

# Adiponectin

www.xenodiagnostics.com

service@xenodiagnostics.com



5108 West 79th Street  
Indianapolis, IN 46268

Phone: (317) 973-4079  
Fax: (317) 973-4171

## Adiponectin

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Adiponectin was first identified by four independent groups utilizing various laboratory methods and was subsequently referred to as Acrp30 (adipocyte complement-related protein of 30 kDa), adipoQ, apM1 (adipose most abundant gene transcript 1), and GBP28 (gelatin-binding protein of 28 kDa) by these groups (1-4). Although adipose tissue is the major site of adiponectin synthesis, it is also expressed in human osteoblasts, myotubes, and placental tissue (5-7).

Structurally, adiponectin is a 244 amino acid protein that forms homomultimers of trimers, hexamers, and high-molecular weight (HMW) oligomers (8). The biological activity of adiponectin is related to multimer formation with the total/HMW multimer ratio being a better indicator of disease associations (9). Adiponectin possesses anti-inflammatory, anti-atherosclerotic, and insulin sensitizing effects (10-12). These properties may in turn be related not only to the oligomeric state but also to the post translational hydroxylations and glycosylations which have been reported (13). Impaired multimerization and secretion of adiponectin has been demonstrated in individuals possessing certain adiponectin gene mutations which may contribute to development of diabetes (8).

Interestingly, adiponectin is higher in lean versus obese individuals and plasma levels are increased in obese individuals who undergo weight loss (14;15). Plasma levels of adiponectin are also decreased in diabetic individuals as well as those with CAD (16). Additional disease associations with adiponectin have been seen in prostate cancer, breast cancer, rheumatoid arthritis, and inflammatory bowel disease (17-20). These associations demonstrate the pleotropic effects of adiponectin which can exhibit both pro- and anti-inflammatory responses.

The interactions between the adiponectin receptors, AdipoR1 and AdipoR2, the specific adiponectin multimer, LMW, MMW, or HMW as well as both cell type (primary or cell line adipocytes, myocytes, etc) and species tested has provided both challenges and opportunities to those involved in adiponectin research.

Additional information can be found in reviews by Kadowaki (21) and Tilg (22). 01/30/09

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