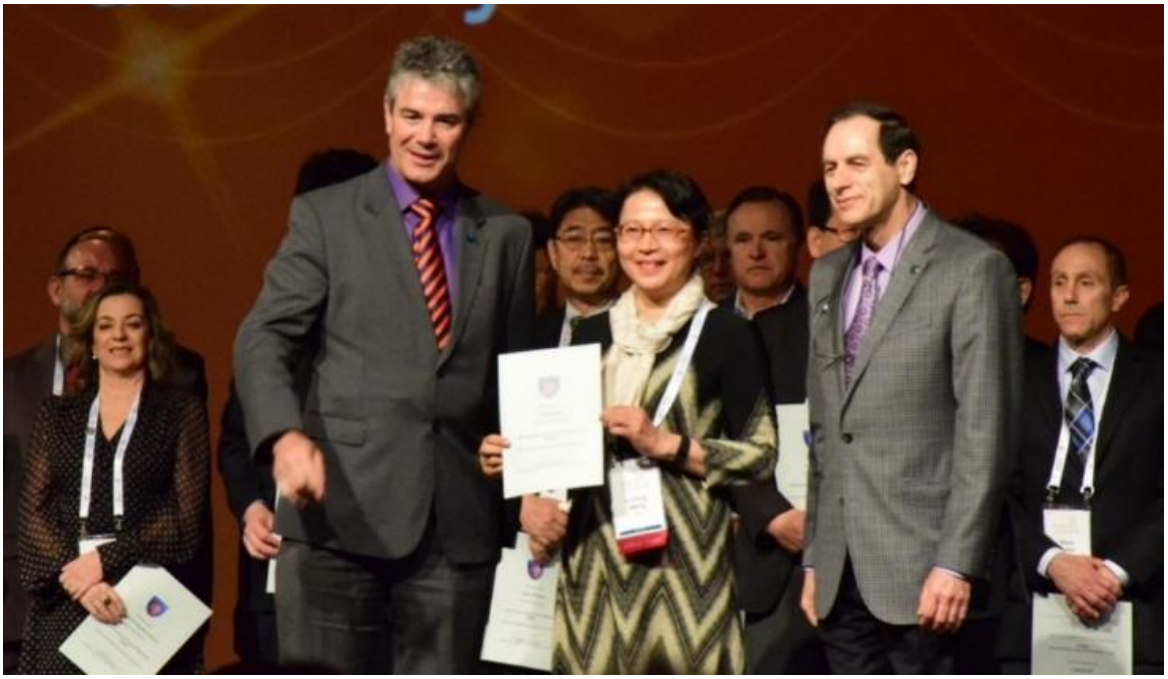

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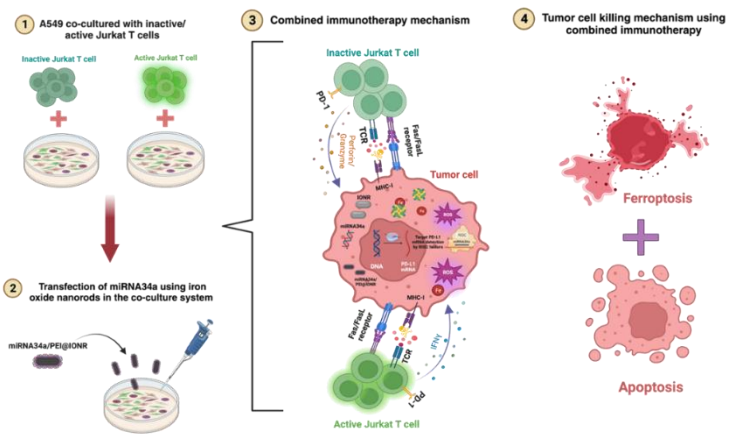
免疫療法是先進的癌症治療方法。在這項研究中，我們利用 miRNA34a 和 Jurkat T 細胞的免疫療法在誘導非小細胞肺癌 A549 細胞死亡方面的有效性。我們使用氧化鐵納米棒 （IONR） 作為 miRNA34a 遞送，探討對 A549 細胞毒殺效果。同時，在 miRNA34a 遞送之前和之後，A549 細胞與活化與不活化的 Jurkat T 細胞共培養，探討 Jurkat T 細胞對 A549 細胞毒殺影響。令人驚訝的是，我們的結果顯示，即使是失活的 Jurkat T 細胞也能夠誘導癌細胞死亡。這一出乎意料的觀察說明 Jurkat T 細胞可對癌細胞發揮細胞毒殺的其他作用機制。我們使用抗 CD3/CD28 刺激 Jurkat T 細胞，並分析了活化的 Jurkat T 細胞聯合 miRNA34a，它們殺死 A549 的加強功效。我們的研究結果表明， A549 細胞與活化的 Jurkat T 細胞和 miRNA34a 的聯合治療顯示出最高水準的癌細胞死亡，表明 Jurkat T 細胞活化和 miRNA 治療之間存在協同作用。除了 Jurkat T



細胞對 A549 細胞的細胞毒作用的凋亡機制外，我們還進一步研究了鐵死亡途徑，該途徑被發現由於癌細胞內部存在 miRNA34a 和 IONRs 作為遞送劑而對癌細胞殺傷有影響。

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【研究團隊】
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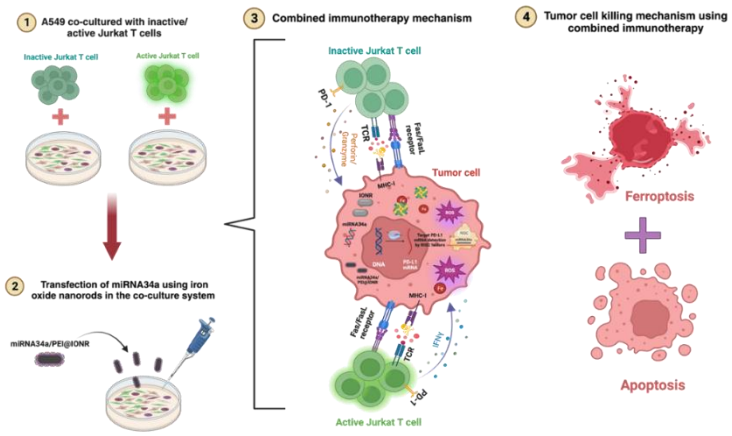
Immunotherapy has emerged as a promising approach for cancer treatment, and the use of microRNAs (miRNAs) as therapeutic agents has gained significant attention. In this study, we investigated the effectiveness of immunotherapy utilizing miRNA34a and Jurkat T cells in inducing cell death in non-small cell lung cancer cells, specifically A549 cells. Moreover, we explored the impact of Jurkat T cell activation and miRNA34a delivery using iron oxide nanorods (IONRs) on killing cancer cells. A549 cells were co-cultured with both activated and inactivated Jurkat T cells, both before and after the delivery of miRNA34a. Surprisingly, our results revealed that even inactive Jurkat T cells were capable of inducing cell death in cancer cells. This unexpected observation suggested the presence of alternative mechanisms by which Jurkat T cells can exert cytotoxic effects on cancer cells. We stimulated Jurkat T cells using anti-CD3/CD28 and analyzed their efficacy in killing A549 compared to the inactive Jurkat T cells in conjunction with miRNA34a. Our findings indicated that the activation of Jurkat T cells significantly enhanced their cytotoxic potential against cancer cells compared to their inactive counterparts. The combined treatment of A549 cells with



activated Jurkat T cells and miRNA34a demonstrated the highest level of cancer cell death, suggesting a synergistic effect between Jurkat T cell activation and miRNA therapy. Besides the apoptosis mechanism for the Jurkat T cells cytotoxic effects on A549 cells, we furthermore investigated ferroptosis pathway which was found to have an impact on the cancer cell killing due to the presence of miRNA34a and IONRs as the delivery agent inside the cancer cells.

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