It's Fab! A hidden touch of antibody

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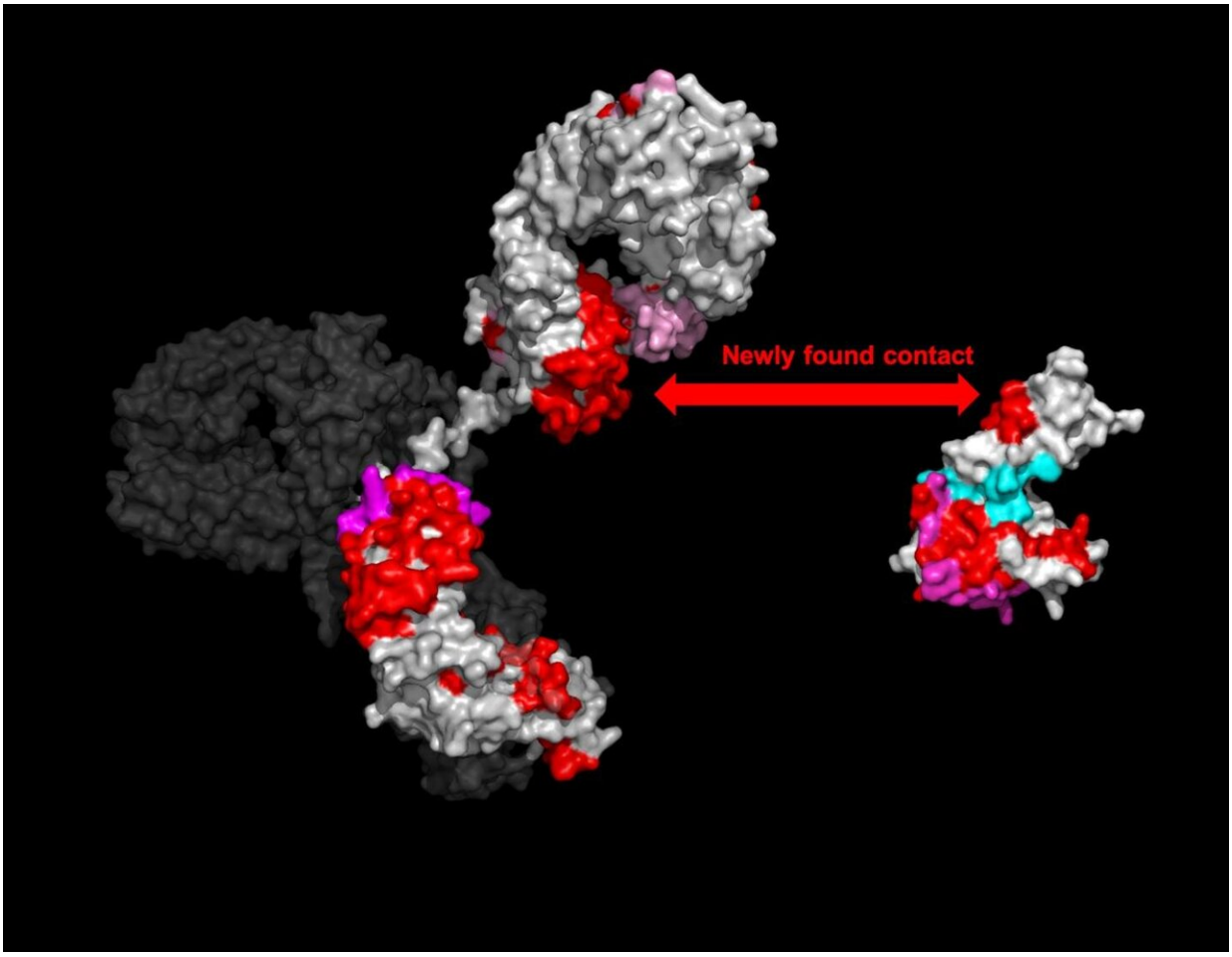

Besides the Fc-mediated canonical interaction, the Fab arm of antibody provides additional contact sites. Credit: Koichi Kato

In our immune system, antibodies recognize viruses, bacteria and even

cancer cells through their Fab arms, initiating recruitment of leucocytes for the destruction of these invaders. The recruitment is mediated by receptors on the leucocytes which, to date, have been supposed to bind the Fc portion of the antibody and have therefore been termed Fc receptors. This textbook view has been established based on cumulative data obtained primarily using Fab and Fc fragments cleaved from antibody molecules.

The collaborative groups including researchers at Nagoya City University, National Institutes of Natural Sciences, and Osaka University reassessed this paradigm employing modern biophysical techniques. Using high-speed atomic force microscopy and hydrogen-deuterium exchange mass spectrometry, they revealed that, in addition to the canonical Fc-mediated contact, the Fab portion of the antibody is directly involved in binding to a cognate Fc receptor.

Enhancement of Fc receptor binding by molecular engineering is a promising strategy to improve the functional efficacy of therapeutic antibodies for cancer treatments. Such attempts have thus far mainly focused on the Fc trunk of the antibody. The groups' findings will open up a new avenue for developing therapeutic antibodies with enhanced binding properties to the Fc receptor by engineering approaches targeting the previously unknown contact sites in their Fab arms."

More information: Rina Yogo et al, The Fab portion of immunoglobulin G contributes to its binding to Fcγ receptor III, *Scientific Reports* (2019). DOI: 10.1038/s41598-019-48323-w

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