

# Abstract

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## GPR120 Is an Omega-3 Fatty Acid Receptor Mediating Potent Anti-inflammatory and Insulin-Sensitizing Effects

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**OBJECTIVE:** Omega-3 fatty acids (n-3 FAs), DHA and EPA, exert anti-inflammatory effects, but the mechanisms are poorly understood. Here, we show that the G protein-coupled receptor 120 (GPR120) functions as an n-3 FA receptor/sensor.

**METHODS:** Stimulation of GPR120 with n-3 FAs or a chemical agonist causes broad anti-inflammatory effects in monocytic RAW 264.7 cells and in primary intraperitoneal macrophages. All of these effects are abrogated by GPR120 knockdown. Since chronic macrophage-mediated tissue inflammation is a key mechanism for insulin resistance in obesity, we fed obese WT and GPR120 knockout mice a high-fat diet with or without n-3 FA supplementation.

**RESULTS:** The n-3 FA treatment inhibited inflammation and enhanced systemic insulin sensitivity in WT mice, but was without effect in GPR120 knockout mice.

**CONCLUSION:** In conclusion, GPR120 is a functional n-3 FA receptor/sensor and mediates potent insulin sensitizing and antidiabetic effects in vivo by repressing macrophage-induced tissue inflammation.

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