

Adiponectin

Overview: Adiponectin receptors (provisional nomenclature, ENSF00000002482) respond to the 30 kDa complement-related protein hormone adiponectin (also known as adipocyte, C1q and collagen domain-containing protein; ACRP30, adipose most abundant gene transcript 1; apM-1; gelatin-binding protein; ENSG00000181092) originally cloned from adipocytes (Maeda *et al.*, 1996). Although sequence data suggest 7TM domains, immunological evidence indicates that, contrary to typical 7TM topology, the carboxyl terminus is extracellular, while the amino terminus is intracellular (Yamauchi *et al.*, 2003). Signalling through these receptors appears to avoid G proteins. Adiponectin receptors appear rather to stimulate protein phosphorylation via AMP-activated protein kinase and MAP kinase pathways (Yamauchi *et al.*, 2003), possibly through the protein partner APPL1 (adaptor protein, phosphotyrosine interaction, PH domain and leucine zipper containing 1, ENSG00000157500, Mao *et al.*, 2006).

Nomenclature	Adipo1	Adipo2
Other names	AdipoR1, progestin and adipoQ receptor family member I, CGI45	AdipoR2, progestin and adipoQ receptor family member II
Ensembl ID	ENSG00000159346	ENSG00000006831
Rank order of potency	gAdipo > flAdipo	gAdipo = flAdipo

T-Cadherin has also been suggested to be a receptor for (hexameric) adiponectin (Hug *et al.*, 2004).

Abbreviations: flAdipo, full-length adiponectin; gAdipo, globular adiponectin

Further Reading

- Goldstein BJ, Scalia RG, Ma XL (2009). Protective vascular and myocardial effects of adiponectin. *Nat Clin Pract Cardiovasc Med* 6: 27–35.
- Hopkins TA, Ouchi N, Shibata R, Walsh K (2007). Adiponectin actions in the cardiovascular system. *Cardiovasc Res* 74: 11–18.
- Kadowaki T, Yamauchi T, Kubota N, Hara K, Ueki K, Tobe K (2006). Adiponectin and adiponectin receptors in insulin resistance, diabetes, and the metabolic syndrome. *J Clin Invest* 116: 1784–1792.
- Kadowaki T, Yamauchi T, Kubota N (2008). The physiological and pathophysiological role of adiponectin and adiponectin receptors in the peripheral tissues and CNS. *FEBS Lett* 582: 74–80.
- Kelesidis I, Kelesidis T, Mantzoros CS (2006). Adiponectin and cancer: a systematic review. *Br J Cancer* 94: 1221–1225.
- Maynadier M, Basile I, Gary-Bobo M (2009). Adiponectin normalization: a clue to the anti-metabolic syndrome action of rimonabant. *Drug Discov Today* 14: 192–197.
- Okamoto Y, Kihara S, Funahashi T, Matsuzawa Y, Libby P (2006). Adiponectin: a key adipocytokine in metabolic syndrome. *Clin Sci* 110: 267–278.
- Ouchi N, Shibata R, Walsh K (2006). Cardioprotection by adiponectin. *Trends Cardiovasc Med* 16: 141–146.
- Shetty S, Kusminski CM, Scherer PE (2009). Adiponectin in health and disease: evaluation of adiponectin-targeted drug development strategies. *Trends Pharmacol Sci* 30: 234–239.
- Sun Y, Xun K, Wang C, Zhao H, Bi H, Chen X *et al.* (2009). Adiponectin, an unlocking adipocytokine. *Cardiovasc Ther* 27: 59–75.
- Szmitko PE, Teoh H, Stewart DJ, Verma S (2007). Adiponectin and cardiovascular disease: state of the art? *Am J Physiol Heart Circ Physiol* 292: H1655–H1663.
- Tilg H, Moschen AR (2008). Role of adiponectin and PBEF/visfatin as regulators of inflammation: involvement in obesity-associated diseases. *Clin Sci (Lond)* 114: 275–288.
- Vasseur F (2006). Adiponectin and its receptors: partners contributing to the ‘vicious circle’ leading to the metabolic syndrome? *Pharmacol Res* 53: 478–481.
- Wang Y, Lam KS, Yau MH, Xu A (2008). Post-translational modifications of adiponectin: mechanisms and functional implications. *Biochem J* 409: 623–633.
- Zhu W, Cheng KK, Vanhoutte PM, Lam KS, Xu A (2008). Vascular effects of adiponectin: molecular mechanisms and potential therapeutic intervention. *Clin Sci (Lond)* 114: 361–374.

References

- Hug C *et al.* (2004). *Proc Natl Acad Sci USA* 101: 10308–10313.
- Maeda K *et al.* (1996). *Biochem Biophys Res Commun* 221: 286–289.
- Mao X *et al.* (2006). *Nat Cell Biol* 8: 516–523.
- Yamauchi T *et al.* (2003). *Nature* 423: 762–769.