TNF-TARGETING APTAMERS AND USES THEROF FOR TREATMENT OR DIAGNOSING TNF-RELATED INFLAMMATORY DISEASES

PI： Prof. Pan-Chyr Yang
Department of Internal Medicine, National Taiwan U.
Experience: https://www.ibms.sinica.edu.tw/pan-chyr-yang/

Applications of Technology:

- TNF-a signaling-related inflammatory diseases such as acute liver injury, acute lung injury, and acute respiratory distress syndrome
- *In vivo* detection of TNF-a level

Our Technology:

The TNF-a pathway plays as a double-edged sword in immune regulation. While excessive TNF-a causes cell apoptosis and triggers cytokine storms, an optimal TNF-a level is essential for innate immunity against bacterial infection and tissue repair. Therefore, timing and duration of intervention are keys to success for TNF-a pathway inhibition in the context of TNF-a signaling-related inflammatory diseases.

Our dimeric TNF-a aptamer blocks TNF-a function with high specificity and affinity (dissociation constant = 8 nM). When using PEG as linker, our TNF-a aptamer has adjustable inhibitory duration. It suppresses the TNF-a-induced cell apoptosis signaling at the early tissue injury phase and then be degraded and excreted without affecting the cell proliferating signaling at the late tissue repair phase. Furthermore, our TNF-a aptamer can be easily conjugated to imaging agents such as CT, MRI, ultrasound agent as diagnostic tool for *in vivo* TNF-a detection.

Strength:

- Adjustable *in vivo* half-life
- Antidote can be easily designed with potentiate quick termination of its antagonistic effects whenever needed
- Easily manipulation for chemical conjugation to other components
- Topical (inhalation) and systematic drug delivery
- No antibody-dependent cell-mediated cytotoxicity (ADCC) and complement-dependent cytotoxicity (CDC) effects
- Low production cost and batch effects

Intellectual Properties:

PCT filing (PCT/US2018/067140) and TW patent application pending

Contact (do not need to fill out):

Center of Industry-Academia Collaboration, NTU
Tel: 02-3366-9945, E-mail: ordiac@ntu.edu.tw