Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

CellPress

Immunity

Correction

Lipid nanoparticles enhance the efficacy of mRNA and protein subunit vaccines by inducing robust T follicular helper cell and humoral responses

Mohamad-Gabriel Alameh, István Tombácz, Emily Bettini, Katlyn Lederer, Chutamath Sittplangkoon, Joel R. Wilmore, Brian T. Gaudette, Ousamah Y. Soliman, Matthew Pine, Philip Hicks, Tomaz B. Manzoni, James J. Knox, John L. Johnson, Dorottya Laczkó, Hiromi Muramatsu, Benjamin Davis, Wenzhao Meng, Aaron M. Rosenfeld, Shirin Strohmeier, Paulo J.C. Lin, Barbara L. Mui, Ying K. Tam, Katalin Karikó, Alain Jacquet, Florian Krammer, Paul Bates, Michael P. Cancro, Drew Weissman, Eline T. Luning Prak, David Allman, Michela Locci,* and Norbert Pardi*

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Due to an oversight, two authors were omitted from the author list. The author list, the author contribution section, and the acknowledgments have been updated and corrected online and in print. The authors apologize for the error.

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N.P. was supported by the National Institute of Allergy and Infectious Diseases (NIAID, R01AI146101 and R01AI153064). M.L. was supported by NIAID (R01AI123738 and R01AI153064). D.W. is supported by NIH/NIAID (UM1-AI-144371, 1U19AI135902, U19-AI142596, R01-AI124429, HHS-NIH-NIAID-BAA2018) and an SRA from BioNTech. E.L.P., W.M., J.K.K., and A.M.R. were supported by P01 AI106697. F.K. was supported by the NIAID Collaborative Influenza Vaccine Innovation Centers (CIVIC) contract 75N93019C00051. D.A. was supported by NIAID (R01AI139123 and R01AI154932). We thank the NIH Tetramer Core Facility for producing the I-A(d) Influenza A HA PE-conjugated tetramer (HNTNGVTAACSHE) used in this study and the Human Immunology Core facility for assistance with immunoglobulin gene rearrangement sequencing (with infrastructure support from P30 CA016520 and P30-AI 0450080). We thank Dr. Florin Tuluc and Jennifer Murray of the Children's Hospital of Philadelphia (CHOP) Flow Cytometry core facility for technical assistance. PR8 HA probes for initial LLPC and MBC studies were provided by Scott E. Hensley (University of Pennsylvania). Mouse-adapted A/Puerto Rico/8/1934 influenza virus for challenge studies was provided by Michael J. Hogan and Laurence C. Eisenlohr (CHOP). We thank Michael J. Hogan for the critical reading of the manuscript. The graphical abstract was created with BioRender.

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ORIGINAL TEXT:

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N.P. and M.L. conceptualized the study. M.L, D.A. and M.P.C. designed B cell studies. N.P, M.L., M.G.A, I.T., and E.B. wrote the paper with help from co-authors. I.T., E.B., and K.L. graphed data and produced figures. H.M. produced mRNA vaccine antigens. Y.K.T., B.L.M., and P.J.C.L. produced empty LNP and encapsulated mRNAs into LNP and performed the physicochemical charac-

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Author contributions

N.P., M.L., and B.Z.I. conceptualized the study. M.L, D.A., and M.P.C. designed B cell studies. N.P, M.L., M.G.A, I.T., and E.B. wrote the paper with help from co-authors. I.T., E.B., and K.L. graphed data and produced figures. H.M. produced mRNA vaccine antigens. Y.K.T., B.L.M., and P.J.C.L. produced empty LNP and encapsulated mRNAs into LNP and performed the physicochemical characterization of LNP. N.P., M.G.A., I.T., K.L., S.N., C.S., E.B., and A.J. performed immunizations. S.N. and B.Z.I. contributed to the design of studies investigating the inflammatory properties of lipid nanoparticles. K.K. designed the untranslated region of the mRNA. D.L., M.G.A., M.P., B.D., and I.T. performed HAI assays. M.G.A., E.B., O.S., and I.T. performed ELISAs. M.L., K.L., D.A., J.R.W., M.G.A, E.B., and B.T.G. performed Tfh and B cell flow cytometry analyses. M.G.A designed and performed, M.G.A. and I.T. analyzed the Luminex assay. E.T.L.P., W.M., A.M.R., M.P.C., J.J.K., and J.L.J. performed B cell sorting and B cell receptor sequencing experiments and analyzed the immune repertoire profiling data. P.B., P.H., and T.B.M performed pseudovirus neutralization assays. F.K. and S.S. produced recombinant PR8 HA and RBD proteins used to produce fluorescently labeled probes. M.L., M.G.A, E.B., and K.L., produced fluorescently labeled probes. I.T. and N.P. performed challenge studies.