

DGGR Lipase: Aiding Diagnosis of Canine & Feline Pancreatitis

CLINICAL PATHOLOGY SERVICE

The plasma lipase test used at the University of Tennessee College of Veterinary Medicine Clinical Pathology Laboratory is a DGGR assay. DGGR is an enzyme substrate used as a reagent in this enzyme activity assay; lipase activity is reported in U/L. Lipase testing by the DGGR method is part of a routine small animal chemistry panel and panel with electrolytes. Lipase is also available as an individually orderable test. Test costs are available at the UTCVM Diagnostic Laboratory Services webpage.

Analytical specificity refers to a laboratory method's ability to measure exclusively the substance of interest, despite presence of other potential interfering substances. (This is different from diagnostic specificity, the probability of obtaining a negative test result in a patient without disease.[Erb, 2011]) Although DGGR lipase was initially reported to be analytically specific for pancreatic lipase in humans, it has been shown that the DGGR substrate reacts not just with pancreatic lipase, but also with other lipase types.(Yim, et al., 2020) Release of extra-pancreatic lipase (e.g., lipoprotein lipase) into plasma via heparin administration, and possibly other conditions, can mildly increase DGGR lipase results.(Yim, et al., 2020) Additionally, it has been shown that administration of prednisone can mildly increase DGGR lipase results.(Mendoza, et al., 2020). Further characterization of interference by extra-pancreatic lipases (and of medical conditions associated with such interference) is needed. Quantitative canine and feline immunoassays (pancreatic lipase immunoreactivity [PLI] testing, available through the Gastrointestinal Laboratory at Texas A&M University) remain the most analytically specific tests for pancreatic lipase measurement at this time.

Studies have reported good agreement between DGGR lipase and PLI results and suggested that DGGR lipase testing has good clinical utility.(Oppliger, et al., 2013; Kook, et al., 2014; Goodband, et al., 2018). A rigorous study of DGGR lipase diagnostic performance that also addresses impact of analytical specificity on diagnostic specificity has not been published. We suggest that plasma DGGR lipase activity is best used as a screening test in patients showing appropriate clinical signs of pancreatitis (see sidebar). Results should be interpreted in light of all available clinical information, and confirmatory PLI testing is suggested when pancreatitis is suspected. Clinicians should be aware that interference from extra-pancreatic lipase activity may decrease diagnostic specificity of increased DGGR lipase activity for pancreatitis diagnosis in some patients, but more study is needed before detailed caveats are possible.

Interpretation

CATS (from Oppliger, et al., 2013)

Normal: ≤ 26 U/L

Increased: > 26 U/L

DOGS (from Kook, et al., 2014)

Normal: ≤ 108 U/L

Inconclusive: 109-216 U/L

Increased: > 216 U/L

REFERENCES:

- Erb HN. Prior probability (the pretest best guess) affects predictive values of diagnostic tests. *Vet Clin Pathol*, 2011. 40:154-158.
- Goodband EL, et al. Validation of a commercial 1,2-o-dilauryl-rac-glycero glutaric acid-(6'-methylresorufin) ester lipase assay for diagnosis of canine pancreatitis. *Vet Rec Open*. 2018;5:e000270.
- Kook, P.H. et. al. Agreement of serum spec cPL with the 1,2-o-dilauryl-rac-glycero-glutaric acid-(6'-methylresorufin) ester (DGGR) lipase assay and with pancreatic ultrasonography in dogs with suspected pancreatitis. *J Vet Intern Med*. 2014;28:863-870.
- Mendoza B, et al. Effect of prednisolone therapy on serum levels of 1,2-Odilauryl-rac-glycero glutaric acid-(60-methylresorufin) ester lipase in dogs. *J Vet Intern Med*, 2020. 34: 2330-2336.
- Oppliger, S. et. al. Agreement of the serum spec fPLTM and 1,2-o-dilarutyl-rac-glycero-3-glutaric acid-(6'-methylresorufin) ester lipase assay for the determination of serum lipase in cats with suspicion of pancreatitis. *J Vet Intern Med*. 2013;27:1077-1082.
- Yim SY, et al. The 1,2-o-dilauryl-rac-glycero-3-glutaric acid-(6'-methylresorufin) ester (DGGR) lipase assay in cats and dogs is not specific for pancreatic lipase. *Vet Clin Pathol*, 2020. 49:607-613.

PANCREATITIS Clinical Signs

Clinical signs of pancreatitis are variable and may range from mild partial anorexia to cardiovascular shock and disseminated intravascular coagulation (DIC).

SIGNS IN CATS:

- Lethargy
- Complete or partial anorexia
- Abdominal pain
- Vomiting, weight loss, and diarrhea are less common in cats

SIGNS IN DOGS:

- Vomiting
- Abdominal Pain
- Anorexia
- Lethargy
- Weakness
- Icterus
- Fever or hypothermia

