

# Lipids

[Health & Medicine](#)



**ASSIGN  
BUSTER**

**Molecular Control Mechanism Of Fat Metabolism** The molecular control of lipids is dependent of various receptors. Nuclear and non-nuclear receptors are responsible for fat metabolism and lipogenesis. Nuclear receptors are basically transcription factors which facilitate hormones like oestrogens, glucocorticoids, mineralocorticoids, progestin, androgens and thyroid hormones. An important nuclear receptor is the peroxisome proliferator activated receptor (PPARs) which is responsible for lipid metabolism. The PPARs are triggered by elements that show proliferation of the peroxisomes. PPARs are responsible for fatty acid synthesis and oxidation. There are 3 subtypes of PPARs which bind to the promoter region of genes and induce fat metabolism. PPARs are located in the liver, heart and kidneys. Non-nuclear receptors such as sterol regulatory element binding protein (SREBP) are also present which are responsible for cholesterol breakdown and synthesis of lipids. In the humans, SREBP-1, SREBP-2 and their subtypes are present. SREBP-1 is involved in lipid biosynthesis whereas SREBP-2 is present for cholesterol biosynthesis. The SREBPs are located in the endoplasmic reticulum.

Lipids are an important part of the human diet. The overuse of lipids leads to various medical conditions such as heart diseases. To overcome these diseases, the food industry has started production of fat-free foods which are basically fat substitute foods such as fat substitutes that are carbohydrate based, fat substitutes that are protein based substitutes and fat based substitutes themselves. Carbohydrate-based fat substitutes are compounds such as starches, cellulose, dextrans and gums. These substitutes provide the same bulk and moistness but they cannot replace the amount of calories actual lipids generate. Carbohydrate-based fat substitutes are easier to

<https://assignbuster.com/lipids/>

digest than fat-based substitutes. Being a dietician, this knowledge would be of significance in deciding the correct diet plan for different individuals. For example, the substituted food products can be advised to people who are at risk of developing diseases such as heart diseases. Fat-substitute compounds are also present in the market which create confusion. People willing to lose weight purchase these fat substitutes thinking their consumption would help them lose weight. Being a dietician it is important to tell people that the substituted fat foods have the same number of calories as actual lipids do. Olean, Salatrim and Caprenin are common substituted fat products which are all non-digestible. Olean has unwanted side effects such as abdominal cramps, diarrhoea and it also decreases the absorption of vitamin A, D, E and K. Dieticians should also advise people to check the ingredients of the substituted food products. Salatrim is used in chocolate chips and Caprenin is used in candy bars. Consumers taking substituted food products should understand that consumption of fat substitutes without increase in calories is impossible.

Some aspects of molecular control mechanisms of fat metabolism are still misunderstood. The physiology of how nuclear receptors work as transcription factors is still not understood completely. It is also unclear how the induction of nuclear receptors results in proliferation of peroxisomes which in turn are associated with fatty acid metabolism. It is also confusing why a PPAR ligand cannot function solely and requires an interaction with a retinoic acid receptor. The function of SREBP cleavage-activating protein (SCAP) is unclear and it is also confusing on how these transcription factors lead to up-regulation of genes. Research is required to provide thorough answers to these questions.

<https://assignbuster.com/lipids/>