

Colloquium

Mathematical modeling of anti-PD-1 and IL-27 synergy in inhibiting tumor growth

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摘 要：

Anti-PD-1 and anti-PD-L1 drugs are already showing promise in clinical trials of cancer treatments. There is the expectation that these drugs will transform the landscape of cancer treatment. Combining the anti-PD-1 with other immunotherapeutic drugs seems to achieve much better results than by the immunotherapeutic drug alone. An important question is how much of an improvement is actually achieved by anti-PD-1. In this talk, I will address this question by a mathematical model in a special case where the immunotherapeutic drug is IL-27. We used this model to study how the combination of these two drugs affects the tumor reduction and to what degree anti-PD-1 improves the efficacy of IL-27. Our simulations not only fit qualitatively with the experimental results but also show that anti-PD-1 could be a powerful agent to enhance the efficacy of IL-27. For example, if we increase anti-PD-1 by a certain percentage, we get approximately twice more tumor reduction than if we increase IL-27 by the same percentage.