



Moderna Omicron Booster Strategy Update

December 20th, 2021

Forward-looking statements and Disclaimer

This presentation contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995, as amended, including statements regarding: the Company's development of a vaccine against the SARS-CoV-2 virus (mRNA-1273); the Company's efforts to develop vaccines against variants of the SARS-CoV-2 virus, including the Omicron variant (mRNA-1273.529) and multivalent candidates (mRNA-1273.211 and mRNA-1273.213); the potential timing for developing and testing an Omicron variant-specific vaccine candidate; the ability of the Company's existing vaccine candidates (including 50 µg and 100 µg boosters of mRNA-1273) to trigger neutralizing antibodies against the Omicron variant; and the safety and tolerability of a 100 µg booster of mRNA-1273. In some cases, forward-looking statements can be identified by terminology such as "will," "may," "should," "could," "expects," "intends," "plans," "aims," "anticipates," "believes," "estimates," "predicts," "potential," "continue," or the negative of these terms or other comparable terminology, although not all forward-looking statements contain these words. The forward-looking statements in this presentation are neither promises nor guarantees, and you should not place undue reliance on these forward-looking statements because they involve known and unknown risks, uncertainties, and other factors, many of which are beyond Moderna's control and which could cause actual results to differ materially from those expressed or implied by these forward-looking statements. These risks, uncertainties, and other factors include, among others, those risks and uncertainties described under the heading "Risk Factors" in Moderna's most recent Annual Report on Form 10-K filed with the U.S. Securities and Exchange Commission (SEC) and in subsequent filings made by Moderna with the SEC, which are available on the SEC's website at www.sec.gov. Except as required by law, Moderna disclaims any intention or responsibility for updating or revising any forward-looking statements contained in this presentation in the event of new information, future developments or otherwise. These forward-looking statements are based on Moderna's current expectations and speak only as of the date hereof.

Moderna COVID-19 Vaccine: Authorized Use & Important Safety Information

Authorized Use in the United States:

Moderna COVID-19 Vaccine is authorized for use under an Emergency Use Authorization (EUA) for active immunization to prevent coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in individuals 18 years of age and older.

Important Safety Information:

- Do not administer the Moderna COVID-19 Vaccine to individuals with a known history of severe allergic reaction (e.g., anaphylaxis) to any component of the Moderna COVID-19 Vaccine.
- Appropriate medical treatment to manage immediate allergic reactions must be immediately available in the event an acute anaphylactic reaction occurs following administration of the Moderna COVID-19 Vaccine. Monitor the Moderna COVID-19 Vaccine recipients for the occurrence of immediate adverse reactions according to the Centers for Disease Control and Prevention guidelines (<https://www.cdc.gov/vaccines/covid-19/clinical-considerations/managing-anaphylaxis.html>).
- Postmarketing data demonstrate increased risks of myocarditis and pericarditis, particularly within 7 days following the second dose.
- Syncope (fainting) may occur in association with administration of injectable vaccines. Procedures should be in place to avoid injury from fainting.
- Immunocompromised persons, including individuals receiving immunosuppressive therapy, may have a diminished response to the Moderna COVID-19 Vaccine.
- The Moderna COVID-19 Vaccine may not protect all vaccine recipients.
- Adverse reactions reported in clinical trials following administration of the Moderna COVID-19 Vaccine include pain at the injection site, fatigue, headache, myalgia, arthralgia, chills, nausea/vomiting, axillary swelling/tenderness, fever, swelling at the injection site, and erythema at the injection site, and rash.
- Anaphylaxis and other severe allergic reactions, myocarditis, pericarditis, and syncope have been reported following administration of the Moderna COVID-19 Vaccine during mass vaccination outside of clinical trials.
- Available data on the Moderna COVID-19 Vaccine administered to pregnant women are insufficient to inform vaccine-associated risks in pregnancy. Data are not available to assess the effects of the Moderna COVID-19 Vaccine on the breastfed infant or on milk production/excretion.
- Additional adverse reactions, some of which may be serious, may become apparent with more widespread use of the Moderna COVID-19 Vaccine.
- Vaccination providers must complete and submit reports to VAERS online at <https://vaers.hhs.gov/reportevent.html>. For further assistance with reporting to VAERS, call 1-800-822-7967. The reports should include the words “Moderna COVID-19 Vaccine EUA” in the description section of the report.

Click for [Fact Sheet for Healthcare Providers Administering Vaccine \(Vaccination Providers\)](#) and [Full EUA Prescribing Information](#) for more information.

Update on strategy to address Omicron Variant

Moderna has had a 3-part strategy for addressing emerging variants of concern (VOC)

1. Prototype vaccine (mRNA-1273) at authorized booster dose (50 µg) and a higher dose (100 µg)
2. Multivalent booster candidates that incorporate mutations from previous VOCs (mRNA-1273.211, mRNA-1273.213) also at 50 µg and 100 µg doses
3. VOC-specific booster candidates to address emerging threats (Delta, Omicron)

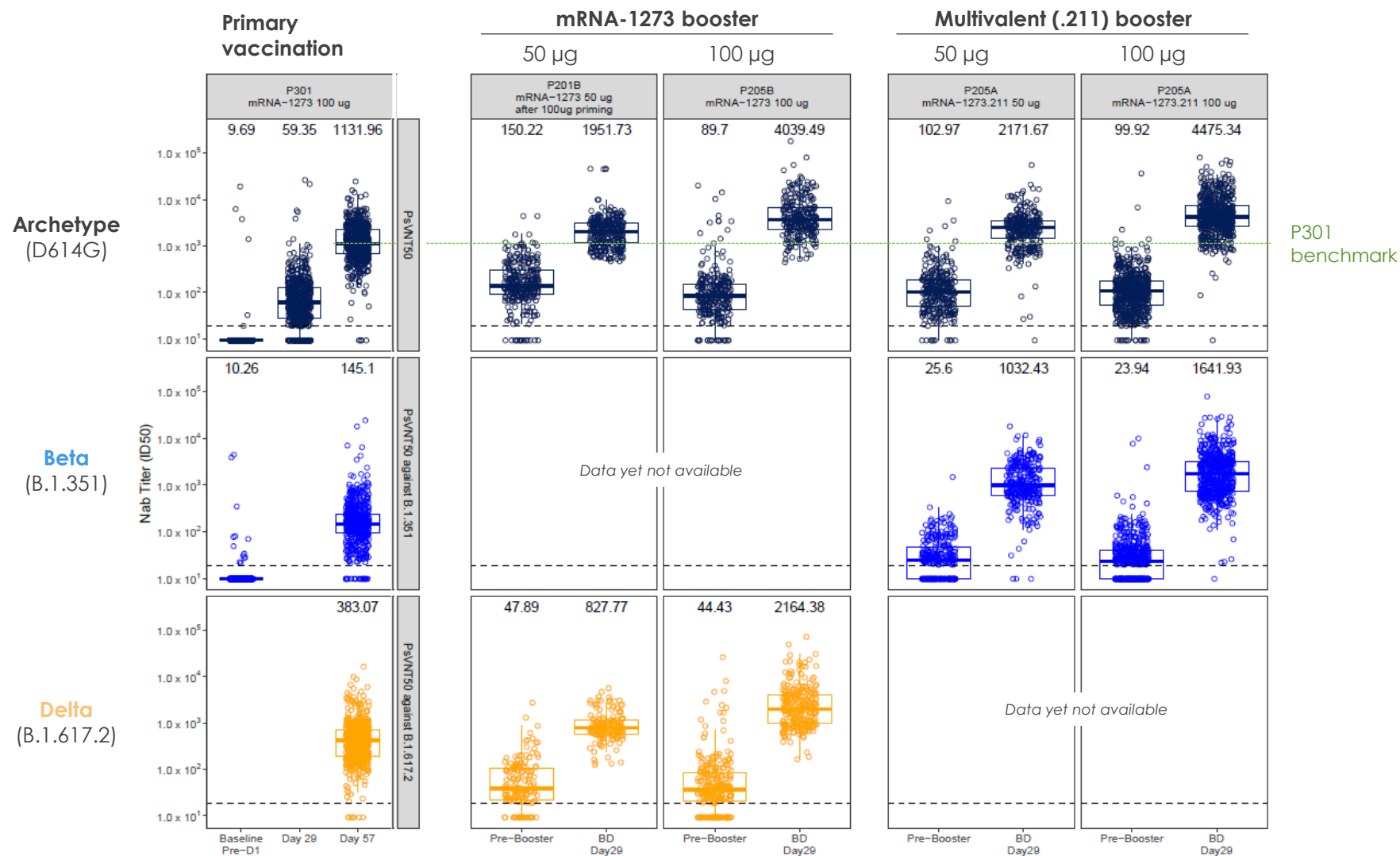
Preliminary data from the NIH/VRC Duke pseudovirus neutralization titer PsVNT (ID50) assay confirms robust Omicron neutralizing activity of the current booster candidates

- Authorized booster (50 µg mRNA-1273) increased Omicron neutralizing geometric mean titers (GMT) to 850, which is approximately **37-fold higher than pre-boost levels**
- Higher dose (100 µg) of mRNA-1273 increased Omicron neutralizing GMT to 2228, which is approximately **83-fold higher than pre-boost levels**
- Multivalent candidates boosted Omicron specific neutralizing antibody levels to similarly high levels at both the 50 µg and 100 µg levels

Based on strong boosting from mRNA-1273, Moderna will focus immediate Omicron strategy on mRNA-1273.

Moderna will continue to advance an Omicron specific booster in clinical trials in early 2022, and will continue to assess the multivalent candidates for durability (beyond D29) and breadth of VOC PsVNT

Comparison of most advanced booster candidates in validated assays (D614G, Beta, Delta)

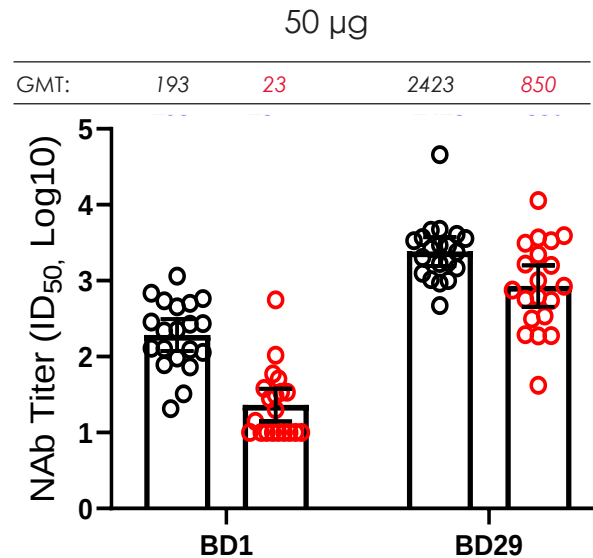


- Authorized booster (50 µg mRNA-1273) neutralizing GMT one month after boost is higher than GMT one month after primary series (D614G)
- 100 µg booster dose results in higher neutralizing GMT than 50 µg booster dose regardless of the booster candidate
- Multivalent candidate results in similar GMT against D614G; further testing against panel of VOC underway to evaluate potential benefits

Preliminary data from Omicron assays (NIH VRC/Duke PsVNT)

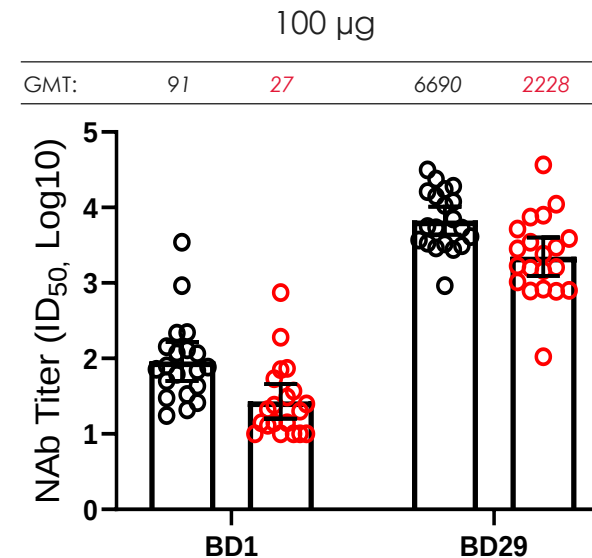
mRNA-1273 at 50 µg and 100 µg booster

mRNA-1273



37-fold boost of Omicron titers
(850 vs. 23)

2.9-fold lower titers for Omicron vs.
D614G (850 vs. 2423)



83-fold boost of Omicron titers
(2228 vs. 27)

3-fold lower titers for Omicron vs.
D614G (2228 vs. 6690)

○ D614G
○ Omicron

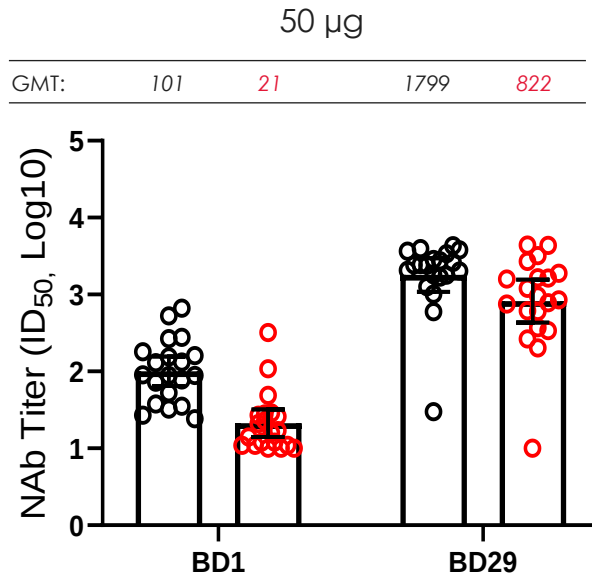
BD1 = Before booster dose day 1; BD29 = After booster dose day 29

N=20 samples randomly selected for Omicron testing across all booster arms; Median interval between primary vaccination and booster:
mRNA-1273 (50 µg) 7.2 months; mRNA-1273 (100 µg) 10.8 months; mRNA-1273.211 (50 µg) 8.7 months; mRNA-1273.211 (100 µg) 9.7 months

Preliminary data from Omicron assays (NIH VRC/Duke PsVNT)

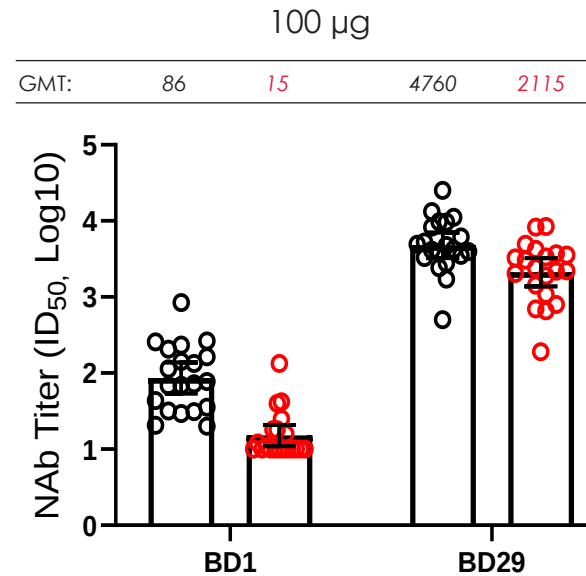
Multivalent booster candidates at 50 µg and 100 µg

mRNA-1273.211 (Beta/Wuhan)



39-fold boost of Omicron titers
(822 vs. 21)

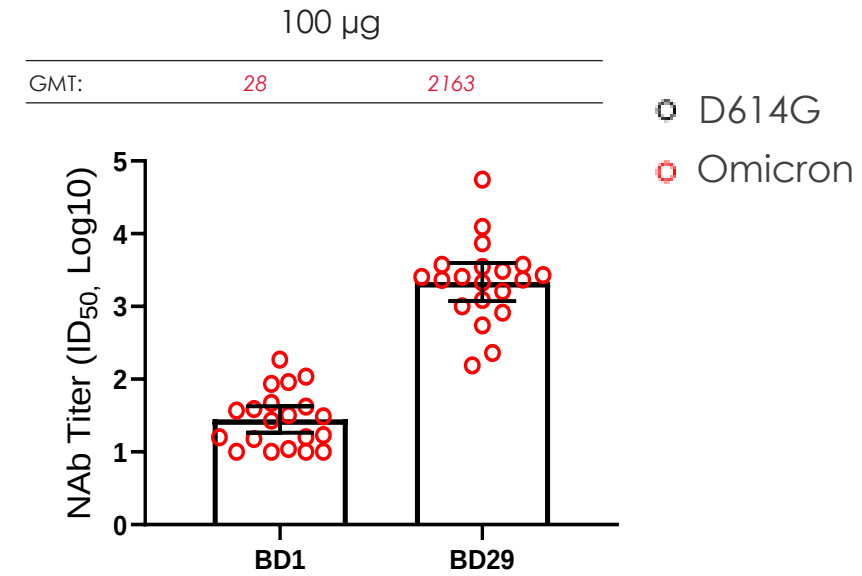
2.2-fold lower titers for Omicron vs.
D614G (822 vs. 1799)



141-fold boost of Omicron titers
(2115 vs. 15)

2.3-fold lower titers for Omicron vs.
D614G (2115 vs. 4760)

mRNA-1273.213 (Beta/Delta)



77-fold boost of Omicron titers
(2163 vs. 28)

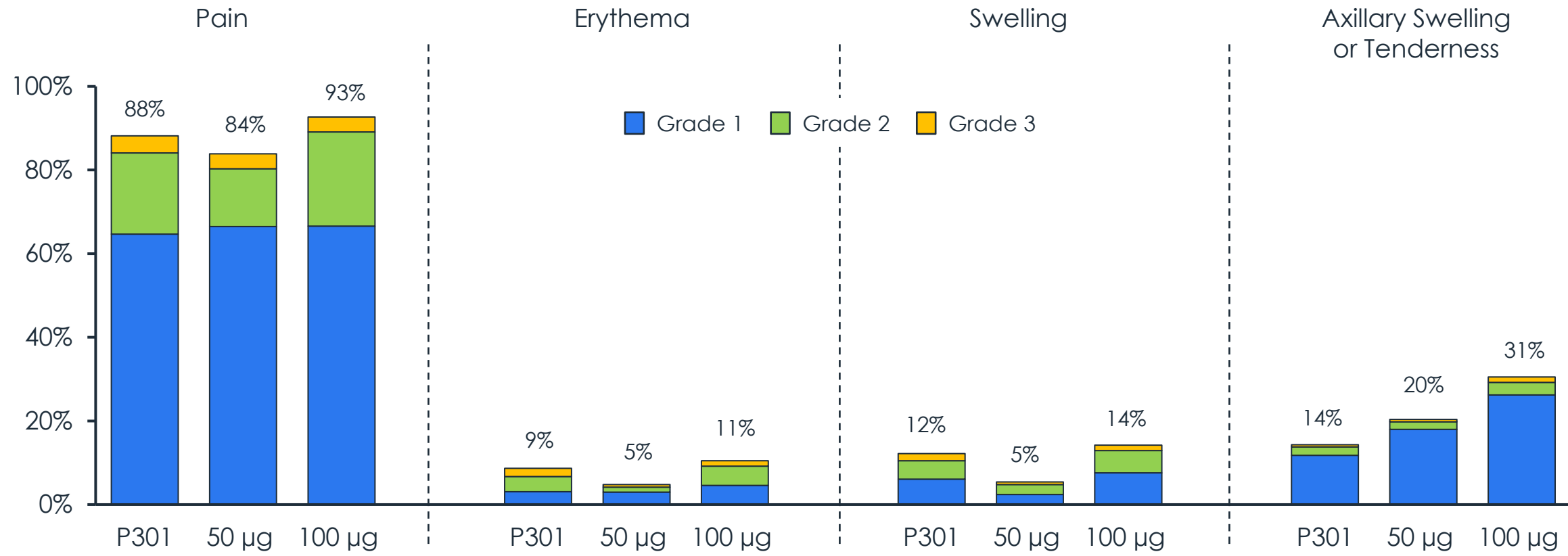
D614G comparator titers pending

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Solicited local adverse reactions through day 7

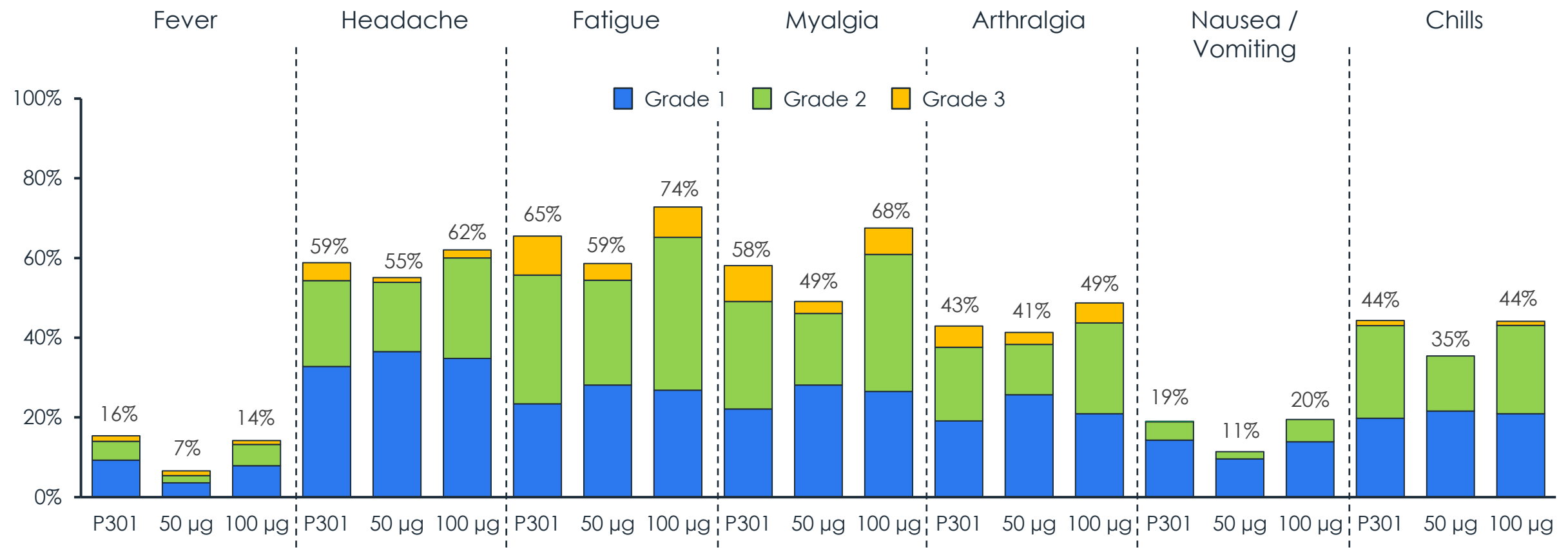
mRNA-1273 primary series, 50 µg booster, and 100 µg booster



- Trend towards increased frequency of axillary swelling or tenderness (mostly mild/Grade 1) for 100 µg booster dose relative to 50 µg booster and primary series

Solicited systemic adverse reactions through day 7

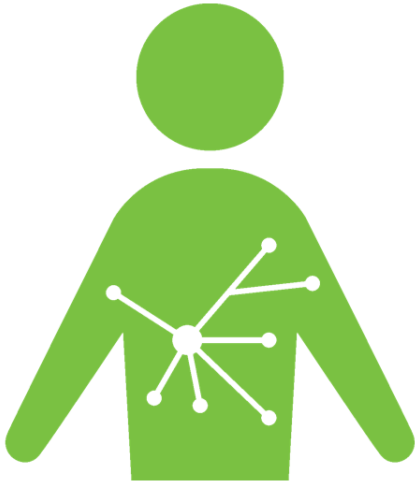
mRNA-1273 primary series, 50 µg booster, and 100 µg booster



- Systemic adverse reactions were generally consistent with dose 2 of the primary series
- Generally higher frequency of adverse reactions reported for 100 µg vs. 50 µg

Emerging perspective on Omicron booster strategies

- **mRNA-1273 results in significant boosting of Omicron neutralizing titers** at both 50 µg (GMT 850) and 100 µg (GMT 2228) dose levels, suggesting good potential cross protection from the current vaccine
- Conversely, given strong boosting with mRNA-1273 (37- to 83-fold boosting of Omicron GMT), the **opportunity for significant additional benefit against Omicron from multivalent boosters is consequently diminished** particularly in the short follow up tested to date (Day 29 post boost). Moderna will focus its near-term efforts on mRNA-1273 as the first line of defense against Omicron
- Higher dose of mRNA-1273 (100 µg vs. 50 µg) results in **dose-dependent increase in Omicron neutralizing titers**, consistent with what has been seen with archetype (D614G) and prior VOC (Beta, Delta)
- Moderna will continue to evaluate Omicron-specific booster in early 2022 given the concerning immune escape features demonstrated by this VOC



Our mission

To deliver on the promise of mRNA science to create a new generation of transformative medicines for patients.