### Japanese University Network in the Bay Area (JUNBA) 2008

Poly(γ-glutamic acid) nanoparticles as an efficient antigen delivery and adjuvant system to dendritic cells: Potential application to anti-AIDS vaccine

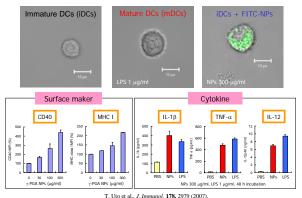
Masanori Baba Center for Chronic Viral Diseases Graduate School of Medical and Dental Sciences Kagoshima University

January 10-11, 2008, Santa Clara, CA

# Preparation of biodegradable NPS Poly(amino acids), polysaccharides Introduction of hydrophobic molecules Protein T. Alagi et al., J. Control. Reloace 188, 226 (2005), J. Biomater, Sci. Polymor Eds. 17, 875 (2006).

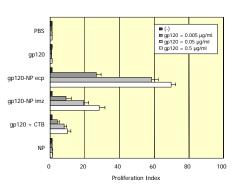
Kagoshima University

# Maturation of DCs by nanoparticles



T. Uto et al., J. Immunol. 178, 2979 (2007).

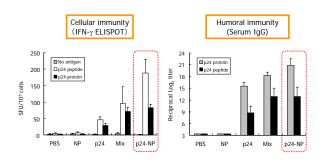
### HIV-1 gp120-specific T-cell proliferation



X. Wang et al., J. Virol. 81, 10009 (2007).

Kagoshima University

# Immune responses to p24 antigen



X. Wang et al., J. Med. Virol. 80, 11 (2008)

Kagoshima University

# Conclusions

- We have created novel biodegradable NPs from γ-PGA.
- Various proteins and peptides can be immobilized onto and/or encapsulated into the NPs.
- The NPs act as an efficient antigen carrier to DCs.
- The NPs are capable of activating DCs (immature DCs  $\rightarrow$  mature DCs).
- The NPs induce potent cellular immune responses to protein antigens, such as gp120 and p24.
- Thus, γ-PGA NPs carrying various HIV-1 proteins and/or peptides may be a great potential as a novel anti-AIDS vaccine.

The present work was conducted in collaboration with Professor Mitsuru Akashi in Osaka University.

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