

# Application of Luminex Multiplex System in IO Research



WuXi AppTec Research Service Division, Oncology & Immunology Unit

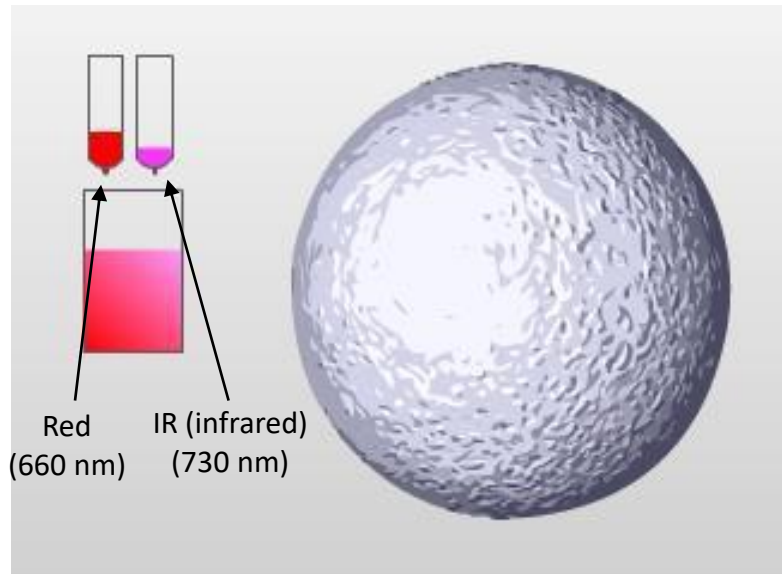


2019.11

## Detection principle

### 1. Microsphere color coding

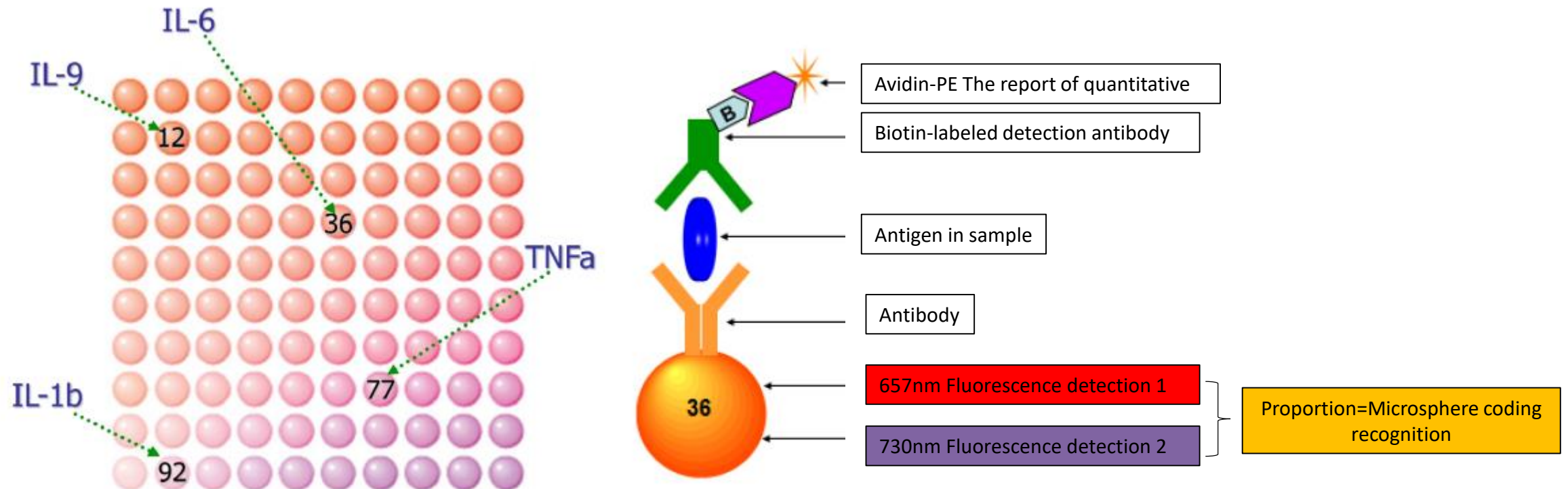
- Red and infrared fluorescent dyes are coated with microspheres
- Each fluorescence has 10 concentrations
- $10 \times 10 = 100$  different proportions of fluorescence



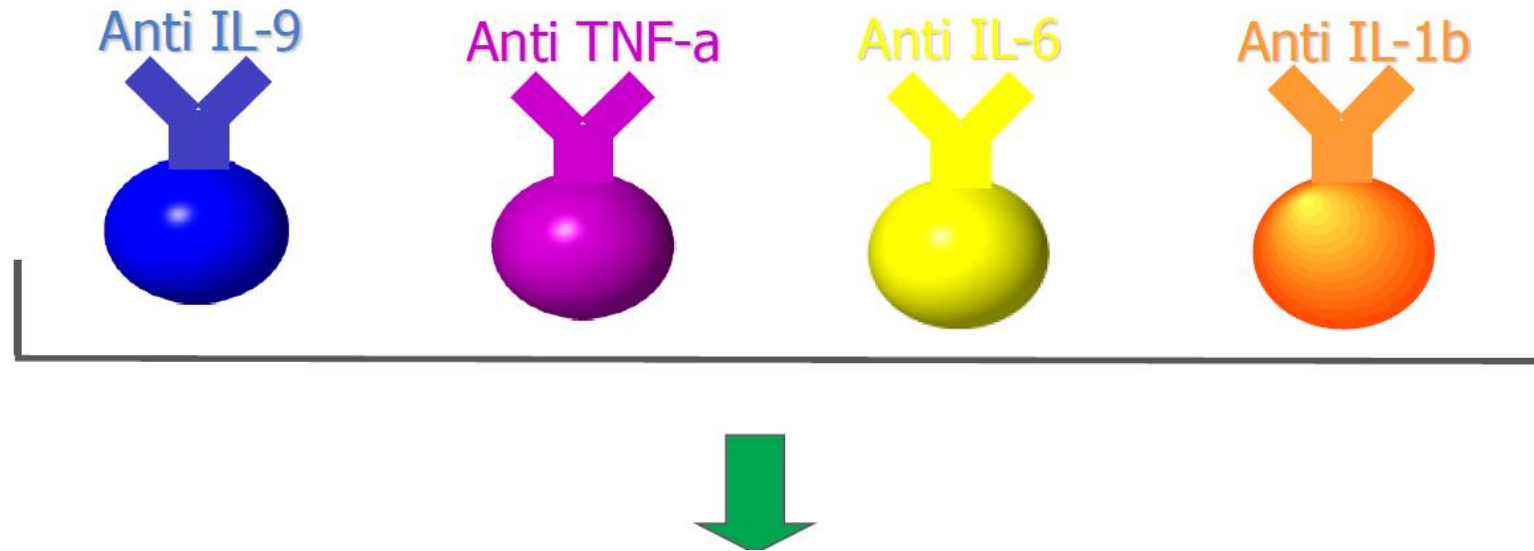
## Detection principle

### 2. Antibodies are conjugated to microspheres

- Different specific antibodies were conjugated to different colored microspheres
- The spheres of each color point to a specific analyte
- The coupled microspheres are used for multiple detection after mixing



## 3. Perform multiple reactions

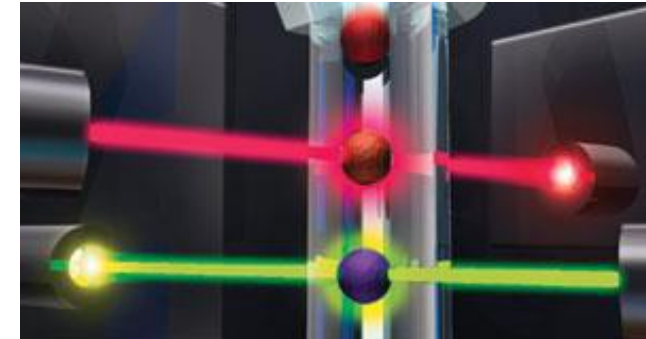
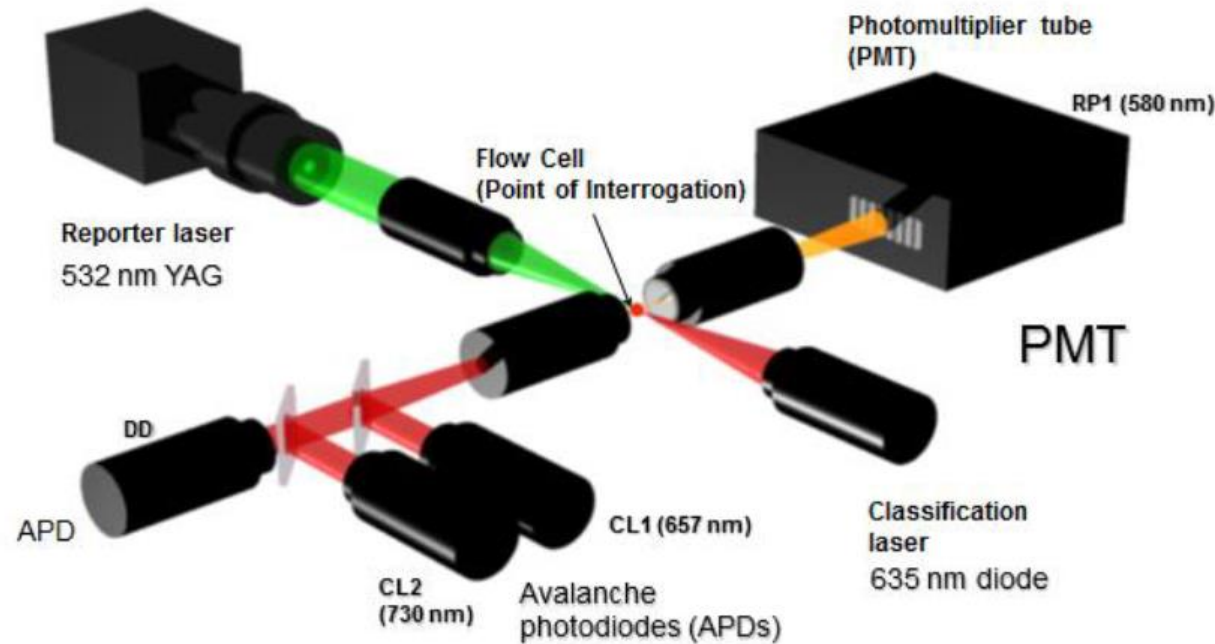


- Different tests were mixed simultaneously in the same reaction hole
- The instrument classified and quantified microspheres for each test
- Also report all test results

# Multiplex immunoassays: Luminex Multiplex System

## Detection principle

- The stained microspheres pass through the liquid flow path step by step
- The red light source (635nm classification laser) in the instrument measures the dye in the microsphere, identifies the microsphere coding and analyzes the species class
- The green light (532nm report laser) measured the microsphere report molecule, that is, the analyte concentration

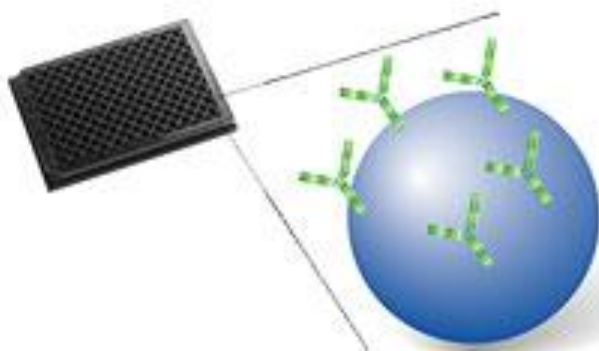




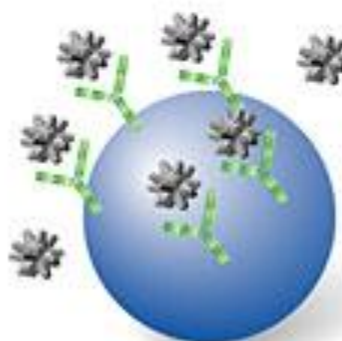
# Multiplex immunoassays: Luminex Multiplex System

Bio-Plex Cytokine Assay Workflow

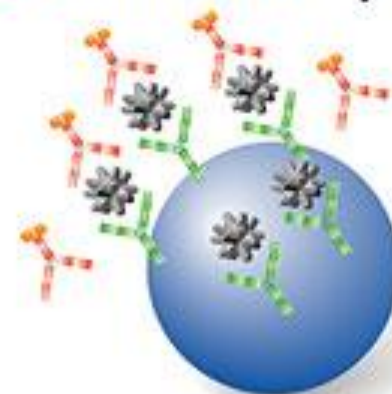
Step One  
Dispense capture beads



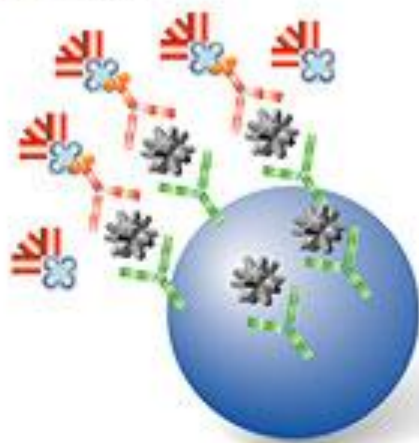
Step Two  
Add samples



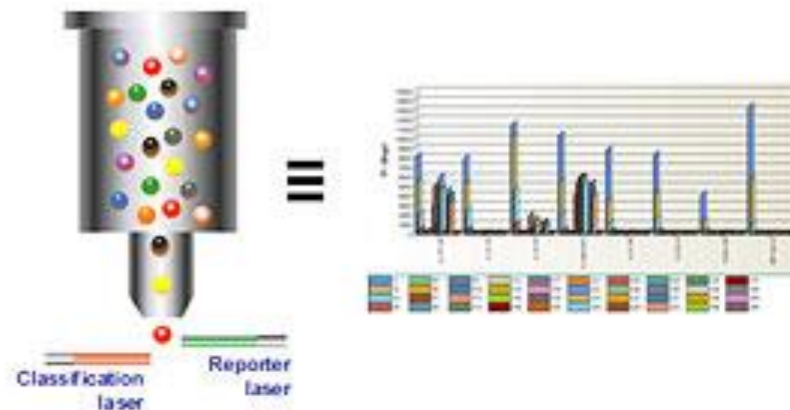
Step Three  
Add detection antibody



Step Four  
Add reporter dye

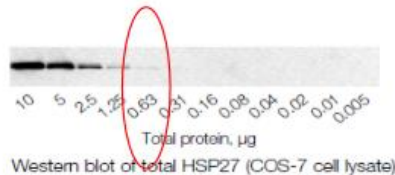
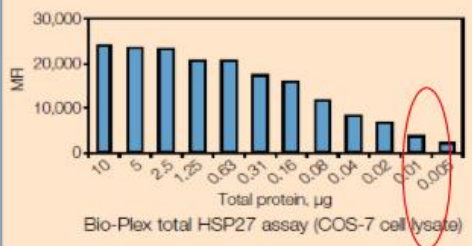


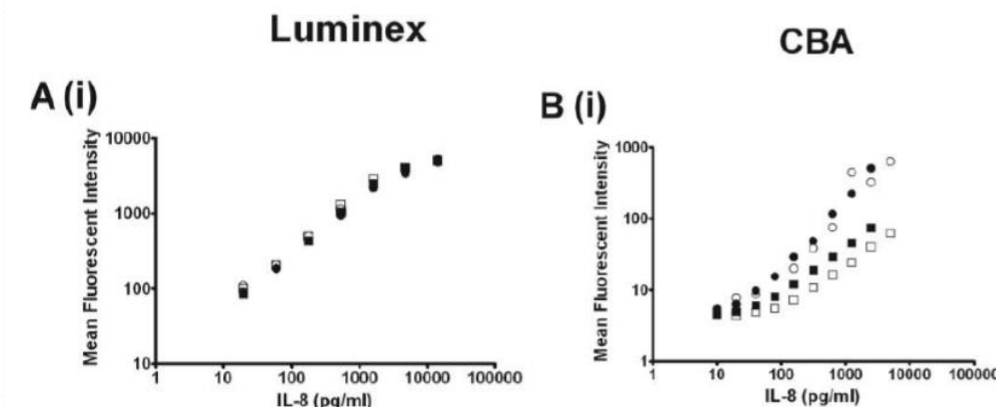
Step Five  
Fluorescent sorting and data reduction



# Multiplex immunoassays: Luminex Multiplex System

## Advantages:

	Western Blot	xMAP Technology
Number of phosphoproteins	5	5
Number of samples	12	12
Total data points	60	60
Number of gels or 96-well plates	5	1
Data points per gel or plate	12	60
Total time required	~8 hr + one overnight incubation	3 hr + one overnight incubation
Sample volume	125 $\mu$ l	25 $\mu$ l
Dynamic range	Limited	50–900 $\mu$ g/ml total protein
Sensitivity*	 <p>Western blot of total HSP27 (COS-7 cell lysate)</p>	 <p>Bio-Plex total HSP27 assay (COS-7 cell lysate)</p>



Luminex kits were found to be highly reproducible and reliable; CBA kits were not due to aberrant standards.

# Multiplex immunoassays: Luminex Multiplex System

## Sample types include:

- Serum
- Plasma
- Cell/Tissue Lysate
- Cerebrospinal Fluid
- Synovial Fluid
- Blister Fluid
- Tissue Culture Supernatants
- Fat Interstitial Fluid
- Bronchoalveolar Lavage Fluid
- Nasal Lavage Fluid
- Peritoneal Fluid





# Multiplex immunoassays: Luminex Multiplex System

Applications include:

## Human

- [Acute Phase Assays](#)
- [Apolipoprotein Assays](#)
- [Apoptosis Assays](#)
- [Chemokine Assays](#)
- [Cytokine Chemokine and Growth Factors](#)
- [Diabetes Assays](#)
- [Inflammation Assays](#)
- [Isotyping Assays](#)
- [Kidney Toxicity Assays](#)
- [Th17 Cytokine Assays](#)

## Mouse

- [Chemokine Assay](#)
- [Cytokine, Chemokine, and Growth Factor Assays](#)
- [Diabetes Assay](#)

## Rat

- [Cytokine, Chemokine, and growth factor Assays](#)
- [Diabetes Assay](#)
- [Kidney Toxicity Assay](#)

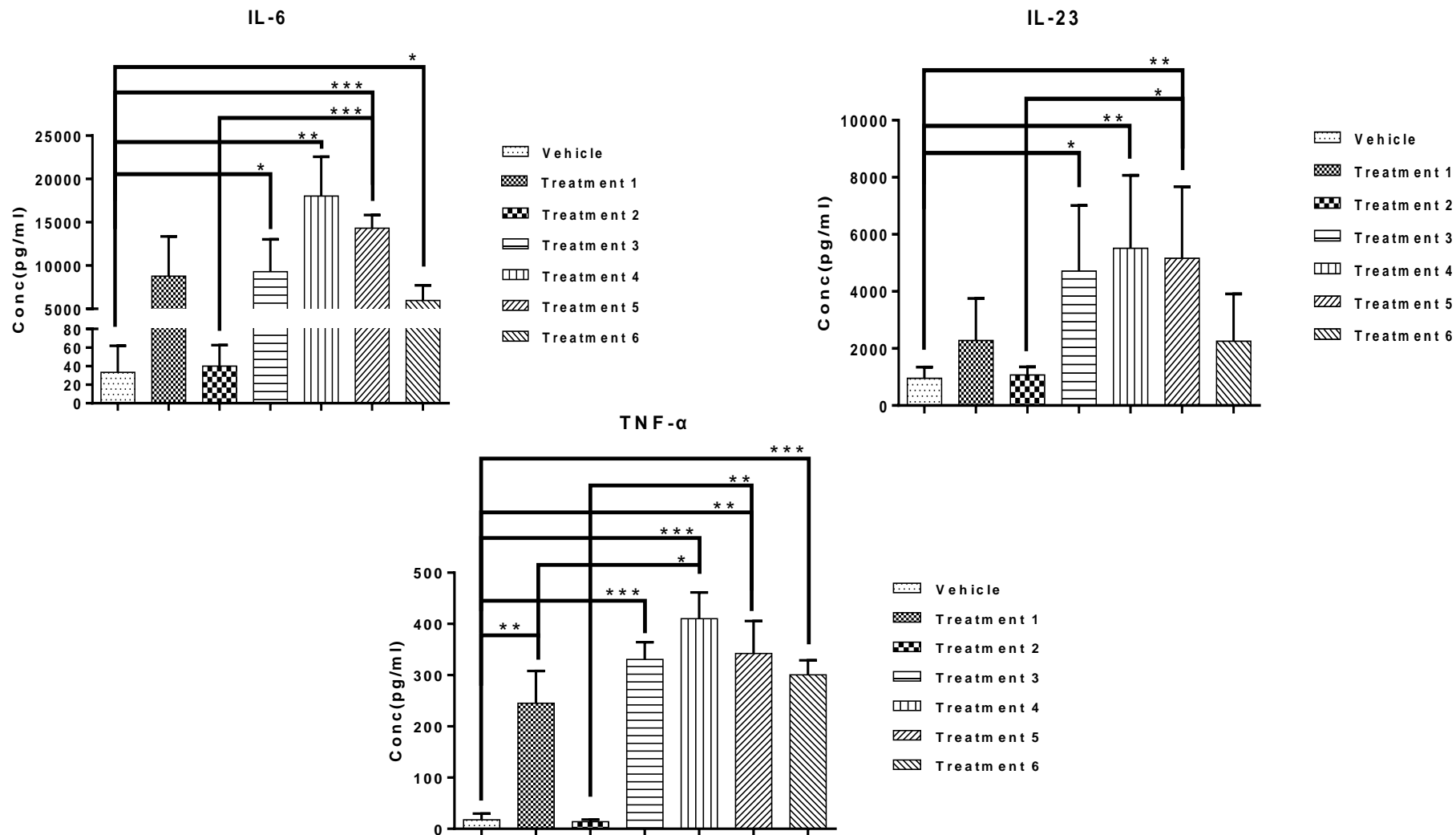
## Other

- [Canine Kidney Toxicity Assay](#)
- [Multi species TGF Beta Assays](#)
- [Multi species Cell Signaling Assays](#)

**Bio-Plex Multiplex immunoassays** use **Luminex magnetic beads** for the quantification of over 450 biologically relevant targets: **assays** for inflammation, disease, cancer, cell signaling and growth, apoptosis, toxicity, and more.

## Showcase Data

Using Luminex to examine the expression levels of cytokines in C57BL/6 plasma after different treatments.





# OUR COMMITMENT

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For questions and requests, please email to [info\\_onco@wuxiapptec.com](mailto:info_onco@wuxiapptec.com)



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