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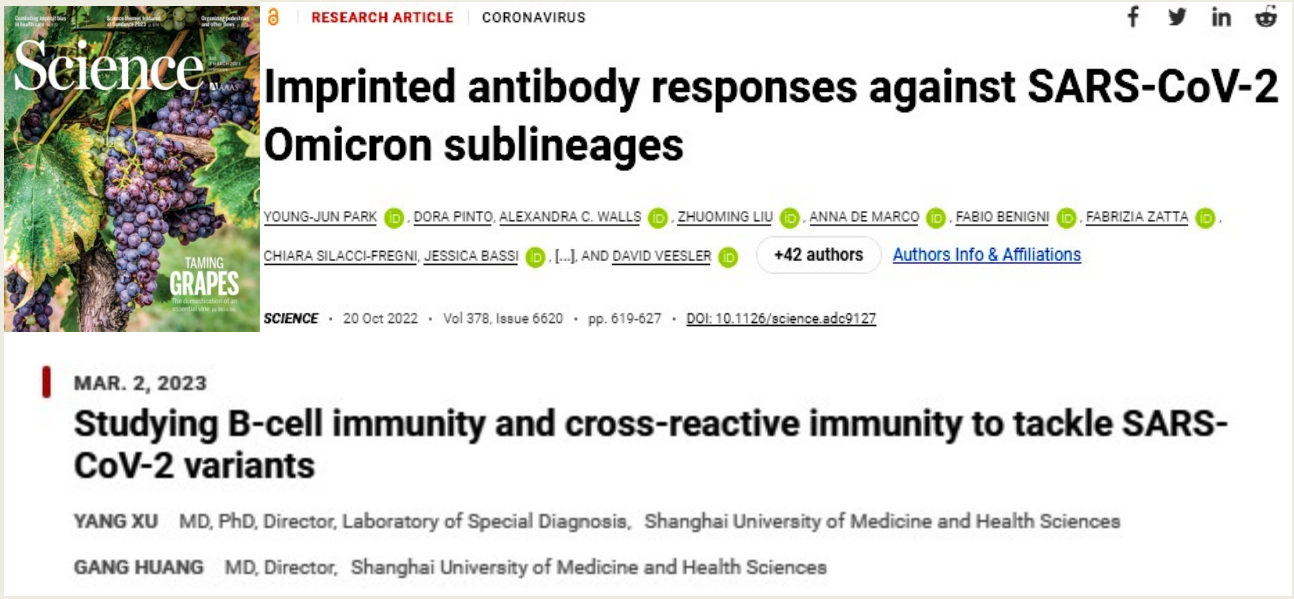
研究 B 细胞免疫力和抗体交叉免疫力来监控SARS-CoV-2 变异株传播的重要性



To The Editor:

Antibody evasion by SARS-CoV-2 Omicron variants BA.4/5 has been shown to be a major problem in the pandemic [1]. Therefore, addressing SARS-CoV-2 variants through cross-reactive specific immunity has become a key area of clinical research as the virus mutates much faster than vaccines can be updated [2].

Park and colleagues show that the antibody S2X324 potently neutralizes all SARS-CoV-2 variants, making it a candidate for therapeutic development through cross-reactivity and showing that blockage of ACE2 binding is the main mechanism of S2X324-mediated inhibition of SARS-CoV-2 which has demonstrated that B-cell immunity plays an important role to control SARS-CoV-2 [3].

B cell immunity also plays an important function in preventing severe COVID-19 and should be investigated in future studies. Zeng and colleagues have identified individuals with inferior B cell immunity after vaccination [4]. In the general population, 7.5-11.7% of individuals have poor B cell responses to COVID-19 vaccines. An individual with a titer of anti-SARS-CoV-2 spike IgG that is below 50 BAU/mL with the WHO IS (20/136) is considered a poor B cell response to COVID-19 vaccination at 14–90 days after the last vaccine dose.

Therefore, identification of populations with poor B cell immunity might be beneficial to encourage the use of SARS-CoV-2 BA.4/5 mRNA vaccines in vulnerable populations such as children, old adults, and immunocompromised people [5]. By isolating the cross-reactive single B cell from patients, these cross-reactive B cells may facilitate the development of potent monoclonal antibodies against future variants [6].

References

[1] McCallum M, Czudnochowski N, Rosen LE, et al. Structural basis of SARS-CoV-2 Omicron immune evasion and receptor engagement, Science. 2022; 375: 864–868.
[2] Zeng Q, Huang G, Li YZ, Xu Y, Tackling COVID19 by exploiting pre-existing cross-reacting spike-specific immunity, Mol. Ther. 2020; 28: 2314–2315.
[3] Park YJ, Pinto D, Walls AC, et al. Imprinted antibody responses against SARS-CoV-2 Omicron sublineages. Science. 2022; 378(6620): 619–627.
[4] Zeng Q, Yang X, Lin BY, et al. Immunological findings in a group of individuals who were poor or non-responders to standard two-dose SARS-CoV-2 vaccines. Vaccines (Basel). 2023;11(2):461. doi: 10.3390/vaccines11020461.
[5] Scheaffer SM, Lee D, Whitener B, et al. Bivalent SARS-CoV-2 mRNA vaccines increase breadth of neutralization and protect against the BA.5 Omicron variant in mice. Nat Med. 2023; 29(1):247–257.
[6] Ju B, Zhang Q, Ge J, et al. Human neutralizing antibodies elicited by SARS-CoV-2 infection. Nature. 2020; 584(7819):115–119.