



## TESTING VOLUME REQUIREMENTS

### Hematology

500 uL EDTA Whole blood + slide made at site.  
**Do not freeze!**

Complete Blood Count	Mean Platelet Volume (stable 8 hours)
Red Cell Count	Red Cell Distribution Width
Hemoglobin	
Hematocrit	
Mean Corpuscular Volume (MCV)	
Mean Corpuscular Hemoglobin (MCH)	
Mean Corpuscular Hemoglobin Concentration (MCHC)	
Platelet Count	
Leukocyte Count	
Leukocyte Differential	
RBC Morphology	

Reticulocyte Count

500uL of whole blood - or -  
 Special stained cells – 2 slides

### Coagulation

Prothrombin Time (PT)	500 µL frozen citrate plasma <sup>1</sup>
Activated Partial Prothrombin Time (APTT)	500 µL frozen citrate plasma <sup>1</sup>
Fibrinogen	500 µL frozen citrate plasma <sup>1</sup>
Thrombin Time	500 µL frozen citrate plasma <sup>1</sup>
Fibrin Degradation Products (FDP) (Monkey)	500 µL frozen citrate plasma <sup>1</sup>
D-Dimer (Monkey, Dog) (Rat non-GLP)	200 µL frozen citrate plasma <sup>1</sup>

1. Sample must be collected in tube with ratio of 1 part sodium Citrate and 9 parts blood. Special tubes must be made for small volumes.



## Testing Volume Requirements (Continued)

### Urinalysis

2 mL or entire specimen of urine refrigerated unspun. Provide total volume. Preferred collected over a timed period. Provide time period.

Appearance	Ketones*
Color	PH*
Osmolarity	Protein* (May not be accurate in many species)
Specific Gravity	Urobilinogen*
Bilirubin*	Casts
Blood*	Cells
Glucose*	Crystals

\*Assays performed as semiquantitative dipstick method

### Clinical Chemistry

Minimum sample for one test 150  $\mu$ L. Up to 20 tests can be performed on 350  $\mu$ L of frozen serum. Separate from cells within 1 hour of collection.

Albumin	Chloride	Magnesium
Alkaline Phosphatase (ALP)	Cholesterol	Phosphorus
Alanine Aminotransferase (ALT)	Creatine Kinase (CK)	Potassium
Aspartate Aminotransferase (AST)	Creatinine	Sodium
Amylase	Gamma Glutamyl Transferase (GGT)	Triglycerides
Bilirubin, Direct	Glucose	Total Protein
Bilirubin, Total	Lactate Dehydrogenase (LD)	Urea Nitrogen
Calcium	Lipase	

Clinical Chemistry tests can be performed on urine samples as quantitative assays.

Indirect Bilirubin is a calculated parameter and requires Total and Direct Bilirubin. (No additional sample volume.) Urea/Creatinine Ratio, Anion Gap calculated.

Globulin and A/G ratio are calculated parameters and require Total Protein and Albumin. (No additional sample volume.)



## Testing Volume Requirements (Continued)

### Special Chemistry

Alkaline Phosphatase Isoenzymes	500 µL frozen serum (Non-GLP)
Aldolase	200 µL serum preferred, 100 µL minimum 13 µL pipetted
Angiotensin Converting Enzyme (ACE)	200 µL serum preferred, 100 µL minimum 25 µL pipetted
Apolipoprotein (A-1, A-2, B, E, Lp(a))	200 µL serum preferred, 100 µL minimum 25 µL pipetted
Bile Acids	200 µL serum preferred, 100 µL minimum 15 µL pipetted
CK Isoenzymes	500 µL serum preferred, 250 µL minimum
Cholinesterase (Non-EPA)	200 µL serum preferred, 100 µL minimum 50 µL pipetted 500 µL of <u>EDTA whole blood</u>
CH50 Total Complement	200 µL serum preferred, 100 µL minimum 25 µL pipetted
Complement Bb (Monkey)	200 µL serum or EDTA Plasma preferred, 50 µL minimum 10 µL pipetted
C3 Complement (Monkey)	200 µL serum preferred, 100 µL minimum 25 µL pipetted
C4 Complement (Monkey)	200 µL serum preferred, 100 µL minimum 25 µL pipetted
C-Reactive Protein (CRP)	100 uL serum preferred, 50 uL minimum.
Erythropoietin (EPO)	250 µL serum preferred, 200µL minimum, 100µL pipetted
Ferritin	200 µL serum preferred, 100 µL minimum 20 µL pipetted
Free Fatty Acids	200 µL serum preferred, 100 µL minimum 25 µL pipetted
Free Hemoglobin	200 µL <u>Heparinized plasma</u> preferred, 100 µL minimum 25 µL pipetted. No vaccum tubes, use syringe.
Fructosamine	200 µL serum preferred, 100 µL minimum 25 µL pipetted
GLDH	200 µL serum preferred, 100 µL minimum 35 µL pipetted
HDL Cholesterol	200 µL serum preferred, 100 µL minimum 2 µL pipetted
Haptoglobin	200 µL serum preferred, 100 µL minimum 50 µL pipetted
HbA1C	200 µL EDTA whole blood, 100 µL minimum
Homocystine	200 µL serum preferred, 100 µL minimum 18 µL pipetted
Hydroxybutarate	200 µL serum preferred, 100 µL minimum 9 µL pipetted
Immunoglobulin A	200 µL serum preferred, 100 µL minimum 25 µL pipetted
Immunoglobulin E	200 µL serum preferred, 100 µL minimum 25 µL pipetted
Immunoglobulin G	200 µL serum preferred, 100 µL minimum 25 µL pipetted



## Testing Volume Requirements (Continued)

Immunoglobulin M	200 µL serum preferred, 100 µL minimum 25 µL pipetted
Inulin	100 µL of serum or heparinized plasma, 200 µL urine
Iron	200 µL serum preferred, 100 µL minimum 12 µL pipetted
LD Isoenzymes	500 µL serum room temperature, ship immediately, do not freeze.
LDL Cholesterol	200 µL serum preferred, 100 µL minimum 25 µL pipetted
Lactic Acid	200 µL Fluoride Plasma, Whole blood – Prepare 1 part blood and 1 part 8% perchloric acid precipitate. Freeze supernatant.
Leptin	100 uL serum preferred, 50 uL minimum
Alpha 2_ Macroglobulin	100 uL serum preferred, 50 uL minimum
Myoglobin	200 µL serum preferred, 100 µL minimum 25 µL pipetted
NAG	200 µL urine unpreserved preferred, 100 µL minimum 25 µL pipetted
5'-Nucleotidase	200 µL serum preferred, 100 µL minimum 5 µL pipetted
p-Aminohippuric Acid (PAH)	100 µL of serum or heparinized plasma, 200 µL urine
Phopholipids	200 µL serum preferred, 100 µL minimum 25 µL pipetted
Protein Electrophoresis	500 µL serum
Sorbitol Dehydrogenase (SDH)	200 µL serum preferred, 100 µL minimum 25 µL pipetted
Tranferrin	100 uL (Monkey), 50 uL rat, rabbit
Unsaturated Iron Binding capacity (UIBC)	200 µL serum preferred, 100 µL minimum 8 µL pipetted



## Testing Volume Requirements (Continued)

### Immunoassays

Adrenocorticotrophic Hormone (ACTH)	200 $\mu$ L <u>EDTA plasma</u> preferred, 100 $\mu$ L minimum 75 $\mu$ L pipetted. Collect in cold siliconized tube, separate and freeze immediately.
Aldosterone	500 $\mu$ L serum preferred, 150 $\mu$ L minimum 100 $\mu$ L pipetted
Antidiuretic Hormone (ADH)	750 $\mu$ L EDTA plasma preferred, 500 $\mu$ L minimum 400 $\mu$ L pipetted
Calcitonin	Rat – 500 $\mu$ L of serum preferred, 250 $\mu$ L minimum, 200 $\mu$ L pipetted. Non-Rodents - 500 $\mu$ L of serum preferred, 200 $\mu$ L minimum, 75 $\mu$ L pipetted.
Catacholamines	500 $\mu$ L EDTA plasma, 250 $\mu$ L minimum 200 $\mu$ L pipetted
Corticosterone	200 $\mu$ L serum preferred, 150 $\mu$ L minimum 50 $\mu$ L pipetted
Cortisol	200 $\mu$ L serum preferred, 120 $\mu$ L minimum 10 $\mu$ L pipetted
C-Peptide	200 $\mu$ L serum preferred, 120 $\mu$ L minimum 20 $\mu$ L pipetted
DHEA	500 $\mu$ L serum preferred, 150 $\mu$ L minimum 100 $\mu$ L pipetted
DHEA Sulfate	500 $\mu$ L serum preferred, 100 $\mu$ L minimum 25 $\mu$ L pipetted
Dihydrotestosterone	200 $\mu$ L serum preferred, 100 $\mu$ L minimum 50 $\mu$ L pipetted
Estradiol	500 $\mu$ L serum preferred, 300 $\mu$ L minimum 250 $\mu$ L pipetted
Folic Acid	500 $\mu$ L <u>Heparinized Plasma</u> preferred, 250 $\mu$ L minimum 200 $\mu$ L pipetted For Whole Blood – Record Hematocrit. 100 $\mu$ L of blood in 2 mL of 1% ascorbic acid (fresh) Freeze immediately.
Follicular Stimulating Hormone (FSH)	500 $\mu$ L serum preferred, 150 $\mu$ L minimum 100 $\mu$ L pipetted
Gastrin	300 $\mu$ L serum preferred, 200 $\mu$ L minimum 100 $\mu$ L pipetted
Glucagon	500 $\mu$ L <u>EDTA Plasma with 5000 U Trasylol</u> /10 mL of blood, 250 $\mu$ L minimum
$\alpha$ GST	Preserved urine sample.
Growth Hormone	500 $\mu$ L serum preferred, 200 $\mu$ L minimum 100 $\mu$ L pipetted
Histamine	250 $\mu$ L <u>EDTA plasma</u> , 100 $\mu$ L minimum Freeze immediately.
Insulin-Like growth Factor (IGF-1)	Rat - 100 $\mu$ L serum preferred, 50 $\mu$ L minimum 10 $\mu$ L pipetted. NHP - 100 $\mu$ L serum preferred, 50 $\mu$ L minimum 20 $\mu$ L pipetted.



## Testing Volume Requirements (Continued)

Insulin	100 $\mu$ L serum preferred EDTA or heparin acceptable, 50 $\mu$ L minimum 25 $\mu$ L pipetted;
Leutenizing hormone (LH)	500 $\mu$ L serum preferred, 150 $\mu$ L minimum 100 $\mu$ L pipetted
Leptin	500 $\mu$ L serum preferred, 150 $\mu$ L minimum 100 $\mu$ L pipetted
N-telopeptide	Serum - 100 $\mu$ L preferred, 75 $\mu$ L minimum 50 $\mu$ L pipetted Urine - 500 $\mu$ L preferred, 50 $\mu$ L minimum 25 $\mu$ L pipetted
Osteocalcin	Rat - 100 $\mu$ L serum preferred (Heparin acceptable), 50 $\mu$ L minimum 20 $\mu$ L pipetted. NHP - 100 $\mu$ L serum preferred, 50 $\mu$ L minimum 10 $\mu$ L pipetted.
Parathyroid Hormone (PTH-intact)	Rat - 500 $\mu$ L serum preferred, 250 $\mu$ L minimum 200 $\mu$ L pipetted Non-Rodent - 200 $\mu$ L serum preferred, 150 $\mu$ L minimum 50 $\mu$ L pipetted
Pro-BNP	200 $\mu$ L serum preferred, 150 $\mu$ L minimum 100 $\mu$ L pipetted
Progesterone	200 $\mu$ L serum preferred, 125 $\mu$ L minimum 25 $\mu$ L pipetted No gel separators
Prolactin	500 $\mu$ L serum preferred, 200 $\mu$ L minimum 100 $\mu$ L pipetted Canine - 100 $\mu$ L serum preferred, 50 $\mu$ L minimum 25 $\mu$ L pipetted
Renin)	150 $\mu$ L serum preferred 100 $\mu$ L minimum 50 $\mu$ L pipetted
Reverse T3	150 $\mu$ L serum preferred (Heparin acceptable), 125 $\mu$ L minimum 100 $\mu$ L pipetted
Thyroid Stimulating Hormone (TSH)	500 $\mu$ L serum preferred, 150 $\mu$ L minimum 100 $\mu$ L pipetted
Testosterone	150 $\mu$ L serum preferred (Heparin acceptable), 120 $\mu$ L minimum 50 $\mu$ L pipetted
Thyroxine (T4)	125 $\mu$ L serum preferred (Heparin acceptable), 115 $\mu$ L minimum 25 $\mu$ L pipetted
Free T3	200 $\mu$ L serum preferred, 150 $\mu$ L minimum 100 $\mu$ L pipetted
Free T4	200 $\mu$ L serum preferred, 100 $\mu$ L minimum 50 $\mu$ L pipetted
Tri-iodothyronine (T3)	150 $\mu$ L serum preferred (Heparin acceptable), 125 $\mu$ L minimum 100 $\mu$ L pipetted



## Testing Volume Requirements (Continued)

T3 Uptake	500 $\mu$ L serum preferred, 200 $\mu$ L minimum
Troponin I (Cardiac, Skeletal)	175 $\mu$ L serum preferred (Heparin acceptable), 150 $\mu$ L minimum 50 $\mu$ L pipetted
Vitamin B12	250 $\mu$ L serum preferred (Heparin acceptable), 200 $\mu$ L minimum 200 $\mu$ L pipetted
Vitamin D 1,25 OH	500 $\mu$ L serum preferred (Heparin acceptable), 250 $\mu$ L minimum 250 $\mu$ L pipetted

### Reference Ranges

Reference ranges are not provided with test results. The philosophy of ANTECH® Diagnostics GLP is that concurrent controls of matched sex, age, supplier, sample site collection and fasting status best reflect the current metabolic status of the animals. Data is collected from samples submitted for analyses and from literature. These ranges can be supplied as available.

### Methodology

The methodologies used at ANTECH® Diagnostics GLP are considered proprietary information. General information about the methodology will be provided to clients with signed confidentiality agreements. Interpretive reports also contain general method descriptions.

#### General Methods

Hematology – Siemens Advia 120 Multispecies Hematology System

Coagulation – Sysmex CA1500 Coagulation System

Urinalysis – Siemens – Clinitek Advantus System  
Manual specific gravity by refractometer  
Osmolality by Advanced Osmometer

Clinical Chemistry – Beckman/Olympus 640e Clinical Chemistry System

Immunoassays – Vary by analyte - measured by Siemens Immulite analyzer, Cobra Packard Gamma Counter for RIA methods or Molecular Devices Microplate Reader.