A ROLE FOR DOGS IN ADVANCING CANCER IMMUNOTHERAPY RESEARCH

THE CANINE CANCER MODEL AND RELEVANCE TO IMMUNOLOGICAL STUDIES

Dog's immune system in cancer immunotherapy studies already very immunological experienced. They are more broadly 'educated' which will shape the development of antitumor immunity.

COMPARISONS BETWEEN DOGS AND HUMANS IMMUNE CELLS AND IMMUNE RESPONSES

T cells	CD28, PD-1, OX40, TIGIT, TIM3, Lag3	CD28, PD-1, OX40, TIGIT, TIM3, Lag3
Ratio of CD4 & CD8T cells in blood and lymph nodes	2:1 ratio	2:1 ratio
IgG molecules	Four (4) A, B, C, D	Four (4) 2 finding Fc receptors 2 functionaly negative
Antigen presenting cells	B cells, DC, monocyte, macrophages	MHCII, CD40, CD80, CD86, PD-L1

SELECTED CANINE CANCER IMMUNOTHERAPY STUDIES WITH HIGH RELEVANCE TO HUMAN IMMUNO-ONCOLOGY

TRIAL	RESULT
• HER2/neu vaccine • TERT vaccine	• Both increase OST vs historical control

- Canine osteosarcoma Listeria-vectored vaccine targeting HER2/neu
- Plasmid DNA based tumor vaccine targeting TERT antigen

CANCER VACCINES

ADOPTIVE CELLULAR THERAPY

1. ACT with CAR T cells
2. ACT with CAR T or CAR NK cells

TUMOR MICROENVIRONMENT MODIFICATION

1. Bacterial Super antigen as T cell activator
2. Prevent recruitment to tumor issues
3. Treatment with an anti-CCR4 antibody
4. Administering agents that increase tumor oxygenation

CHECKPOINT MOLECULE TARGETED IMMUNOTHERAPIES

- PD-1
- PD-L1
- OX40

OTHER IMMUNOTHERAPY APPROACHES

- Viral vectored cytokine delivery approaches
- Systematic administration of IL-12 nanoparticles
- Bacterial delivered therapeutics
- Adoptive transfer of non-specifically activated T cells and IL-15 activated NK cells
- Regulatory T cell depletion

THE CHALLENGE FOR IMMUNOTHERAPY

1. Lack of necessary immunological reagents
2. Large variety of cytokine for dog studies