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## Canine T lymphocytes activation depends on signal strength and temperature

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Domestic dog is an attractive model for immunological studies. Major subsets of the dog immune system were characterized with significant homology to humans. However, culture of large amounts of canine T cells for the purpose of adoptive cellular immunotherapy still requires optimization. Expansion of T cells *in vitro* depends on proper activation. In dogs, as well as in humans, stimulation of T lymphocytes engages T-Cell receptor (TCR) signal and co-stimulatory signal. Activated T cell up-regulate expression of receptor for interleukin2 (IL2R), the main T cell growth factor. In our study we used nano-sized magnetic beads coated with anti-canine CD3/anti-canine CD28 to mimic immunological synapse. Canine T lymphocytes were stimulated with beads at either 1:1, 1:2 or 1:0.5 bead:T cell ratio. Our research shown that low-strength activation signal (1:0.5 ratio) caused increased expression of CD25, the alpha chain of IL2R (marker of activation) on canine T cells, 24 and 72 hours post-stimulation. Lower beads concentration made T lymphocytes to create multiple aggregates, which are the sign of cells activation. We also determined the impact of temperature range from 33 °C to 41 °C on T lymphocytes activation and proliferation. We found that increase of temperature resulted in increased expression of CD25 on T cells. Overall our research revealed the optimal conditions for canine T cells expansion for further immunological assessment and importantly for adoptive T cell transfer, which is a very promising therapy to treat cancer in humans, as well as, in canine patients.

### Biography

Kinga Majchrzak has completed her PhD in 2012 from Warsaw University of Life Sciences, Poland. She has completed her Postdoctoral training at the Medical University of South Carolina, USA. She investigated Th17 lymphocytes in adoptive cell transfer therapy. Currently she is an Associate Professor in Department of Physiological Sciences, WULS. She has published 15 papers in the field of Immunotherapy and Veterinary Immunoncology.

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