Gathering of data per COVID-19 vaccine platform technology to support acceleration of future vaccine development and approval

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The COVID-19 pandemic has seen a significant and unprecedented acceleration in vaccine development timelines with approximately 300 days between availability of the SARS-CoV-2 genetic sequence and submission of the first vaccine Phase 3 clinical trial data to regulatory authorities. The emergence of new variants and rapid replacement of circulating strains create a dynamic situation that risks immune escape. Vaccines targeting new SARS-CoV-2 variants are under development and regulatory guidance has been published[1,2] . The data that have been generated *via* these programmes, provide an important opportunity to explore with regulators where platform data can be leveraged and enable a justification to reduce or eliminate steps in the development process and hence to accelerate overall (new variant) vaccine development timelines.

Parallels to this proposal exist and have been used for many decades annually supporting seasonal strain change for influenza vaccines[3]. Developers license their influenza vaccines by submitting data of their platform technology to gain approval for commercial supply. However, this may have been achieved many influenza seasons ago leveraging vaccine candidate data of strains that no longer circulate. Through understanding each influenza vaccine platform technology, a regulatory update process has been aligned on whereby developers submit a strain change supplement describing differences to the original influenza vaccine license, to continue commercial supply of their revised vaccine per season. Such a process may potentially be adapted to future SARS-CoV-2 vaccine strain changes (if/when required), for which an understanding on the platform technologies is necessary to instigate.

CEPI would therefore like to engage with COVID-19 vaccine developers and manufacturers with the aim of collating data around specific steps in the manufacturing process or non-clinical development that may demonstrate that the specific vaccine platform technology used by the developer can be readily, reliably and reproducibly adapted to candidate vaccines targeting different variants of SARS-CoV-2 and which could therefore be discussed with regulatory authorities with the intent of justifying the potential elimination or acceleration of specific development steps. Where the same platform manufacturing technology has been used in connection with vaccine development across different diseases these data will also be valuable to collate and address the broader question on the utility of vaccine platform technology data beyond vaccine development for SARS-CoV-2.

CEPI would work with each applicant to collate data focussing on specific steps in manufacturing, process development, testing and characterisation of the drug substance and/or non-clinical development with the aim of drafting a scientific advice briefing document and subsequently engaging

[1] European Medicines Agency. https://www.ema.europa.eu/en/regulatory-requirements-vaccines-intended-provide-protection-against-variant-strains-sars-cov-2
[2] Food and Drugs Administration. https://www.fda.gov/media/142749/download
[3] Weir & Gruber (2016) An overview of the regulation of influenza vaccines in the US. Influenza and Other Respiratory Viruses 10 (5), 354–360

with regulatory authorities to confirm the ability to use these data in support of streamlining and accelerating future development for that specific platform. Data from each developer would form a stand-alone section of a scientific advice procedure and discussions and feedback from the advice would only be shared with the specific developer. Publications in collaboration with the applicant(s) would be considered on a case-by-case basis. All data would be treated in the strictest confidence.

Data that are generated build the platform knowledge for each manufacturer's specific vaccine technology and must establish the rationale that these data robustly support acceleration of future novel SARS-CoV-2 vaccine pre-clinical characterisation and manufacturing irrespective of strain being targeted and reference their broader applicability beyond SARS-CoV-2.

Areas that might be discussed with regulatory agencies may include e.g.,

- Reduction in different aspects of process validation and the numbers of PPQ batches required for regulatory submission
- Establish a common set of specifications aligned on for each vaccine platform technology
- Data needed to support and justify in-process critical quality parameters, in process controls and release specifications
- Reduction of manufacturing characterisation and process development data for regulatory filing (including data related to process-related impurities, extractables / leachables, stability and characterisations of cell banks etc.).
- Reduction in extent of process development work to implement each vaccine strain change
- Leverage validation work of analytical procedures for tests/assays shared across the platform
- Leverage supportive stability data for the purpose of shelf-life determination
- Elimination of the necessity to conduct non-clinical evaluations e.g., toxicology, tissue distribution
- Acceleration of assay development and extent of validation data required
- Greater understanding of avidity and binding antibodies to live virus vaccine technologies
- Generation of Module 3 documentation including the drafting of standardised template sections and highlighting variable sections that are strain or construct specific

Material that has been developed and characterised to generate the data per vaccine platform may be full GMP but could also include pilot scale and manufactured under the principles of GMP (although areas of divergence should be fully documented).