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Hong Kong designs computational model to facilitate improvement of influenza vaccines' protective effects

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Model forecasts virus changes, facilitating the design of influenza vaccines of greater effectiveness

A research team from The Chinese University of Hong Kong (CUHK)'s Faculty of Medicine (CU Medicine) has developed a cutting-edge computational model, beth-1, to predict genetic evolution in viruses and select representative strains for influenza vaccines. The model works like a weather forecast, projecting virus changes in the future, and has the potential to facilitate optimal vaccine strain selection. This will enhance the protective effect of influenza vaccines.

Validations show that the virus strain predicted by beth-1 is more accurate than existing vaccines in almost 90% of influenza seasons in terms of genetic match to circulating strains. Hence, vaccine effectiveness against the H1N1 and H3N2 viruses, the two common influenza A subtypes in Hong Kong, is expected to be improved by using beth-1.

This new model provides a promising and ready-to-use tool to inform influenza vaccine strain selection. The research team has been working closely with research institutions in mainland China to conduct animal experiments for manufacturing more effective vaccines using beth-1.

It is estimated that every 5% increase in vaccine effectiveness could prevent one million diseases and 25,000 hospitalisations in one season in the United States alone.