Supplementary Information

In situ IL-2/IL-12 released from SiO_2-engineered dendritic cells for synergistic immunotherapy

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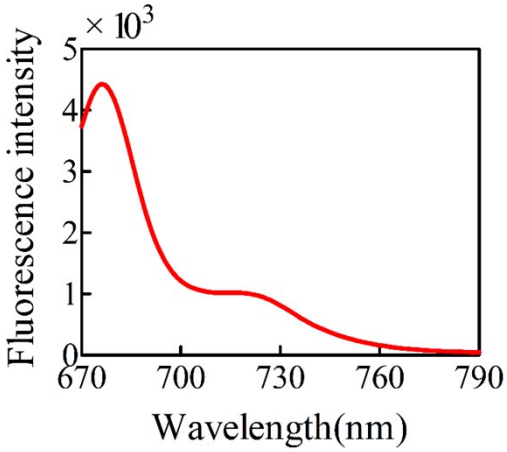

Fig. S1 Fluorescence spectrum of Pheoa-MAL, the excitation wavelengths was 665 nm, emission wavelength was 676 nm.

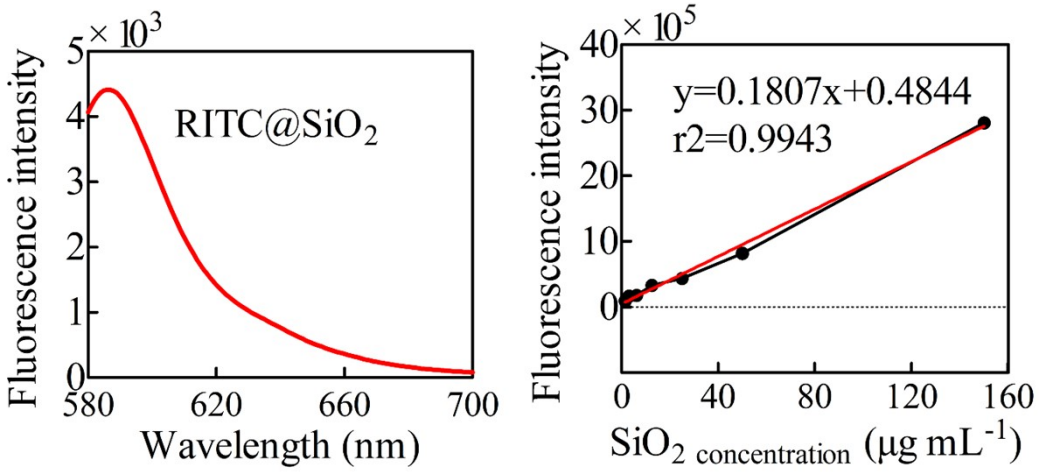

Fig. S2 The fluorescence spectrum of RITC@SiO_2-MAL (excitation wavelength of 556 nm, emission wavelength of 590 nm) and the standard curve of fluorescence intensity as a function of RITC@SiO_2-MAL mass concentration.

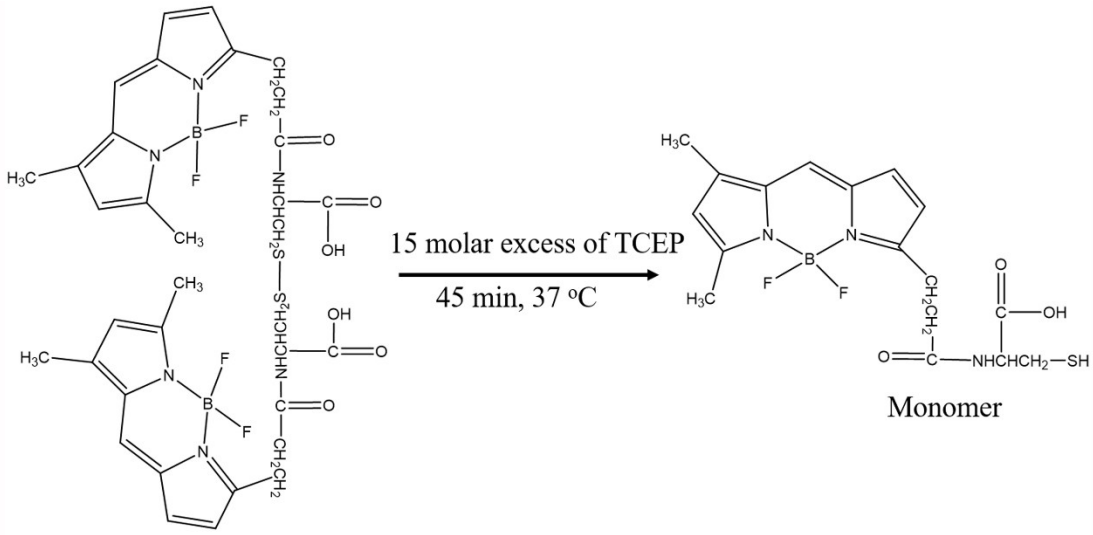

Fig. S3 BODIPY L-cystine is virtually nonfluorescent due to interactions between the two fluorophores. However, thiol-specific exchange with thiolated biomolecules occurs to form mixed disulfides, resulting in green fluorescence. Disufide crosslinks of cystines can be reduced to cysteine residues by TCEP (Tris-(2-Carboxyethyl)phosphine, Hydrochloride). Unlike dithiothreitol, TCEP does not contain thiols and therefore usually does not need to be removed prior to thiol modification.

Fig. S4 Flow cytometry analysis of mBMDCs conjugated with 6.25 μg/mL of SiO_2-MAL and PEGylated with indicated PEG-SH concentrations. Unreacted -MAL groups on SiO_2-MAL were detected by staining particle-conjugated cells with BODIPY-tagged cysteine.

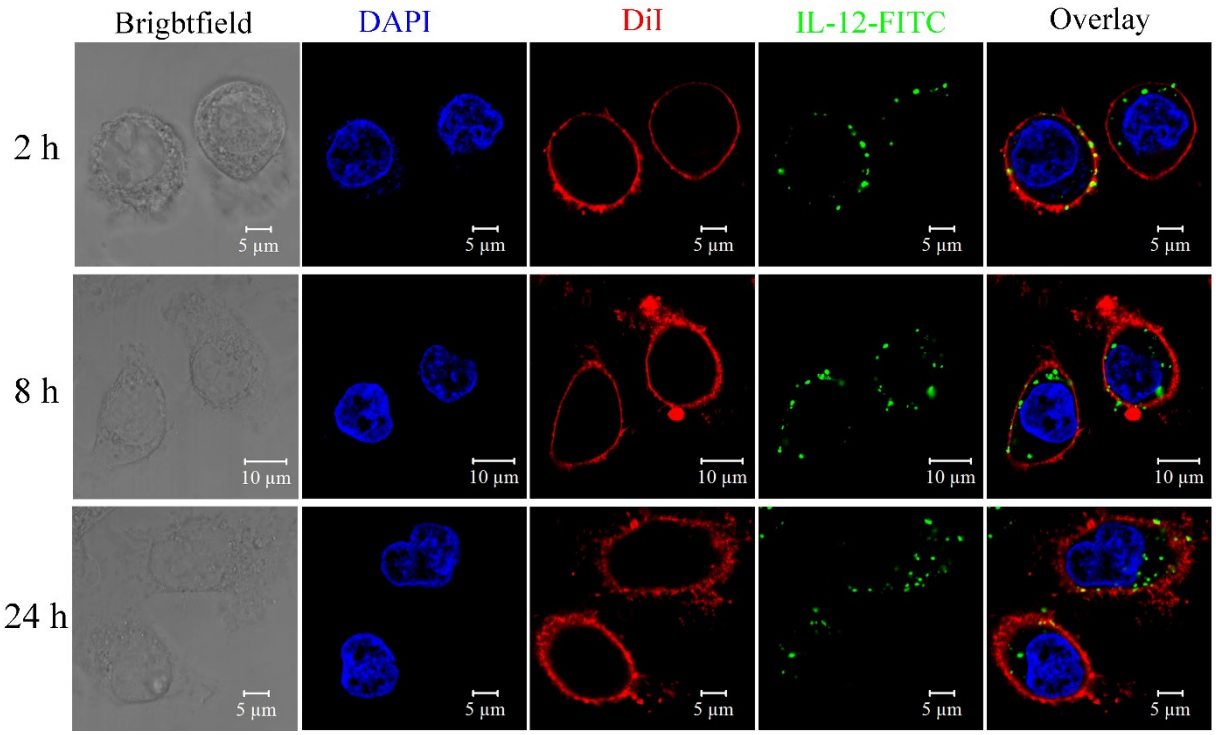

Fig. S5 SiO_2 NPs can be internalized by naïve BMDCs, CLSM images of IL-12-FITC@SiO_2-conjugated naïve BMDCs after *in vitro* culture of 2 h, 8 h and 24 h, the cells nuclei was stained with DAPI, and the cells membrane was stained with Dil.

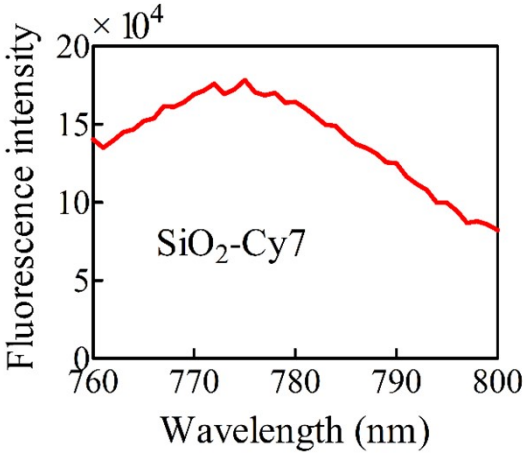

Fig. S6 Fluorescence spectrum of Cy7@SiO_2-MAL suspension, the excitation wavelengths was 743 nm, emission wavelength was 775 nm.

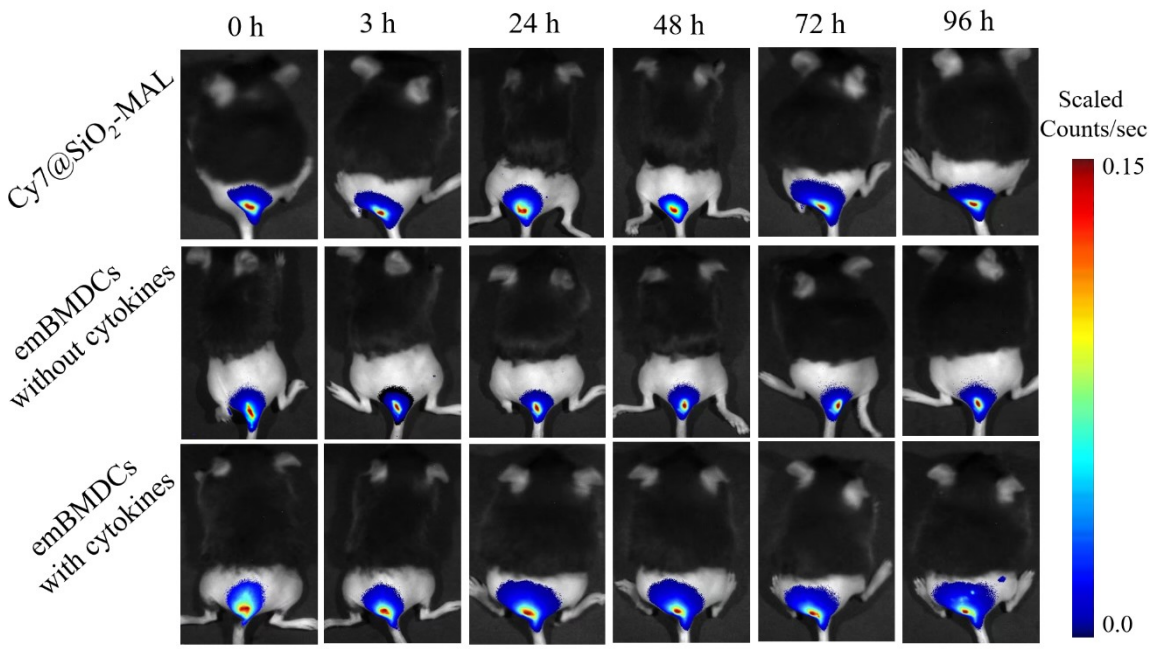

Fig. S7 The Cy7 fluorescent signal at the administration site of mice vaccinated by Cy7@SiO_2-MAL or emBMDCs engineered with Cy7@SiO_2-MAL or IL-2/IL-4-loaded Cy7@SiO_2-MAL.

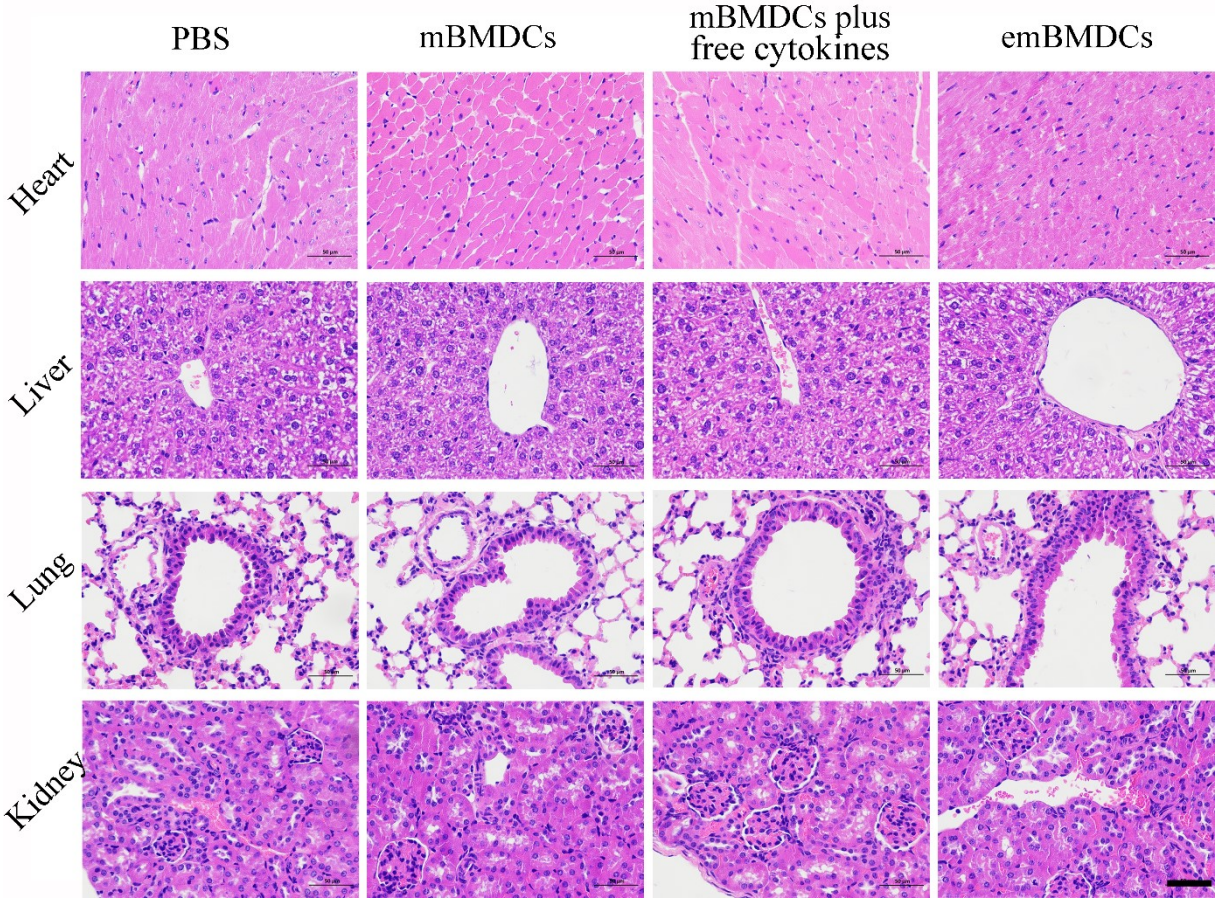

Fig. S8 Hematoxylin and eosin (HE) staining of mice organ sections after different treatments, the magnification of all the images was 40×.

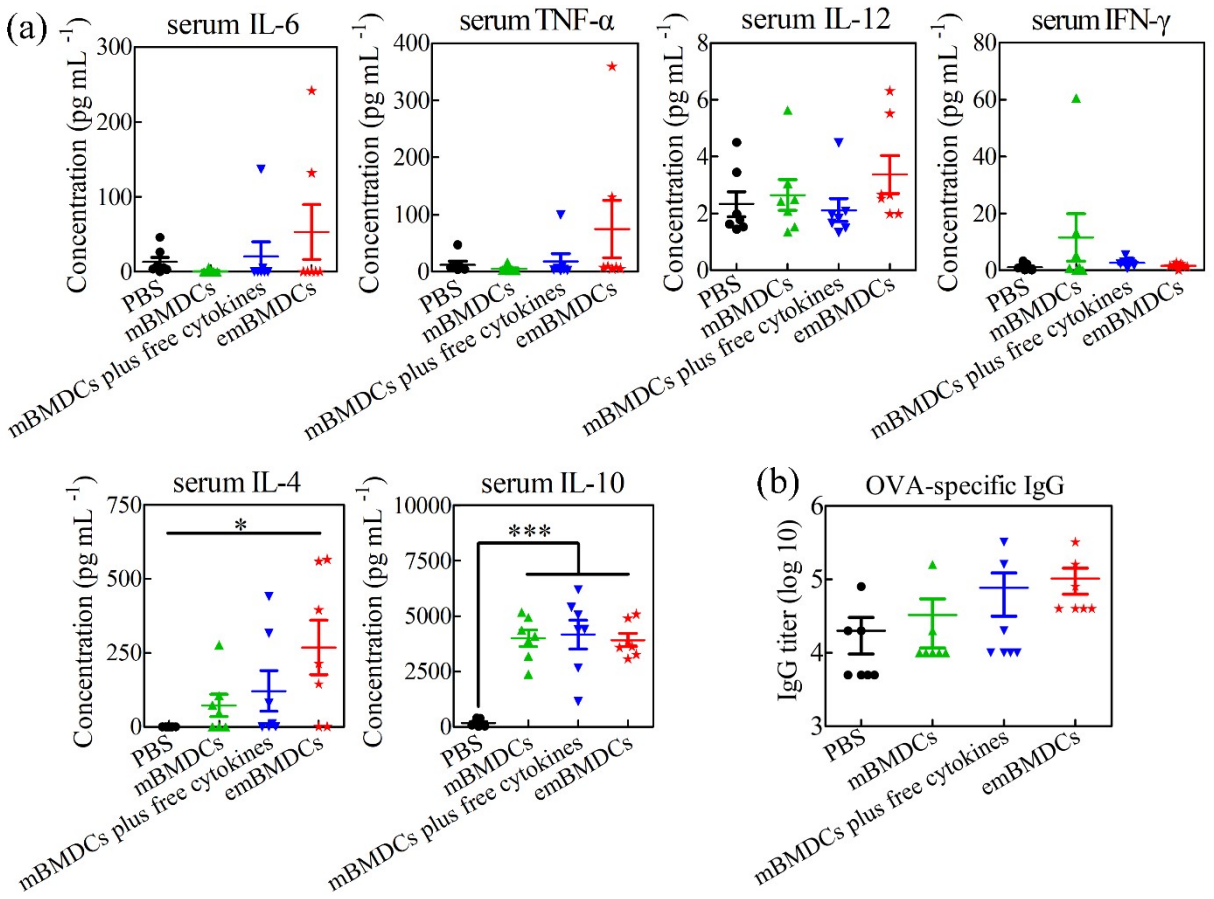

Fig. S9 (a) The serum proinflammatory cytokines (IL-6, TNF-α, IL-12 and IFN-γ) and (b) the OVA specific total IgG titer of mice stimulated with PBS, mBMDCs, mBMDCs plus free cytokines and emBMDCs.