Public Competition Assessment

25 February 2014

Thermo Fisher Scientific Inc – proposed acquisition of Life Technologies Corporation

Introduction

1. On 19 December 2013, the Australian Competition and Consumer Commission (**ACCC**) announced its decision not to oppose the proposed acquisition of Life Technologies Corporation by Thermo Fisher Scientific Inc (**proposed acquisition**), subject to section 87B undertakings accepted by the ACCC on 19 December 2013 (the **undertakings**). The ACCC decided that the proposed acquisition, in conjunction with the undertakings, would be unlikely to have the effect of substantially lessening competition in the markets for the manufacture and supply of foetal bovine serum (**FBS**) sourced from Australia and New Zealand, the supply of cell culture media, and the supply of siRNA in Australia in contravention of section 50 of the *Competition and Consumer Act 2010* (**the Act**).
2. The ACCC made its decision on the basis of the information provided by the merger parties and information arising from its market inquiries. This Public Competition Assessment outlines the basis on which the ACCC has reached its decision on the proposed acquisition, subject to confidentiality considerations.

Public Competition Assessment

3. To provide an enhanced level of transparency and procedural fairness in its decision making process, the ACCC issues a Public Competition Assessment for all transaction proposals where:
    - a merger is opposed;
    - a merger is subject to enforceable undertakings;
    - the merger parties seek such disclosure; or
    - a merger is not opposed but raises important issues that the ACCC considers should be made public.
4. This Public Competition Assessment has been issued because Thermo Fisher Scientific Inc's proposed acquisition of Life Technologies Corporation is subject to a court enforceable undertaking.
5. By issuing Public Competition Assessments, the ACCC aims to provide the public with a better understanding of the ACCC's analysis of various markets and the

associated merger and competition issues. It also alerts the public to circumstances where the ACCC's assessment of the competition conditions in particular markets is changing, or likely to change.

6. Each Public Competition Assessment is specific to the particular transaction under review by the ACCC. While some transaction proposals may involve the same or related markets, it should not be assumed that the analysis and decision outlined in one Public Competition Assessment will be conclusive of the ACCC's view in respect of other transaction proposals, as each matter will be considered on its own merits.
7. Public Competition Assessments outline the ACCC's principal reasons for forming views on a proposed acquisition at the time the decision was made. As such Public Competition Assessments may not definitively identify and explain all issues that the ACCC considers arise from a proposed acquisition. Further, the ACCC's decisions generally involve consideration of both non-confidential and confidential information provided by the merger parties and market participants. In order to maintain the confidentiality of particular information, Public Competition Assessments do not contain any confidential information or its sources.

The parties

8. Thermo Fisher and Life Technologies (the **merger parties**) are global companies that operate in the life sciences sector.

Thermo Fisher

9. Thermo Fisher is a diversified global manufacturing company. Its principal activity is the production and sale of analytical instruments, scientific equipment, consumables, reagents, services and software for research, analysis, discovery and diagnostics.
10. Thermo Fisher's business in Australia includes the distribution of scientific instruments and consumables to scientific, environmental and medical customers, the manufacture and sale of mining analysis equipment, the provision of infomatics solutions, chemical manufacturing, the distribution of medical testing equipment and reagents, serum manufacturing, the manufacture of microbiological culture, and the sale of chromatography systems.

Life Technologies

11. Life Technologies is a global biotechnology tools company. It is active in the production and supply of technologies for a range of life sciences applications, including gene sequencing, polymerase chain reaction, sample preparation, cell culture, RNA interference analysis, functional genomics research, proteomics and cell biology applications, as well as clinical diagnostic applications, forensics and animal, food, pharmaceutical and water testing analysis.
12. In Australia, Life Technologies distributes its products in the areas of protein biology, molecular biology, cell culture and transplant diagnostics. It also produces sera in Australia and New Zealand.

Other industry participants

13. As explained further below, the primary areas in which the merger parties both supply products are cell culture, molecular biology and protein biology. Other suppliers in these areas are set out below.

Table 1: Key competitors

Supplier	Cell culture	Molecular biology	Protein biology
Bio-Rad		✓	✓
GE Healthcare	✓	✓	✓
Merck Millipore	✓	✓	✓
Moregate Biotech	✓		
New England Biolabs		✓	✓
Promega		✓	✓
Qiagen		✓	✓
Roche		✓	✓
Serana	✓		
Sigma-Aldrich	✓	✓	✓

The proposed transaction

14. Thermo Fisher proposed to acquire all of the shares of Life Technologies.

15. Thermo Fisher sought regulatory clearance for the proposed acquisition in other jurisdictions, including the United States, the European Union, New Zealand, Canada and China.

Review timeline

16. The following table outlines the timeline of key events in this matter.

Date	Event
20-Sep-2013	ACCC commenced review under the Merger Process Guidelines.
11-Oct-2013	Closing date for submissions from interested parties.
11-Nov-2013	ACCC timeline suspended and former proposed decision date of 14 November 2013 delayed to allow the merger parties to provide additional information to the ACCC.
13-Dec-2013	Thermo Fisher provided additional information to the ACCC. ACCC timeline recommenced.
19-Dec-2013	ACCC announced it would not oppose the proposed acquisition, subject to a section 87B undertaking accepted by ACCC.

Market inquiries

17. The ACCC conducted market inquiries with a range of industry participants including suppliers, customers, competitors of the merger parties and interested third parties.

18. Submissions were sought in relation to the substantive competition issues and targeted inquiries were conducted regarding the undertakings.

Future with/without the proposed acquisition

19. Section 50 of the Act prohibits mergers or acquisitions that would have the effect or be likely to have the effect of substantially lessening competition in a market. In assessing a proposed acquisition pursuant to section 50 of the Act, the ACCC considers the effects of the acquisition by comparing the likely future competitive environment post-acquisition if the acquisition proceeds (the "with" position) to the likely future competitive environment if the acquisition does not proceed (the "without" position) to determine whether the proposed acquisition is likely to substantially lessen competition in any relevant market.

20. In the absence of the proposed acquisition, the ACCC considered that the likely future competitive environment would be the status quo, that is, both Thermo Fisher and Life Technologies would continue to operate as independent, viable and effective competitors in the relevant markets.

Areas of overlap

Table 2: List of products supplied in Australia by both merger parties

Area		**Products**
Cell culture		Calf sera FBS Media Standard process liquids
Molecular biology	Gene silencing effectors	siRNA shRNA
	Delivery	Transfection reagents
	Nucleic acid synthesis	Oligonucleotides
	Gene content	Standard genes
	Cloning enzymes	Restriction enzymes Modifying enzymes
	Nucleic acid purification	Agarose gel Horizontal gel boxes Magnetic bead-based instruments NA purification kits Nucleic acid / molecular weight standards

Area		Products
	Nucleic acid amplification	Thermal cyclers qPCR instruments and PCR instruments Taq polymerase, high fidelity polymerase, Hot Start polymerase, other specialty polymerase PCR kits, RT PCR kits, dye based qPCR kits RT enzymes cDNA synthesis kits
Protein biology	Protein expression	In vitro expression
	Protein isolation and purification	Affinity chromatography kits Cell lysis detergents, reagents and protease inhibitors SDS-PAGE vertical gel boxes, power supplies, pre-cast gels and gel stains
	Protein detection, identification and quantification	ELISA assays Western blotting membranes, chemiluminescent substrates and transfer boxes
	Protein modification	Chemical modification reagents Cross-linking reagents Proteases
	Antibodies	Biotin reagents Immunoassays – primary antibodies and secondary antibodies Streptavidin and Avidin reagents
	Other	Mass spectrometry Reactive dyes Western blotting – detection kits
Transplant diagnostics		Tests
Liquid chromatography		Analytical HPLC columns
Fluorescent spectroscopy		Fluorescent spectroscopy
Particles		Magnetics

Industry background

21. The life sciences sector comprises a number of interrelated fields which involve the scientific study of living organisms, from microorganisms to human beings. For example:

- biochemistry – the study of chemical processes within and relating to living organisms (for example, structures, functions and interactions of proteins, nucleic acids, carbohydrates and lipids);
- biotechnology – technological applications that use biological systems to make or modify products or processes for specific uses, which predominantly have had applications in medical, agricultural, industrial and environmental applications;
- cell biology – the study of the physiological composition of cells, which is fundamental to all biological sciences and is closely related to genetics, and other developmental biologies;
- molecular biology – the application of recombinant DNA, DNA sequencing methods and bioinformatics to sequence, assemble and analyse the function and structure of genomics (the complete set of DNA within a single cell of an organism);
- protein biology – the study of the structure and functions of proteins.

22. The applications of life sciences products range from pharmaceutical and biotechnology manufacturing processes, to academic and government applications, and to industrial and applied uses such as healthcare.

23. The primary overlaps in the products supplied by the merger parties are in the areas of cell culture, molecular biology and protein biology. Within these broad product categories, there are several relevant product markets. However, this Public Competition Assessment primarily focuses on the areas where the proposed acquisition raised competition concerns, due to the closeness of competition between the merger parties and where market inquiries indicated that the merged entity was not likely to be adequately constrained by existing competitors or new entrants in the relevant markets.

24. Accordingly, the remainder of this Public Competition Assessment outlines the ACCC's competition assessment in the areas of Cell Culture and Molecular Biology. The ACCC did not identify any competition concerns in the field of protein biology. Therefore, protein biology markets are not considered further in this Public Competition Assessment.

25. In addition, the ACCC considered the potential for the merged entity to foreclose competition in other markets. This is outlined further below.

Cell culture

Overview

26. 'Cell culture' describes the process of growing cells from plants, animals, or other sources (e.g. bacteria) in artificial environments. Cell culture is used to grow cells for use in academic research and vaccine production.

27. Cell culture products can be categorised into the areas of sera, media, and standard process liquids.

28. The supply of foetal bovine serum and the supply of cell culture media were identified by the ACCC as areas of competition concern relating to the proposed acquisition.

Sera and foetal bovine sera

29. Cell culture sera are blood-based liquids that are a by-product of the meat processing industry. They contain growth factors, proteins and other biological components which are combined with cell culture media to provide an advanced level of nutrients to facilitate the growth of cells for further research and product development by end users.

30. Foetal serum is often preferred to serum from more mature animals since it contains a higher level of hormones, growth factors, and lower levels of antibodies. While there are many types of animals from which sera can be derived, the most significant portion of the sera market is made up of foetal bovine sera (**FBS**). This is because of the abundance of cows and their large volume of foetal blood relative to other animals.

31. Since FBS is a biologically-sourced product, its precise content is inherently inconsistent, so many customers engage in batch testing. This involves the testing of a small sample of FBS from a number of suppliers before placing an order.

Supply chain for FBS

32. Three stages are generally involved for the transformation of raw foetal blood to the final product. These are collection, centrifugation, and filtration.

    - **Collection**: Raw foetal blood is harvested in a sterile room within an abattoir.
    - **Centrifugation**: Raw foetal blood yields raw serum (**raw FBS**) after it is spun in a centrifuge and separated. Raw foetal blood is either spun on-site at the abattoir before being sold or is supplied to an intermediary or reseller who spins it.
    - **Filtration**: Raw FBS must be filtered before it can be sold as a final product (**processed FBS**). This is done either by intermediaries or, more commonly, by resellers (including the merger parties). Abattoirs do not typically possess the sterile facilities necessary for filtration. The filtered serum is bottled, branded, and sold to end customers in the bio-manufacturing or research sectors both in Australia and overseas.

Intermediaries

33. The primary role of intermediaries is to source raw foetal blood from abattoirs. In general, intermediaries also centrifuge raw foetal blood, while some may also filter the resultant raw sera into FBS for sale to end customers. Some, but not all intermediaries are involved in centrifugation and sterile filtering. As such they may be suppliers of raw FBS only, or competitors in the supply of processed FBS. Where intermediaries are not involved in any part of the sera manufacturing process, they provide value to customers (resellers) through their established commercial relationships with abattoirs, and vice versa).

Resellers

34. The suppliers of the final FBS product to end users are known as resellers. These include the merger parties. As well as selling to end customers, resellers may engage in the upstream activities of centrifuging raw foetal blood and sterile filtration of raw FBS, as well as the bottling stage of the manufacturing process.

End users

35. End users for processed FBS can generally be grouped into two categories, comprising scientists in the academic research sector, and companies in the pharmaceutical manufacturing sector. In Australia, the majority of end users and customers of FBS are in the research sector and typically comprise university departments, research institutes, and specialised laboratories.

Australian and New Zealand-sourced FBS

36. FBS sourced from Australia and New Zealand is perceived to be of a higher quality than FBS sourced from other countries because biodiseases such as mad cow disease have never been known to occur in either country. This is of particular concern for customers using FBS for therapeutic applications, but other customers, including research institutions, also consider Australian and New Zealand sourced FBS to be superior. Australian and New Zealand FBS therefore commands a substantial price premium relative to sera from other countries.

Cell culture media and standard process liquids

37. Cell culture media are powders or liquids that promote cell growth through supplying cells with essential nutrients such as basic amino acids. Standard process liquids are saline solutions and water-based buffers which facilitate the cell culture process and ensure that the cell culture environment remains at a constant pH.

38. Thermo Fisher and Life Technologies sell their cell culture media and standard process liquids under the brands of HyClone and Gibco, respectively.

Molecular biology

39. Molecular biology is concerned with the study of the molecular components present in the cells of living organisms, primarily RNA and DNA. The study of molecular biology and, in particular, the function of genes within cells, is of important application to academic and bio-industrial researchers, for example in developing new therapies for particular diseases, or producing crops capable of generating greater yields.

40. Molecular biology techniques have applications in a number of end-use segments, including diagnostics, microbiology, forensics and agriculture.

41. The merger parties supply several products which are used in molecular biology processes. Within this range of products, the merger parties were found to be particularly close competitors in respect of products supplied for a process known as gene modification. This is a process where the functions and characteristics of genes (known in the industry as gene ‘expression’) can be studied either by promoting or suppressing a gene.

42. In particular, the merger parties supply a product known as siRNA, a type of gene effector which is used to silence genes for a short period of time. The supply of siRNA was the only area of molecular biology identified by the ACCC’s market inquiries as an area of competition concern relating to the proposed acquisition.

43. siRNA products are commonly sold in portfolios known in the life sciences industry as ‘libraries’. A library is a collection of individual siRNAs. Market inquiries indicated that some customers buy individual siRNA which target individual genes,

while other customers obtain products to conduct research across the entire genome. The merger parties supply libraries which can comprise thousands of individual siRNAs, each one designed to target a specific gene. There are also sub-libraries within that collection that target a subset of the human genome. Some sub-libraries are associated with a particular pathway, for example the cell growth pathway. A research group may only be interested in that pathway, and so acquire the sub-library for that pathway. Market participants noted that the merger parties were market leaders in this respect.

Market definition

44. The ACCC has considered in some detail the relevant markets in relation to the supply of processed FBS and siRNA, since these were principal areas of concern arising from the proposed acquisition.

Geographic dimension – all markets

45. The ACCC has observed that suppliers of life sciences products are often active globally. In many cases, it is not necessary to have manufacturing capabilities in Australia in order to supply Australian customers. However, market inquiries have indicated that the geographic scope of the relevant markets (including the supply of FBS) is no more than Australia-wide due to the following factors:
    - Not all suppliers may be active in Australia.
    - Those suppliers that are active in Australia may not sell their full range of products in Australia.
    - Prices may not be set by reference to global prices.
    - Suppliers may need to have a subsidiary in Australia or appoint a local distributor.
    - Suppliers may need to engage in local sales, marketing and after-sales activities.
    - Suppliers may need to comply with local regulatory requirements.
46. The relevance of these factors varies as between the different products supplied by the merger parties, but some or all of them apply to each product.
47. Market inquiries have not suggested that any of the relevant markets are narrower than Australia-wide.
48. The ACCC therefore considers that the relevant geographic scope of the markets affected by the proposed acquisition is Australia-wide. This means that global suppliers not already active in Australia would be considered as potential new entrants.

Market One – Processed FBS

Product dimension

49. As noted above, the merger parties are major suppliers of processed FBS, which is processed from raw blood sourced directly from abattoirs or via an intermediary. With regard to the merger parties' products, the ACCC's market inquiries indicated that:

- calf or adult bovine sera are not substitutes for FBS;
- sera sourced from other animals is not a substitute for FBS;
- FBS is sourced primarily from cattle in Australia, New Zealand, the United States and Canada;
- due to the relative absence of disease in cattle, Australian and New Zealand FBS are regarded as superior to FBS sourced from other countries and therefore attract a higher price;
- Australian and New Zealand FBS are regarded as essentially equivalent;
- for some customers, particularly those manufacturing products for therapeutic use in humans, FBS from countries other than Australia or New Zealand is not an alternative to Australian or New Zealand FBS.

50. The ACCC therefore considered the relevant product market was likely to be no wider than the supply of FBS; and Australian and New Zealand FBS either constitute a distinct product market or a distinct segment of the market for the supply of FBS.

51. As explained in the Industry background section above, market inquiries indicated that Australian and New Zealand FBS suppliers source FBS:
    - by acquiring raw foetal blood from abattoirs, centrifuging it to produce raw FBS, then filtering and bottling it to produce processed FBS; and/or
    - by acquiring raw FBS from abattoirs or intermediaries (i.e. after they have centrifuged the raw foetal blood) then filtering and bottling it to produce processed FBS.

52. In either case, the product supplied to end customers is processed FBS and suppliers compete in relation to the price and quality of that processed FBS.

Competition analysis

Unilateral effects: Absent the undertakings, the proposed acquisition would give the merged entity market power in the supply of processed FBS, particularly Australian and New Zealand FBS

53. Market inquiries indicated that Thermo Fisher and Life Technologies are close competitors for the supply of FBS to end users on the basis of the volumes they are capable of supplying and the strength of their brands and reputations for supplying very high quality FBS. The merger parties' strong reputations for producing high quality processed FBS reinforces their place as buyers of the raw materials necessary to manufacture and supply processed FBS.

54. This section sets out a number of factors underpinning the closeness of competition between the merger parties, which were relevant to the ACCC's overall assessment.

Brand

55. Market inquiries indicated that the merger parties have particularly strong brands for the supply of cell culture products. However, since FBS customers tend to test each batch of FBS that they acquire, ultimately the performance of the sera against quality, volume and price metrics will determine which suppliers are chosen by end-users, rather than simply brand reputation. Nonetheless, the ACCC's market

inquiries indicated that brand reputation is very significant in cell culture markets. For example:

- The volumes of raw foetal blood or raw FBS ultimately supplied by abattoirs and intermediaries are unpredictable and the material is expensive.
- Testing batches of FBS can also take a considerable amount of time.
- To minimise these factors, many customers only test FBS from a limited range of suppliers. The brand reputation is highly relevant to the selection of (and indeed awareness of) potential FBS suppliers. In some cases, customers only test batches supplied by the merger parties, whose brand reputation was established and is supported by its ability to supply a large customer base globally.

Relationships with upstream suppliers

56. Market inquiries indicated that outside the merger parties, there are limited alternative sources of supply. Sigma-Aldrich was the only other supplier of processed FBS that was generally identified by customers.

57. The ability to secure supply of a scarce resource is partly a function of FBS resellers' long-standing commercial relationships with abattoirs and intermediaries. The ACCC understands that abattoirs typically sell all the raw foetal blood collected to a single customer. In addition, intermediaries carefully select their customers, having regard to a number of factors including the long-term strategy, reputation, knowledge and customer base of the potential purchaser.

58. Market inquiries indicated that the merger parties have strong commercial relationships with abattoirs and/or intermediaries in Australia and New Zealand, largely due to their strong position in the downstream supply of processed FBS to end-users.

Barriers to entry and expansion

Procurement of and expansion of supply

59. The ACCC's market inquiries suggest that there are material fixed costs involved in being able to take supply of and process raw foetal blood over a period of time. Abattoirs do not typically sell their supply of raw foetal blood to multiple customers. This means that prospective entrants (or smaller intermediaries and resellers) may not have the necessary infrastructure, financial capital and established customer base to be able to viably participate in some tenders.

60. The ability to be able to reliably purchase and manage the supply of raw foetal blood or raw FBS consistently is an important consideration when abattoirs and intermediaries choose their customers for raw foetal blood or raw FBS. Relevant factors include a strong brand, reliable customer base, and favourable reputation and track record.

61. The ACCC's market inquiries have indicated that not all types of abattoirs may be suited to collecting raw foetal blood, and that most (if not all) abattoirs which are capable of collecting raw foetal blood already do so.

Role of industry relationships

62. The ACCC's market inquiries indicated that relationships between abattoirs, intermediaries, and resellers are important in the supply decision for raw foetal

blood and raw FBS, and that these may serve to hinder potential new entry, supplier-switching, and bypassing of the merger parties by end users.

63. Commercial relationships between abattoirs and intermediaries are often established over a long period of time and may span a wider breadth of products and operations than raw foetal blood. That is, relationships between intermediaries and abattoirs may extend and have originated from different areas to raw foetal blood (a by-product).

Likelihood of competitive constraint from existing competitors

64. The ACCC considered whether, post-acquisition, the merged entity would be constrained by:

- other FBS resellers – the key competitor in this regard is Sigma-Aldrich. Smaller competitors include Moregate, Serana, Bovagen, GE Healthcare and Merck Millipore;
- other participants in the supply chain, in particular, intermediaries and abattoirs who may be able to integrate down the supply chain and supply processed FBS to end customers;
- end customers, who may be able to bypass the merged entity and acquire raw FBS or processed FBS directly from intermediaries and abattoirs.

65. The ACCC concluded that the merged entity is unlikely to be competitively constrained by existing competitors and other market participants for the following reasons:

- The other resellers constitute a relatively small volume of the processed FBS supplied to end customers, and are constrained in their ability to acquire greater volumes of raw foetal blood or raw FBS (see 'Barriers to entry and expansion' above). This means that those resellers would not be likely to expand their supply of processed FBS to customers to a level that is likely to be sufficient to constrain the merger parties.
- The barriers to forward-integration into the supply of processed FBS by abattoirs are high – the ACCC's market inquiries have indicated that:
  - the processes of sterile filtration and dispensing/bottling are technically complex and require specialised equipment requiring significant capital outlays; and
  - abattoirs are extremely unlikely to possess the facilities and technical expertise necessary to engage in both the centrifugation of raw foetal blood and the sterile filtration of raw FBS and dispensing of the final product.

66. The ACCC's market inquiries have indicated that end-users are not typically able to bypass resellers:

- The supply of raw foetal blood and raw FBS from abattoirs is not generally available to end customers, due to abattoirs' long standing commercial relationships with intermediaries.
- Many customers face budget constraints, knowledge and technical barriers, staffing requirements, difficulty establishing the required logistical arrangements, and the need to ensure quality control across batches. Only a few customers, such as pharmaceutical manufacturing companies, may have the facilities necessary for sterile filtration and bottling.

67. The ACCC considered that absent the undertakings, the proposed acquisition would be likely to substantially lessen competition in the market for the supply of FBS in Australia, by further strengthening the position of the merged entity in the supply of FBS and eliminating the actual or potential competitive constraint between the merger parties. In particular, the ACCC considered that post-acquisition, Thermo Fisher would have the ability and incentive to raise prices for the supply of processed FBS.

Market Two – siRNA reagents

Market definition

68. As noted in the section titled 'Areas of Overlap', the merger parties both supply gene silencing products known as 'Small Interfering RNA', known as '**siRNA'**, and 'Short Hairpin RNA', or '**shRNA'**. As the main area of overlap and increase in market concentration as a result of the proposed acquisition would be in the supply of siRNA, the ACCC considered whether there is a distinct product market for siRNA or whether it was a part of a broader market for gene silencing products.

69. Market inquiries indicated that siRNA and shRNA are the two principal gene silencing technologies. While they are both used to silence genes, there are functional differences between the two products. Principally, these differences relate to the duration of the effects of applying these products – siRNA delivers a short term effect on a gene, while shRNA delivers a longer-lasting reaction. The latter was described in market inquiries as more complex for end-users to use and having limited clinical applications compared to siRNA.

70. Market inquiries also indicated that end-users typically have very specific functional requirements meaning there can be little or no substitutability between different types of gene silencing products. Market inquiries indicated that, due to an end-user's intended clinical application or research objectives, an increase in the price of siRNA is unlikely to cause large numbers of end-users to switch to shRNA or any other form of gene silencing product.

71. Market participants also noted the development of new gene silencing technologies, including a technology known as transcription activator-like effector nucleases ('**TALENs**'). However, market inquiries indicated that neither TALENs nor other developing technologies were likely to competitively constrain the supply of siRNA in Australia in the foreseeable future.

72. Accordingly, the ACCC considered it was appropriate to assess the competitive effects of the proposed acquisition in a market for the supply of siRNA in Australia.

Competition analysis

73. The merger parties are significant suppliers of siRNA in Australia. Market inquiries indicated that the merger parties' position in relation to the supply of these products is underpinned by related patents (known as the "Tuschl patents") which have been licensed to only four suppliers. This patent provides for a specific design of siRNA product.

74. The licensed suppliers are the merger parties, Sigma-Aldrich and Qiagen. Between them, these four suppliers currently have a very substantial share of supply of siRNA in Australia, and no other single supplier has a comparable share of supply to any one of them. In addition, market inquiries indicated that many suppliers do

not provide a full “library” of gene modulation products and so provide only a marginal constraint on the merger parties.

75. Despite there being four licensees to the Tuschl patent of siRNA, market inquiries indicated that Thermo Fisher and Life Technologies were the closest competitors of each other. Market participants distinguished the merger parties from their competitors, mostly on the basis of their capacity to undertake high levels of investment in product development and quality assurance processes. Market participants considered that these attributes resulted in the merger parties offering vast portfolios of siRNA products and product libraries, which were superior in the market.

76. The ACCC considered that barriers to entry into the siRNA market appeared to be high. Market inquiries indicated that effective competition in the siRNA market requires high levels of investment in R&D and intellectual property, and the development of a strong brand reputation and customer relationships, and that these entry requirements are high risk and take several years to establish.

77. In addition, market inquiries suggested that existing or new manufacturers and suppliers of siRNA who are not licensees of the Tuschl patent, are limited in their ability to compete effectively in the market, relative to the existing licence holders.

78. The ACCC also understands that it is unlikely that further Tuschl licences will be provided. The ACCC therefore considered that the merged entity was not likely to be constrained by the threat of new entry in the siRNA market.

79. The ACCC was therefore concerned that, absent the undertakings, the proposed acquisition would be likely to substantially lessen competition in this market. The ACCC considered there would be limited competitive constraints on the merged entity following the Proposed Acquisition, and that the merged entity would have the ability and incentive to reduce innovation and product development, or raise prices for the supply of siRNA to customers in Australia.

Other issues

Cell culture media

80. The ACCC’s market inquiries suggested that the proposed acquisition would raise competition concerns in the supply of cell culture media. Market participants indicated that the merger parties' cell culture media products, and particularly Life Technologies' brand, Gibco, are considered superior to those of their rivals.

81. The closeness of competition between the merger parties was based primarily on the strength of their respective brands. Market participants frequently referred to the role of brand and trust in the supply of cell culture media, and it was also noted that these reputations were to some extent derived from the parties’ strong reputations for the supply of FBS.

82. Market inquiries indicated that some customers may be able to self-supply cell culture media to some extent. However, for many customers, self-supply was not a viable alternative in the event of a small but significant increase in price or decrease in quality of products.

83. The ACCC did not reach a concluded view on the scope of the relevant market or whether the proposed acquisition would be likely to substantially lessen competition effects in the supply of cell culture media.

84. As explained below, the undertakings offered by Thermo Fisher include a commitment to divest its entire HyClone business, which incorporates cell culture sera and cell culture media. Accordingly, to the extent that the proposed acquisition would have raised competition concerns in this market, they would be alleviated by the undertakings.

Other products supplied by the merger parties

85. The ACCC considered concerns raised by some market participants in relation to other products supplied by the merger parties, including Quantitative PCR ('**qPCR'**) and magnetic bead-based instruments.

qPCR

86. (qPCR, also known as 'real-time' PCR) is a technique used in the process of copying short segments of DNA molecules. Market inquiries indicated that the merger parties are strong competitors in the area of qPCR, with Life Technologies possessing particularly leading-edge technology for qPCR systems and a number of key patents associated with qPCR.

87. However, market inquiries indicated that Thermo Fisher does not necessarily appear to be a particularly strong competitor in the field of qPCR and that there would be alternative suppliers and/or technologies (some of which are continually emerging) available to customers.

Magnetic bead-based instruments

88. Magnetic bead-based instruments are a type of instrument used in certain molecular biology processes. Market inquiries have indicated that these products can be supplied within a package of reagents or on a stand-alone basis. The ACCC understands that Thermo Fisher manufactures magnetic bead-based instruments and supplies these to Life Technologies (among other customers), and that Life Technologies resells these products as part of a reagent kit. Market participants generally considered that the reagent kits supplied by Life Technologies are a particularly close substitute for the instruments supplied by Thermo Fisher.

89. However, Thermo Fisher's magnetic bead-based instruments are designed as open systems, meaning that there are alternative suppliers of reagents and reagent kits based on this technology. In addition, since Life Technologies was already a reseller of Thermo Fisher magnetic bead-based instruments. The ACCC considered this may have limited the degree of competitive constraint that it imposed on Thermo Fisher and indicated that other manufacturers of magnetic bead-based instruments represent a stronger competitive constraint on Thermo Fisher. Therefore, the ACCC considered that the proposed acquisition would not increase Thermo Fisher's ability or incentive to restrict alternative suppliers from using its instruments and that alternative suppliers were therefore likely to remain available to customers.

Conclusions on qPCR and magnetic bead-based instruments

90. The ACCC concluded that the proposed acquisition was not likely to lead to an increase in market power constituting a substantial lessening of competition in relation to qPCR, magnetic bead-based instruments.

Potential for vertical foreclosure of rivals

91. A number of market participants noted that post-acquisition, Thermo Fisher would have the ability to supply a vast range of life sciences products. The ACCC considered whether, as a result of the proposed acquisition, Thermo Fisher would have the ability and incentive to offer a 'package' of products to customers on the basis that:
    - a particular product (for instance, product 'A') is supplied only if the customer also purchases another product (e.g. product 'B') ('tying'); or
    - customers are supplied a 'bundle' of products in such a way that the incremental price of product B (for example), is so low that efficient firms who only supply product B cannot recover the costs of supply that matches the incremental price under the bundle, and are foreclosed from supplying those customers who need both products ('bundling').
92. Competition concerns would arise if such conduct would be likely to limit, or raise the cost of, rivals' abilities to access a sufficient customer base, or to deny them the ability to access customers altogether. Bundling or tying therefore has the potential to reduce the competitive constraint that competitors provide, allowing the merged entity to increase the price of a tied product or the overall price of a bundle at a later time.
93. The ACCC considered that for this to arise, the merged firm would need to :
    - identify a substantial proportion of customers who must purchase both products A and B (to use the illustrative example above), whether from one or more suppliers; and
    - have market power in the supply of a particular product, often referred to as a 'must have' product (e.g. Product A), which could be combined with other products (e.g. Product B) in a way that would foreclose competing suppliers from accessing customers of Product B, thus leveraging market power in the supply of Product A into the supply of the previously competitive Product B.
94. However, the ACCC's market inquiries indicated that it was unlikely that these conditions would be fully satisfied in the present case. The combination of the merger parties' product portfolios may create a 'one stop shop' that could cover some customers' requirements, which may be an appealing offer to customers. Barriers to entry for several life sciences products also appeared to be high. However, the ACCC's market inquiries revealed that:
    - there isn't always a 'must have' product – that is, the products required by many customers, particularly those in the academic research field, may differ according to their particular research objectives. Therefore, it did not appear likely that a substantial proportion of customers would frequently need to purchase a particular combination of products; and in light of this
    - there are likely to be sufficient competitors who are likely to be capable of offering substitutes for the products offered by the merged entity (either alone or combined with another product) such that they would not be foreclosed from accessing customers who require both products.
95. The ACCC therefore concluded that the proposed acquisition was not likely to lead to foreclosure of the merged entity's competitors, constituting a substantial lessening of competition in any relevant markets.

Undertakings

96. Thermo Fisher offered to the ACCC section 87B undertakings in order to address the ACCC's concerns arising from the proposed acquisition. On 19 December 2013 the ACCC accepted these undertakings.

97. Given the global nature of Thermo Fisher's businesses and the supply links between Thermo Fisher's business in Australia and businesses overseas, the undertakings rely upon a remedy that the European Commission (**EC**) has accepted from Thermo Fisher (**EC commitments**). The ACCC considered whether the court enforceable undertakings proposed by Thermo Fisher Scientific Inc, pursuant to section 87B of the Act, would address the issues of concern identified by the ACCC.

98. The undertakings provide that Thermo Fisher must:

    (a) divest its Australian cell culture business (a component of the global cell culture business to be divested under the EC commitments) to an ACCC-approved purchaser;

    (b) divest its Australian siRNA business (a component of the global gene modulation business to be divested under the EC commitments) to an ACCC-approved purchaser; and

    (c) appoint an ACCC-approved Australian-based independent manager, who will manage the Australian cell culture business in the period between completion of the acquisition and divestiture.

99. Thermo Fisher offered divestitures of the Australian cell culture business and Australian siRNA business in order to address the ACCC's competition concerns in relation to FBS and siRNA reagents respectively.

100. The Australian cell culture business includes a manufacturing facility in Melbourne that processes high quality FBS. This facility is an important part of the Australian FBS market and the global cell culture business. An Australian-based independent manager would provide day to day management of the Australian cell culture business, including the Melbourne facility, with a view to successfully transitioning the business to the approved purchaser.

101. The ACCC considered the undertakings would remedy the competition concerns raised by the proposed acquisition on the basis that they:

- will remove the competitive overlap between Thermo Fisher and Life Technologies in the national supply of FBS and siRNA reagents;
- provide an approved purchaser with the assets, rights and agreements necessary to enable the purchaser to compete effectively in Australia in the supply of FBS and siRNA reagents;
- will bind Thermo Fisher to the EC Commitments as they relate to the Australian cell culture and siRNA businesses;
- require that Thermo Fisher only divest the divestiture businesses to a purchaser or purchasers approved by the ACCC; and
- require that Thermo Fisher appoint an ACCC-approved Australian-based independent manager to implement the transition of the Australian cell culture business, which is an important element of the global supply of FBS.

Conclusion

102. On the basis of the information outlined above, the ACCC considered that the proposed acquisition would raise competition concerns in the market for the supply of FBS in Australia and in the market for the supply of siRNA in Australia.

103. However, taking into account the undertakings, the ACCC formed the view that the proposed acquisition of Life Technologies Corporation by Thermo Fisher Scientific Inc would not be likely to result in a substantial lessening of competition in the market for the manufacture and supply of FBS, cell culture media, or the supply of siRNA in Australia, in contravention of section 50 of the Act.