增幅mRNA疫苗免疫效性之奈米佐劑

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mRNA 疫苗的特色及奈米佐劑策略

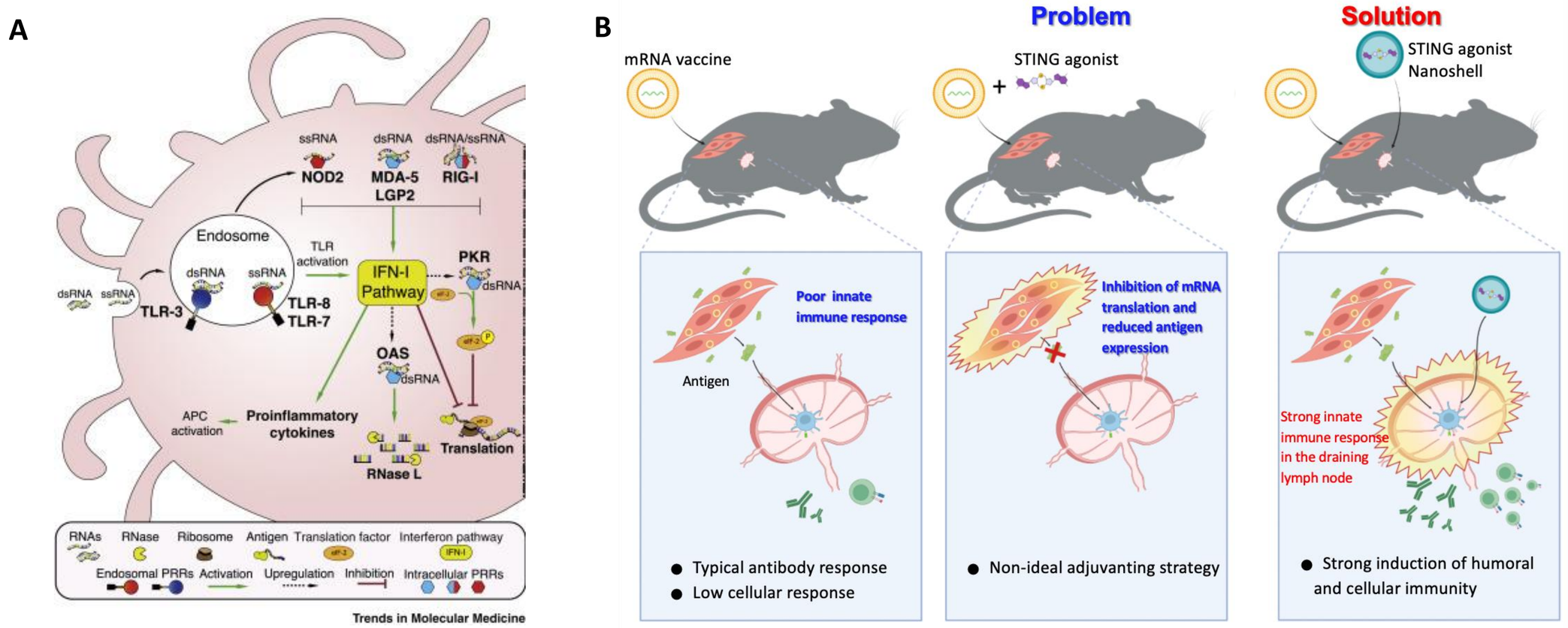

Figure 1. (A) Schematic illustrating the inherent antagonism between mRNA translation and innate immunity induction. Innate immune pathways can activate antiviral state within cells, leading to translation inhibition. Figure referenced from [Trends in Molecular Medicine VOLUME 26, ISSUE 3, P311-323, MARCH 01, 2020]. (B) Schematic illustrating the dilemma behind adjuvanting mRNA vaccines as the translation interference and poor temporal coordination could compromise vaccine potency. A spatio-temporally coordinated adjuvant delivery strategy using nanoshell vaccine is proposed to enhance mRNA vaccinaton.

可調節釋放速率並標靶地送至淋巴結的STING agonist 奈米佐劑

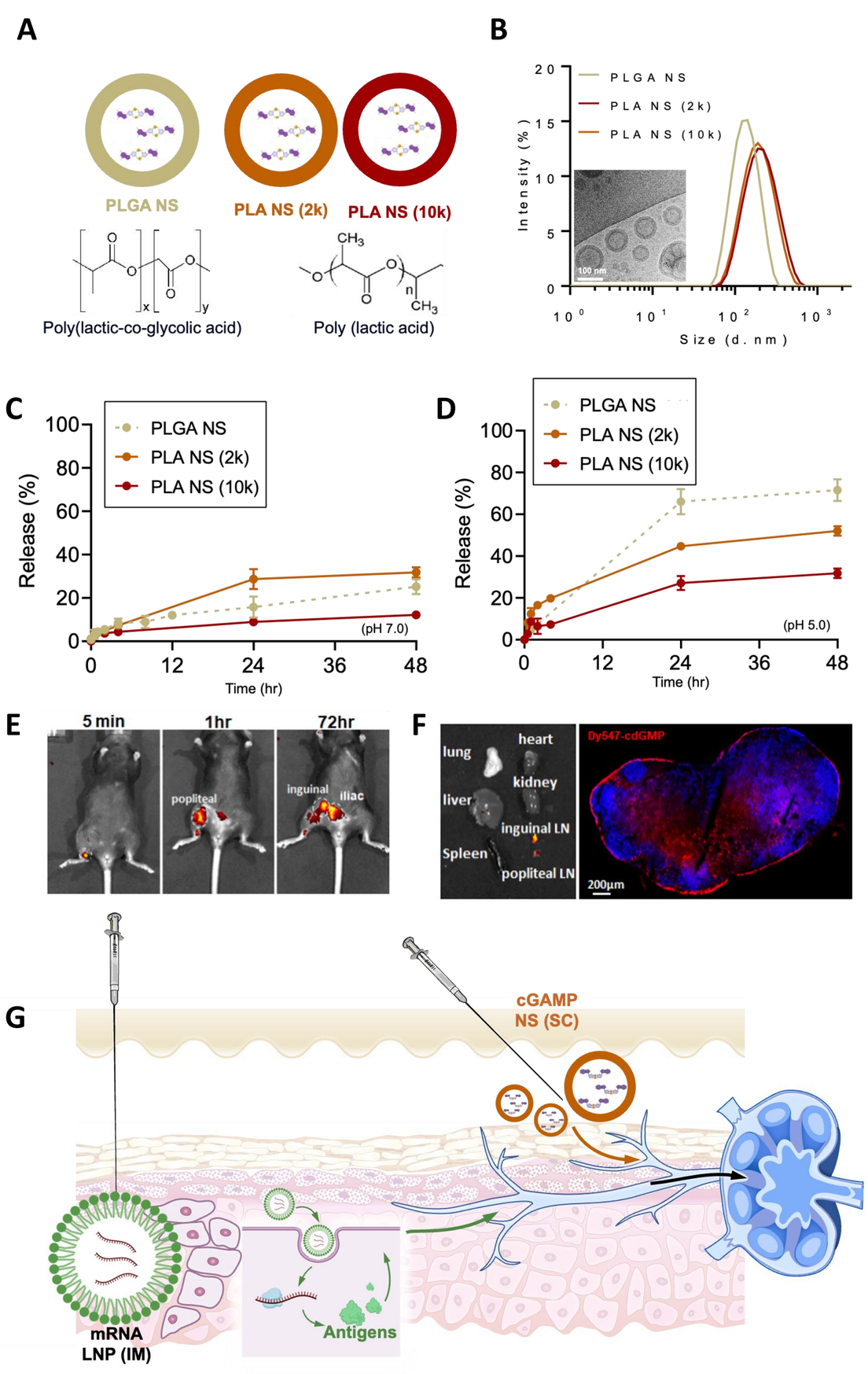

Figure 2. (A) Proprietary STING agonist-loaded polymeric nanoshells, which can be formulated with polymers of different hydrolytic rates for controlled release. (B) DLS characterization and cryo-EM of STING agonist-loaded nanoshells. The release kinetics of STING agonists from the nanoshells were characterized at (C) pH7 and (D) pH 5. (E)(F)Effective lymph node drainage is observed with the STING agonist nanoshells upon subcutaneous injections. (G) Schematic illustration of spatio-temporally coordinately adjuvant delivery strategy to enhance mRNA vaccine by STING agonist nanoshells.

時空調節之奈米佐劑策略增幅CD8T細胞激活的數量及質量

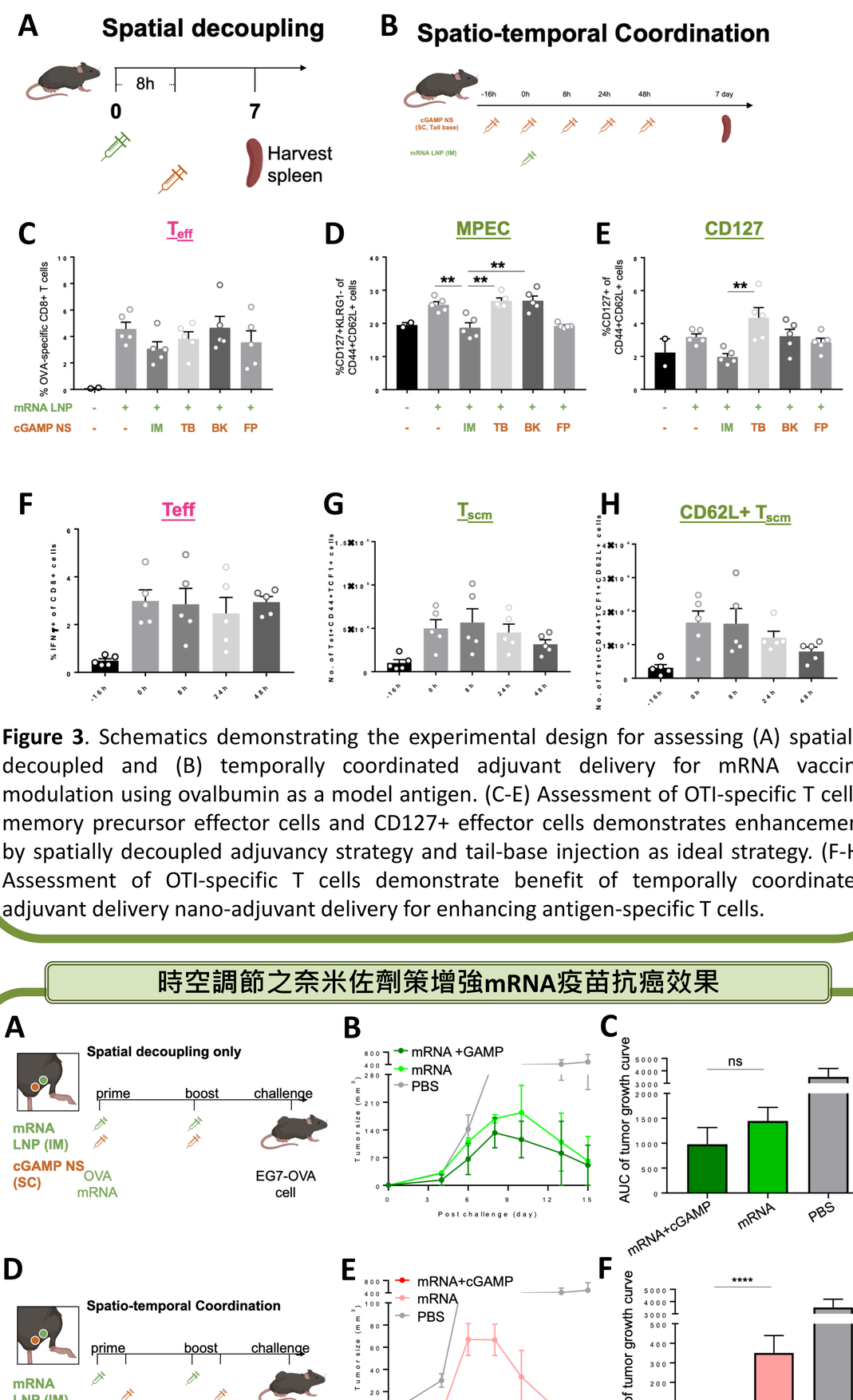

Figure 3. Schematics demonstrating the experimental design for assessing (A) spatially decoupled and (B) temporally coordinated adjuvant delivery for mRNA vaccine modulation using ovalbumin as a model antigen. (C-E) Assessment of OTI-specific T cells, memory precursor effector cells and CD127+ effector cells demonstrates enhancement by spatially decoupled adjuvancy strategy and tail-base injection as ideal strategy. (F-H) Assessment of OTI-specific T cells demonstrate benefit of temporally coordinated adjuvant delivery nano-adjuvant delivery for enhancing antigen-specific T cells.

時空調節之奈米佐劑策略增強mRNA疫苗抗癌效果

Figure 4. Anticancer study against OVA-expressing EG.7-OVA tumor models demonstrating enhanced adjuvancy effect by spatio-temporally coordinated adjuvancy strategy against mRNA-based anticancer vaccine.