



## Bivalent COVID-19 Vaccines

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Particularly, the Omicron and its subvariants [1], such as BA.4, BA.5, BQ.1, BQ.1.1, BF.7, XBB, and XBB.1 [2] have triggered COVID-19 pandemic waves around the world [1]. In January and February 2022, a containing 15 µg of mRNA directed against the SARS-CoV-2 (COVID-19) ancestral strain and 15 µg directed against BA.1 bivalent COVID-19 vaccine was produced by Pfizer-BioNTech, whereas 25 µg of mRNA directed against the same two strains was produced by Moderna [2]. On August 31, 2022, United States Food and Drug Administration (US FDA) authorized the use of Pfizer-BioNTech (Figure 1) [1] and Moderna (Figure 2) [1] bivalent COVID-19 vaccines as a single booster dose in persons 12 years of age and above and in persons 18 years of age and above, respectively [3], whereas Barouch, *et al.* revealed no impression of CD4+ or CD8+ T-cell different response between bivalent-booster group and monovalent-booster group [2].

In conclusion, COVID-19-variant-specific vaccines are needed, whereas monovalent booster dosing could be best reserved for old-aging adults, immunocompromised people and multiple-coexisting-conditions persons that have similar effects as bivalent boosting.

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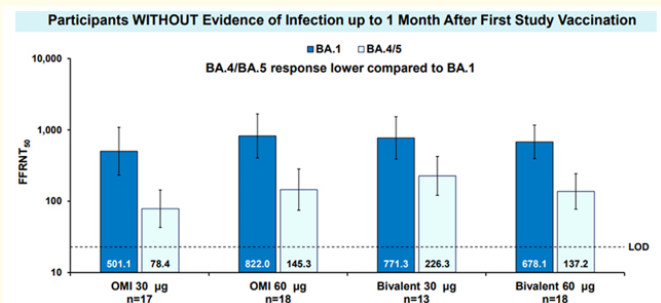


Figure 1: Demonstrating Omicron-containing Modified Variant Vaccines as 4<sup>th</sup> Dose Elicit Improved Omicron Neutralization Response (From Pfizer and BioNTech) [1].

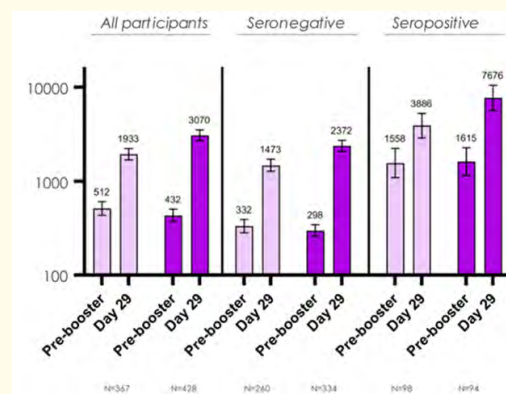


Figure 2: Demonstrating comparison between mRNA-1273.214 and mRNA-1273 (From Modern) [1].

## Bibliography

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3. United States Food and Drug Administration (2022).