Case ME/6795/18

ANTICIPATED ACQUISITION BY ILLUMINA, INC. OF PACIFIC BIOSCIENCES OF CALIFORNIA, INC.

Response to Remedies Working Paper

10 December 2019

NON-CONFIDENTIAL VERSION

I. Illumina's proposed IP remedy would be effective

1. The Remedies Working Paper concludes that there is insufficient evidence to conclude that an IP remedy would be sufficient to constrain the merged entity to the same extent as the alleged competition between Illumina and PacBio.[1] This is simply not the case. As explained in Section A, below, the majority of third parties engaged with the CMA thought that an IP remedy would be effective. Further, as the Parties have repeatedly noted, at no point in the course of this investigation has the CMA made any attempt to quantify the alleged current competition between the Parties. As a result, it is simply not possible for the CMA to have conducted a balancing exercise assessing the significant benefits that would accrue to licensees taking advantage of the revised remedy proposal, on the one hand, and the unquantified but *de minimis* alleged competition, on the other.

2. As the Remedies Working Paper itself notes, licensing may be viewed generally as a specialised form of asset divestiture where it is irrevocable, non-terminable, has no performance-related royalties, and the licensees will not rely on the licensor for technology updates or continuing access to specialists inputs or know-how, as is the case with Illumina's revised remedy proposal. Indeed, Illumina has included its own pre-closing patents and patent applications in the scope of the revised remedy proposal, despite the fact that there is nothing merger-specific about its rights in connection with those patents and patent applications.

3. The field of use set out in the annexed proposed License Agreement makes clear both the breadth of the license proposed and the limited nature of the exceptions (which essentially exclude only sequencing that does not use a single molecule method and assembled short read sequencing). Further, it covers pre-closing patents and patent applications, all continuations, divisionals, and other derivatives, and all patent applications filed within 2 years.

4. As a result, third parties availing themselves of a license would be in a materially better IP position that they could have been absent the concentration. Illumina's revised remedy proposal facilitates new entry by a range of innovative market players.

5. The CMA, however, concludes that an IP license would not "*create a level of constraint equivalent to that previously applied by PacBio on Illumina*" because it would not address various other barriers to entry, including:

    - The time and cost of commercialisation;
    - Building scale to become profitable; and
    - Customer perceptions (including the time and cost of building a good reputation).

6. This is at best perplexing. As the CMA well knows, PacBio is not, and has never been, profitable. Further, and as explained at length below in Section II.A., PacBio is not in a position to effectively commercialise its systems. Indeed, its scale will be further impaired if the CMA prohibits the Transaction – [redacted]

[1] See Remedies Working Paper, paragraph 100.

[redacted]

A. Third party feedback confirms that an IP remedy would be effective

7. The majority of third parties who made submissions to the CMA regarding remedies confirmed that an IP remedy would be effective and would address the CMA's provisional SLC finding.[2] Several third parties expressly confirmed that Illumina's revised remedy proposal would be effective:

   - Company D stated that it "*is encouraged by, and fully supports, the latest remedy offer of Illumina and Pacific Biosciences (Pac Bio) in connection with the proposed merger between the two companies. Our concerns with the anticompetitive nature of the combined patent portfolios of the two companies are addressed by this latest remedy offer, properly clarified*";[3]

   - Company E explained that "*licensing of IP could … be effective*" and that "*although the effect of its adjusted version of the Illumina proposal would not be felt immediately, after a few years it would expect potential entrants to be in a stronger place to provide a competitive constraint on the Parties. The effect on [Company E] itself would reduce the threat of litigation and allow it to refocus its resources, as well as reducing the need to "work around" the relevant patents when developing its own technology*";[4] and

   - Company H considered that licensing of IP could be effective but raised certain questions regarding the scope of the proposed IP remedy.[5] As explained in Section I.B below, the proposed License Agreement attached as **Annex 1** addresses the questions raised by Company H.

8. In addition to these responses provided to the CMA in its consultation process, additional third parties provided input to the CMA at their own initiative:

   - Company F stated that it "*was concerned that prohibition could weaken PacBio, and alternative approaches should be considered*" and "*proposed that the IP in PacBio's technology be licensed to a small number of identified existing or*

[2] For reasons not clear to Illumina, Companies F and G have not been consulted by the CMA about Illumina's remedy proposals.
[3] See Remedies Working Paper, paragraph 95(a). "*The effect of a well implemented licence of this form would be to incentivise [Company D] to develop a long read technology (which it would not intend to do otherwise) and accelerate its entry into the market by [✂].*" See Remedies Working Paper, paragraph 78.
[4] See Remedies Working Paper, paragraphs 32 and 95(b). Prior to publication of Illumina's remedy proposals, Company E stated that "*an IP licensing remedy could have a downstream effect in spurring competition and provide an alternative remedy to prohibition. In particular, it noted that access to PacBio's patents could speed up the time to market of potential entrants, as well as removing the existing or future threat of litigation. [Company E] stated that companies getting a licence to the relevant patents may not need any accompanying know-how or other resources to effectively exploit the patented technology*". See Remedies Working Paper, paragraph 72(c).
[5] See Remedies Working Paper, paragraph 77.

potential competitors, or to all comers on fair, reasonable and non-discriminatory terms";[6] and

- Company G told the CMA that "*one major barrier which influenced its decision not to enter sequencing was specific IP held by the Parties. If these patents were licensed to potential competitors, it could materially change the opportunity for developing a competitive nanopore sequencing technology. It stated that while it recognised that there were important legal nuances to any such agreement, this approach could make a difference*".[7]

9. Further, the Remedies Working Paper states that, in addition to Companies F and G, the CMA did not solicit the views of Company B on any of Illumina's remedy proposals, despite the fact that all three entities had engaged during the course of the CMA's investigation.[8] As a result, none of these third parties substantively engaged on Illumina's revised remedy proposal. It is not clear to Illumina why the CMA simply decided to disengage with these third parties.

10. The other third parties who made submissions to the CMA, *i.e.*, Companies A and C, have fundamentally misunderstood or mischaracterised the scope of Illumina's revised remedy proposal. Further, it appears that ONT has deliberately misconstrued the intended scope and purpose of Illumina's revised remedy proposal with a view to cajoling the CMA into prohibiting the Transaction.

11. First, Companies A and C appear to ignore the fact that Illumina's revised remedy proposal includes all of Illumina's and PacBio's pre-closing patents and patent applications.[9] Company A stated that "*it did not feel that it was in a position to identify exactly what patents would need to be included*".[10] Company C said that "*the IP included was too narrow to be meaningful*" and that "*the proposal was very limited with regard to PacBio's existing patent portfolio*".[11] The CMA – like companies A and C – also appears to have misunderstood the scope of Illumina's revised remedy proposal. Indeed, the CMA states that "*it is difficult for us to identify the correct list of relevant patents*" and indicated that it expects additional information from Illumina "*identifying the appropriate portfolio of patents*".[12] As Illumina has made clear, its revised remedy proposal applies to the entire Illumina and PacBio pre-closing patents and patent applications.

12. Second, Company A and ONT failed to appreciate that the purpose of the remedy is to replicate the level of competitive constraint allegedly imposed by PacBio on Illumina. Company A stated that "*any patent licence should cover the whole of the NGS market rather*

[6] See Remedies Working Paper, paragraphs 33 and 72(a).
[7] See Remedies Working Paper, paragraph 72(e).
[8] The Remedies Working Paper only mentions that "*[Company B] submitted that the CMA's view on prohibition of the merger seemed reasonable*" but does not include the views of Company B on any of Illumina's remedy proposals. See Remedies Working Paper, paragraph 28.
[9] See Illumina's revised remedy proposal, paragraph 5(a).
[10] See Remedies Working Paper, paragraph 74.
[11] See Remedies Working Paper, paragraphs 76 and 105. See also Remedies Working Paper, paragraph 101, where the CMA states that the remedy "*would need to include a sufficiently broad portfolio of patents*".
[12] See Remedies Working Paper, paragraphs 121(a) and 130.

than being restricted to long-read".[13] ONT submitted, inter alia, that "*the limited field of use … would exclude sequencing of shorter lengths of DNA and RNA*" and provided many examples of short read applications "*which may be excluded from Illumina's proposed licenses on the basis of the limited field of use*".[14] As explained in Section I.B below, the field of use covered by the license addresses long read, to replicate the existing competitive constraint imposed on Illumina by PacBio.

B. The proposed License Agreement addresses the questions raised by third parties

13. Some third parties have raised concerns regarding the scope of Illumina's revised remedy proposal. However, as explained below, the definitions and provisions included in the proposed License Agreement, attached as **Annex 1,** make it clear that the concerns raised by third parties are unfounded.

14. First, some third parties have raised concerns regarding the field of use that would be covered by the license.[15] ONT stated that "*each of the terms "native", "long read", and "single molecule" had not been defined in Illumina's revised remedies proposal and, in combination, may result in a very restricted field of use and so the resulting licence would potentially exclude large areas of biological analysis that are currently being performed or could potentially be performed by scientists using ONT or other sequencing technologies*".[16] Company E stated that there are issues with the interpretation of the meaning of "*native long read*" and that, therefore, the reference to this term should be removed from Illumina's definition of the field of use.[17]

15. The definitions in the annexed proposed License Agreement remove any uncertainty regarding the field of use and the meaning of the terms "long read" and "single molecule":

- "Field" means "*use of a Sequencing System for determining the bases of a Long-read Sequence directly from a Single Molecule. For clarity, the Field excludes use of a Sequencing System to (i) observe or otherwise capture a signal collectively produced from two or more copies of a Single Molecule, or (ii) determine the bases of two or more computationally or otherwise assembled Short-read Sequences.*";[18]

- "Long-read Sequence" means "*a nucleic acid sequence containing five thousand or more contiguous bases*";[19] and

[13] See Remedies Working Paper, paragraph 74.
[14] See ONT's views on Illumina's revised remedy proposal of 19 November 2019 and corresponding Annex, available on the CMA's case page.
[15] See Remedies Working Paper, paragraphs 121(b) and 128-129.
[16] See Remedies Working Paper, paragraphs 75(b) and 104.
[17] See Remedies Working Paper, paragraph 79. See also Remedies Working Paper, paragraph 106.
[18] See Article 1.3 of the proposed License Agreement, attached as **Annex 1**. Further, "Sequencing System" means "*collectively, an instrument to the extent performing actual nucleic acid sequencing, together with reagents and other consumables used for performing such sequencing on such instrument. For clarity, a Sequencing System does not include ancillary components or instruments (such as robotic liquid handlers) that do not perform actual sequencing*". See Article 1.13 of the proposed License Agreement, attached as **Annex 1**.
[19] See Article 1.10 of the proposed License Agreement, attached as **Annex 1**.

- "Single Molecule" means "*an individual nucleic acid molecule (either single- or double-stranded), including, for example and without limitation, a single genomic DNA fragment, a single DNA amplicon or a single cDNA molecule*".[20]

16. Second, a couple of third parties have asked whether the license would cover continuation and divisional patents. For example, Company H said that it was unclear "*whether the grant of licence included continuation/divisional patent applications*".[21] Company E asked to "*ensure that the licence would cover the entire relevant patent families (eg including continuations, divisionals, etc, even if filed subsequently)*".[22]

17. As noted in paragraph 6 above, Illumina's revised remedy proposal encompasses all of Illumina's and PacBio's pre-closing patents and patent applications.[23] Further, the proposed License Agreement makes clear that the license would cover all continuations, divisionals, and other derivatives of the licensed patents:

    - The definition of "Patent" includes "*patents and patent applications of any kind, including provisional and nonprovisional patent applications, utility models, petty patents, reissue patents, continuation and divisional patent applications, substitutions, reexaminations and design patents and certificates of invention and any similar rights, including so-called pipeline protection, patent term extension and supplemental protection certificates*";[24] and

    - The definition of "Licensed Patents" covers (i) all Patents owned by Illumina or PacBio or their Affiliates, at closing, except the Joint Patents (see below),[25] (ii) all patent applications filed by Illumina or any of its Affiliates within 2 years of the date of the antitrust commitment which claim any invention within the Field that had been conceived and reduced to practice before the date of the antitrust commitment, and (iii) all Patents issuing from the Patents in (i) and (ii).[26]

18. Third, Company H has raised concerns as to whether "*the licensors of in-licensed technology would be willing to grant non-exclusive licences to the potential users*".[27] The proposed License Agreement provides the following:

    - "*Illumina has notified each In-License Licensor that, notwithstanding the exclusive grants to Illumina or its Affiliates under the applicable In-License Agreement, Illumina and its Affiliate relinquishes its or their exclusive rights under the relevant Licensed Patents in the Field, and consents to the In-License Licensor granting any Person a non-exclusive license under the Licensed Patents (i) to make, use, sell, offer for sale and import products in the Field in the Territory, and*

[20] See Article 1.15 of the proposed License Agreement, attached as **Annex 1**.
[21] See Remedies Working Paper, paragraph 77.
[22] See Remedies Working Paper, paragraph 79. See also Remedies Working Paper, paragraph 72(c).
[23] See Illumina's revised remedy proposal, paragraph 5(a).
[24] See Article 1.11 of the proposed License Agreement, attached as **Annex 1**.
[25] These patents will be listed in Schedule A, and the Licensee may select all, or any subset, of the Patents set forth on Schedule A for inclusion within the scope of the License Agreement. See footnote 7 of the proposed License Agreement, attached as **Annex 1**.
[26] See Article 1.9 of the proposed License Agreement, attached as **Annex 1**.
[27] See Remedies Working Paper, paragraphs 77 and 109.

(ii) to practice any process or method covered by a claim of such In-Licensed Patents in the Field in the Territory"; and

- "*In the event that Licensee desires to obtain a non-exclusive license under any In-Licensed Patent in the Field, Illumina (a) shall not contest any efforts by Licensee to obtain such non-exclusive license, and (b) if requested by the applicable In-License Licensor, shall amend the In-License Agreement for such In-Licensed Patent to convert Illumina's rights to such In-Licensed Patent from exclusive in the Field to non-exclusive in the Field; provided however, that Illumina shall not have any obligation to make any payment, or grant any right, to the applicable In-License Licensor in connection with (x) such conversion, or (y) any exercise by the Licensee of its rights under such license or otherwise in connection with the practice or other exploitation of the Joint Patents by the Licensee, its Affiliates or their respective sublicensees*".[28]

19. Fourth, Company H has raised the question whether "joint owners of patents have consented to license them".[29] The CMA explained that "if there are joint owners of any of licensed, or in-licensed patents, other joint owners of patents could refuse to allow them to be licensed".[30] Illumina notes that none of its patents are co-owned with third parties. Of the 1,237 rows included in PacBio's patents spreadsheet, only 12 are indicated as being jointly owned. Specifically, three patents are co-owned with the University of Chicago (patent family no. 6), two with Northeastern University (patent family no. 7), two with UC Davis (patent family no. 8), four with IMEC (patent family no. 11), and one with Shaare-Zedek Scientific Ltd. (patent family no. 12).[31] The proposed License Agreement provides as follows:

    - "*Illumina has notified each Co-owner that, notwithstanding its or its Affiliates rights in the Joint Patents, it consents to such Co-owner granting any Person a non-exclusive license under the Joint Patents (i) to make, use, sell, offer for sale and import products in the Field in the Territory, and (ii) to practice any process or method covered by a claim of such Joint Patents in the Field in the Territory*"; and

    - "*In the event that Licensee desires to obtain a non-exclusive license under any Joint Patent in the Field, Illumina (a) shall not contest any efforts by Licensee to obtain such non-exclusive license, and (b) if requested by the applicable Co-owner, shall amend any Joint Patent Agreement to confirm the Co-owner's right to grant such license; provided however, that Illumina shall not have any obligation to make any payment, or grant any right, to the applicable Co-owner in connection with (x) such consent, or (y) any exercise by the Licensee of its rights under such license or otherwise in connection with the practice or other exploitation of the Joint Patents by the Licensee, its Affiliates or their respective sublicensees*".[32]

[28] See Article 2.3 of the proposed License Agreement, attached as **Annex 1**.
[29] See Remedies Working Paper, paragraph 77.
[30] See Remedies Working Paper, paragraph 109.
[31] See PacBio's patents spreadsheet, rows 1224 to 1226, 1236 to 1239, and 1241 to 1245.
[32] See Article 2.2 of the proposed License Agreement, attached as **Annex 1**.

Accordingly, Company H's concerns in this regard have been addressed.

20. Fifth, Company H has asked "*who would negotiate the final wording in any licence*".[33] The CMA noted that "*if an IP remedy were pursued, this also gives rise to the practical problem as to who negotiates with whom in relation to finalising wording of the IP licence, recognising that different licensees are at different stages of development, and have different technologies and incentives*".[34] The CMA added that it is likely that "*substantial third party input*" would be required "*in designing, and finalising the exact wording of, a licence*".[35] This is incorrect. As explained in Illumina's revised remedy proposal, Illumina would "*make available prior to and as a condition to closing the Transaction and thereafter for as long as the patents are in force, to any interested third-party undertaking a complete form license agreement*".[36] The license agreement, of which the version proposed by Illumina is attached as **Annex 1**, would not be subject to further negotiation, and would not need such negotiation, given its broad and straightforward terms. It will be made available for signature by any third party.

21. Therefore, the terms of the proposed License Agreement address all of the questions and concerns raised by third parties. Accordingly, the CMA should solicit the views of third parties on the proposed License Agreement to confirm that Illumina's revised remedy proposal addresses their questions and concerns.[37]

C. Illumina's proposed IP remedy addresses the SLC provisionally found by the CMA

22. The CMA has provisionally found that the Transaction would lead to a reduction in current and future competition. In particular, the CMA is concerned that the Transaction would reduce the merged entity's incentive to innovate, which is an important parameter of competition in the dynamic sequencing sector. While Illumina believes that the CMA's Provisional Findings are fundamentally flawed, it will address the alleged SLC "as if" it were correct.

23. A license of all of Illumina's and PacBio's pre-closing patents and patent applications to any interested third party undertaking for use in the field specified in the proposed License Agreement would enable third party innovation and drive the merged entity to continue to compete to out-innovate third parties. As a result, it would be effective in addressing the SLC provisionally found by the CMA.

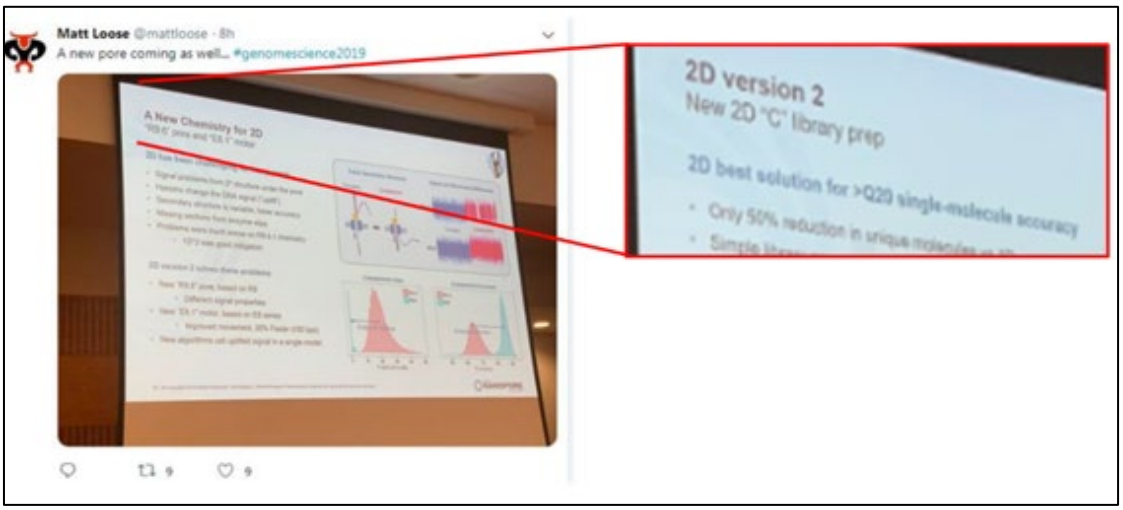
24. First, the license would provide material and immediate benefits for ONT. Specifically, the license would enable ONT to further improve its native long read systems offering and to become a significantly stronger competitor on the market for native long read systems in the immediate short term. With almost immediate effect, it would enable ONT to commercialise its 2D products in Germany and the UK, which it had agreed to refrain from

[33] See Remedies Working Paper, paragraph 77.
[34] See Remedies Working Paper, paragraph 121(g).
[35] See Remedies Working Paper, paragraph 121(h).
[36] See Illumina's revised remedy proposal, paragraph 5(c).
[37] Illumina notes that the CMA has not yet obtained the views of third parties on Illumina's explanation of the field of use covered by the license. See Remedies Working Paper, paragraph 73.

offering until 2023 as part of a settlement of patent infringement lawsuits with PacBio. As a result of the license, ONT would no longer be restricted from offering its new solution.

25. Figure 1 below illustrates the importance of 2D technology to improve ONT's accuracy. This snapshot is taken from a presentation given in September 2019 by Clive Brown, ONT's Chief Technical Officer, at the Genome Science Conference in Edinburgh, and shows that 2D technology would enable ONT to reach Q20 accuracy. Reports from the Conference indicate that ONT has a new proven-to-work version of 2D chemistry ready to bring to market in a matter of weeks. Given that this presentation was made very recently and at a time when both ONT and Mr. Brown knew that the CMA was conducting a Phase II review of the Transaction, it also shows that 2D version 2 technology is still relevant for ONT, despite its assertion that "*2D products were superseded in May 2017 and are no longer sold*".[38]

Figure 1: Clive Brown Presentation at Genome Science Conference



26. The license would also resolve the ongoing litigation between PacBio and ONT over the infringement of three separate PacBio patent families, enabling ONT to improve the accuracy and throughput of its systems and to focus its financial resources and efforts on R&D and commercialisation of its systems rather than on litigation.[39]

27. The resulting enhanced competition from ONT will also incentivise the merged entity to continue innovating and improving its systems to compete for customers seeking native long read functionality. Further, the license would mitigate any alleged short-term adverse effects of the SLC, as ONT is already active on the market for native long read systems, and the licence would enable it to commercialise an improved offering rapidly.

28. In addition, the license would enable and/or accelerate the entry of several new competitors. As explained in Section I.A above, Companies D, E, F and G all have told the CMA that an IP license would be an effective remedy. Accelerated third party entry facilitated by the license will ensure that the merged entity keeps innovating in the short and long term. As the CMA noted in its Provisional Findings, sequencing is a dynamic industry. New products

[38] See ONT's views on Illumina's original remedy proposal of 7 November 2019, p. 2.
[39] See the Presentation from the CMA Response Hearing of 15 November 2019, slides 25-28.

and technologies are regularly launched and manufacturers compete through research, development and innovation.[40] Therefore, the merged entity could not stand idly by while new entrants, which will no longer need to innovate around the merged entity's patents, develop new technologies that could be disruptive.

29. Finally, in the medium to long term, the license would not only address the SLC provisionally found by the CMA, it would also facilitate increased competition as compared to a prohibition of the Transaction. Indeed, the license would enable the effective and/or accelerated entry of any number of new competitors and would facilitate the launch of a new system that ONT itself identifies as providing the "best solution" to improve accuracy. Absent the Transaction and the license, neither of these things would occur. Prohibiting the Transaction would at best maintain the *status quo*, but in all likelihood would lead to a weakened PacBio that becomes less able to innovate over time.

D. Illumina will not be able to circumvent the proposed remedy

30. The CMA asserts that "*the Parties could seek to circumvent the intended effects of the IP remedy … if this could reduce the threat posed by existing competitors or future competitors*".[41] For example, in the CMA's view, the merged entity could:

- "*Frequently litigate (or appeal to the Monitoring Trustee) on whether third parties' activities fall within the specified field of use, or even on whether the activities infringe other non-licensed patents which the Merged Entity owns*";
- "*Encourage joint owners of patents, or owners of in-licensed patents, not to offer licences to other suppliers*";
- "*Delay the filing of any patents such that they occur after*" the 2 years period specified in Article 1.9 of the proposed License Agreement.[42]

31. These concerns are ill-founded. First, as explained in Section I.B above, Article 1.3 of the proposed License Agreement clearly defines the field of use covered by the license and does not leave room for interpretation. Second, Illumina cannot terminate the license in the event of any alleged breach, enabling licensees to continue activity within the broadly defined Field while any disputes around activity not clearly within the Field are resolved. Third, any dispute would be rapidly resolved through arbitration (see Section I.E.ii below). In any event, repeated arbitration aimed at reducing the effectiveness of the IP remedy would likely be considered to amount to a breach of Illumina's commitment, potentially exposing Illumina to administrative penalties imposed by the CMA and the potential for damages actions by licensees under Section 94 of the 2002 Enterprise Act.

32. In addition, contrary to the assertions of Company C, Illumina is not an "*aggressive litigant*" who initiates litigation "*as a strategic tactic to deter new entrants rather than to protect its own products from imitation*".[43] As explained in the Response to the Issues Paper submitted on 27 May 2019, Illumina files a lawsuit only after careful consideration and when it has

[40] See Provisional Findings Report, paragraph 8.39.
[41] See Remedies Working Paper, paragraphs 137 and 138.
[42] See Remedies Working Paper, paragraph 138.
[43] See Remedies Working Paper, paragraph 138.

evidence that its patented technology is being infringed. Illumina has legitimate legal rights resulting from its substantial investments in research and development relating to cutting edge sequencing technologies to protect. Indeed, courts have repeatedly vindicated Illumina's actions, by finding that its patents were valid and infringed by the defendant. Further, the key litigations between Illumina and various entities offering sequencing systems were initiated by the other party, not Illumina.[44]

33. Lastly, as explained in Section I.A above, Illumina's revised remedy proposal includes all of Illumina's and PacBio's pre-closing patents and patent applications. Therefore, there would be no risk of litigation on whether third parties' activities "*infringe other non-licensed patents which the Merged Entity owns*".

34. The CMA's concern that the merged entity could encourage co-owners or owners of in-licensed patents not to offer licenses is also unfounded. With respect to in-licensed patents, Article 2.3 of the proposed License Agreement explicitly stipulates that Illumina "*has notified each In-License Licensor that, notwithstanding the exclusive grants to Illumina or its Affiliates under the applicable In-License Agreement, Illumina and its Affiliate relinquishes its or their exclusive rights under the relevant Licensed Patents in the Field, and consents to the In-License Licensor granting any Person a non-exclusive license under the Licensed Patents ...*" and that Illumina "*... (a) shall not contest any efforts by Licensee to obtain such non-exclusive license, and (b) if requested by the applicable In-License Licensor, shall amend the In-License Agreement for such In-Licensed Patent to convert Illumina's rights to such In-Licensed Patent from exclusive in the Field to non-exclusive in the Field ...*".[45] Therefore, if Illumina were to encourage owners of in-licensed patents not to offer licenses, it would be in breach of the License Agreement and IP remedy.

35. With respect to co-owned patents, Illumina notes that none of its patents are co-owned, and that out of PacBio's 1,237 patents, only 12 are co-owned. In addition, Article 2.2 of the proposed License Agreement explicitly provides that "*Illumina has notified each Co-owner that, notwithstanding its or its Affiliates rights in the Joint Patents, it consents to such Co-owner granting any Person a non-exclusive license under the Joint Patents ...*" and that Illumina " *... (a) shall not contest any efforts by Licensee to obtain such non-exclusive license, and (b) if requested by the applicable Co-owner, shall amend any Joint Patent Agreement to confirm the Co-owner's right to grant such license ...*".[46] Therefore, if Illumina were to encourage co-owners of joint patents not to offer licenses, it would be in breach of the License Agreement and IP remedy.

36. Finally, Illumina would not have the incentive to delay the filing of patents such that they would occur after the 2 years period specified in Article 1.9 of the proposed License Agreement. As the CMA itself recognises, overlaying a first-to-file patent system on an industry driven by development and innovation means that delaying patent applications would create a material risk that another company files a patent application before Illumina does, with the result that Illumina would also be barred from exploiting its own discovery.

[44] See Response to the Issues Paper submitted on 27 May 2019, paragraph 134.
[45] See Article 2.3 of the proposed License Agreement, attached as **Annex 1**. See also paragraph 13 above.
[46] See Article 2.2 of the proposed License Agreement, attached as **Annex 1**. See also paragraph 14 above.

E. Illumina's remedy proposal addresses the CMA concerns with respect to monitoring and enforcement

37. Illumina has proposed the introduction of compliance mechanisms to address any concerns that Illumina might be incentivised to breach any of its commitments including: (i) the appointment of a monitoring trustee; and (ii) making a fast-track arbitration-based dispute resolution mechanism available to third parties.

38. The CMA has expressed certain concerns with respect to how these compliance mechanisms will work in practice. In the following paragraphs, Illumina addresses the CMA's concerns.

i. Monitoring trustee

39. The monitoring trustee would report to the CMA on the implementation of the IP remedy. In particular, the monitoring trustee would maintain a list of the licensees, update the list of patent applications covered by the proposed License Agreement – following the filing of new patents within the two year period mentioned in Article 1.9 of the proposed License Agreement – and report on disputes between the merged entity and licensees or prospective licensees. The monitoring trustee would report to the CMA on these matters in writing on an annual basis.

40. The monitoring trustee would have no role in negotiating the terms of the License Agreement. As explained above in Section I.B, under the revised IP remedy proposal, the proposed License Agreement would be available to any third party undertaking for signature, and would not be subject to negotiation. Further, the monitoring trustee would not have a role in the resolution of disputes either. Pursuant to Article 6.4 of the proposed License Agreement, all disputes would be resolved through the Arbitration procedure outlined below.

41. Further, it seems that many of the CMA's concerns regarding the role of the monitoring trustee are based on the CMA's misunderstanding of the scope of Illumina's revised remedy proposal. For example, the CMA notes that "*in its original proposal, Illumina stated that, following completion, if it became apparent that licences for other patents were needed in order to meaningfully exploit those included in the proposal, then a Monitoring Trustee would act as a mechanism for adding these additional patents to the remedy. The stated aim of this approach was to avoid "litigation on the margins". Illumina told us that the actual process for this would require additional consideration, and we have not received any additional information on this approach or the role of the Monitoring Trustee under Illumina's revised proposal*".[47] However, as already explained in Section I.A above, Illumina's revised remedy proposal (as compared with the original proposal discussed at the Response Hearing) includes all of Illumina's and PacBio's pre-closing patents and patent applications.[48] As a result, there will be no need for the monitoring trustee to rule on whether patents are or should be within the scope of the License Agreement.

42. Further, the CMA asserts that "*the inclusion of a Monitoring Trustee and "fast-track" arbitration function will, at the very least, introduce additional complexity and ongoing*

[47] See Remedies Working Paper, paragraph 68. See also Remedies Working Paper, paragraphs 121(f) and 142.
[48] See Illumina's revised remedy proposal, paragraph 5(a).

interactions between the Parties and any licensees. In more extreme circumstances, the mechanisms could introduce what amounts to a parallel litigation process (or a precursor to litigation) over whether uses of patents would be covered by the licence or not".[49] However, as explained above, the monitoring trustee would not have a role in the resolution of disputes, contrary to what had initially been foreseen in Illumina's remedy proposal. Pursuant to Article 6.4 of the proposed License Agreement, all disputes would be resolved through the Arbitration procedure outlined below.

43. The CMA has also expressed concerns with respect to how the monitoring trustee will be selected and appointed.[50] To address the CMA's concerns, Illumina proposes the monitoring trustee to be appointed as follows:

- No later than two weeks after the CMA's acceptance of Illumina's revised remedy proposal, Illumina shall submit the name or names of one or more natural or legal persons whom Illumina proposes to appoint as the monitoring trustee(s) to the CMA for approval. The monitoring trustee shall be a professor specialising in IP law, based in the UK, and be familiar with the CMA's process in implementing remedies;

- The monitoring trustee shall be assisted by a technical expert with regard to all technical questions related to its role. The technical expert shall be an industry expert with years of experience in the field of sequencing. All information provided to the monitoring trustee may also be exchanged with the technical expert. The technical expert will be independent of the merged entity, and will not have or be exposed to any conflict of interest;

- The CMA shall have the discretion to approve or reject the proposed monitoring trustee. If only one name is approved, Illumina shall appoint or cause to be appointed the person or persons concerned as trustee. If more than one name is approved, Illumina shall be free to choose the trustee to be appointed from among the names approved; and

- If all the proposed trustees are rejected, Illumina shall submit the names of at least two more natural or legal persons within one week of being informed of the rejection.

44. Illumina is confident that the CMA's involvement in the appointment of a monitoring trustee will ensure the independence of the person(s) selected.

45. Finally, with respect to the remuneration mechanism and the concerns identified by the CMA,[51] Illumina commits to remunerate the monitoring trustee and the technical expert in a way that does not impede the independent and effective fulfilment of their roles.

ii. Arbitration

[49] See Remedies Working Paper, paragraph 121(d). See also Remedies Working Paper, paragraph 143(a).
[50] See Remedies Working Paper, paragraphs 121(d), 121(e) and 143(b).
[51] See Remedies Working Paper, paragraphs 121(e), 143(d).

46. All disputes will be settled by an arbitration panel, as provided in Article 6.4 of the proposed License Agreement. The arbitration procedure will be based on the Expedited Procedure set out in the Arbitration Rules of the International Chamber of Commerce ("ICC"). This procedure is simpler, more expeditious and less expensive than traditional court procedures and has the following features:

- **Composition of the Arbitration panel**: the panel will consist of 3 arbitrators with experience in the field of sequencing. Each party will name one arbitrator and the arbitrators named by each party will designate a President within 15 days, failing which the International Chamber of Commerce will appoint the President.[52] The President will have experience in arbitration. The arbitrators must meet the standards of impartiality and independence set out in Article 11 of the ICC Arbitration Rules;

- **Conduct of proceedings**: the Expedited Procedure set out in Article 30 of the ICC Arbitration Rules will apply to all conflicts brought before the arbitrators, irrespective of the amount of the parties' claims. Further, all disputes will be decided on the basis of the documents submitted by the parties with no hearing and no examination of experts or witnesses, unless the parties request otherwise or the tribunal so decides after consultation with the parties. When a hearing is held, the arbitral tribunal may conduct it by videoconference, telephone or similar means of communication.[53] The arbitral tribunal must render its final award within six months of the date of the case management conference;[54]

- **Costs**: the costs of the arbitration will include the fees and expenses of the arbitrators, the ICC administrative expense and reasonable legal and other costs of the parties.[55] The arbitration panel will fix the costs of the arbitration in the final award and decide which of the parties will bear them or in what proportion they will be borne by the parties.[56]

- **Scope of award**: the arbitration panel may grant any remedy or relief that it deems just and equitable and within the scope of the License Agreement. In addition to a final award, the arbitration panel may also order interim or conservatory measures.[57]

47. This procedure will enable a swift resolution of potential conflicts by independent and impartial arbitrators, thus alleviating the monitoring and enforcement risks identified by the CMA in the Remedies Working Paper.[58]

[52] See Article 12 (4) and 12 (5) of ICC Arbitration Rules.
[53] See Article 3 of Annex VI to the ICC Arbitration Rules.
[54] See Article 4 of Annex VI to the ICC Arbitration Rules.
[55] See Article 38 (1) of ICC Arbitration Rules.
[56] See Article 38 (4) of ICC Arbitration Rules.
[57] See Article 28 of the ICC Arbitration Rules.
[58] See Remedies Working Paper, paragraph 143.

II. Prohibition would not be a proportionate solution

48. The Remedies Working Paper provisionally concludes that "*prohibition is the least onerous effective remedy and is not disproportionate to the SLC and its adverse effects*".[59] However, Illumina submits that prohibition would be neither proportionate nor "*reasonable*" (under section 36(3) Enterprise Act 2002). The relevant customer benefits ("RCBs") are significant in scale and nature,[60] and the CMA should take into account the RCBs that would be lost as a result of a prohibition. All RCBs would be lost if the Transaction were to be prohibited.

49. As already explained to the CMA, the RCBs resulting from the Transaction include the following:

- Wider distribution of/access to PacBio's systems and technology by enabling PacBio to benefit from Illumina's global production, and support and service infrastructure;
- Increased adoption of PacBio's systems by clinical and diagnostic customers by enhancing PacBio system quality with Illumina's quality systems and system management processes;
- Improved PacBio systems using Illumina's proprietary technologies;
- Development of coordinated solutions (including bioinformatics) to enable customers to harness the complementary nature of the Parties' technologies; and
- Accelerated innovation.

50. However, the CMA asserts that "*there was insufficient evidence on the extent to which any of these changes would be expected to result in an increase in rivalry (and benefits to customers)*"[61] and that the Parties "*have not provided convincing evidence that there would be any RCBs arising from the Proposed Merger in all cases compared to the counterfactual, in particular since:*

- *The Parties have provided no indication of the likely scale of any claimed benefits;*
- *The Parties have provided no convincing evidence that these initiatives would provide benefits to customers, rather than providing benefits to the Merged Entity's shareholders; and*
- *There are other plausible approaches which could achieve the same (or equivalent) benefits as to those claimed by the Parties without the associated loss of competition. For example, PacBio could sign a distribution agreement with one or*

[59] See Remedies Working Paper, paragraph 189.
[60] See *e.g.*, Merger Notice, paragraphs 426 to 459.
[61] See Remedies Working Paper, paragraph 171.

more external parties without incurring the loss of competition associated with this Proposed Merger".[62]

51. As a result, the CMA has not accepted Illumina's submissions with respect to the RCBs, stating that "*we provisionally conclude that there is insufficient evidence to support the existence of any RCBs arising from the Proposed Merger*".[63]

52. Illumina addresses the CMA's Provisional Findings regarding RCBs below.

A. Wider distribution of/access to PacBio's products and technology by enabling PacBio to benefit from Illumina's global production, and support and service infrastructure

53. As the Parties have explained to the CMA in several submissions, PacBio has very limited commercial infrastructure which it has been forced to cut back as a result of its financial circumstances. While PacBio has managed to sell systems in several regions, its overall user base is small and its modest sales force makes it challenging to pitch new customers for business. The Sequel II does not change this picture, as Sequel II has not increased PacBio's overall sales volume, and has largely cannibalised sales of Sequel I and imposed a brake on sales of consumables.

54. Illumina, in contrast, has a robust and experienced commercial operation with the capabilities and know-how to place sequencing systems – and more importantly, support customers – on a much larger scale. PacBio's commercial operation does not even begin to compare to Illumina's, and could not offer such support. [redacted].[64] Further, Illumina's commercial infrastructure enables it to provide robust and customised customer support, including providing scientists to work with customers to develop individualised solutions for their needs. It is self-evident that the Transaction will enable PacBio's customers to access this infrastructure. These benefits are Transaction-specific and will directly benefit customers.

55. The CMA acknowledges that "*the Merged Entity would be likely to have the ability to improve on PacBio's commercial operations*",[65] but argues that Illumina has provided no convincing evidence that the wider distribution of PacBio's products would provide benefits to customers "*rather than providing benefits to the Merged Entity's shareholders*". Illumina fails to understand the CMA's criticism. Illumina already has the infrastructure and the necessary salesforce to increase PacBio's overall sales volumes and, as a result, it is self-evident that PacBio's systems will be more widely distributed as part of Illumina's portfolio. Further, although it is true that PacBio's increased sales post-Transaction could benefit the merged entity's shareholders, they would undeniably also benefit customers: every additional sale of PacBio's systems achieved as a result of Illumina's better

[62] See Remedies Working Paper, paragraph 174.
[63] See Remedies Working Paper, paragraph 175.
[64] [redacted]
[65] See Remedies Working Paper, paragraph 171.

commercial operations and customer support capabilities can be considered an RCB that would be lost if the Transaction were to be prohibited.[66]

56. Further, the CMA argues that this RCB is not Transaction-specific because "*PacBio could sign a distribution agreement with one or more external parties […]*".[67] This is simply incorrect and based on no evidence:

- There are not many other companies with robust and experienced commercial operations similar to Illumina's and with the capabilities and know-how to place sequencing systems;

- Before entering into negotiations with Illumina, PacBio had a distribution agreement in place with Roche, a company that theoretically has enormous commercial and marketing capabilities. As already explained to the CMA, this agreement was not successful (*i.e.*, PacBio's failed "Development, Commercialisation and License Agreement");[68] and

- Before entering into the Transaction, PacBio contacted [redacted] companies (other than Illumina) to explore potential partnership opportunities that may have provided resources and capital to strengthen its commercialisation capabilities and expand routes to market. None of them showed interest, other than Illumina.[69]

57. As a result, the Parties fail to understand the basis on which the CMA argues that, if the Transaction were to be prohibited, PacBio would easily find another interested third party to distribute its products. To date, there is absolutely no evidence that this would be the case. In fact, there is considerable evidence that this is unlikely to be the case.

58. Finally, to state the obvious, increased distribution of PacBio's systems will increase competition with ONT. Therefore, the CMA's conclusion that there would be no rivalry-enhancing effects is fundamentally flawed.

B. Increased adoption of PacBio's systems by clinical and diagnostic customers by enhancing PacBio system quality with Illumina's quality systems and system management processes

59. As the Parties have explained, PacBio does not have a clinical system and has no viable pathway to develop such a system in the foreseeable future. Illumina, by contrast, has several systems/tests approved for clinical use, and has developed expertise and infrastructure relating to securing clinical approval. As a result, Illumina is well positioned

[66] From an economic perspective, the value to consumers of a product must be greater than the price they pay, otherwise, they will not purchase the product. The net benefits the consumer derives equals the difference between the value to the consumer and the price they pay. Some consumers may be willing to pay far more for the product than the price actually paid, but it would have to be at least equal to the price for the transaction to be made. Given the well-documented literature on consumer benefits associated with genetic sequencing, it is assumed that consumer benefits increase with additional sales. That is, more sales of the product lead to more consumer benefits, all else equal.
[67] See Remedies Working Paper, paragraph 174(c).
[68] See Merger Notice, paragraphs 49 to 51.
[69] See Merger Notice, paragraphs 45 to 48.

to assist PacBio in developing approved systems/tests, and in securing necessary approvals/markings. PacBio's expansion beyond research systems into clinical systems will directly benefit customers by enabling PacBio to offer systems that are currently not offered by either Party.

60. The CMA acknowledges that accelerating PacBio's development of a clinically-approved PacBio system "*could act to introduce a new competitor for these contracts/requirements earlier than would be likely to occur otherwise*".[70] The CMA also acknowledges that "*there could be some efficiencies with Illumina speeding up the launch of a PacBio clinical solution*".[71] To state the obvious, that is a quintessential rivalry-enhancing efficiency that would directly benefit customers.

61. Remarkably, however, the CMA has provisionally concluded that "*it is not clear if the change in the market structure arising from the Proposed Merger would result in the benefits of these developments accruing to customers or shareholders*".[72] Illumina respectfully disagrees. As explained to the CMA, currently there are no native long read systems/tests that are clinically approved. As a result, access to clinical native long read systems/tests would directly and immediately benefit customers. Again, as also noted above with respect to the wider distribution of PacBio's systems, every additional future sale of a PacBio clinical system/test achieved as a result of Illumina's success in securing the necessary approvals/markings can be considered an RCB that would be lost, if the Transaction were to be prohibited.

62. Further, the CMA is incorrect that these efficiencies and RCBs should be tempered by the fact that PacBio might eventually enter the clinical space on its own.[73] Even if PacBio might eventually manage to market a clinical system/test without Illumina's assistance, that does not affect the conclusion that the Transaction, by substantially accelerating and enhancing the likelihood of such development, will generate rivalry-enhancing efficiencies and RCBs.[74]

63. This RCB is also Transaction-specific. The CMA cannot assume that PacBio could foreseeably partner with another company to enter the clinical space. As the CMA is aware, PacBio has tried unsuccessfully for years to secure a clinical partner, including as part of its exhaustive process in 2018 to find a strategic partner or buyer. While PacBio had partnered with Roche to pursue clinical entry, Roche terminated the partnership several years ago.

64. Finally, while the CMA is correct that the benefits of PacBio's clinical entry would only accrue to clinical customers,[75] clinical use of sequencing is expected to grow significantly

[70] See Provisional Findings Report, paragraph 9.130.
[71] See Provisional Findings Report, paragraph 9.132.
[72] See Provisional Findings Report, paragraph 9.132.
[73] See Provisional Findings Report, paragraph 9.131.
[74] See Response to Annotated Issues Statement, paragraph 202. [redacted]
[75] See Provisional Findings Report, paragraph 9.133.

in the short- to medium-term, and Illumina's modelling suggests that clinical customers make up a substantial portion of that forecast growth. The fact that these benefits accrue to a subset of customers (but not at the expense of other customers) does not diminish their importance.

65. In short, the efficiencies and RCBs generated by facilitating PacBio's clinical entry are far from a "*temporary benefit*" of the Transaction, as the CMA casts them.[76] Rather, the Transaction is the only viable route for PacBio to secure clinical entry, and the full efficiencies and RCBs associated with clinical entry should be attributed to the Transaction.

C. Improved PacBio systems using Illumina's proprietary technologies and development of coordinated solutions (including bioinformatics) to enable customers to harness the complementary nature of the Parties' technologies

66. As the Parties have explained, they anticipate that post-Transaction Illumina will be able to meaningfully improve PacBio's data analytics, including through the use of its Edico technology. Illumina also anticipates being able to develop coordinated workflows, which will facilitate complementary uses of native long read and short read systems. These improvements cannot occur absent the Transaction, and will benefit customers by facilitating complementary use cases.

67. The CMA does not engage with or dispute the potential improvements Illumina has described, nor the feasibility of such improvements. However, the CMA disputes that these efficiencies and RCBs will be Transaction-specific based on Illumina's comment that "*analytics platforms are agnostic to the instrument they are relying on*".[77] The fact that an analytics platform might not be proprietary, and only made accessible to users of particular systems, does not equate to the potential for improvements to be made to a platform that can be used in connection with, or is optimised for, particular systems.

68. Further, the CMA discounts these efficiencies and RCBs because Illumina has not provided timelines for them or quantified their impact beyond the dates and values reflected in Illumina's deal model.[78] It is of course widely accepted by competition law enforcers around the world that mergers can generate efficiencies and benefit consumers by enabling merging firms to combine complementary assets or capabilities in order to offer new or improved products. Such "dynamic" efficiencies – in contrast to those generated by reductions in the cost of production, for example – are more difficult to quantify, but that is not a justification for summarily ignoring them. While Illumina will not be able to develop exact timelines and estimates until the Transaction is completed and the Parties' teams can share information and work together, nothing suggests that these efficiencies and RCBs are unrealistic or unachievable within a reasonable timeline.

D. Accelerated innovation

69. The CMA notes that there are two mechanisms by which the Transaction could accelerate innovation: (i) it could accelerate PacBio's rate of innovation, and/or (ii) it could accelerate

[76] See Provisional Findings Report, paragraph 9.133.
[77] See Provisional Findings Report, paragraph 9.137.
[78] See Provisional Findings Report, paragraph 9.135.

Illumina's rate of innovation. The Parties have explained why the Transaction will actually do both. The following paragraphs discuss each in turn, and the CMA's criticisms.

i. Accelerating PacBio's rate of innovation

70. As the CMA notes, the Parties have explained how "*access to greater capital, and Illumina's support in R&D innovation, would accelerate PacBio's development of new products*".[79] Illumina's prior acquisitions and its deal model both support this view. Illumina has invested in and further developed the technologies it has acquired previously, and its deal model rests on its intention to accelerate PacBio's development. These efficiencies will enhance PacBio's ability to compete with ONT and other entrants to the market for native long read systems. As a result, they are rivalry-enhancing.

71. [redacted][80]

- [redacted];
- [redacted]

[redacted]

[79] See Provisional Findings Report, paragraph 9.115.
[80] See Response to Valuation Working Paper, paragraphs 5 to 12.
[81] [redacted]
[82]

72. While the CMA theorises that post-Transaction R&D investment in PacBio's technology could be aimed at reducing PacBio's ability to compete with Illumina,[83] that is baseless speculation. As the Parties have repeatedly explained, Illumina and PacBio do not currently compete, and nothing suggests that PacBio will be able to overcome the technological constraints inherent in its technology that prevent it from competing against Illumina in the foreseeable future. As a result, Illumina has no incentive to redirect R&D investments in PacBio to avoid potential competition that, in its view, cannot occur. By contrast, there is extensive evidence that Illumina plans to invest in increasing the throughput of PacBio's systems, thereby reducing sequencing costs for customers, and enhancing competition in the market for native long read systems.[84]

73. Finally, Illumina fails to understand why the CMA has ignored the customer feedback it received. As explained in the Response to the Provisional Findings, almost all customers expect Illumina to improve PacBio's technology, and that the Transaction will lead to a better product offering.[85] For example:

- [redacted].[86]
- [redacted][87]
- [redacted][88]
- [redacted][89]
- [redacted][90]

[83] See Provisional Findings Report, paragraph 9.117.
[84] See the Presentation from the CMA Response Hearing of 15 November 2019, slide 20.
[85] See Response to Provisional Findings Report, paragraph 156.
[86] [redacted]
[87] [redacted]
[88] [redacted]
[89] [redacted]
[90] [redacted]

- [redacted][91] and
- [redacted].[92]

74. The potential beneficiaries of the RCBs resulting from the Transaction have made clear to the CMA that Illumina's increased investment in PacBio's technology will lead to a better PacBio offering. Contrary to the CMA's Provisional Findings, they did not suggest that this change will benefit the merged entity's shareholders. Rather, they believe that they will benefit from Illumina's efforts. It is unclear to Illumina why the CMA has ignored customers' voices. In any event, if the Transaction were to be prohibited, these RCBs that customers expect will be lost.

ii. Accelerating Illumina's rate of innovation

75. Illumina has explained that PacBio's expertise in native long read technologies could [redacted]. It is not correct that acquiring PacBio reduces or changes Illumina's incentives to continue to invest in its [redacted] programme.[93]

76. Illumina has responded in detail to the CMA's assertions in this regard in their Response to the CMA's Provisional Findings.[94] For completeness, the key points of the Response are summarised below:

- [redacted]
- [redacted]

[91] [redacted]
[92] [redacted]
[93] See Remedies Working Paper, paragraph 171.
[94] See also Response to Provisional Findings Report, paragraphs 158 to 167.