

Difference Between DHEA and DHA

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Key Difference - DHEA vs DHA

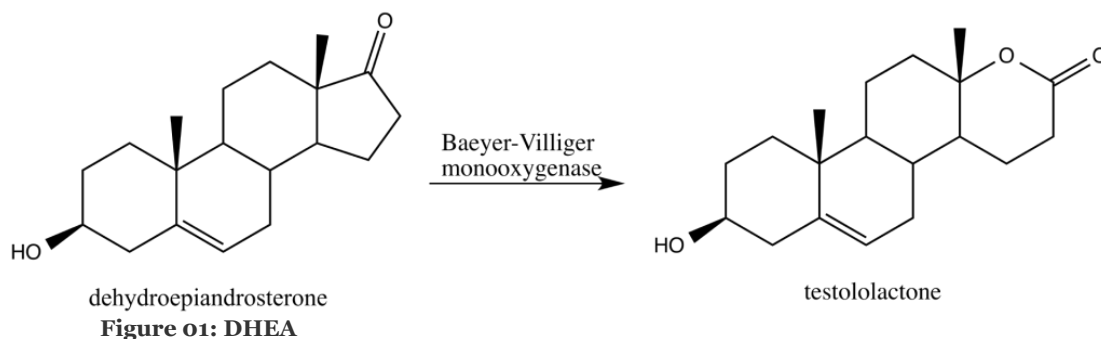
DHEA (Dehydroepiandrosterone) and DHA (Docosahexaenoic acid) are important components present in the human body. Both compounds are involved in the different specific development and regulatory processes of the body. Even though both these compounds seem to possess similar types of acronyms, both compounds are totally different in the aspect of [classification](#), [synthesis](#), and function. **DHEA is an endogenous [steroid hormone](#), and DHA is an [omega-3 fatty acid](#).** This is the key difference between DHEA and DHA.

What is DHEA?

DHEA (dehydroepiandrosterone) is commonly referred to as androstenedione. DHEA is an endogenous steroid hormone. It is mainly synthesized in the adrenal glands, brain and in the [gonads](#). DHEA is considered to have many potential functions within the body and is one of the steroids that circulates within the body most abundantly. In the brain, DHEA acts as a metabolic intermediate which involves in the synthesis of [estrogen](#) and androgen steroid sex hormones.

It also has the potential to act as a neurosteroid and neurotrophin which the DHEA binds to an array of nuclear and cell surface proteins. Neurosteroids have the potential to involve in rapid alteration of neuronal excitability processes which is achieved through different interactions with cell surface receptors and ligand-gated ion channels. Neurotrophins are a class of proteins which involve in the induction of survival and development of [neurons](#). Therefore, DHEA is an essential important component of the [central nervous system](#).

The synthesizing mechanism of DHEA involves the two hormones ACTH (adrenocorticotropic hormone) and GnRH (gonadotrophin releasing hormone). ACTH controls the synthesis of DHEA in the zona reticularis of adrenal cortex and GnRH regulates gonads during the synthesis of DHEA. This endogenous steroid hormone is also produced in the brain. [Cholesterol](#) acts as a precursor in synthesizing DHEA through different [enzymes](#). Out of the total DHEA synthesized in the body, higher percentage of DHEA is derived from the adrenal cortex and through desulfation of dehydroepiandrosterone sulfate (DHEAS).



Higher DHEA production in the body could be stimulated through regular exercises. In primates, this is achieved through calorie restriction. Theories suggest endogenous DHEA production stimulation through calorie restriction lead to longer lifespans.

What is DHA?

DHA (docosahexaenoic acid) is considered to be an omega-3 fatty acid which is present as the primary structural components in the human brain, the [cerebral cortex](#), retina of the eye and skin. DHA could be obtained from different sources which include maternal milk, fish oil or oil from specific types of [algae](#).

It also could be synthesized from alpha-[linolenic acid](#), which is one of the two essential fatty acids that cannot be synthesized within the body. This mechanism is utilized mostly by [herbivores and carnivores](#) that don't depend on any seafood dietary sources. Alpha-linolenic acid is basically synthesized in plants and is a short omega-3 fatty acid. Animals that obtain lesser amounts of seafood have the ability in producing DHA through metabolic pathways at lower quantities.

Fish and other [multicellular organisms](#) acquire DHA through photosynthetic microalgae which are [heterotrophic](#) that is present as oceanic dietary sources. The concentration of DHA increases along the food chains in those ecosystems. *Cryptocodinium cohnii* and *Schizochytrium* are different types of microalgae that involve in the commercial production of DHA. Since the DHA is synthesized using plant-based resources, it is 100% vegetarian.

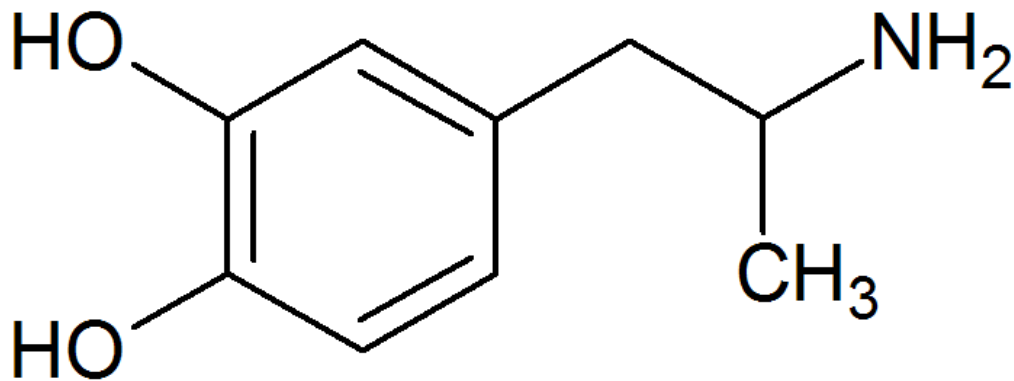


Figure 02: DHA

In the context of brain and retina of the eye, DHA is present as the most abundant omega-3 fatty acid. 60 % of the brain's total unsaturated fatty acids are present as DHA whilst in the retina; it is 40%. The best source of DHA for humans during infancy is obtained from maternal milk through breastfeeding. Breast milk possesses the highest percentage of DHA compared to any other source. At later stages of development of humans, DHA is obtained through the diet.

What is the Similarity Between DHEA and DHA?

- Both are involved in the development processes of the human body.

What is the Difference Between DHEA and DHA?

DHEA vs DHA	
DHEA is an endogenous steroid hormone.	DHA is an omega-3 fatty acid.
Synthesis	
DHEA is synthesized in the adrenal glands, brain and in the gonads and derived through cholesterol.	DHA is synthesized by modified <i>Escherichia coli</i> , alpha linolenic acid and through photosynthetic microalgae <i>Cryptocodinium cohnii</i> and <i>Schizochytrium</i> .
Function	

DHEA functions as a precursor to male and female sex hormones, including testosterone and estrogen.

DHA is an important structural and functional component of the developing brain and important for health of the heart.

Summary - DHEA vs DHA

DHEA is an endogenous steroid hormone. It is mainly synthesized in the adrenal glands, brain and in the gonads. DHEA is present as an important component of the central nervous system which functions in the development and excitation of neurons. DHA is an omega-3 fatty acid. DHA is synthesized by modified *Escherichia coli*, alpha-linolenic acid and through photosynthetic microalgae *Cryptocodinium cohnii* and *Schizochytrium*. Both compounds are involved in the different specific development and regulatory processes of the body. This is the difference between DHEA and DHA.

Reference:

1. "DHEA Background." Mayo Clinic, Mayo Foundation for Medical Education and Research, 1 July 2014. [Available here](#)
2. Bjarnadottir, Adda. "DHA (Docosahexaenoic Acid): A Detailed Review." Healthline, Healthline Media, 29 June 2016. [Available here](#)

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