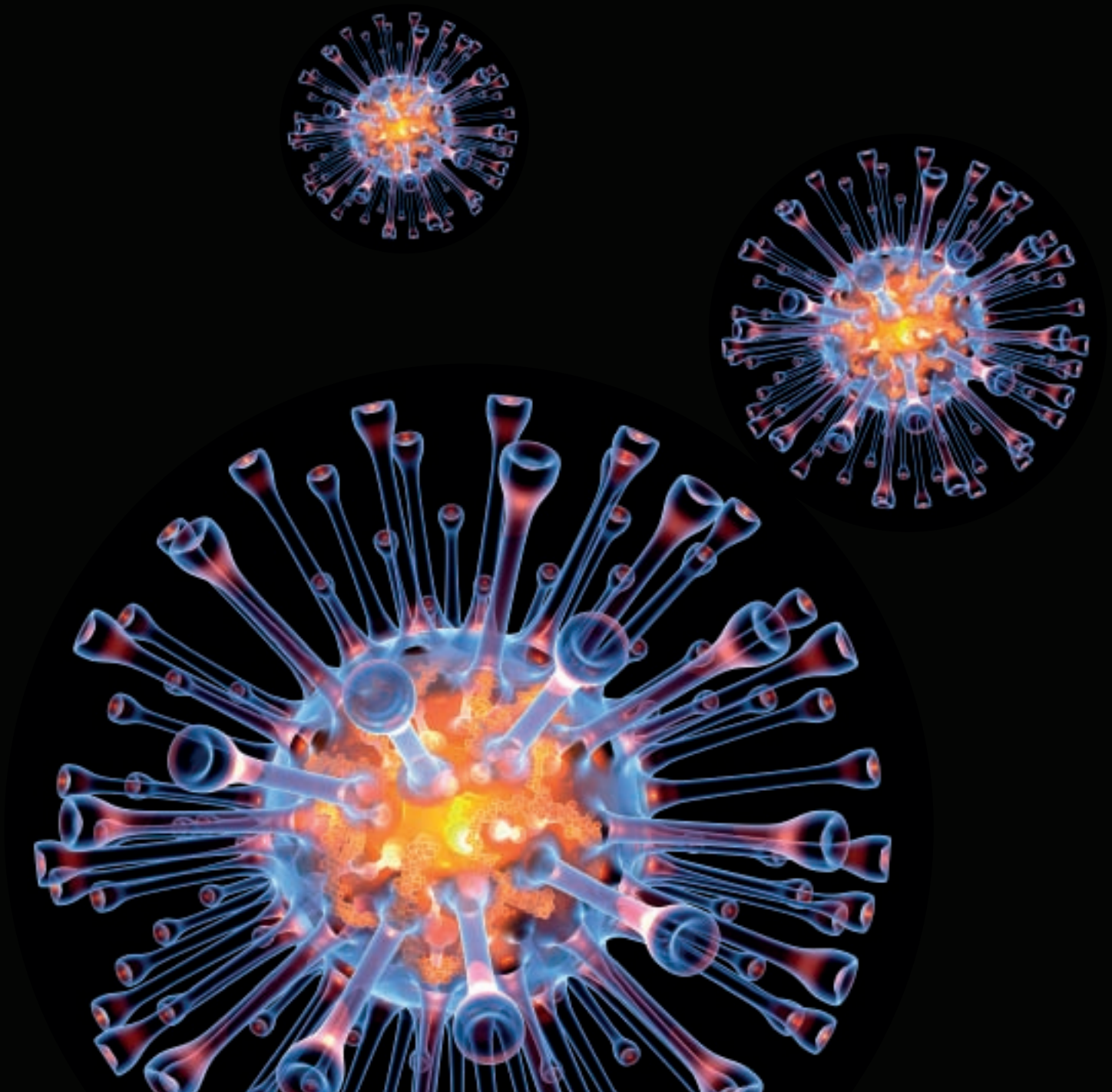
Marks&Clerk

Life Sciences Report 2013

The changing IP landscape



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Foreword

Scott Alban currently is Vice President of Global Intellectual Property at AstraZeneca headquartered in London, UK. Prior to joining AstraZeneca in 2012, Scott was the Head of Intellectual Property at MedImmune, which is now the biologics business unit of AstraZeneca. Before joining MedImmune Scott was a patent practitioner at Human Genome Sciences. Scott has experience working in nearly all aspects of IP law including patent prosecution, litigation, opinions, interferences, oppositions, licensing and other complex R&D transactions. Scott has a BS in Biology and a PhD in Microbiology from Virginia Tech, and a JD from American University. He is a member of the Maryland State Bar and registered to practice before the United States Patent and Trademark Office.

Almost five years on from the beginning of the global economic crisis, life sciences professionals are no strangers to disconsolate headlines about the state of their industry. Many of the problems, economic or otherwise, that came to the fore last decade have had lasting consequences that will continue to be felt for years to come.

Constrained consumer and public spending have maintained overwhelming pressure on the balance sheets of all kinds of life sciences organisations, from the latest start-ups to big pharma. Austerity measures, including price caps on drugs, have hit the headlines and hit life sciences R&D budgets hard, particularly in Europe. Under such stress, it is clear that the life sciences business model, particularly that of pharma companies, must fundamentally change if it is to survive. We are surely going to see new forms of collaboration and an increasing focus on patient tailored therapies.

As Governments try to balance spending cut-backs with schemes designed to incentivise innovation (such as the UK Government's Patent Box scheme), the life sciences industry hopes to see new forms of funding become available, particularly as drug portfolios start to deplete in the face of dwindling R&D pipelines. In March of this year, we saw the UK Government's Chief Medical Officer warning of the growing threat of antibiotic resistance, and calling for the development of new drugs to tackle this potential crisis. And yet, are governments doing enough to encourage such innovation, even in key areas such as this?

As the regulatory landscape shifts, it too continues to cause headaches for pharmaceutical and biotech companies around the world. Particularly in the US, the length of time taken for drugs to obtain marketing approval not only delays patients' access to vital drugs, but also puts enormous strain on companies that must wait years before any hope of clawing back R&D spend. The differing regulatory and IP regimes around the world create many obstacles to getting therapies to market.

With growing Asian influence and an increasing consumer base in those territories, Europe and the US face not only internal challenges, but also stiff competition from other fast-growing markets. Without a doubt, the coming years will be known as a period in which countries like China and India asserted their capabilities in life sciences. The question that we will come back to in future will be whether Europe and the US were able to provide an adequate response to this challenge.

It is against this backdrop that the role of IP has become more critical than ever to the business of life sciences. As the products that organisations are dependent on for their profits become fewer and even farther between, secure protection against competition becomes more valuable by the day. And with a widespread awakening to the commercial use of IP as an asset that can be traded, licensed and securitised like any other piece of property, we will surely observe even more innovative use of patent portfolios.

Although the life sciences industry faces myriad questions, ultimately, the solutions to the challenges faced by industry and policymakers must encourage the innovation necessary to deliver the new drugs that are so desperately needed both today and tomorrow.

Dr Scott Alban
Vice President of Global Intellectual Property, AstraZeneca

Introduction

Welcome to the 2013 Marks & Clerk Life Sciences Report. It has been a year of significant change in the intellectual property landscape, and it is these changes and how they impact the life sciences sector which provide the theme of this year's report.

The fundamentals of the IP system itself are changing, with patent reform in the United States – the America Invents Act – to some extent bringing the US into line with the rest of the world through adoption of the first-to-file system for patent protection, but also altering the impact of prior patent publications, and opening up new avenues for attacking third party patents. The reforms will necessitate shifts in IP strategy within the sector. On the other side of the Atlantic, Europe has at last made progress towards the goal of a true single European patent, and a single pan-European patent court (the Unified Patent Court, or UPC) for litigation. However, serious questions remain over the implementation of these goals. Are the reforms and new structures robust enough, and how will they affect the industry in practice?

The core business of getting therapies to the patient is also seeing major shifts. Governments around the world would like to see greater progress towards getting biosimilars onto the market, and indeed Europe seems to be ahead of the curve in this sector. As a counterpoint to this, the European system for patent term extension – SPCs, or Supplementary Protection Certificates – continues to provide legal uncertainty and to occupy a disproportionate amount of time at European courts. Indeed, the fallout from the spate of CJEU referrals of recent years continues to be felt, and national courts are still uncertain as to how to apply the latest rulings in practice. As a consequence, several new referrals have been made. As product pipelines continue to be of concern, and the patent cliff approaches, certainty for the sector in this particular area is of great significance.

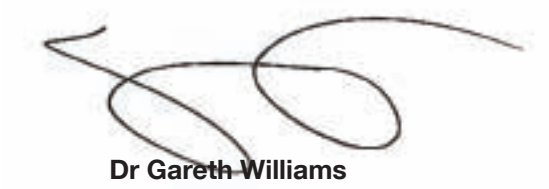
Legal developments in other fields also influence the mood of the sector. Personalised medicine continues to hold great promise for future therapies, but where do recent developments regarding patentability of genes, diagnostic methods, and stem cells leave it?

Commercially, too, the landscape is altering. China and South Asia are not only growing target markets, but are also becoming significant sources of innovation and competition. Many of these countries are introducing regulatory and legal reforms to promote innovation and market expansion. But how are these reforms reflected in commercial reality?

This report is our response to these changes, and an attempt to answer the questions the changes give rise to. We present our own opinion in a series of articles, together with the response of the industry, as gauged from our survey of life sciences executives, researchers, academics, and investors. We asked questions relating to these key developments for the industry, as well as seeking comment on issues such as access to funding and the biggest challenges faced by the sector.

We would like to thank all who took the time to respond to our survey and to offer their opinions on the challenges facing their industry.

An overview of the survey results is presented in the following section, after which we present our own experts' take on the various shifts in the IP landscape. These opinions are of course not definitive; indeed, we welcome further responses and challenges to our views. We are happy to debate and engage with the sector and stakeholders, as together we explore the new IP landscape.



Dr Gareth Williams
Partner, Marks & Clerk LLP

Overview of survey findings

In order to inform our analysis of the key issues facing the life sciences sector, we undertook a survey of individuals within the sector. Invitations to complete the survey were sent to life sciences executives, researchers, academics, and investors. As well as seeking opinions on major IP developments for the industry, we also took soundings on the financial health of the sector, asking respondents to give their opinions on funding and industry activity.

The outlook for the market

The overall view of the last twelve months is somewhat negative, with nearly four in five respondents (77 per cent) stating that the overall financial climate has either stayed the same or deteriorated over the past year. Only 20 per cent believe it has improved. Looking at the geographical split in responses, both European and American respondents gave a similar overall assessment (18-19 per cent agree the climate has improved). However, there is somewhat more positivity from those who identify as being involved in biotech specifically (29 per cent improved) and being involved in investment (33 per cent improved). This last figure must give some comfort to the industry, as the climate for investment is one of the key concerns.

These results are in contrast to our previous survey – conducted in 2010 – which found that nearly two thirds (63 per cent) of respondents felt there had been an improvement in the preceding twelve months. Of course, the 2010 survey must be seen against the backdrop of the industry beginning to emerge from the effects of the global financial crisis, so it is not unexpected that there is less positivity in recent months.

Breaking down the overall climate into separate issues, several key areas appear to be causing concern. Half of all respondents (50 per cent) believe that the appetite for partnerships and strategic alliances has improved – less than one in ten believe it has deteriorated – and over a third (34 per cent) feel the same about mergers and acquisitions. This is consistent with the greater degree of optimism from the investment sector, and with predictions made in our 2010 survey, in which three quarters (75 per cent) looked ahead to an improvement in conditions for acquisitions and collaborations over a two year timescale. Recent news from the sector seems to bear this out; March 2013 has seen the Scripps Research Institute expand its partnership with Takeda Pharmaceutical Co and Pathwork Diagnostics begin collaborating with Kindstar Global in China, to take just two examples.

Rather than being good news, however, these figures perhaps reflect the decline in the climate overall, with partnerships and acquisitions being one of the key ways in which companies can continue to grow in the absence of cash investment. Indeed, investment is the area considered to have deteriorated most over the past twelve months, with 40 per cent reporting that smaller ventures' access to funding has declined, and nearly one third (31 per cent) feeling that investor appetite for the sector has deteriorated. The other key concern is for R&D pipelines, with 39 per cent of respondents stating that these have deteriorated over the past year. This ties in with ongoing concerns regarding the patent cliff, and whether there are suitable incentives for companies to develop new therapies rather than repurposing existing drugs.

77%

of respondents consider the overall financial climate has stayed the same or deteriorated over the past year

The future

We also asked respondents to look ahead to the next twelve months, and predict how the financial climate will change. The sector is slightly more optimistic overall, with 30 per cent predicting an improvement in the financial climate generally. This optimism is not evenly split among respondents, though. Again, the investment community is most positive, with some 67 per cent predicting improvement. Similarly, small companies (0 to 10 employees) have a higher percentage predicting improvement (49 per cent) than large (>10,000 employees) companies, of whom only 22 per cent predict improvement. Figures

63%

of respondents expect there to be major consolidation in the industry over the next three years

for specific key areas are similar to those for the last twelve months: just under half (49 per cent) predict improvement in the appetite for partnerships and strategic alliances, and 40 per cent are optimistic regarding mergers and acquisitions. The major areas of predicted deterioration are similar again – one quarter (24 per cent) feel that each of smaller ventures' access to funding and R&D pipelines will deteriorate, and 21 per cent are pessimistic as to investor appetite for the sector.

The consistency between the figures for the past twelve months and the predictions for the following twelve months suggests that the industry does not see any reasons for a significant shift in the financial climate. In particular, investment and pipelines remain an area of concern, with avenues for growth being primarily focused on collaborations and acquisitions, so favouring those companies with deep pockets. This pessimism is borne out by the nearly two thirds (63 per cent) of respondents who expect that there will be major consolidation in the industry over the next three years. As investment falters, though, there could be opportunity for growth of alternative funding models; some 59 per cent agree that crowdsourcing and other alternative models will be increasingly prevalent within and important to the life sciences sector. We are seeing some tentative examples of this new approach already; in the UK the Government has recently thrown its weight behind the Biomedical Catalyst programme, which seeks to combine private and state funding to bridge the"valley of death" funding gap that often faces early-stage biotech and medtech companies not far enough along the R&D process to attract the attention of bigger investors. In the US a research team at Columbia recently raised over $25,000 on crowdfunding site RocketHub for a study into the subcellular distribution of radioactive amphetamines in mouse brain cells.

Longer term problems

We also asked respondents to look further ahead, and to assess the significance of a number of potential problems to the industry over the next five years. The global economic climate is the clear dominant concern, with nearly nine in ten (88 per cent) naming it as a very or quite significant problem; these figures were similar across all types of organisation, and all geographical areas. However, several regulatory or legal issues are also identified as looming large in the near future: around two thirds (ranging from 62 per cent to 68 per cent) of respondents suggest each of the "patent cliff", variability in patent and regulatory protection across territories, and increasing regulatory barriers to market as being key concerns. Perhaps unsurprisingly, respondents identifying as being in the generics market also rank uncertainty regarding biosimilars as a key concern (86 per cent of generics respondents, against 55 per cent of respondents overall). Regulatory barriers also score significantly higher as a concern amongst pharmaceutical and biotech companies (81 per cent and 85 per cent respectively) than among respondents overall.

Patent reform

These results suggest that patent reform and changes to regulatory regimes have the potential to seriously affect the life sciences industry – for better, or for worse. It is therefore of crucial importance that legislators get the balance right when introducing changes to these systems. Two major reforms in particular have recently been passed, in the shape of the America Invents Act, and the single European (Unitary) Patent and Unified Patent Court. We consider these changes in more detail in section 1 of this report. It is worth noting here that nearly half of respondents indicate that the European developments are a significant concern for the future, although nearly two thirds (64 per cent) of respondents believe there will be a positive impact on the European life sciences sector. When asked whether the AIA will have a positive or negative impact on the sector, 47 per cent of respondents suggest the reforms will be positive for the US sector, while only 28 per cent feel there will be a positive impact on the European sector. (These figures are remarkably consistent across company type and geographical split, suggesting that these views are broadly shared across the industry.) Interestingly, when our 2010 survey asked a similar question, nearly two thirds (59 per cent) of respondents believed US patent reform would be of benefit to the sector as a whole. It is clear that the initial optimism seen in 2010 has to some extent been tempered by the realities of reform; and

67%

of respondents feel that the new Unitary Patent and Unified Patent Court will to a certain extent address the historical problem of a fragmented European marketplace

that the changes in the US are now being treated with greater scepticism than the European reforms. It is also apparent that although reform is desired, industry is taking a guarded response to the changes with a mixture of concern and slight optimism. It remains to be seen whether this optimism is justified – and as we discuss in section 1, the European experiments at least have a number of shortcomings which could put the sector at risk.

There is also a split between perceived beneficiaries of reform. As noted, the AIA is seen primarily as benefiting the US sector, but even within this our respondents feel the main beneficiaries will be large corporations (41 per cent agree, rising to 86 per cent agreeing among the generics industry), with only one in five (20 per cent) thinking the sector as a whole will benefit, and even fewer (10 per cent) considering that non-US corporations will be the main beneficiaries. This reflects the general feeling that the US law reform is important because it brings the US more into line with the rest of the patent world in terms of first-to-file; however, there is clear concern that smaller entities will not have the resources to take full advantage of the new system and may suffer as a result. Perhaps hearteningly for the IP profession, almost a third of respondents (32 per cent) felt that patent lawyers would be the main beneficiaries.

The picture from the European reforms is noticeably different. Far more respondents (64 per cent, again with consistent figures when split across European or US respondents) believe the Unitary Patent and Unified Patent Court will be positive for European industry; and two thirds (67 per cent) feel the changes will go some way towards addressing the historical problem of a fragmented marketplace. This last figure is encouraging, since this has long been a major concern of industry as regards the European market. This suggests that the European reforms are addressing the needs of the industry, to some extent – although as always, the devil is in the detail, and the final outcome may not be as beneficial as the industry hopes.

Territorial issues

Our survey also asked respondents how attractive various territories are to the life sciences industry in terms of market opportunities and regulatory regimes. Although the US is by far the most attractive market, with a net attractiveness score of 81 (calculated as percentage rating it attractive or very attractive minus the percentage rating it as unattractive or very unattractive), this is closely followed by China, with a net attractiveness score of 70. This confirms the significance of China to the industry, and it will be interesting to see how this changes relative to the US and other territories in future.

There is bad news for Europe, which in contrast lags behind both the US and China with a net attractiveness score of only 57. This is comparable to several other Asian territories including India (55) and South East Asia (54). Industry focus is clearly moving away from Europe, possibly linked to Europe's continuing economic woes and the struggles to achieve a true Unitary Patent. It remains to be seen whether the single patent, Unified Court, and other developments, such as those relating to SPCs and biosimilars, will help to address the slide in Europe's fortunes.

However, the regulatory regimes in the growing Asian markets still have some way to go. Although none of the global regulatory regimes have a majority rating them as attractive, the two highest scoring territories are the US (47 per cent rating attractive or very attractive) and Europe (42 per cent). China and India have the lowest ratings, with 25 per cent and 23 per cent rating them as unattractive or very unattractive. A significant minority of respondents regards the growing Asian territories as regulatory and IP minefields (15 and 17 per cent respectively). More positively, when asked if regulatory regimes had improved or deteriorated over the last five years, China emerged as the regime that respondents see as having improved the most, scoring a net ranking of 27 (percentage of respondents saying it has improved minus percentage of respondents saying it has deteriorated). Although China clearly has some way to go on this front, the general industry feeling is that it is rapidly improving to meet global standards; and indeed this ties in with China's development in other areas.

The importance of the Asian market is confirmed by the fact that over two thirds (67 per cent) view the continent as a growing market, and nearly the same figure (66 per cent) agree that the rise of China will fundamentally transform the global life sciences industry. This transformation will include both inward investment into China, as established life sciences companies seek to sell to the market, and outward investment, as China becomes a key global R&D centre in addition to its current manufacturing significance. A majority of our respondents predict a moderate to significant increase in investment in Asia by life sciences companies across the board, from marketing, sales, and advertising (84 per cent) to production capability (80 per cent) and R&D capability (69 per cent). This movement to Asia is already happening; Merck + Co. and Novartis alone have invested a total sum (taken together) of $3.75 billion in China over the last five years, often partnering with regional or state-run Chinese companies in the process. Further discussion of the Chinese market is given in section 3 of this report.

The full survey results follow.

84%

of respondents predict an increase in investment in Asian marketing, sales and advertising

80%

of respondents predict an increase in investment in Asian production capability

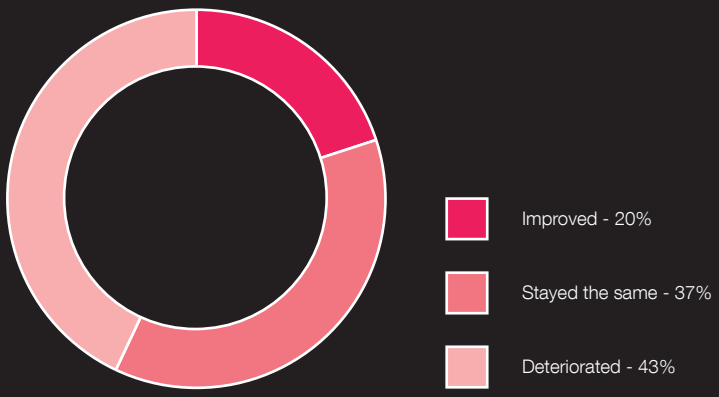
69%

of respondents predict an increase in investment in Asian R&D capability

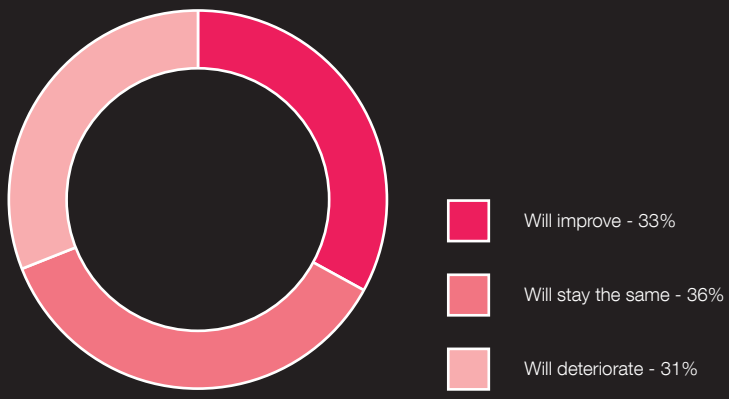
Industry research – key findings*

***Results displayed do not include respondents answering "Don't know".**

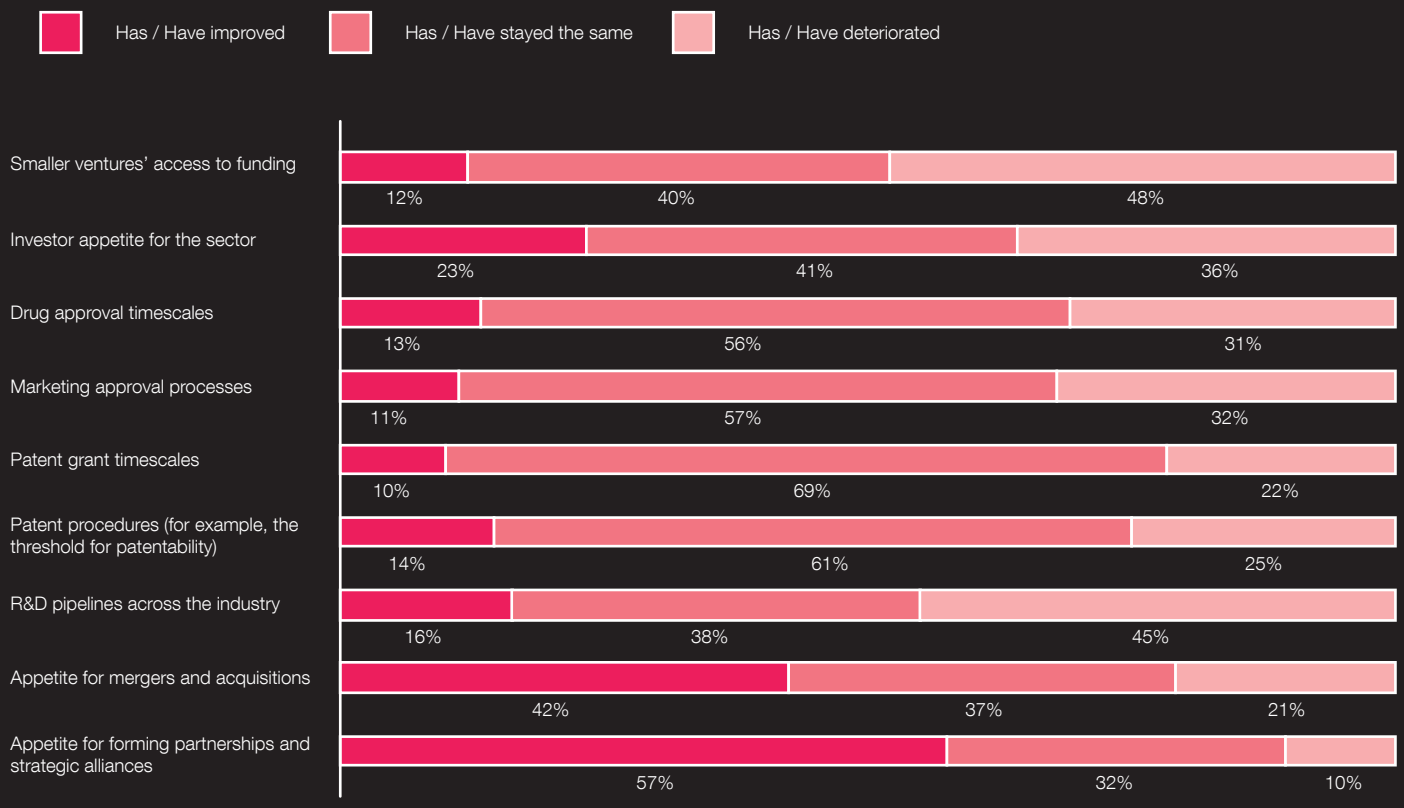
Q1 - Thinking about the overall financial climate across the life sciences sector, how do you think it has changed over the last 12 months?



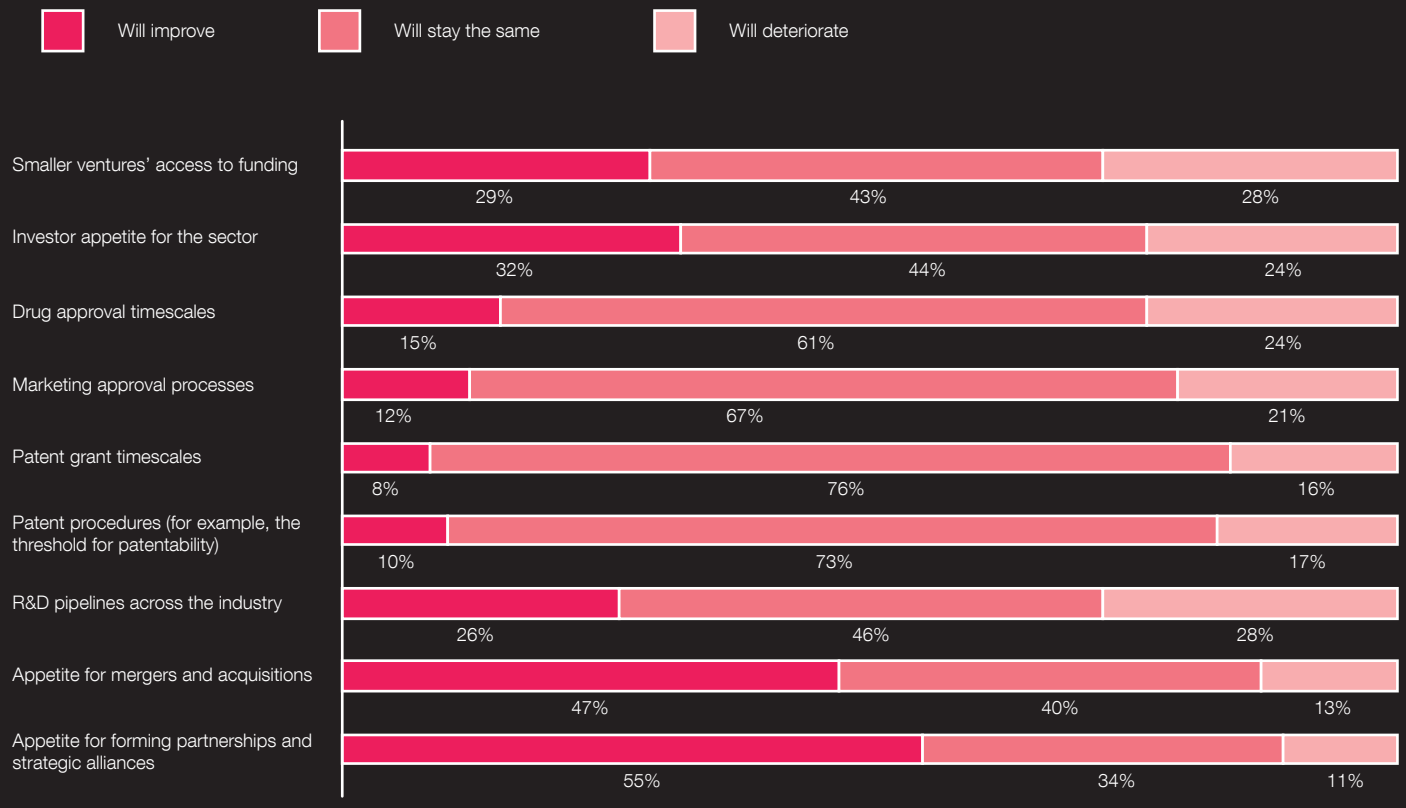
Q2 - Thinking about the overall financial climate across the life sciences sector, how do you think it will change over the next 12 months?



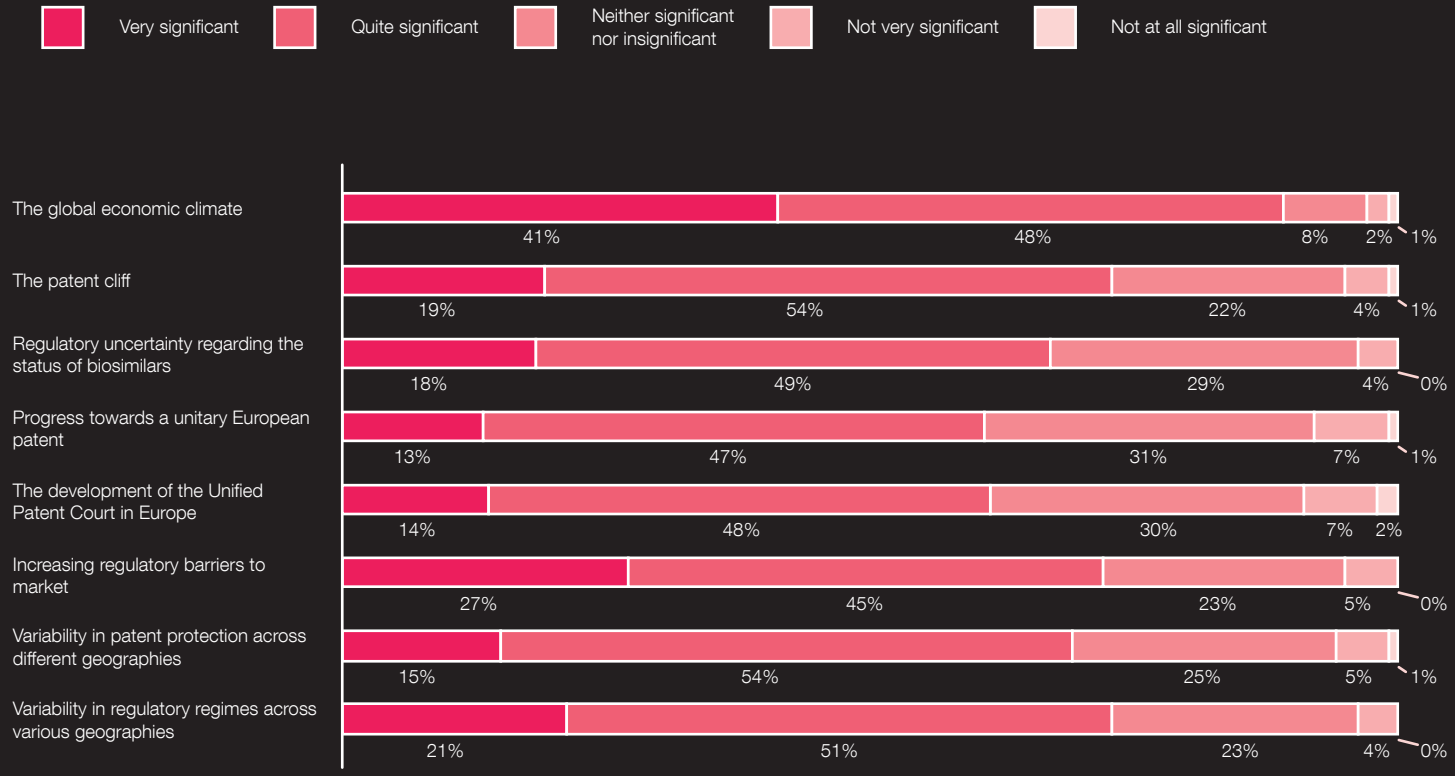
Q3 - More specifically, thinking about the following areas, how do you think they have changed over the last 12 months?



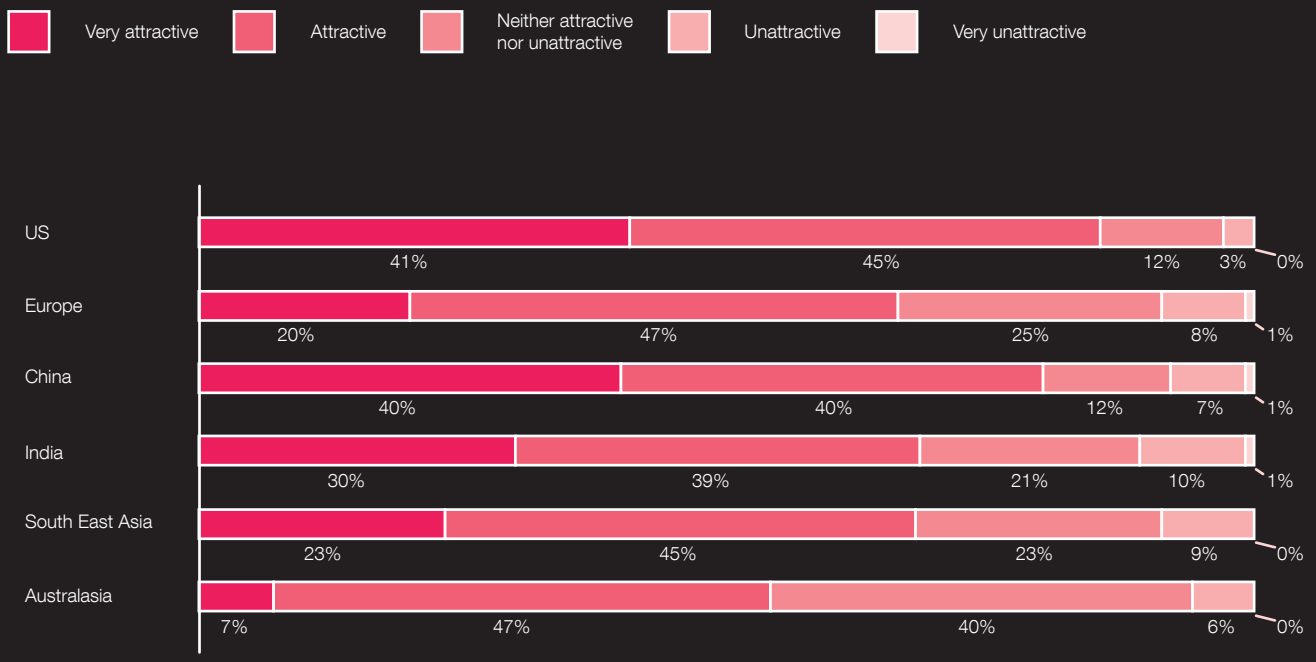
Q4 - And how do you expect these areas to change over the next 12 months?



Q5 - How significant a problem do you expect the following factors will be for the life sciences sector over the next five years?

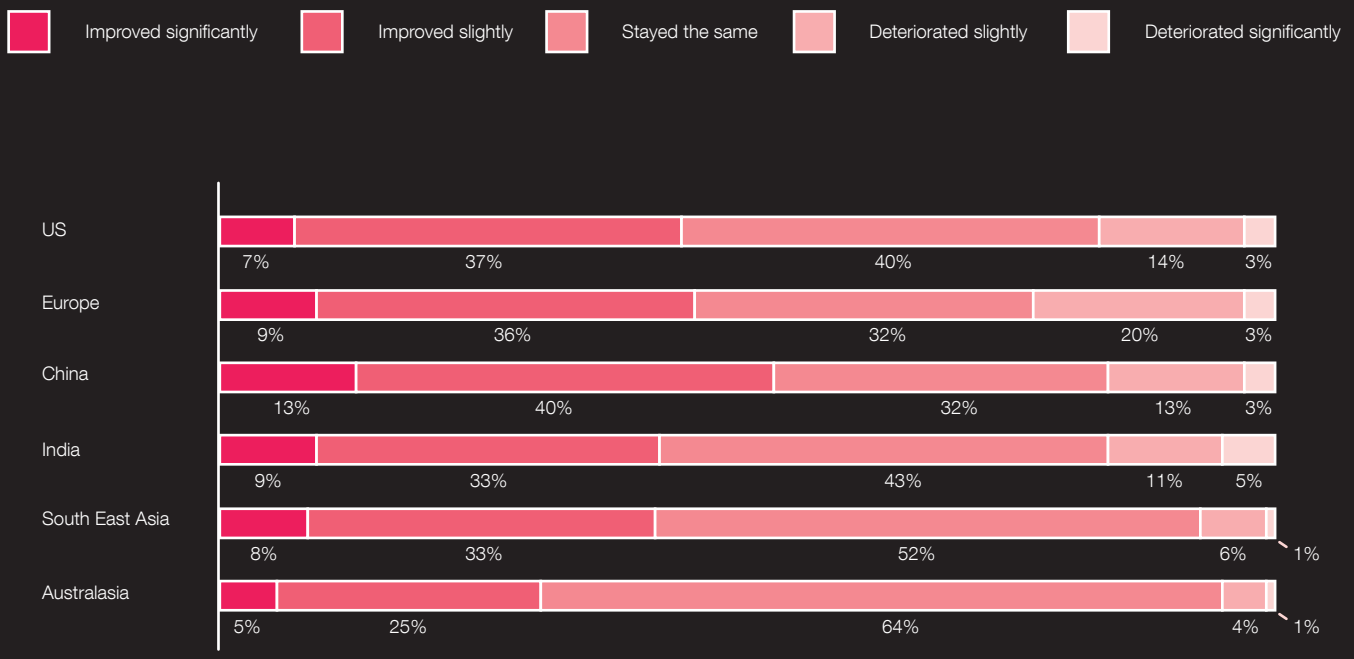


Q6 - How attractive or unattractive would you say the following territories are to life sciences companies in terms of market opportunities?

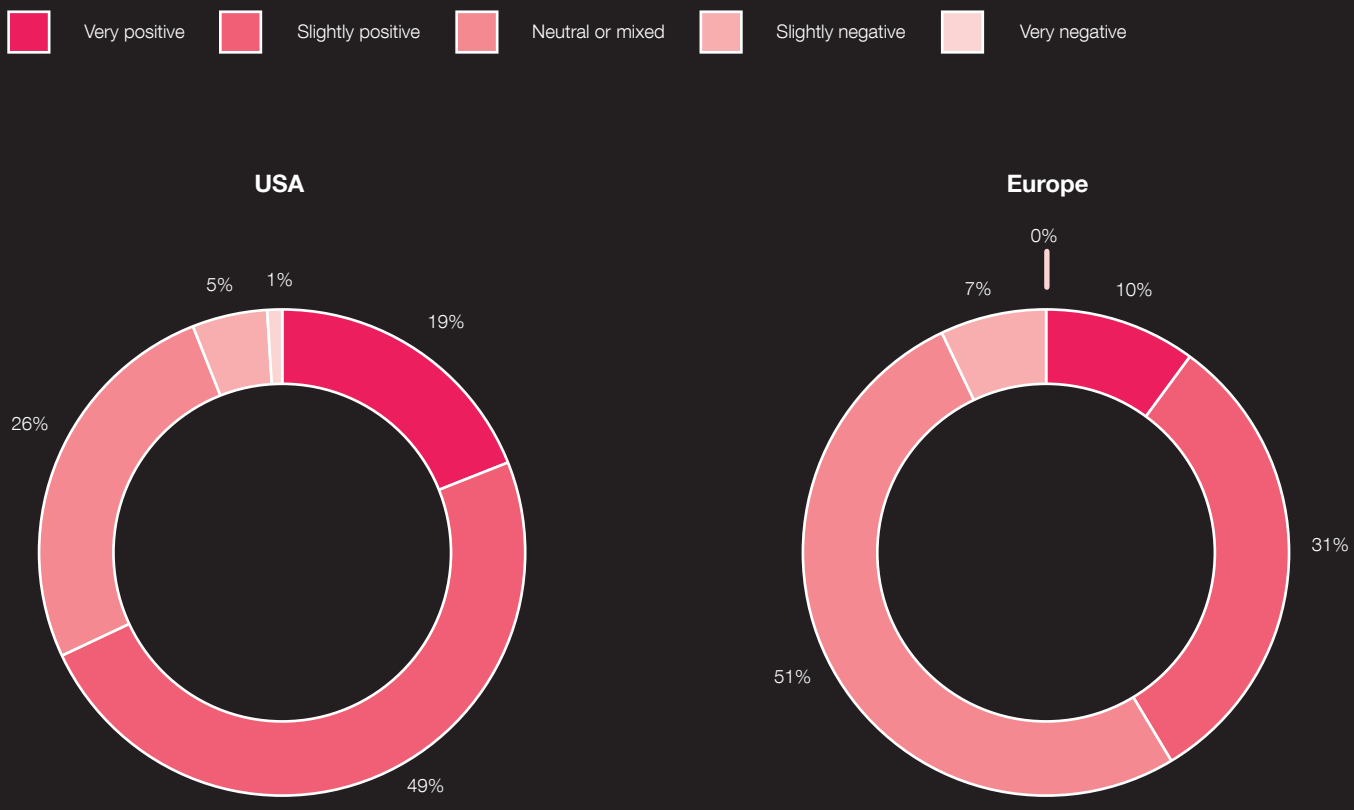


Q7 - And how attractive or unattractive would you say these territories are to life sciences companies, in terms of regulatory regimes?

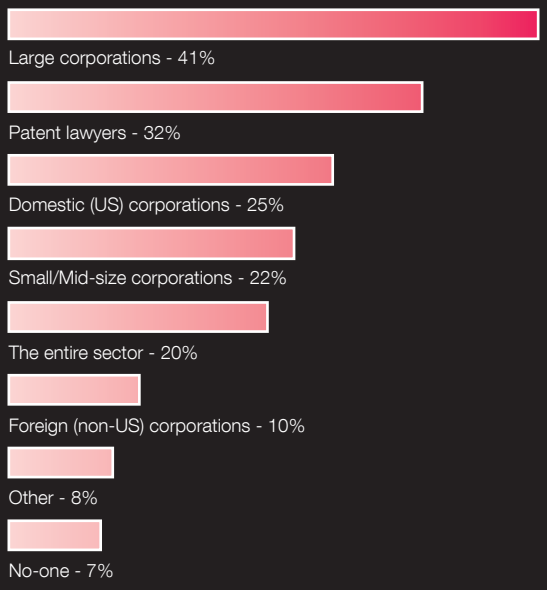
Q8 - How do you think the regulatory regimes in the following territories have changed over the last five years?



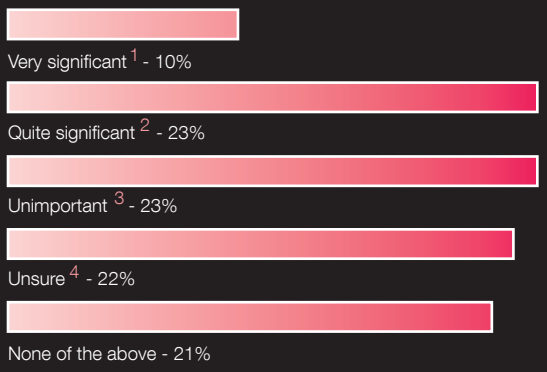
Q9 - What kind of impact do you think the America Invents Act will have on the life sciences sector in the following territories?



Q10 - Who, in your view, will be the main beneficiaries of the America Invents Act in the sector?



Q11 - The America Invents Act changes the patent filing system from the first-to-invent system to the first-inventor-to-file system. Which of the following best describes the impact this will this have on your business's patent filing strategy?



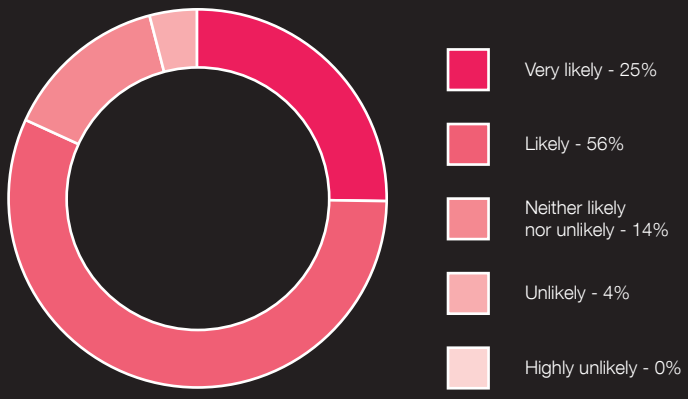
1 My organisation files patent applications on a first-to-invent basis, and so we will be changing our strategy to file applications earlier in the US.

2 My organisation uses both first-to-invent and first-to-file filing strategies to date, deciding on a case by case basis, and so we will be changing our strategy to file some applications early in the US.

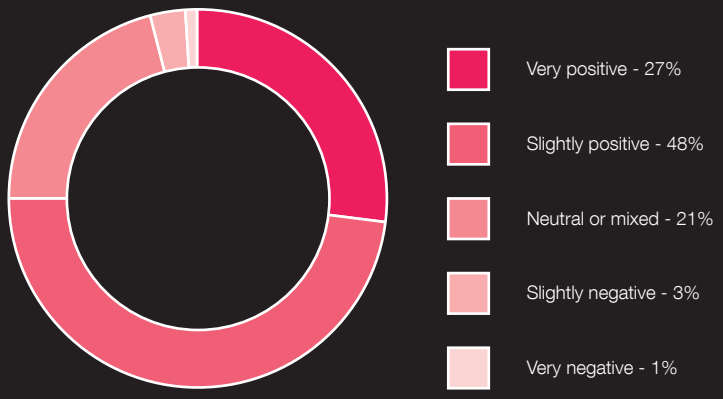
3 My organisation already files patent applications under the first-to-file system used in most parts of the world, and so it is unlikely we will change our strategy.

4 My organisation files some/all patent applications on a first-to-invent basis, but we do not yet have plans to change our strategy to file earlier.

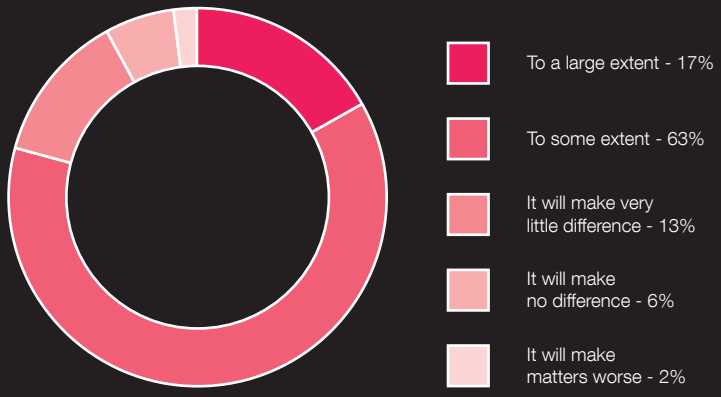
Q12 - The America Invents Act will introduce new post-grant validity review provisions similar to those in Europe. How likely or unlikely do you think it is that these provisions will be used by the life sciences industry?



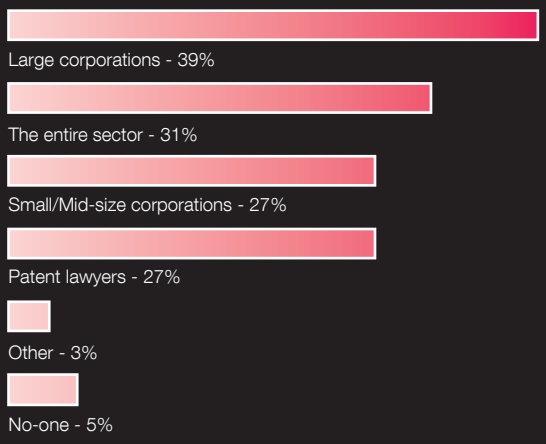
Q13 - Following many years of negotiations, European policymakers have agreed the establishment of a Unitary Patent and a Unified Patent Court. What kind of impact do you think these will have on the European life sciences industry?



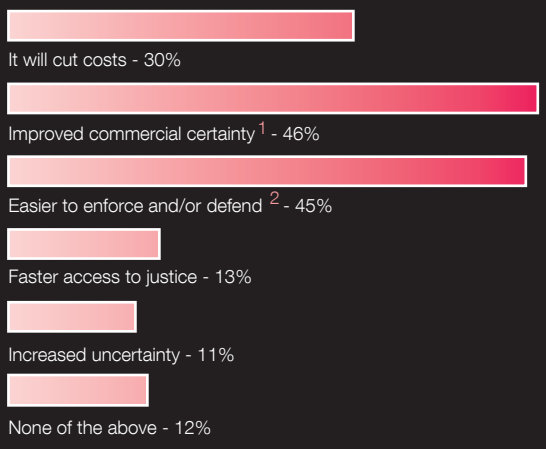
Q14 - To what extent do you think the new Unitary Patent and Unified Patent Court will address the historical problem of a fragmented European marketplace?



Q15 - Who, in your view, will be the main beneficiaries in the life sciences sector of the new Unitary Patent and Unified Patent Court?



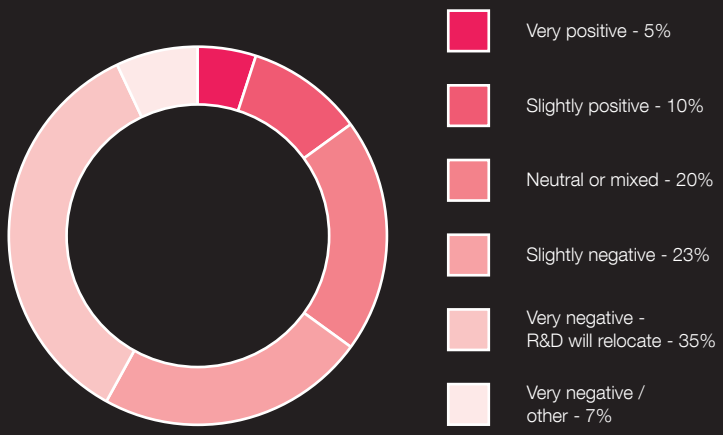
Q16 - What, in your view, will be the main outcomes for the European life sciences sector of the new Unitary Patent and Unified Patent Court?



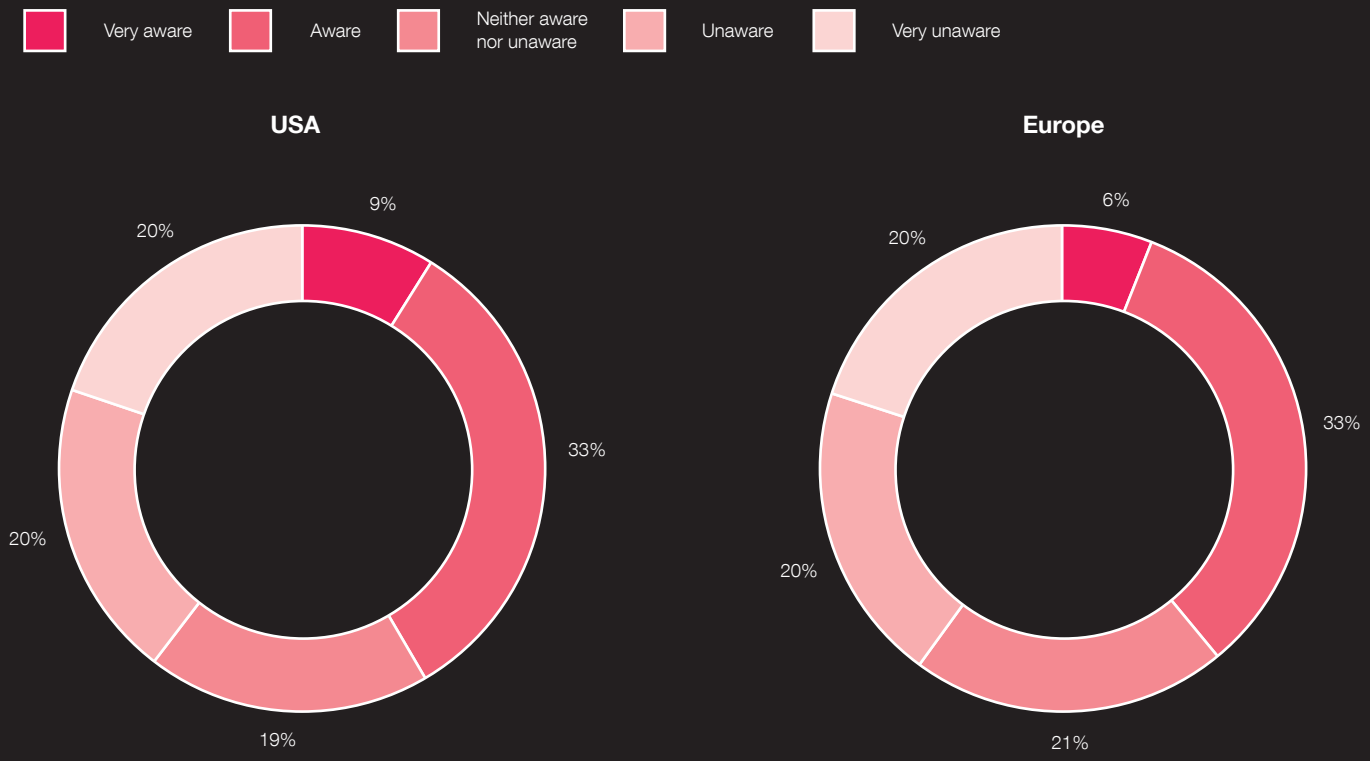
1 for companies operating in the European market

2 and/or defend patents seeking/against pan-European injunctions

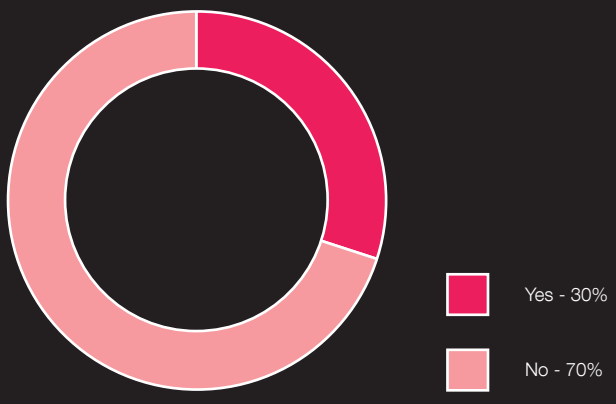
Q17 - In 2011 the Court of Justice of the European Union (CJEU) ruled that patent protection for inventions based on the use of human embryonic stem cells is forbidden under EU law. What kind of impact do you think this ruling will have on levels of research and investment in the stem cell community?



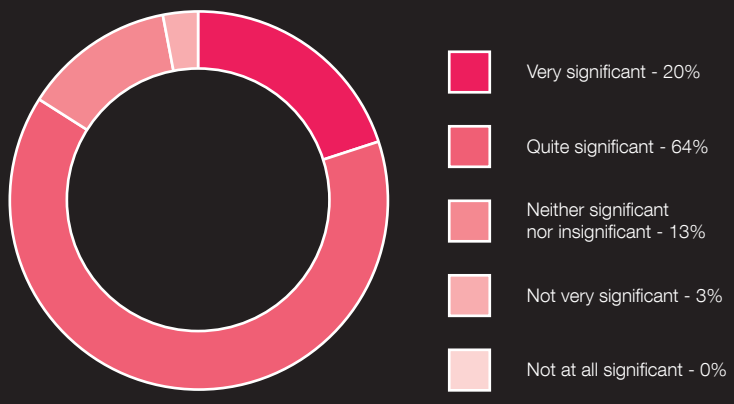
Q18 - How aware or unaware are you of the progress that is being made towards biosimilar monoclonal antibody products in the following territories?



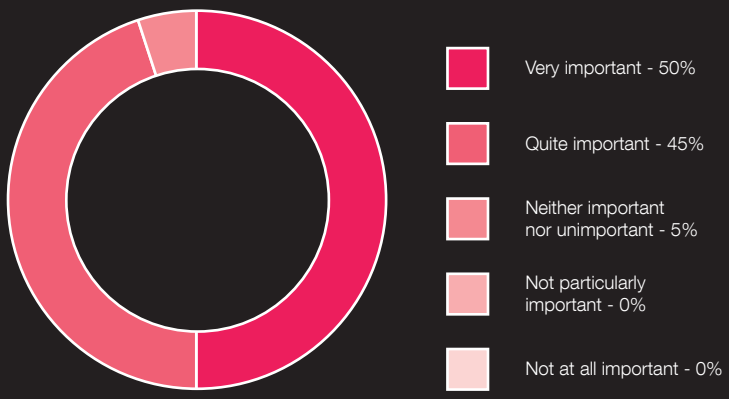
Q19 - Were you aware that two biosimilar monoclonal antibody products are currently being evaluated by the EMA for regulatory approval in Europe?



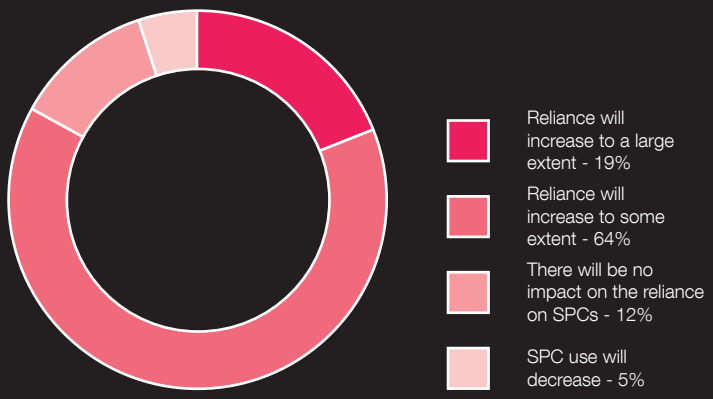
Q20 - How significant do you expect the predicted rise of biosimilar monoclonal antibody products to be, with respect to the commercial landscape of the life sciences industry?



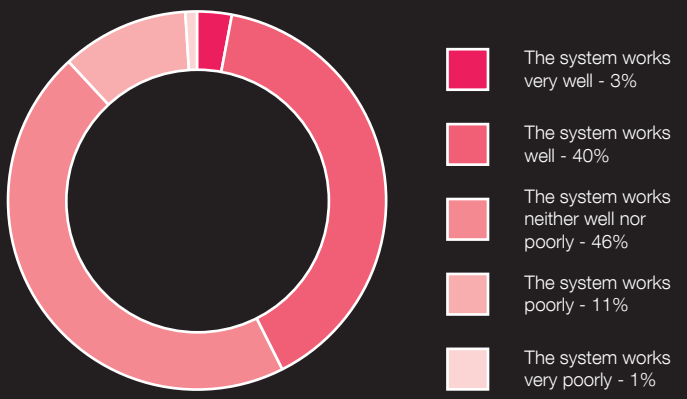
Q21 - In your opinion, how important is it to the life sciences industry that regulatory regimes establish clarity with regard to biosimilars?



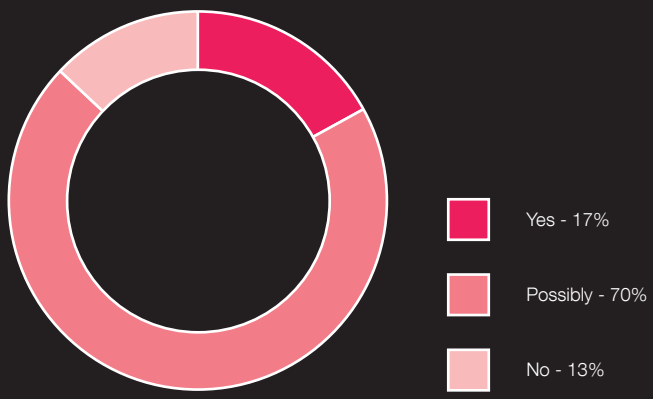
Q22 - What impact do you think dwindling pipelines will have on the reliance of the life sciences sector on SPCs (Supplementary Protection Certificates) going forward?



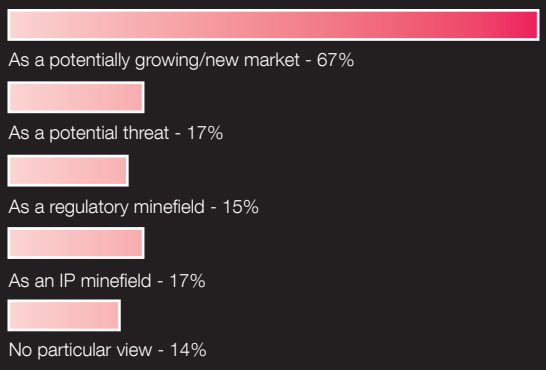
Q23 - To what extent do you think that the SPC system in Europe is fit for purpose?



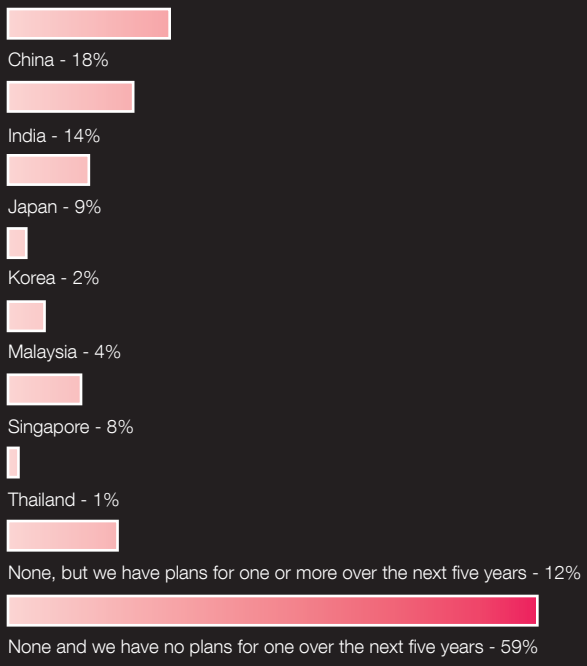
Q24 - Do you think the SPC system in Europe should be rewritten to more closely reflect the US system of patent term extensions?



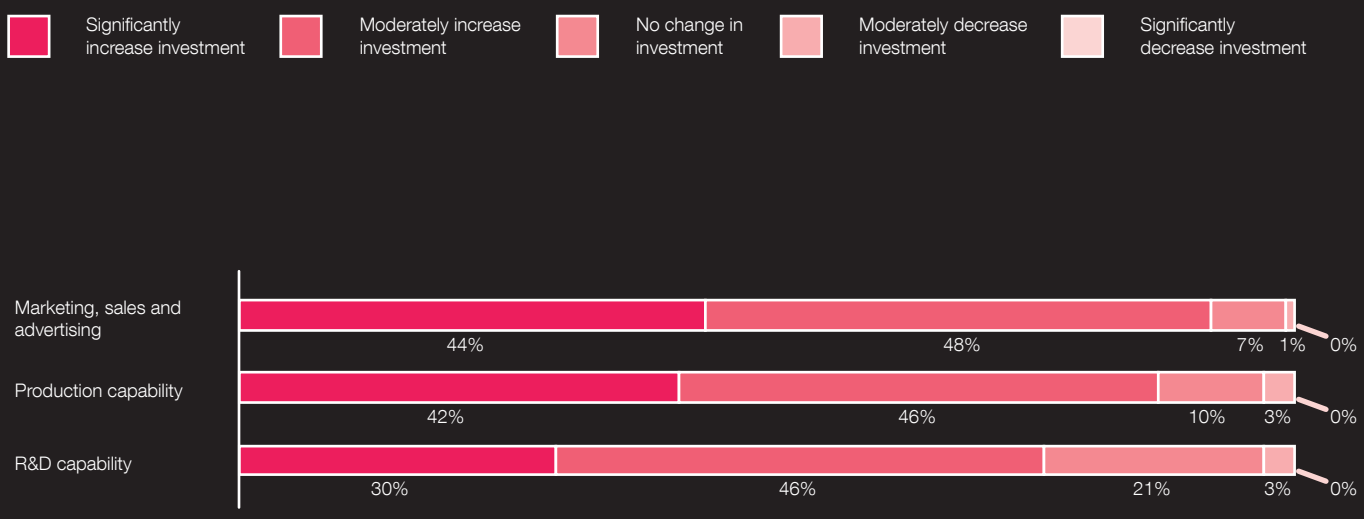
Q25 - How does your organisation view the changing economic influence of Asia?



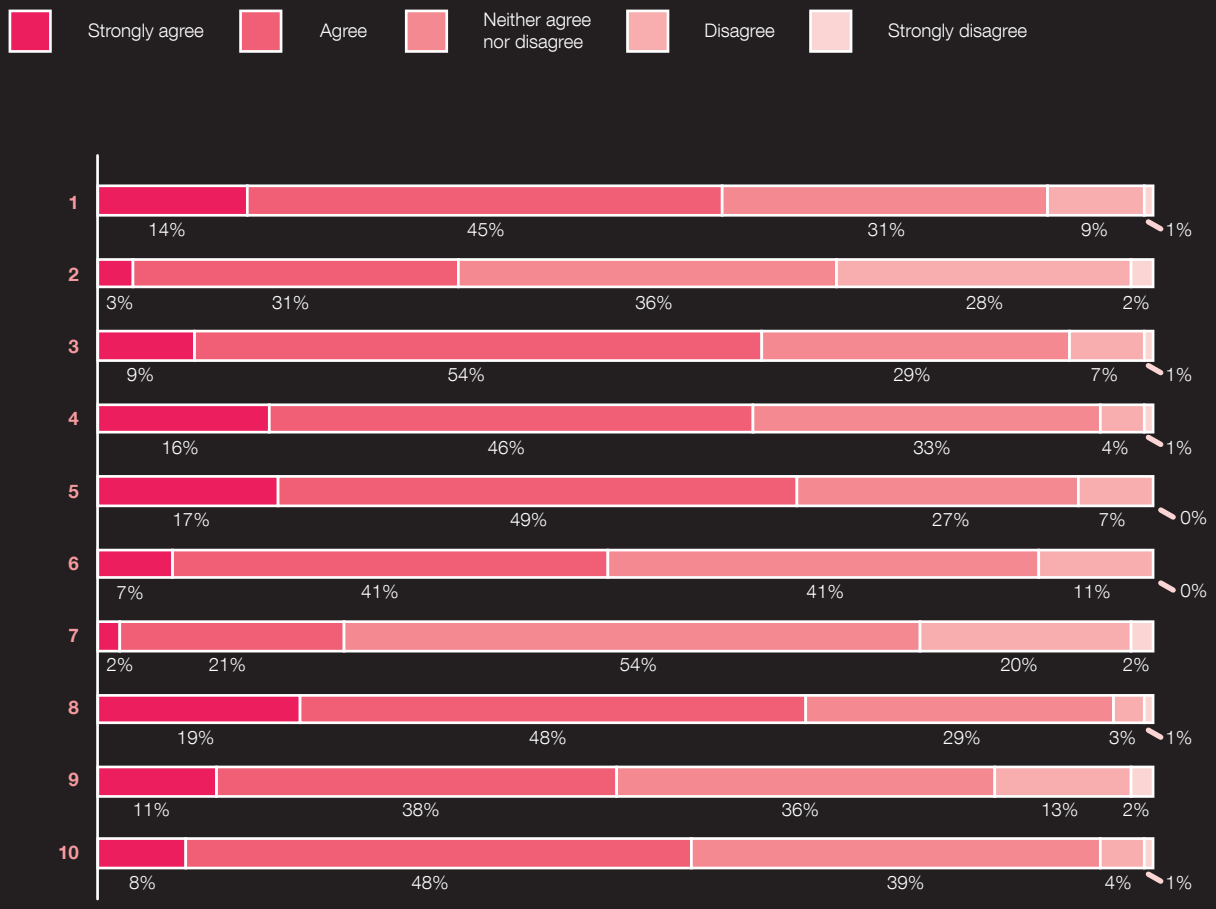
Q26 - Does your organisation have a R&D centre in any of the following Asian countries?



Q27 - How do you think the life sciences sector will adjust its investments in Asia over the next five years in the following areas?



Q28 - To what extent do you agree or disagree with the following statements?



1 Crowdsourcing and other alternative models of funding will become increasingly prevalent in and important to the life sciences sector.

2 The situation regarding funding and investment in the life sciences industry has recovered significantly following the dip in the aftermath of the financial crisis, particularly for smaller organisations.

3 We are likely to see major consolidation within the life sciences industry over the next three years.

4 The patent cliff poses a severe threat to the business models of originators, who have not done enough to replenish pipelines.

5 The rise of China will fundamentally transform the global life sciences industry.

6 Until European policymakers throw their weight behind a genuinely comprehensive unitary European patent system, Europe will fall behind global competitors such as the US.

7 The details of the new Unitary Patent system mean it is unlikely to make a significant difference, and if anything will simply increase confusion.

8 It is essential for the future of the life sciences industry that clear provisions regarding the market entry of biosimilars be established as soon as possible.

9 The CJEU ruling on stem cell patents will be disastrous for stem cell research in Europe, and will impede promising lines of medical research as well as prompting an exodus to competing markets such as the US.

10 As the patent cliff begins to bite, we will see increased usage of and litigation related to SPCs, as originators increasingly look to squeeze all possible sources of revenue.

1. The changing regulatory landscape

The America Invents Act

Over the course of 2012 and the first months of 2013 various provisions of the America Invents Act, the first substantive amendment to US patent law since 1952, have come into force. Thanks to this and developments in Europe with regard to the Unitary Patent and Unified Patent Court (covered later in this section), the US and European patent systems are becoming more and more similar in their nature, although some important conceptual differences do still exist. Whilst our survey indicates that the changes in Europe seem to be warmly welcomed, respondents' reaction to the changes brought by AIA seems to be more mixed, with 47 per cent of respondents considering the changes positive for the US life sciences industry, but only 28 per cent of respondents feeling the same for European life sciences companies.

Moving from first-to-invent to first-inventor-to-file
As has been widely reported, AIA replaces the first-to-invent system with the first-inventor-to-file (often referred to as FITF) system. The FITF system retains an element of the previously available grace period that protected patent availability from inventors' own disclosures and is intended to encourage early publication of inventions. For applicants with a filing strategy aligned with the former first-to-invent system this will inevitably mean that changes to their filing strategy have to be made. Our survey indicates that over 50 per cent of all respondents used to file at least some (23 per cent all) patent applications on a first to invent basis. Surprisingly, however, some 26 per cent of US (18 per cent of European) headquartered respondents indicated that, although they used to use base their filings on the first-to-invent system, they still had to consider how to change their filing strategy. This may be a reflection of the complexity involved in designing a filing strategy in fast moving fields that balances the often conflicting requirements of coverage, predictability and cost, with the often competitive nature of life sciences filings, with multiple groups working on related inventions. Indeed, the balancing act between being first to file an application and making sure that the invention can be sufficiently disclosed may be one reason why many respondents felt that large corporations will be the chief beneficiaries of the AIA.

US post-grant validity challenges
The introduction of post-grant validity challenges by AIA, in contrast, has caused a more buoyant response, with 63 per cent of respondents considering it likely that the industry will use these new provisions. It is these new proceedings, in combination with European developments, that have rendered the US and European systems much more alike, with post-grant proceedings for challenging the validity of a granted patent being offered both by the US Patent and Trademark Office ("USPTO"; through the new post-grant validity challenges) and the European Patent Office ("EPO"; through the long-established EPO opposition procedure). The changes to the European enforcement system (explored in more detail later) mean that infringement and validity challenges can now also be brought centrally in Europe to cover a 350 million-strong consumer market, a coverage not dissimilar to that long achieved by a US patent.

In drawing up the new US post-grant system, US legislators seem to have considered the system available in Europe and have mitigated some of its less desirable aspects. Importantly, safeguards have been put in place to allow limiting the number and type of challenges filed. In Europe opposition proceedings that may be considered frivolous have, at times, been a problem. Opponents/Challengers in Europe are, for example, not required to have a nexus with the opposed patent at all, giving rise to oppositions filed purely for the purpose of training the opponent in qualifying as a European patent attorney. The low opposition fees (€745, a long way short of the five figure US$ fees required to initiate US post-grant validity challenges) no doubt foster opposition of such nature as well as the filing of speculative and weakly substantiated oppositions. The high(er) fees for filing

22%

of respondents' organisations file some or all patent applications on a first-to-invent basis, but do not yet have plans to change their strategy to file earlier under AIA

post-grant validity challenges in the US should help prevent such problems, as should the fact that such challenges can simply be refused.

Post-grant validity challenges brought under the AIA provisions are also required (with few exceptions) to be completed speedily and are consequently poised to provide increased certainty to the parties involved.

European opposition proceedings do enjoy considerable popularity, no doubt at least partly because they do not allow patent proprietors to file counterclaims for infringement. This advantage will be preserved even after the Unified Patent Court has started operating. The positive response in our survey regarding the likely use of the AIA post-grant validity challenge opportunities suggests that this is a welcome development in the life sciences industry that may be much used. Having said this, the AIA provides a mechanism that is intended to prevent challengers from filing serial challenges to US patents. Challengers are in particular precluded from having two bites of the cherry, in that attacks may not be raised during court proceedings if this attack could reasonably have been raised during an earlier post-grant validity challenge. This is likely to be an important factor for challengers to consider when deciding whether or not to use these new provisions.

Expedited (Track 1) examination

Patent Offices around the world are blighted by sometimes very considerable examination backlogs. It is well understood that this places applicants at a commercial disadvantage. AIA has introduced an accelerated examination provision that ensures that examination of patent applications concludes within one year. Compare this to the average pendency rates in Patent Offices around the world (USPTO: 32.4 months in 2012, EPO: 44 months in 2011) and it is easy to see how these provisions can be rather attractive. While the number of patent applications that can take advantage of this program is limited to 10,000 applications (a shrewd move to prevent the system from becoming inefficient) and the fee for requesting prioritised examination is rather substantial (at $4,800 for large entities, in addition to all other fees normally payable for patent applications), gaining early certainty regarding the scope of patent protection available seems to hold considerable attraction for patent applicants, with over 1,200 requests for Track 1 examination having been filed in the first three months following the introduction of this procedure.

It will be interesting to observe the differences between Track 1 examination at the USPTO and accelerated examination at the EPO under the PACE accelerated examination program. Whilst entry to PACE requires only the filing of a simple request (without the need to pay an official fee), the time period between office actions that issue under the PACE program can vary considerably, depending on the field of technology concerned.

We are entering a period of uncertainty for the life sciences industry in both Europe and the US. However, from this review of the new US provisions, and our survey response to them, it seems that the changes in the US are broadly welcomed by industry, with the caveat that there remains some scepticism over who the chief beneficiaries will be. Indeed, it seems likely that the AIA changes will initially favour patentees who to a large extent already operate under the first-to-file system and those patentees with extensive knowledge of their competitor's research activities. It remains to be seen whether the changes will benefit smaller companies to the same extent, and indeed whether the US legislators have managed to avoid the worst pitfalls of the European system.

41%

of respondents think that large corporations will be the main beneficiaries of AIA

The Unitary Patent and Unified Patent Court

The significant reforms to the US patent system are being paralleled by similarly dramatic changes in Europe, in the form of the introduction of a European (Unitary) Patent and a Unified Patent Court.

Although our survey shows the US to be leading Europe in terms of sentiment regarding both market opportunities and the existing regulatory regimes, respondents are far more positive about the European patent reforms than they are about the AIA. Nearly two thirds (64 per cent) of respondents expect the European reforms to have a positive impact on the European life sciences industry. Over two thirds (67 per cent) feel the changes will go some way to addressing the historical problem of a fragmented marketplace.

Unprecedented progress with the Unitary Patent

19th February 2013 marked a major milestone for the Unitary Patent system, as almost all of the European Union member states signed an international agreement for the creation of the Unified Patent Court ("UPC"). It is no exaggeration to say that the UPC will be the greatest and most significant development of the European patent system for 40 years. This agreement, in conjunction with two EU regulations that were passed last December, will enable the European Patent Office to grant "unitary patents", that is, a single patent covering every country that has signed up to the agreement, rather than, as is the current practice, granting a European patent that takes effect as a bundle of national patents, one for each jurisdiction. Assuming all the current signatories ratify the agreement, this means a unitary patent will span the whole of the European Union, save for Poland and Spain. However, even if the agreement is ratified by the signatories, further objections and challenges against the European Parliament and European Commission have been made very recently by Spain filing two actions at the Court of Justice of the European Union ("CJEU") on 22nd March. Although details of the two challenges are sparse, it appears that Spain is challenging the fundamental principles upon which the Unitary Patent system is founded and, inevitably, translation arrangements. The filing of these actions will undoubtedly have a delaying, if not a profound, effect on the system. We wait to see how the cases develop.

Notwithstanding Spain's challenge, eventually the UPC will have exclusive jurisdiction over unitary patents, existing and future European patents that are in force in a participating member state (but which are not unitary) and supplementary protection certificates issued for a product protected by such patents. A decision from the UPC on infringement or validity – and associated injunctions – will then have effect Europe-wide, rather than just in a single country.

Life sciences disputes

The UPC will have a profound effect on life sciences disputes in the EU. Up to now, such disputes have been characterised by multi-jurisdictional proceedings. Victory – or defeat – in one country in no way means the end of the war. Even though the alleged infringements and the patents concerned may be identical in every respect, there is the prospect of different courts in different jurisdictions coming to different conclusions. But a decision from the UPC will be binding across all participating jurisdictions – it will no longer be possible to start new proceedings in the courts of another country in the hope of getting a different result.

67%

of respondents expect the Unitary Patent and Unified Patent Court will go some way in addressing the historical problem of a fragmented European marketplace

The UPC has a somewhat complicated structure, which is a consequence of the negotiations that preceded the political agreement. At first instance there will be a number of local and regional divisions, which will have primary responsibility for infringement proceedings. Importantly, there is also a central division, whose jurisdiction will include revocation proceedings, though revocation counterclaims may be handled by the local/regional division dealing with the related infringement proceedings. In a typical European compromise, the central division will in fact be split between three locations: London, Paris and Munich. Allocation of cases will be by patent classification. For the life sciences industry, London will be the key location, as London will be allocated all cases concerning "chemistry, metallurgy and human necessities", which encompasses all life sciences products (small molecule and biologics), medical devices and other associated equipment. (Mechanical engineering patents will go to Munich and all others will go to

Paris.) A further important feature of proceedings in the central division is that the default language of the proceedings is the language of the patent. For the vast majority of life sciences patents, this means English.

The upshot is that London is expected to become the centre for life sciences disputes in the EU, with invalidity actions in particular being heard in London, and nearly always in English, though it will always be possible to commence infringement proceedings in other jurisdictions.

Looking ahead

In our survey, just under half of respondents feel the UPC will improve commercial certainty and make it easier to enforce/defend against pan-European injunctions (46 per cent and 45 per cent respectively). Ultimately the Unitary Patent and UPC should indeed bring greater certainty for litigants and the possibility of resolving disputes through one set of proceedings, rather than many, should reduce litigation costs. In the short term there may in fact be greater uncertainty, as the new court gets up to speed and litigants explore and learn the approaches taken by the various local, regional and central divisions to the exercise of their new powers. Transitional proceedings mean that the existing system of national enforcement of European patents will continue for at least seven years. In particular, holders of (non-unitary) European patents will be able to opt out of the jurisdiction of the UPC during this period, provided this is done before any proceedings are brought at the UPC in respect of that patent.

A great deal of work still needs to be done. The divisions of the UPC have to be established, judges appointed and trained, a secretariat staffed, IT systems installed and rules of procedure finalised. The earliest date on which the European Patent Office can grant unitary patents is 1st January 2014 but it is likely that it will take longer than this for ratification of the agreement to be completed and for the necessary administrative machinery to be in place. In the light of Spain's challenge as well, there may be yet further delays. Nevertheless, all European life sciences patent holders need to start preparing for the new legal landscape, in particular by deciding whether to opt out of the UPC system under the transitional regime and whether to seek European (unitary or non-unitary) or national patent protection for future inventions.

46%

of respondents conceive that the Unitary Patent and Unified Patent Court will improve commercial certainty

45%

of respondents think that the Unitary Patent and Unified Patent Court will make it easier to enforce and/or defend patents seeking/against pan-European injunctions

30%

of respondents believe that the Unitary Patent and Unified Patent Court will cut costs

2. Getting therapies to the patient

Biosimilars

It is fair to say that there has been, and continues to be, an understandable concern from biotech and pharma companies alike about the threat of biosimilars to existing biologic therapeutic products. The products that are considered to be most under threat are the leading monoclonal antibody therapeutics which have had phenomenal success in the market place.

Biosimilar precedents
However, biosimilars therapeutics are not new – at least, they are not new in Europe. The first biosimilar to receive approval by the then EMEA was for Omnitrope (somatropin) in 2006. The regulatory approval, which proceeded under the abridged mechanism, took some 651 days. Other biosimilar products that have received more recent abridged approval in Europe include EPO alpha and EPO zeta and Filgrastim. The time for approval for these later biosimilars was between 538 and 596 days.

As will be apparent, none of these products are large macromolecules of the size or complexity of monoclonal antibodies. Indeed, the question to be answered is: what is the current state of the biosimilar landscape when it comes to such products both in Europe and in the US?

Awareness, concern and certainty
It is interesting to note that despite the hype about the current threat of biosimilar activity there are currently only two monoclonal antibody products that are actively under examination by the EMA. Both products are biosimilars of infliximab and at least one of the products is Celltrion's Remsima. Remsima has already received marketing authorisation in South Korea.

Our survey highlighted that there is generally very little awareness of the status of biosimilars. There is a fairly even divide between those who are aware and unaware of the progress that is being made towards biosimilar monoclonal antibody products in both Europe and USA. 38 per cent consider themselves aware of the progress in Europe whereas 40 per cent are unaware; 42 per cent said they aware of the progress in the US compared to 39 per cent who are not aware. A large proportion (70 per cent) said they were not aware that two biosimilar monoclonal antibody products are currently being evaluated by the EMA for regulatory approval in Europe.

However, the route to authorisation in Europe remains uncertain. The position is even more uncertain in the US, which was some way behind Europe in putting procedures in place that would enable any form of abridged approval to apply to biologic therapies. There are many sceptics who are concerned about whether biosimilar monoclonal antibodies that have not gone through the raft of clinical studies that the referenced product did will perform and be safe in patients. There is a real need for regulators to establish clearly defined boundaries for what will and what will not fall the right side of the line when it comes to bioequivalence.

2

the number of monoclonal antibody products actively under examination by the EMA

The results of our survey confirm this view. 63 per cent of those surveyed overall expect the predicted rise of biosimilar monoclonal antibody products to be significant in respect to the commercial landscape of the life sciences industry. However, 84 per cent feel it is important to the life sciences industry that regulatory regimes establish clarity with regard to biosimilars.

There is little doubt that biosimilars will be a major threat and challenge to originator companies in the future. The uncertainties as regards both the necessary regulatory hurdles and the uncertainties concerning SPCs and IP protection will do nothing but fuel the concerns and anxieties alike. While the current threat may be considered to be low with the number of products actively seeking approval limited to two, there is absolutely no doubt that companies must at this early stage be on their guard to assess how their assets can be best protected in what will be furious and critical battles.

SPCs

Complexities and uncertainties surrounding the SPC system

Many readers will be familiar with the EU-wide Supplementary Protection Certificate ("SPC") system. The system is intended to encourage innovation and compensate proprietors of patents for medicinal products for the erosion of patent term caused by the lengthy periods required to obtain regulatory approval to put the product on the market. SPCs can provide up to five years' additional protection and, given current financial limitations and dwindling pipelines, they are of huge commercial importance to pharmaceutical companies.

However, the legal framework under which SPCs are granted is complex. It was intended to provide a harmonised system across Europe. However, because SPCs are applied for and granted on a national basis, in practice this has resulted in local patent offices and courts differing in their interpretation of the legislation. These differences have frustrated pharmaceutical companies and practitioners alike, with a number of cases being referred to the CJEU for clarification on how the law should be interpreted. Instead of leading to clarity as hoped, the CJEU's decisions have only increased uncertainty, resulting in many questioning whether the SPC regime is fit for purpose.

Indeed, in a recent decision (*GSK Biologicals v the UK IPO*) handed down on 21 March 2013 by one of the UK's leading patents judges, Mr Justice Arnold, the judge said:

> *Finally, I would observe that this is the third time in six months that I have had to refer questions of interpretation of the SPC Regulation to the CJEU. I do so with considerable regret. That this should be necessary demonstrates the dysfunctional state of the SPC system at present. This is primarily due to the poor drafting of the SPC Regulation and to the failure of the European Commission, Council and Parliament to revise it to address the problems which have emerged. Matters have not been assisted, however, by the fact that the Court of Justice's recent case law interpreting the SPC Regulation has not provided the level of clarity and consistency that is required.*

The CJEU's involvement

The CJEU's recent case law to which the judge was referring to started with the *Medeva* case in 2011. This was a referral from the UK Court of Appeal, following the refusal of the UK Intellectual Property Office ("IPO") and High Court to grant SPCs for combination vaccines, where only some of the active ingredients were strictly "protected" by the patent in question. Prior to the CJEU's decision, many commentators had advocated an "infringement test", where an SPC should be granted if the product would be held to infringe the patent. For example, in the case of a combination product, the combination would "infringe" due to the presence of the patented active ingredient (A), and not the combination (A+B) per se. To the dismay of many in the industry, the CJEU took a narrow view, and held in the *Medeva* case (and indeed in four other cases that followed) that the correct approach was whether the active ingredients were "specified or identified in the wording of the claims of the basic patent". Many had hoped that *Medeva* would clarify matters, but the decision has been widely criticised, in particular by UK patent judges, for failing to provide proper guidance as to the test that must be applied in determining whether a product is "specified or identified in the wording of the claims". In a further reference from the UK (*Actavis v Sanofi Pharma*), Mr Justice Arnold made it clear that the CJEU did not provide enough clarity for the courts to determine what the appropriate test is, and has sought further guidance on this point. It will be interesting to see how the CJEU tackles this and whether it is willing to put its head above the parapet and set a clear test.

However, the fall-out from *Medeva* has been much wider than this. Following the case of *Biogen* in 1997, it was a long accepted principle that the SPC legislation permitted the granting of one SPC per product per patent. To great surprise, in *Medeva* the CJEU appeared to interpret *Biogen* as meaning that only one SPC can be granted per patent. Clearly, this apparent narrowing of the law is of great concern to life sciences companies, and there is some doubt over whether it is now permissible to obtain SPCs on multiple products protected by the same patent. Reactions across Europe have differed, leading to further divergence in the application of the SPC legislation. For example, the UK IPO and

Swedish Patent Office have indicated that their practice will not change and that they will continue to permit the granting of one SPC per product per patent. However, the Dutch IPO has refused to issue multiple SPCs on a single patent following *Medeva*. Both the Dutch IPO (*Georgetown*) and the UK High Court (*Actavis v Sanofi*) have now sought further clarification from the CJEU, and it is hoped that this issue will be resolved in the course of the next 12 months.

This apparent narrowing of the SPC system is, however, not the only uncertainty in this important area of law at the present time. Confusingly, in some respects, the legislation has been broadened. For many years, it was generally thought that an SPC would not be granted if the active ingredient in question had been authorised in an earlier marketing authorisation within the EU, even if the earlier authorisation related to a different use in a different species. In the case of *Neurim*, the UK IPO and High Court had refused to grant an SPC for a product that had previously been authorised for use in sheep. The CJEU held, however, that an SPC was in fact permissible for the same product which was authorised for a different use in humans. The positive outcome of this decision is that it clearly incentivises companies to look at new uses of previously authorised active ingredients. However, the CJEU yet again failed to formulate a test of general applicability and it is unclear whether the same outcome would be reached if the previous marketing authorisation had related to human use. It is likely that another reference will be required to fully clarify this issue.

The willingness of life sciences companies to take cases to the CJEU demonstrates the increasing importance of the SPC regime. This is supported by the results of our survey, where more than 50 per cent of respondents believe that dwindling pipelines will increase the reliance of the life sciences sector on SPCs going forward. However, the uncertainties arising out of the recent CJEU decisions raise the question: is the current SPC regime fit for purpose? In the light of Mr Justice Arnold's recent statements, not only is it telling, but it is also highly appropriate that only one in five respondents to our survey believe that the current system works well. One could argue that the CJEU's willingness to allow Neurim's SPC demonstrates to some extent that the SPC regime is flexible enough to deal with such situations, and so is fit for purpose. However, this is not something that should, at considerable cost, have required the guidance of the CJEU. Further, in both *Medeva* and *Neurim*, the CJEU struggled to formulate a one-size-fits-all test that can be applied in a simple manner to all cases. As a result, unless future cases are factually identical to those which have gone before, it is difficult to see how the principles will be easily applied in the future and further references to the CJEU are likely to be required. At present, practitioners and companies are completely in the dark as to whether, in a particular scenario, an SPC will be granted for their products, be it a combination product or a product which contains previously authorised active ingredients or otherwise. This cannot have been what the legislators had in mind when the system was devised.

In view of all of these concerns, the question remains as to whether the SPC regime should be replaced by something that is better fit for purpose in this day and age. 70 per cent of respondents to our survey think that consideration should be given to whether the system should be rewritten to more closely reflect the US system of patent term extensions.

53%

of respondents predict that dwindling pipelines will increase the reliance of the life sciences sector on SPCs

The future

An interesting consideration is how SPCs will be incorporated into the proposed Unitary Patent system. It would be a major disincentive for life sciences companies to seek a unitary patent if it would not provide a basis for an SPC. What is more, the Unitary Patent Regulation is currently being developed on the basis of enhanced cooperation between all member states except Spain and Poland. Any proposal for SPCs for unitary patents would not presently extend to these jurisdictions, which is concerning, given the importance of these jurisdictions for the life sciences sector. The proposals for the Unitary Patent system are currently being negotiated and are subject to further revision, but clearly this will be monitored by the life sciences industry and IP professionals alike.

It seems that 2013 will be just as eventful for those with an interest in SPCs as 2012 – and the series of pending referrals is perhaps further evidence that the SPC system is, fundamentally, broken. Industry requires greater certainty than that offered now by the SPC Regulation, but it is doubtful that there is the political will to tackle the possibly controversial subject of extending patent term on medicinal products. We await further developments in the SPC arena with bated breath.

Personalised medicine / Stem cells

Personalised medicine, being the identification of individuals responsive to certain treatments or at risk of developing certain disease conditions, is one of the most exciting and fast-developing fields in the life sciences. Patent claims have tended to be directed towards isolated or purified DNA, or methods and kits based around biomarkers. Similarly, stem cell technology is also moving forward at a great pace. Both areas have attracted a considerable amount of controversy, and political and judicial intervention, but also deliver (or at least promise) a great number of benefits. In stem cell technology, there has been recognition at the Nobel Prize level and some successful experimental treatments. In terms of treatments and commercialisation, personalised medicine is further ahead. Both are politically sensitive and subject to divergent approaches to what is patentable on each side of the Atlantic.

Diagnostics – Biomarkers

Diagnostics in the field of personalised medicine primarily revolve around tests for biomarkers to determine whether a particular individual is likely (or not) to benefit or suffer serious side effects from administration of a particular drug, or be at risk of developing a particular type of disease. Classic examples include determining the likelihood of a patient suffering complications from administration of the blood-thinner Warfarin or determining the presence of biomarkers such as proteins or single nucleotide polymorphisms ("SNPs") that are linked to diseases like breast cancer. Improved treatment and patient safety are obvious benefits of this, but in the case of determining responsiveness to certain drugs, more effective treatments can be made by largely eliminating the prescription of drugs that may have little or no effect on a particular individual (the majority of drugs only working in a proportion of the population). There are also cost savings to be made by targeted treatment of this kind.

In Europe, the patent position is fairly clear with respect to methods in personalised medicine, such as those for determining the likelihood of a patient being responsive to a particular drug for rheumatoid arthritis ("RA"). In general, provided that the step of taking a sample from the patient is excluded from the claim, these inventions are not inherently excluded from patentability (although considerations of novelty, inventive step and so forth apply as usual). Essentially, this means that methods and kits for such tests can be patented, provided that they are essentially in vitro.

In the US, the *Prometheus* decision has effectively ruled out corresponding claims, the US Supreme Court ruling that previously allowable claims were so broad as to be patent-ineligible, covering as they did "all applications" of what was deemed to be a "natural correlation." This approach has since been applied in *Perkin-Elmer*. This is not to say that all is lost, as the exclusion from patentability can be addressed by limitation of the claims to a "practical application" of said "natural correlation". In practice, this is likely to require a significant limitation of the claims. In the case of, for instance, an invention based on assaying for a protein biomarker, the means for identifying that biomarker may be an antibody. This ruling seems to require that the claims are limited to a specific (i.e. named) antibody than general wording such as an "antibody specific for said biomarker". Another way around the exclusion is to include a "transforming step" (i.e. treatment step) in accordance with the "machine or transformation" test. This latter option effectively means rewording the claim into a method of diagnosis and treatment, for instance, comprising the steps of assaying for the presence of a biomarker, correlating the presence of the biomarker with a particular disease state, and then treating said disease based on that prediction. For instance, a claim directed to a method of immunising a mammal comprising screening, identifying, comparing and then immunising was found to be patent-eligible (i.e. not excluded) in the *Classen* case.

This leaves applicants seeking protection in the US with little option but to make significant limitations to their claims, either to narrow down to particular detecting means (such as antibodies) or to include method of treatment steps (following the above examples).

DNA inventions

The ongoing saga of the *Myriad* patents has also thrown into doubt the patentability of "isolated (or purified) DNA" despite the USPTO having sanctioned the patentability of isolated/purified DNA for over a decade. This was overturned but, at the time of writing, Myriad had recently submitted its responsive brief for consideration by the US Supreme Court, so this could all change.

The corresponding position in Europe for DNA claims is that DNA is not excluded from patentability, although the body of prior art is now much fuller following the publication of the Human Genome and subsequent investigations. Further, the European Patent Convention ("EPC") requires that "the industrial application" of a gene "must be disclosed in the patent application".

Divergence

If the US Supreme Court does find that isolated DNA sequences are patent-ineligible, this would leave us with divergent patenting landscapes in US and Europe for personalised medicine. In Europe, claims can be directed to isolated DNA per se, and to in-vitro testing methods or kits. In the US, isolated DNA is in doubt, and methods or kits for use in personalised medicine need to be significantly restricted to, for instance, named antibodies or to combined methods of diagnosing and treating.

Stem cells

The position on both sides of the Atlantic with respect to stem cells is even more complicated: in addition to some uncertainty surrounding patent eligibility, there are also bans in place on Government funding for therapeutic cloning at the Federal (EU/US) and the State (US) or National level (Europe). Therapeutic cloning is, for example, the use of stem cells for research into and treatment of degenerative diseases. It is a complex situation, but it is safe to say that this field is highly regulated and highly politicised.

Within Europe, the UK and Sweden are strongly in favour of research into therapeutic cloning, whilst Germany has a much stricter regulatory approach. In addition to this, the highest court in Europe (the CJEU) has ruled in the recent *Brüstle* case that stem cell lines that were created involving the destruction of human embryos are excluded from patentability. The EPO and national courts are fairly consistent in their approaches, in particular excluding from patentability any stem cell line produced after a certain date (although that date does vary between countries).

Following President Obama's reversal of President Bush's blanket ban on the Federal funding of stem cell research, things are now looking more positive in the US, although certain states do have blanket bans on any research into therapeutic cloning. To date, however, the debate in the US has seemed to focus more on the political side (funding or regulation) than the judicial (patentability).

Returning to Europe, the majority of respondents to our survey think that the CJEU decision on the patentability on human embryonic stem cells ("hES cells") is likely to have a negative impact on levels of research and investment in the stem cell community, with 29 per cent going as far as saying it will force R&D abroad, which is clearly concerning. From a UK standpoint, this is particularly distressing given the UK's pioneering work in this field, initiated back in the 1970s with the birth of the world's first IVF child, Louise Brown, in the northern English town of Oldham, and the 2012 announcement that existing centres were to be combined into a single Wellcome Trust-MRC Institute in Cambridge, England.

Fortunately, there is less divergence across the Atlantic in terms of patentability of stem cells, with instead a great deal of heterogeneity within those two jurisdictions in terms of Government funding and regulation.

Commercial strategies

The overall situation over the last decade or so has been fairly fluid, but perhaps two positives can be taken from a snapshot of the current position. The first is that, although upsetting the apple-cart and hardly speaking in the clearest terms, the highest courts in the US and Europe have pronounced, or will soon pronounce, on diagnostic methods in personalised medicine, isolated DNA and the patentability of human embryonic stem cells, which will provide some degree of certainty in these fields.

New technology

Perhaps more encouraging for those willing to refresh their IP portfolios is that advances in technology may, in time, make the claims at issue irrelevant or outdated. The development of induced pluripotent stem cells ("iPS cells") as recently recognised by the Nobel Institute in awarding their prize to Shinya Yamanaka and James Gurdon, takes us away from embryos and this may mean that the ban on therapeutic cloning is lifted or should at least allow research and patents to navigate around any exclusion in respect of human embryonic stem cells.

With regard to the *Myriad* cases in the US, if the Supreme Court upholds an exclusion to isolated/purified DNA, then the rapid development of whole genome sequencing may render this type of claims largely irrelevant anyway.

New law

Patentees will also welcome the US Federal Circuit decision in *Akamai* which broadens the net when asserting infringement by no longer requiring a single actor to be liable for direct infringement. This is, however, still awaiting approval in the form of cert from the Supreme Court, but if upheld, could have huge implications for a number of industries. For methods and kits in the personalised medicine field affected by the *Prometheus* decision, *Akamai* may mean that including method of treatment steps does not necessarily render claims as hard to enforce in the US as previously thought.

Whilst Europe may not have a decision equivalent to *Akamai*, this is perhaps less of an issue given that in-vitro personalised medicine testing methods are, in general, patentable, so there is no need to bring in a method of treatment step. Indeed, such would not be advisable given the general exclusion to methods of treatment per se in Europe, and the anticipated tightening up of the EPO's approach to the use of the second medical use claim format used by European practitioners in place of method of treatment wording.

Although there is a greater harmonisation across the field of stem cells in terms of patent eligibility, there are significantly diverging positions between the US and Europe in respect of personalised medicine, due to significant changes in the US law being made at the highest level over the last few years. However, all hope has not been lost just yet in the US as the *Akamai* decision offers comfort to applicants and patentees forced to include method of treatment steps into their diagnostic claims. In general, advances in technology may render irrelevant the exclusion of isolated DNA from patentability. The same also holds true for human embryonic stem cells which may be surpassed by induced pluripotent stem cell technology.

If personalised medicine claims do become much narrower, particularly in the US, this will open up the patenting landscape, so patentees should look to expand their IP portfolio to take account of narrower patents being granted and to further develop their pipeline. This may, in time, lead to benefits such as reducing an over-reliance on only one or two patents and the resulting "patent cliffs" that follow from their expiry.

29%

of respondents believe that the CJEU decision on the patentability of hES cells will force R&D to relocate

3. The competitive landscape – Focus on Asia

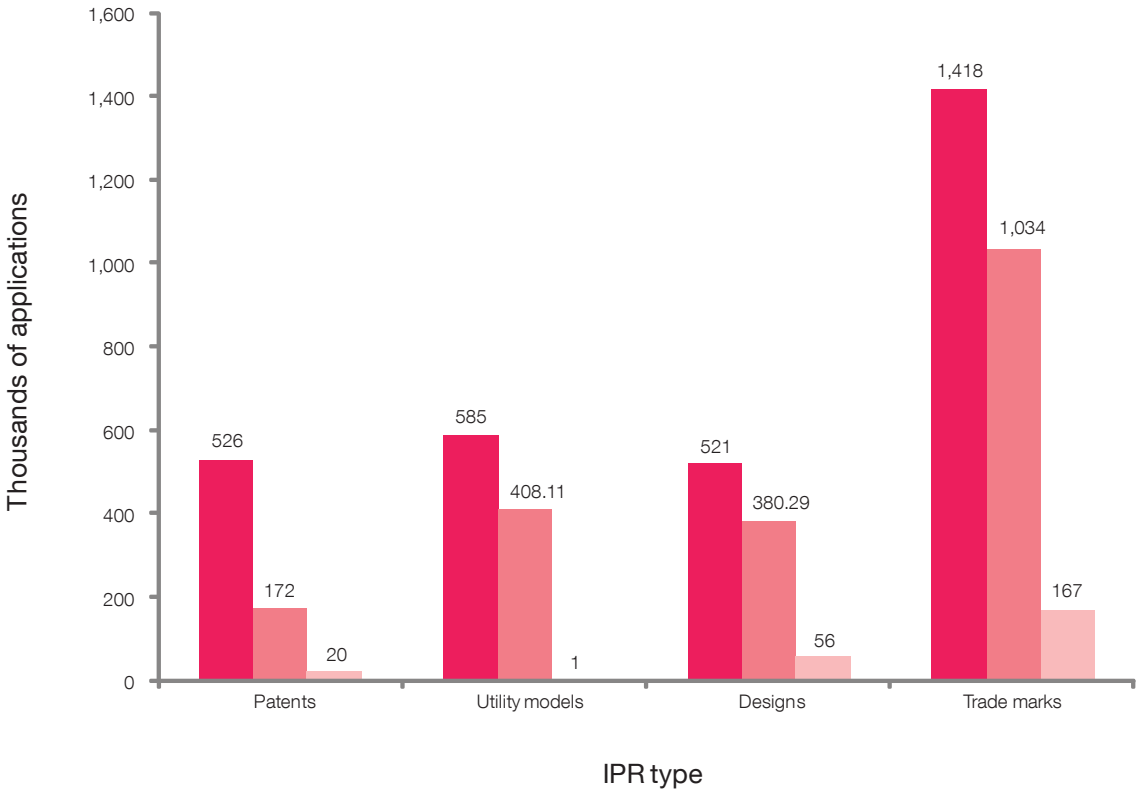
Over two thirds (67 per cent) of respondents to this year's survey indicated that they believe Asia to be a potentially growing/new market. And, looking ahead, 84 per cent expect to increase their Asian marketing, sales and advertising investments over the next five years and four out of five feel Asia will increase in production capability. The industry is also showing signs of confidence in Asian R&D, with 69 per cent of those surveyed predicting an increase in investment in R&D capability in the next half-decade.

Although 59 per cent of respondents do not have a R&D centre in Asia and attested to having no plans for one in the next five years, a significant minority of respondents of respondents already have R&D centres in Asia (18 per cent in China, 14 per cent in India, 9 per cent in Japan, 8 per cent in Singapore, 4 per cent in Malaysia and 2 per cent in Korea), and 12 per cent have plans for one in the next five years.

What with the increasing attractiveness of Asia, both in terms of market opportunities and the regulatory regime, a closer look at the IP and life sciences-related activities in this region is necessary.

Chinese patent filings

China IPR Applications, 2011



77%

of respondents view China as an attractive or very attractive geography in terms of market opportunities

IP filings over the past few years have been a great topic of discussion in recent years, increasing by between 20-30 per cent annually in each IP category type since 2008. Analysis of World Intellectual Property Organisation ("WIPO") statistics for 2011 shows that although the number of Chinese IP applications is increasing rapidly, the number of Chinese-originating IP filed abroad is quite low. Specifically, the percentage of patents, utility models, designs and trade marks of Chinese origin which are being filed internationally appear to be modest at 3.8 per cent, 0.1 per cent, 11 per cent, and 11.8 per cent, respectively.

In our survey, 18 per cent of respondents indicated that they already have a R&D centre in China, and thus, with the Chinese regulations relating to foreign filing licenses, we expect that an increasing number of foreign companies in China will begin first-filing in the Chinese State Intellectual Property Office ("SIPO").

Even though Chinese companies are increasingly filing in China, most are filing relatively little outside. Furthermore, it can be seen that the high-tech/telecommunications companies ZTE (number 1 PCT filer with 2826 PCT applications) and Huawei (number 3 PCT filer with 1831 PCT applications) appear to count for almost 24 per cent of the 19,779 Chinese-originating applications being filed abroad.

In contrast, the corresponding international filing percentages for Japan are 54 per cent for patents, 21 per cent for utility models, 54 per cent for designs, and 83 per cent for trade marks, respectively. The corresponding percentages for the US are 37 per cent for patents, 89 per cent for designs, and 61 per cent for trade marks. (Since the US does not have any utility models, there is no relevant comparison for this category.)

While the total number of Chinese IP filings is quite staggering, and 66 per cent of our survey respondents feel that the rise of China will indeed transform the global life sciences industry, the fear of a wave of Chinese-originating IP filings overseas is at present unfounded. As can be seen from the above, on the IP filing and exportation front, the rise in filing numbers seems to be mostly a localised Chinese phenomenon and does not appear to correlate to a flood of Chinese-originating IP filings in other countries, with the exceptions of the filings noted above for ZTE and Huawei.

Consolidation in the health sector

According to survey participants, China is also the second most attractive geography in terms of market opportunities, with 77 per cent viewing it as attractive or very attractive. With the Chinese health sector remaining quite undefined and filled with myriad companies (estimates of the number of "Health Care" companies in China range from 3,000 to 6,000) and the increasing spending power of the Chinese consumer, the potential opportunities here are extensive. However, this range is partly due to the nebulous definition of health care in China, as it may encompass everything from drug manufacturers, to toothbrush and toothpaste companies, to bandage adhesive manufacturers and magnetic wristband makers.

In our 2012 Life Sciences Update, we predicted that the Chinese health care sector was ripe for consolidation and in our survey this year, we found that 63 per cent of respondents expect to see a major consolidation in the global life sciences industry in the next three years. The industry will watch with interest to see if this consolidation will begin in China.

Asian and Australian IP updates

Singapore
Positive grant system
Singapore will change from a "self-assessment system" to a positive grant system likely with the proposed change going into effect by the end of 2013. The first batch of Singapore examiners has already been hired, and they are undergoing training; it appears that this first batch is focused in the electrical engineering arts. The hiring of Singapore examiners for additional art areas such as life sciences is expected to follow. Particularly for the eight per cent of our survey respondents who already have a R&D facility in Singapore, this change is likely to be a positive improvement, significantly strengthening the commercial value and validity of Singapore patents, and lead to overall greater faith and trust in the Singapore patent system.

Hong Kong
Eight year data exclusivity
In order to fulfil certain treaty obligations related to the European Free Trade Association countries, Hong Kong changed its rules regarding pharmaceutical data protection as of 1st October 2012. Accordingly, Hong Kong now provides data exclusivity for eight years from the date of registration.

Patent system reform
In mid-February 2013, the Hong Kong Intellectual Property Department ("HKIPD") announced its long-awaited proposals to reform the Hong Kong patent system. The proposed changes fall into three general categories: firstly, the HKIPD proposes to add a new Original Grant Patent option to the existing re-registration system. Thus, future applicants may file for a Hong Kong patent without first filing for a Chinese, United Kingdom, or European patent. Examination would be outsourced to the Chinese Patent Office, and documents will be able to be filed in English or simplified Chinese. This will not affect the current HK Standard Patent system, but would instead be a new option for applicants. For life sciences applicants, such a system may allow additional flexibility to seek broader HK patent protection than one may expect from, for example, the EPO or the SIPO.

Secondly, the HKIPD proposes to formalise the requirements for warning letters related to Short Term Patents, ensuring that potential warning letters actually plead the charges/allegations with specificity. In addition, the proposed law changes require a more formalised examination of HK Short Term Patents prior to the enforcement thereof. As life sciences applicants typically do not file for HK Short Term Patents, we do not expect this change to affect the sector much, if at all.

Thirdly, the HKIPD proposes to begin regulating the HK patent profession by establishing a patent agent registry and qualification system. Since there is currently no patent agent or patent attorney qualification system, test, or regulatory body in Hong Kong, the patent profession is open to all, regardless of technical background, training, etc. This is intended to strengthen the HK patent system, and its effects will be felt particularly in the life sciences industry, where a strong technical understanding is essential to ensure the broadest and strongest coverage for applicants.

The final details of these changes and the effective date are unknown at the time of writing. However, it is expected that these changes will come into effect at some point in 2014.

Australia
Isolated gene patenting confirmed
On 15th February 2013, in the landmark decision *Cancer Voices Australia v Myriad Genetics Inc.*, Judge Nicholas of the Federal Court of Australia affirmed that isolated gene sequences are patentable subject matter under Australian patent law. This case turned upon the court's finding that the corresponding BRCA1 genes that occur in nature are for a "manner of manufacture" according to the Australian Patents Act and the corresponding sections of the Statute of Monopolies.

Claims 1-3 of AU 686004 B were in dispute. Claim 1 states:

> *An isolated nucleic acid coding for a mutant or polymorphic BRCA1 polypeptide, said nucleic acid containing in comparison to the BRCA1 polypeptide encoding sequence set forth in SEQ.ID No:1 one or more mutations or polymorphisms selected from the mutations set forth in Tables 12, 12A and 14 and the polymorphisms set forth in Tables 18 and 19.*

Judge Nicholas found that the removal of the gene from its natural environment and its separation from other cellular components resulted in an artificial state of affairs that supported the patentability of the isolated gene fragments. Specifically, Judge Nicholas found that the isolating of the gene from the cell and its purification was a sufficient human intervention to support a finding of patentability.

On 4th March 2013, Cancer Voices, et al., filed a Notice of Appeal which at the time of writing was likely to be heard on 17th April 2013.

Raising the Bar

Changes to the Australian patent law known generally as "Raising the Bar" will go fully into effect as of 15th April 2013. Thus, for applications filed on or after that date, the general public knowledge will change from a "local knowledge" to an "absolute knowledge" standard. This should make the inventive step threshold higher. Furthermore, the available prior art will be greatly expanded to all publications prior to the filing date.

The "usefulness" threshold will also be raised to require that the specification provide a specific, substantial and credible use of the invention which is appreciable by one skilled in the art. Additional refinements to the level of sufficiency, clarity, and support required are also provided as well as the addition of a best mode description. Many additional points are also addressed, such as priority dates, amendment practice, examination, re-examination, opposition, divisionals, etc. with the overall purpose being to make Australian patents more robust and to ensure that the actual technical contribution and technical descriptions of future Australian patents are higher than in the past.

Thailand

Tightening of pharma patent requirements

Thailand proposed draft patent guidelines to make it more difficult to obtain patents in the pharmaceutical fields. For example, if approved, the guidelines will not allow claims on second medical use.

In January 2011, the Thai Patent Board issued decision No. 1/2553, effectively disallowing Swiss-type claims in Thailand. The pertinent patent application is 0201033643 and the claimed invention relates to use of consensus interferon and ribavirin for the manufacture of a pharmaceutical product for treating hepatitis C virus infection in patients having interferon- α failure. The Board ruled that the substantial scope of protection of Swiss-type claims 1-11, despite its language defining a use, is understood to relate to a method for the treatment or therapy of human animal diseases and is not patentable pursuant to section 9(4) of the Thai Patents Act. This decision was a departure from the previous practice of the Thai Patent Office acknowledging that Swiss-type claims were patentable. Following this decision, the Thai Department of Intellectual Property ("DIP") has routinely objected to Swiss-type claims.

Further, the DIP has also published draft examination guidelines stipulating that Swiss-type claims are no longer allowed. In addition, the guidelines, if approved in the current proposed version, would make it more difficult for patent to be granted for enantiomers, polymorphs, isomers, salts, etc. In fact, the draft guidelines appear to request a "surprising effect" in addition to the requirement of novelty, inventive step and industrial application.

These guidelines represent a change of practice of DIP and are expected to impact the pharmaceutical industry in Thailand. Several parties, including representatives of the pharmaceutical industry, have submitted concerns, objections and counter-proposals to the guidelines. The DIP is expected to issue a new version of the guidelines in April 2013 and to allow a public consultation. Accordingly, it is suggested that any interested party

should submit their comments and/or proposal since the new guidelines, if implemented in the present form, will seriously affect the pharmaceutical industry business in Thailand.

India

Gleevec/Glivec patent denied

On 1st April 2013, the Indian Supreme Court rejected Novartis' 1998 Gleevec/Glivec patent application as lacking inventiveness according to the Indian patent law. The key portions focused upon by the court were the requirement in Section 2(1)(ja) that an "inventive step" means a feature of an invention that involves technical advance as compared to the existing knowledge or having economic significance or both and that makes the invention not obvious to a person skilled in the art. Also, Section 3(d) was pivotal as it states that the mere discovery of a new form of a known substance which does not result in the enhancement of the known efficacy of that substance or the mere discovery of any new property or new use for a known substance or of the mere use of a known process, machine or apparatus unless such known process results in a new product or employs at least one new reactant.

Based on the combination of these sections, as well as a review of the legislative history of the Indian patent law, the Indian Supreme Court found that Novartis' claimed compound lacked the required improvement over the compounds in the prior art, and thereby rejected the application.

Running at almost 100 pages, the landmark decision will be long perused and dissected by commentators and analysed far and wide for its effect on the Indian pharmaceutical industry and how life science applicants view the Indian patent system. However, it is clear that this decision and its effects will significantly favour generic manufacturers over originating companies. With 14 per cent of our survey respondents indicating that they already have a R&D facility in India, it is yet to be seen how or if this decision will affect foreign direct investment in India, and the willingness of the international life sciences industry to invest in Indian R&D.

First compulsory license upheld

On 4th March 2013, the Justice Prabha Sridevan, Chairman of the Intellectual Property Appellate Board ("IPAB") confirmed that the grant of the first post-TRIPS Compulsory License was proper. Previously in 2012, the Controller of Patents granted a compulsory license to Natco for Bayer's anti-cancer drug Nexavar, and Bayer had appealed to the IPAB. Bayer has allegedly already stated that it will appeal to the Mumbai High Court.

The IPAB sided with the Controller of Patents in most instances, but did slightly disagree that importation of drugs into India may satisfy the definition of "working" in India. Specifically, the IPAB seems to believe that the definition of "working" does not require "manufacture in India" and that in some cases Bayer's importation of the drug into India may satisfy the working requirement.

Second compulsory license requested

In what may be the beginning of a trend, BDR Pharmaceuticals, Ltd. has filed the second application for a compulsory license in India for Bristol Meyers Squibb's anti-cancer drug Dasatinib.

Patent Working Statements

Recently we have been seeing indications that the Indian Patent Office is taking Statements of Working seriously. Form 27 is required by all patentees to be filed every year to show whether or not the patent is being worked in India. While many, if not most patentees ignore this requirement, the law does require that it be filed each and every year. Furthermore, this form is instrumental in judging whether or not to approve a compulsory license for the patent, and so given the recent activity in compulsory licenses, it may serve patentees well to take the filing of this form more seriously.

Patent attorney qualification system challenged

The Madras High Court ruled on 20th March 2013 that regular attorneys may file papers in the Indian Patent Office, thus effectively negating the importance of the Indian Patent Bar. The actual ruling was unavailable at the time of writing.

Biotechnology patent guidelines

The Indian Patent Office published on 25th March 2013 the final version of the "Guidelines for Examination of Biotechnology Applications for Patents". A draft version of these guidelines was published initially in December 2012 and made available for public comment on the Patent Office website. Most of the comments made by the public received by the Patent Office were negative. In general, they raised concerns that the guidelines take a stricter approach to patentability than the current law and guidelines.

For example, the guidelines provide that products directly isolated from nature such as nucleic acid sequences, proteins and enzymes are not patentable subject matter under Section 3(c) of the Act. The section accordingly would preclude the patentability of subject matter related to genes which are identified, purified and made available in an isolated form. What is more, the guidelines provide that a method of treatment including diagnostic procedures or method of drug administration either to humans or animals will not be patentable. They also appear to impose a complete bar on the patenting of any gene-based diagnostics.

However, patent practitioners have made statements that these guidelines do not constitute rule making. In fact, in case of any conflict between these guidelines and the provisions of the Patents Act 1970 and the Patents Rules 2003, the provisions of the Act and Rules will prevail over these guidelines. Accordingly, it has been suggested that should the Patent Office object to the patentability of particular subject matter by relying on an aspect of the guidelines in conflict with the Patents Act or the Rules, it is expected that the court will reverse such a decision.

Indonesia

Compulsory licences for seven HIV and hepatitis drugs

On 3rd September 2012, the Indonesian government took the step of overriding the patents on seven HIV and hepatitis treatments, thereby opening the way for cheap generic versions of those drugs.

The new order renews a previous compulsory licence issued against Merck & Co (US)'s HIV anti-retroviral (ARV) Sustiva (efavirenz) in 2007 (this patent was, however, due to expire on 7th August 2013), and adds six more drugs to the list: Abacavir (Ziagen) of GlaxoSmithKline (UK); Didanosine (Videx) of Bristol-Myers Squibb (US); Combination lopinavir, ritonavir (Kaletra) of Abbot Laboratories (US); Tenofovir (Viread) of Gilead Sciences (US); Combination of tenofovir and emtricitabine (Truvada) and Combination of tenofovir, emtricitabine and efavirenz (Atripla) Gilead Sciences (US). Pre-existing 2007 compulsory licences remain against Boehringer Ingelheim (Germany)'s ARV Viramune (nevirapine) and Shire Pharmaceutical (United Kingdom)'s hepatitis B treatment lamivudine. All these drugs can be licensed by the Ministry of Health to pharmaceutical companies to exploit patents on behalf of the Government.

The International Federation of Pharmaceutical Manufacturers and Associations (IFPMA), representing global drugmakers, expressed concern at the wide-ranging decree. According to IFPMA, developing countries have a right to over-ride patents by issuing so-called compulsory licences in certain limited circumstances but this should be a last resort. The concern of the life sciences industry is that the issuance of compulsory licenses by Indonesia may set a negative precedent and could reduce the incentive to invest in the research and development of new medicines.

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