0.00	0.00
Exceptional items	0.00	0.00	-1.10	0.00	0.00	0.00	0.00	0.00
Statutory Operating profit	0.67	1.21	0.72	-9.86	-7.61	-4.72	-0.95	8.12
Net financial income	-0.24	-0.13	-0.07	-0.15	-0.25	-0.30	-0.30	-0.30
Pre-tax profit	**0.62**	**1.27**	**2.16**	**-9.50**	**-7.86**	**-5.02**	**-1.25**	**7.82**
Exceptional items	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Reported pre-tax	0.43	1.08	0.65	-10.00	-7.86	-5.02	-1.25	7.82
Reported taxation	0.10	-0.34	-0.55	-0.40	-0.44	-0.48	-0.53	-0.47
Minorities	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Underlying net income	**0.72**	**0.92**	**1.61**	**-9.90**	**-8.30**	**-5.51**	**-1.78**	**7.35**
Statutory net income	0.54	0.74	0.11	-10.40	-8.30	-5.51	-1.78	7.35
Period-end shares in issue (m)	409.9	451.5	545.8	545.8	545.8	545.8	545.8	545.8
Weighted average shares (m)	427.0	451.5	475.2	545.8	545.8	545.8	545.8	545.8
Fully diluted shares (m)	445.7	471.5	498.2	570.8	573.8	578.8	583.8	591.8
Underlying Basic EPS (p)	**0.17**	**0.20**	**0.34**	**-1.81**	**-1.52**	**-1.01**	**-0.33**	**1.35**
U/l Fully-diluted EPS (p)	**0.16**	**0.20**	**0.32**	**-1.73**	**-1.45**	**-0.95**	**-0.31**	**1.24**
Statutory Basic EPS (p)	0.13	0.16	0.02	-1.91	-1.52	-1.01	-0.33	1.35
Stat. Fully-diluted EPS (p)	0.12	0.16	0.02	-1.82	-1.45	-0.95	-0.31	1.24
DPS (p)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Source: Hardman & Co Life Sciences Research

Balance sheet

- AGY ended fiscal 2015 with net cash of £20.2m, most of which was held in US$ in readiness for payment of the US clinical trials
- High R&D and marketing investment will see AGY reach a net debt position in fiscal 2017, which is adequately covered by the company's overdraft facility
- Long- and short-term loans were the consequence of the Alerpharma acquisition in June 2015, offset by the £1.3m cash acquired
- After-tax return on invested capital (ROIC) has been rising, but will drop again with the large increase in R&D investment over the coming three years
- There is a naturally strong seasonality to the business, therefore stock days appear unusually high taking a snapshot at the balance sheet year-end date

Balance sheet

@ 30th June (£m)	2013	2014	2015	2016E	2017E	2018E	2019E	2020E
Shareholders' funds	14.67	15.08	34.47	24.07	15.76	10.25	8.47	15.82
Cumulated goodwill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total equity	14.67	15.08	34.47	24.07	15.76	10.25	8.47	15.82
Share capital	0.42	0.42	0.56	0.56	0.56	0.56	0.56	0.56
Reserves	14.25	14.66	33.91	23.51	15.20	9.70	7.92	15.26
Capitalised R&D	15.17	10.83	9.43	18.31	25.37	29.44	28.98	29.78
Minorities	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Provisions	0.30	0.22	0.21	0.21	0.21	0.21	0.21	0.21
Deferred tax	-0.04	-0.04	0.30	0.30	0.30	0.30	0.30	0.30
Long-term loans	0.00	0.07	1.55	1.55	1.55	1.55	1.55	1.55
Bank overdrafts	0.61	0.05	0.25	0.25	0.75	8.41	13.41	20.35
less: Cash & securities	1.26	2.03	21.20	9.15	0.02	0.02	0.02	0.02
less: Marketable securities	0.00	0.35	0.78	0.78	0.78	0.78	0.78	0.78
less: Non-core investments	3.06	3.21	3.16	3.16	3.16	3.16	3.16	3.16
Invested capital	**32.61**	**27.04**	**27.81**	**38.35**	**46.73**	**52.95**	**55.71**	**70.79**
Fixed assets	7.34	7.03	8.75	8.88	9.07	9.33	9.83	11.09
Intangible assets	1.35	1.29	2.02	1.74	1.46	1.18	0.90	0.62
Capitalised R&D	15.17	10.83	9.43	18.31	25.37	29.44	28.98	29.78
Goodwill	2.56	2.48	2.98	2.98	2.98	2.98	2.98	2.98
Stocks	6.01	6.47	6.75	6.89	7.07	7.64	8.04	13.13
Trade debtors	3.13	2.76	2.84	3.03	3.24	3.50	5.55	14.61
Other debtors	4.06	2.61	2.22	2.22	2.22	2.22	2.22	2.22
Trade creditors	-3.05	-2.46	-3.05	-3.25	-3.48	-3.76	-7.68	-17.85
Tax liability	-0.54	-0.59	-0.59	-0.59	-0.59	-0.59	-0.48	-0.53
Other creditors	-3.42	-3.37	-3.53	-1.86	-0.61	1.02	5.39	14.76
Debtors less creditors	0.18	-1.06	-2.11	-0.46	0.78	2.39	4.99	13.20
Invested capital	**32.61**	**27.04**	**27.81**	**38.35**	**46.73**	**52.95**	**55.71**	**70.79**
Net cash/(debt)	0.65	2.25	20.19	8.14	-1.50	-9.15	-14.16	-21.09
Net debt/equity (%)	4%	15%	59%	34%	-9%	-89%	-167%	-133%
After-tax ROIC	3%	5%	7%	-25%	-17%	-10%	-3%	11%
Net asset value/share (p)	3.44	3.34	7.25	4.41	2.89	1.88	1.55	2.90
Stock days	193	191	198	172	171	166	164	168
Debtor days	29	26	24	23	23	23	29	40
Creditor days	86	84	83	82	83	83	126	212

Source: Hardman & Co Life Sciences Research

Cashflow

- AGY has generated positive free cashflow in each of the last three years
- The incremental increase (ca.£9-10m estimate) in R&D investment in 2016 and 2017 drops straight through the cashflow statement
- Significant recent investment in manufacturing facilities, coupled with the addition of a state-of-the art facility with Alerpharma suggests that only modest maintenance cap-ex is required for continued regulatory compliance
- £2.65m cash was paid for the Alerpharma acquisition in addition to taking on £1.7m of debt and receiving £1.3m cash. An expected deferred consideration of £113k is due for payment in fiscal 2017
- One strand of corporate strategy is to grow inorganically and further acquisitions along the lines of Alerpharma – strong local player – should be expected
- In the event that AGY markets Pollinex Quattro on its own in the US, investment and working capital is likely to rise towards the end of the decade. In contrast, a decision to out-license the product would result in a significant up-front milestone receipt, given that ca.£80m has been invested in the product to date.

Cashflow								
Year end June (£m)	**2013**	**2014**	**2015**	**2016E**	**2017E**	**2018E**	**2019E**	**2020E**
Trading profit	0.85	1.39	2.23	-9.36	-7.61	-4.72	-0.95	8.12
Depreciation	0.97	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Amortisation	0.37	0.28	0.28	0.28	0.28	0.28	0.28	0.28
Stocks	0.77	-0.63	-0.42	-0.14	-0.18	-0.57	-0.40	-5.09
Working capital	-1.42	0.78	0.63	-2.00	-1.00	-1.50	-2.50	-8.00
Exceptionals/provisions	0.00	0.00	-1.10	0.00	0.00	0.00	0.00	0.00
Disposals	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other	0.08	0.14	0.29	0.00	0.00	0.00	0.00	0.00
Company op cashflow	**2.23**	**2.97**	**2.92**	**-10.20**	**-7.50**	**-5.50**	**-2.56**	**-3.68**
Net interest	-0.19	-0.03	-0.24	-0.15	-0.25	-0.30	-0.30	-0.30
Tax	-0.11	-0.05	-0.17	-0.40	-0.40	-0.44	-0.48	-0.53
Operational cashflow	1.92	2.89	2.51	-10.75	-8.15	-6.24	-3.34	-4.51
Capital Expenditure	-0.66	-0.90	-1.09	-1.15	-1.20	-1.26	-1.52	-2.27
Capitalised R&D	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sale of fixed assets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Free cashflow	**1.26**	**2.00**	**1.42**	**-11.90**	**-9.35**	**-7.50**	**-4.86**	**-6.78**
Dividends	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acquisitions	-0.16	-0.02	-2.67	-0.10	-0.23	-0.10	-0.10	-0.10
Disposals	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other investments	-0.36	-0.28	-0.28	-0.30	-0.30	-0.30	-0.30	-0.30
Cashflow after investments	**0.75**	**1.69**	**-1.52**	**-12.30**	**-9.88**	**-7.90**	**-5.26**	**-7.18**
Share repurchases	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Share issues	0.15	0.00	20.08	0.25	0.25	0.25	0.25	0.25
Currency effect	0.05	-0.08	-0.25	0.00	0.00	0.00	0.00	0.00
Borrowings acquired	0.00	0.00	-0.37	0.00	0.00	0.00	0.00	0.00
Change in net debt	**0.95**	**1.61**	**17.93**	**-12.05**	**-9.63**	**-7.65**	**-5.01**	**-6.93**
Hardman cashflow/share (p)	0.45	0.64	0.53	-1.97	-1.49	-1.14	-0.61	-0.83

Source: Hardman & Co Life Sciences Research

Valuation

Discounted cashflow

The best approach to valuing biopharmaceutical companies is to prepare detailed discounted cashflow analyses of key products through to patent expiry and then to risk-adjust the NPV based upon industry standards for the probability of the product reaching the market. In the case of AGY, given that Pollinex Quattro will dominate sales and profits of the company, we have undertaken such an analysis on this one technology.

Key assumptions

- Pollinex Quattro is launched in Europe (birch) in 2019 and the US (grass) in 2020
- AGY markets the product itself in key markets
- The weighted average cost of capital is 11%
- There is no terminal value after patent expiry
- Because the technology has already been used in over 200,000 patients there is limited regulatory risk

Our DCF model uses the following core inputs, from which the weighted average cost of capital is calculated at 11%. Given that most biopharmaceutical companies raise capital from the markets to fund their projects, their WACC is actually the cost of equity and, at this point in time, 11% seems to be a sensible figure.

Core inputs		
WACC	**11.0%**	Net Present Value (NPV)
% of debt	0%	
% of Equity	100%	
Equity Beta	1.00	
Average Interest Rate	0.5%	
CAPM	11.0%	
Risk-free Rate	2.0%	10 year UK bond yield
Market return	7.0%	
Market Risk	6.0%	UK equity risk premium

Source: Hardman & Co Life Sciences Research

Risk-adjusted net present value – 93p per share

Our NPV of future cashflows is 186p per share, which, after risk adjustment, equates to 93p per share

Our NPV of the discounted cashflows for the forecast period until patent expiry equates to £1,062m or 186p per share on a fully diluted basis. Because sales fall very quickly after patent expiry, particularly in the US, there is no need to have a terminal value. However, we would expect the company to obtain some patent extensions in the future. Moreover, management is likely to argue that biologicals do not suffer the same level of erosion observed with traditional pharmaceutical products, so our model could be deemed conservative.

This NPV assumes that the product is regulatory approved for commercialisation and needs to be risk-adjusted to reflect the stage of development and likelihood of regulatory approval. Under normal circumstances, we would apply a 40% probability to a drug that has completed Phase II trials and 80% following completion of Phase III trials.

Applying a 50% risk adjustment is deemed conservative

In this case, in the strictest sense, Pollinex Quattro has only completed Phase IIb trials in the US, which implies that we should use a 40% probability of the product reaching the market. However, given its position in Europe, where it has extensive use on a 'Named Patient' basis, coupled with the clear US regulatory pathway agreed with the FDA, we would argue that this deserves some credit. Therefore, we have applied a conservative 50% risk-adjustment, which brings our risk-adjusted NPV for Allergy Therapeutics to 93p per share.

DCF analysis		
Discounted Cash Flow for Forecast Period	£1,064m	100%
Terminal Value	£0m	0%
Total Enterprise Value	**£1,064m**	**100%**
Net cash/(debt) in year 1	-£1m	
Implied market value	**£1,062m**	
Fully diluted shares	571m	
Implied value per share	**186p**	
Risk adjustment/probability	50%	
Risk-adjusted NPV	**93p**	

Source: Hardman & Co Life Sciences Research

Sensitivity analysis

We would normally provide a sensitivity analysis, comparing the effect of WACC against different terminal growth rates. However, given that this model does not include a terminal value, we simply show the sensitivity to different average costs of capital and the risk-adjusted values.

WACC sensitivity analysis						
	WACC					
Pence per share	**8.0%**	**9.0%**	**10.0%**	**11.0%**	**13.0%**	**15.0%**
NPV	261	233	208	186	127	120
Risk-adjusted	131	116	104	93	63	60

Source: Hardman & Co Life Sciences Research

Comparative valuation

In addition to the DCF, and to provide potential investors with an alternative method of valuation, we have constructed a table of competing biopharmaceutical companies that are quoted on various stock exchanges. This is not comprehensive because some competitors are private companies and have not made suitable financial disclosures, or are subsidiaries of much larger organisations.

There are four direct competitors/comparators to Allergy Therapeutics with stock market quotes. ALK-Abelló and Stallergenes (Ares Immunotherapy) are the market leaders, but do not have the growth prospects in the absence of short-course technologies, whereas Circassia and DBV Technologies have new competing technologies, but currently have no sales (Circassia has made respiratory acquisitions in 2015, but not in allergy immunotherapy). Despite being the best positioned company in our opinion, with current sales and new technology, AGY is rated the lowest within this group of peers. This suggests that either the competing companies are too expensive, or that Allergy Therapeutics is being mis-priced by the market and offers significant upside potential, backing up the DCF outcome.

Comparative valuations

Company	ALK-Abelló	Circassia	DBV Technologies	Stallergenes	Allergy Therapeutics
Currency	DKK	£	€	€	£
Share price	738.2	273.3	59.9	45.9	28.4
Shares in issue	9.7	284.9	19.4	13.9	545.8
Market cap (lc)	7,130.6	778.6	1,163.8	637.9	154.9
Mkt cap (£m)	702.1	778.6	855.7	469.0	154.9
Cash	289.0	238.9	110.0	136.0	22.0
Debt	-324.0	0.0	0.0	0.0	1.8
EV (lc)	7,165.6	539.7	1,053.8	501.9	131.1
EV (£m)	**705.6**	**539.7**	**774.9**	**369.0**	**131.1**
2015 Sales (Est)	2,350.0	0.0	0.0	260.0	46.1
EV/sales	3.0	-	-	1.9	2.8

Prices/Currencies taken at close of business on 19th October 2015
Source: Company reports; Hardman and Co Life Sciences Research

Company matters

Registration

Incorporated in the UK with company registration number: 5141592

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www.allergy therapeutics.com

Board of Directors

The Board consist of two executive directors and four non-executive directors, including the Chairman. Their representation on the various committees is shown in the following table.

Board of Directors				
Position	**Name**	**Nominations**	**Remuneration**	**Audit**
Chairman	Peter Jensen	C		M
Chief Executive Officer	Manuel Llobet			
Chief Financial Officer	Ian Postlethwaite			
Non-executive director	Thomas Lander		M	
Non-executive director	Jean-Yves Pavée			
Non-executive director	Stephen Smith	M	C	C

M = member; C = chair
Source: Company reports

Peter Jensen – Non-executive Chairman

Peter is an experienced executive from the pharmaceutical industry, having worked at SmithKline Beecham in a number of roles for 21 years. Between 1994 and 1998, he was Chairman of Consumer Healthcare Europe. Then between 1998 and 2001 he held the position of President of Worldwide Supply Operations, based in Philadelphia. Peter left SKB following its merger with GlaxoWellcome. Peter joined AGY as an NED in 2010 before being appointed Chairman in January 2011. Peter plays an active role in group strategy and ensures adherence to good corporate governance.

Manuel Llobet – Chief Executive Officer

Manuel joined Allergy Therapeutics at the time of the capital increase in 2009 when the Weinstein family group of companies bought a major shareholding in the company and took over at CEO on 1st September of that year. Manuel was responsible for the international development of Weinstein's investments in pharmaceutical companies in 20 countries. As such he gained considerable insight and experience into the industry, particularly in South America. During this period, he was Chairman of Farmindustria SA, a Peruvian company listed in Lima, Executive Director of Coporación Drokasa, CEO of Laboratorios Andrómaco where he led the company to an IPO on the Santiago Stock Exchange; and Business Development Manager for Laboratorio Chile. Since becoming CEO Manuel has led the strategy to drive growth and profitability from the existing portfolio of products whilst generating the cash needed to invest in Pollinex Quattro to obtain regulatory approvals.

Ian Postlethwaite – Chief Financial Officer

Ian is the longest serving executive director at Allergy Therapeutics, having joined as CFO in April 2002 and since listing on AIM in 2004 has also acted as Company Secretary. Ian is a Fellow of the Chartered Association of Certified Accountants. Prior to joining AGY, Ian held senior executive positions at Philips Electronics, Ericsson, AFS (independent finance house) and Ellerman Investments, a private equity house.

Thomas Lander – Non-Executive Director

Thomas has spent more than 25 years in senior R&D positions in the pharmaceutical industry, including Boehringer Ingelheim, Novo Nordisk, Bristol-Myers-Squibb and Glaxo Wellcome. In 2003, he joined Merck KGaA as Executive Vice President of global clinical R&D and Chief Medical Officer. Thomas is board certified in internal medicine and diabetology and has a strong background in oncology and immunotherapy.

Jean-Yves Pavée – Non-Executive Director

Jean-Yves is the appointed director of AGY's major shareholder, Abbott Laboratories, where he is Senior Vice President in developed markets for established products. Having joined Abbott in 1992, he has held a number of senior positions in Europe and Emerging Markets and Africa (EMEA).

Stephen Smith – Non-Executive Director

Stephen is a Chartered Management Accountant, Fellow of the Association of Corporate Treasurers and Member of the Institute for Turnaround. Until 1995, Stephen held a number of senior positions at quoted companies, including Group Treasurer of The Rank Organisation. Subsequently, he has operated as an independent executive, an interim manager, or an NED to support companies in transition.

Executive management team

Allergy Therapeutics has a number of senior executives that support the CEO and CFO, who provide considerable industry expertise, covering manufacturing and quality control, marketing, R&D and business development. Some of this team will be responsible for the integration process in Spain of Alerpharma with AGY's existing Iberian operations.

Executive management team	
Name	**Position**
Prof Tim Higginbottom	Research & Development Director
Prof. Dr. Matthias Kramer	International Medical Director
Bev Lees	Operations Director
Santiago Puig	Business Development Director
Dr. Murray Skinner	Chief Scientific Officer
Nunzio Di Grazia	Regional Director, Italy & Spain
Bodo Steinert	Regional Director, Germany & Austria
Sue Baker	HR Manager

Source: Company reports

Company history

The origins of Allergy Therapeutics can be traced back CL Bencard Ltd in the 1930s. Bencard was well-known in the field of allergies and acquired by Beecham in 1949, which, in turn, merged with SmithKline Corp, and then Glaxo Wellcome to become GlaxoSmithKline as we know it today.

However, being a specialist business did not fit well within a massive global operation, so Allergy Therapeutics Holdings was formed in 1998 and sold to management. The company still has strong ties with GSK, with its HQ and its main manufacturing base situated within GSK's antibiotic production facility in Worthing and it remains a shareholder. Through organic growth and acquisition, the business evolved to what we know today as Allergy Therapeutics plc, which was floated on AIM in October 2004.

Capital increases

Since its Listing on AIM, Allergy Therapeutics has raised £95m gross funds (£90m net) from the capital markets in five fundraisings. This has largely been used to fund its R&D programme – cumulative spend of £80m since 2000 – and upgrading the manufacturing facility to ensure that it is regulatory compliant – Certificate of GMPO Compliance received in April 2014 following MHRA inspection.

At the end of fiscal 2015, the company had just over £20m net cash, most of which was held on deposit in US$ in preparation for the pivotal US trials for Pollinex Quattro.

Dependent on future marketing strategy, further capital may be required. Given the recent, and ongoing, marketing investment to grow sales and market share in Europe in preparation for the regulatory approval of Pollinex Quattro, it is more than likely that management will adopt a go-it-alone strategy in Europe. However, the position in the US is much less clear and no firm decision has been made. A go-it-alone strategy in the US would likely require more working capital towards the end of the decade to employ and train a sales force for the launch of Pollinex Quattro (grass) in 2020. However, this should not be considered a bad option, as it will mean that AGY will maximise profitability and shareholder returns.

Additional capital might also be required to fund management's inorganic growth strategy. Regulatory approvals of short-course SCIT are expected to alter the commercial market and potentially leave a number of small, usually privately-owned, local allergy players exposed to this changing environment. Again, this should not be viewed negatively, as it could boost AGY's position in an important territory and provide an experienced sales force for a relatively low price.

Capital increases since Listing

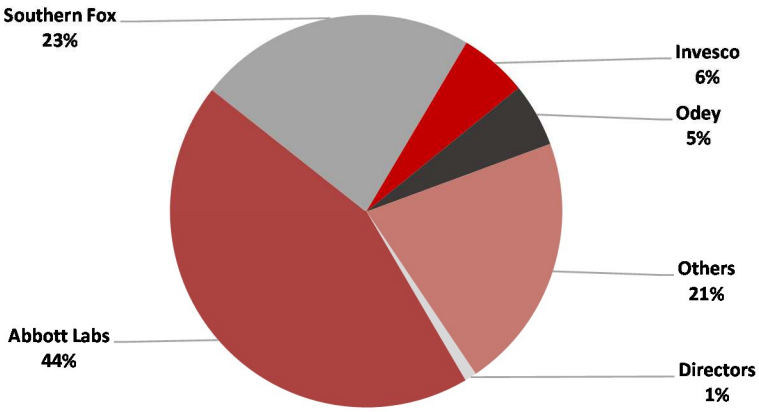
Date	Shares (m)	Price (p)	Raised (£m)	Shares o/s (m)	Valuation (£m)	Comment
Oct-04	21.92	73.0	16.00	62.95	45.95	Listing on AIM
Apr-06	19.00	100.0	19.00	81.95	81.95	Issue of Equity
Jun-09	168.72	12.0	20.25	246.16	29.54	Issue of Equity
Jun-09	12.92	12.0	1.55	264.00	31.68	Open offer to existing shareholders
Jul-09	12.50	12.0	1.50	276.50	33.18	Exercise of warrants
Sep-09	16.27	12.3	2.00	292.77	35.98	Exercise of warrants
Mar-12	96.14	9.7	9.33	406.91	39.47	Placing & subscription
Apr-12	2.13	9.7	0.21	409.04	39.68	Open offer to existing shareholders
Mar-15	41.67	9.7	4.04	451.73	43.82	Conversion of Convertible Loan Note
Mar-15	94.12	22.1	20.80	545.85	120.63	Placing of share
Total			**94.67**			

Source: Company reports; Hardman and Co Life Sciences Research

Share capital

The company has 545.85m shares issued, with Abbott Laboratories being the largest shareholder. The stock is tightly held with only 21% of the outstanding shares available outside management and the top four shareholders.

Major shareholders

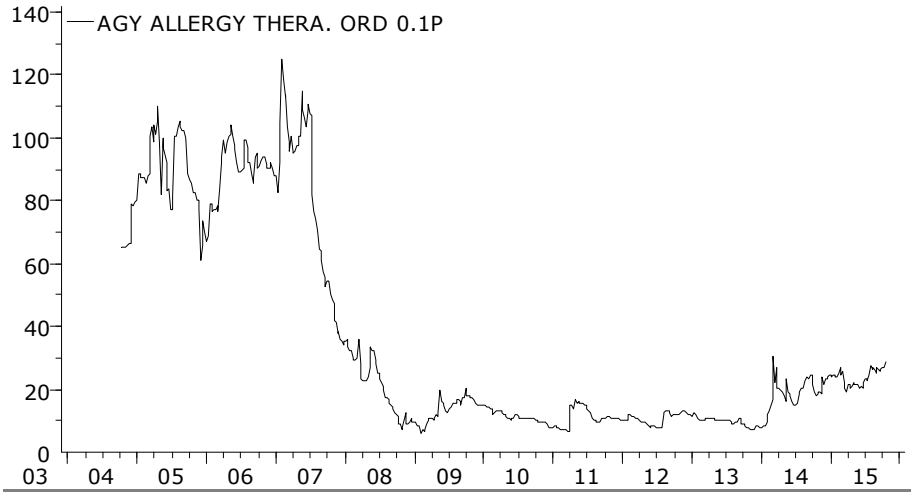


Source: Company reports

Share price performance

The stock did reasonably well for a number of years following IPO. However, the announcement that the FDA had put Pollinex Quattro on a clinical hold in 2007 changed the market's view on the company. The stock has had a steady period of recovery following the appointment of Manuel Llobet as CEO in September 2009 since who instigated the three pronged growth strategy that is bearing fruit.

Share price performance since listing on AIM



Source: Fidessa

Risks

Regulatory

As with all pharmaceutical and drug development companies, there is a regulatory risk. It is important for companies to liaise with regulators on a regular basis throughout the development programme. Protocols for clinical trials need to be planned carefully to ensure that, if the drug works, the results will deliver the answer being sought. They also need to be approved by the regulators. In the case of Pollinex Quattro, the FDA has given the company very clear direction about what needs to be done in order to get US approval and this has been reflected in the US development plan.

Manufacturing

The manufacturing site needs to have strict procedures and comply with GMP regulations. Being a long established company and, in its history, having been part of multinational pharmaceutical companies, AGY has excellent GMP manufacturing facilities that were issued with a Certificate of Compliance by the European regulator within the last two years

Commercialisation

Management is keeping all options open regarding the commercialisation of Pollinex Quattro, particularly in the US. On the one-hand there are attractions to be partnered with a multinational company. On the other hand, however, management will also consider the specialised nature of the product and the education process required for commercial success. In addition, changing the practise of US allergists may take much longer than expected, especially if their income is reduced. However, we expect the change to licensed products to be driven also by the regulators and the public.

Patent robustness

As with all therapeutic products, there is risk that the intellectual property is insufficiently covered by the global patents, allowing a competitor to gain market access. However, in the case of allergy immunotherapy, apart from the issued patents which are likely to receive extensions, there is considerable know-how through years' of experience, which would be very difficult for a generic company to replicate.

Dilution risk

The company has sufficient cash to fund the ongoing US and EU clinical trial programmes. However, if the decision is made to commercialise Pollinex Quattro in the US through its own sales force, further working capital would be required. This has the potential to dilute existing investors should they choose not to follow their money.

Share liquidity

As with many small cap companies listed on AIM, there can be difficulty in buying and shares in volume. Market makers only guarantee prices in a very small number of shares.

Glossary

AIT	Allergy immunotherapy
Allergoid	Chemically modified antigen
BLA	Biologics License Application
EMEA	European medicines Agency
FDA	US Food & Drug Administration
IgE	Immunoglobulin E
MCT	Micro Crystalline Tyrosine
MPL	3-O-desacyl-4'-monophosphoryl lipid A
NDA	New Drug Application
PQ	Pollinex Quattro
Rx	Prescription
SCIT	Subcutaneous immunotherapy
SLITD	Sublingual immunotherapy drops
SLITT	Sublingual immunotherapy tablets
SPIRE	Synthetic Peptide Immuno-Regulatory Epitopes
Th	T-helper cells

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