**What is flow cytometry?**

**Clinical Flow Cytometry FAQs**

Flow cytometry is a test that determines the immunophenotype of cells by recognizing normal and abnormal expression of cell surface markers on T cells (helper T cells, cytotoxic T cells), B cells, neutrophils, and monocytes.

**Clinical flow cytometry is most often used for cats and dogs:**

1. To help distinguish between reactive and neoplastic lymphocytes
2. To determine if lymphoma/leukemia is of B or T cell origin and in some cases, identify specific subtypes of B or T cell lymphoma/leukemia which will aid in prognosis
3. To differentiate between lymphoid and non-lymphoid (myeloid/monocytic) neoplasia

***Clinical flow cytometry is used most often in combination with clinical history/presentation and cytology/blood smear examination for diagnosis of disease****.* In some cases, additional diagnostics (PARR- PCR for antigen receptor rearrangement, histopathology, immunohistochemistry, immunocytochemistry) are also required.

**When might clinical flow cytometry be most helpful?**

1. **Lymphadenopathy, organomegaly, or mediastinal mass with the following cytology results**:
   1. Confirmed or probable lymphoma composed of intermediate to large lymphocytes
   2. Homogeneous expansion of small to intermediate lymphocytes
   3. Suspected lymphoma or thymoma (for mediastinal mass)

Sample to submit: Fine needle aspirate of lymph node/enlarged organ/mass (see sample submission guidelines)

*Note: Flow cytometry is not indicated on these samples if cytology results report rare to low numbers of atypical/suspicious cells*

1. **Abnormal CBC findings consisting of**:
   1. Peripheral lymphocytosis with increased numbers of small mature, intermediate, or immature lymphocytes
   2. Presence of any immature cells/’blasts’ with a normal or elevated white blood cell count

Sample to submit: Peripheral blood (EDTA tube)

*NOTE: If the lymphocytosis is composed of small to intermediate lymphocytes test for Ehrlichia infection in dogs with lymphocyte counts up to ~50k and ‘stress’ in cats with lymphocyte counts up to ~30k prior to running flow cytometry*

1. **Abnormal bone marrow findings with the following cytology/CBC results:**
   1. Increased numbers of blasts or small/intermediate lymphocytes withleukopenia on CBC

Sample to submit: Bone marrow (EDTA tube) for samples with leukopenia on CBC. Peripheral blood (EDTA tube) is preferred if lymphocytosis is present.

1. **Body cavity effusion with the following cytology results:** 
   1. High numbers of small/intermediate/OR large lymphocytes consistent with or concerning for lymphoma

Sample to submit: Cavity fluid (EDTA tube and red top tube when possible- 0.5ml in each tube, see sample submission guidelines)

**Uncertain if flow cytometry will be helpful for your patient? Email** [**vetclinflow@uga.edu**](mailto:vetclinflow@uga.edu) **or contact (706)542-9430 alt phone: (706)542-5161**

**Sample shipping guidelines**

* **Collect samples and ship on the same day overnight for Monday through Friday delivery**
* **Keep samples refrigerated (DO NOT FREEZE) until shipped**
* **Ship overnight with an ice pack**
* Samples may be submitted via:
  + *The Athens Veterinary Diagnostic Laboratory*
    - Courier services may be available in your area
    - Or ship overnight via UPS- $10 UPS overnight labels available by email
    - For courier service information or for shipping labels by email contact AVDL [(706) 542-5568](javascript:void(0)) or visit <http://www.vet.uga.edu/dlab/> for information

**Sample collection and submission guidelines**

**Lymph node, organ or mediastinal mass aspirates**

* Put 1 ml of 0.9% saline in a red top tube (*no additives, no serum separator*)
* Add 0.1ml of serum from the same patient or another patient of the same species
  + *Note: the volume of serum should be ~10% of the total volume (this helps preserve cells)*
* Using a 22ga needle and 6 or 12cc syringe, **aspirate with suction**
* Eject the contents into the saline, gently aspirate the saline into the syringe and eject back into the tube to recover all cells
* Aspirate several times(2-3X if possible)repeating the above process **until the saline is slightly cloudy**

**Blood and bone marrow**

* Provide a minimum of 0.5ml in an EDTA tube
* A current CBC (within 2days) of the flow sample collection is required
  + Include a copy of your patient CBC

OR

* + Check the CBC test request box and include: 1) *a minimum of 2.0 ml* of blood in an EDTA tube (use the appropriate fill volume for your tube) for the CBC and flow cytometry and 2) one unstained blood smear
    - See pricing schedule for CBC

**Body cavity fluid**

* Provide a minimum of 0.5ml in an EDTA tube
* If enough fluid is available please provide an additional red top tube (no additives, no serum separator) with a minimum of 0.5ml
* If the total protein is < 5mg/dl please add two drops of serum from the same patient or another patient of the same species (if protein measurement is unavailable, add 2 drops of serum regardless)

**Reporting and pricing schedule**

* Samples will processed on the day they are received or the next day to determine the cell count and cell viability and perform flow cytometry
* *Note: If a sample has too few cells or the cell viability is too low, flow cytometry results will not be accurate and flow cytometry will not be performed.* 
  + *A fee of $15 may be charged for the initial sample assessment in these cases*
* **Pricing Schedule**
  + **Canine & Feline Flow Cytometry $115.00**
* **Reporting**
  + Reports will be generated within approximately 3 business days of sample processing

**Questions?**

**Email:** [**vetclinflow@uga.edu**](mailto:vetclinflow@uga.edu)

**Phone: (706)542-9430**

**Alternate phone: (706)542-5161**