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China translates blood's hidden gem Neutrophil into new generation anti-cancer therapy

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There are more than 5,000 new cases of lung cancer and about 4,000 related deaths in Hong Kong every year

Lung cancer remains the most common cancer in Hong Kong. As a leading cancer killer worldwide, its treatment still needs a breakthrough. Recent research from The Chinese University of Hong Kong (CUHK)'s Faculty of Medicine (CU Medicine) has discovered that neutrophils, the most abundant immune cell type in our blood, play a key role in lung cancer.

The team successfully enhanced the anticancer capacity of human neutrophils with gene editing technology and confirmed their clinical potential on lung cancer animal models, suggesting them as the next generation immunotherapy that can overcome existing therapeutic barriers. Research results have been published in the leading international scientific journal Nature Communications.

Immunotherapy has begun to be applied to lung cancer in addition to the traditional chemotherapy and targeted therapy. However, checkpoint inhibitors, the most used immunotherapy in lung cancer, can only benefit 30% of lung cancer patients when used alone. A better understanding of the uniqueness of the lung cancer microenvironment may shed new light on existing clinical dilemmas.

This new study has led to the first patented invention using gene engineering to mass produce anti-cancer neutrophils from human blood. They effectively inhibit human non-small cell lung carcinoma in vitro and in vivo, revealing the possibility of developing neutrophils into a novel immunotherapy. The researchers hope to further translate the research discovery into a safe and effective new generation of immunotherapy for solid cancers.