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The following Specification is taken from documents submitted by the inventors

(54) Hypocholesterolemic Agents

(57) The present invention describes the use of organic nitrates in lowering the concentration of cholesterol in organisms.

Description

Field of Application of the Invention

[0001] The utility of the present invention is in the pharmaceutical industry.

Known Prior Art

[0002] It is known that an elevated concentration of cholesterol in human blood leads to or is responsible for the onset and advance of cardiovascular disease. Many compounds have been described as so-called hypolipidemics. By way of example, Simvastatin and Atorvastatin can be mentioned. Pentaerythritol tetranitrate is a generally recognized, potent vasodilator with endothelium-protecting, antiatherosclerotic activity described in cases of hypercholesterolemia. (Publication Series "Pentaerythritol tetranitrate," Steinkopff Verlag, 1994-2000)

Explanation of the Invention

[0003] The problem addressed by the invention is the lowering of the cholesterol concentration in the tissues and fluids of organisms, especially in humans. The problem was solved with the use of pentaerythritol tetra-, di-, tri- or mononitrate to lower the concentration of cholesterol in the tissues and fluids of organisms. Especially preferred is the human organism. The preparation of the active compounds can be carried out according to methods and procedures known to one skilled in the art. Unexpectedly, it became evident that the active compound pentaerythritol tetranitrate, either in combination with its metabolites or alone, displayed cholesterol-lowering activity as is shown by the hypolipidemics Simvastatin and Atorvastatin, for example. The special advantage of this use is based particularly on the high therapeutic index, on the null to minimal toxicity, and on the diminished side effects with concomitant good tolerance of the active compounds. Moreover, these compounds are readily available at low cost. This allows a very flexible therapeutic regime in a wide established dosage range. Specific references have been taken from the publications in the Publication Series "Pentaerythritol tetranitrate."

[0004] The following Examples illustrate embodiments of the present invention, without intention of limiting them.

Working Examples

Example 1

[0005] Hypercholesterolemia and atherosclerosis were induced in guinea pigs by adding 0.5% cholesterol to their feed over 2 months. The cholesterol levels rose six-fold, and the extent of atherosclerosis in the aorta amounted to 50% of the surface (by comparison)

Example 2

[0006] Guinea pigs were fed as in Example 1 and in addition were fed continuously $6 \text{ mg kg}^{-1} \text{ day}^{-1}$ of pentaerythritol tetranitrate

Example 3

[0007] Following Example 2, guinea pigs were fed $10 \text{ mg kg}^{-1} \text{ day}^{-1}$ of Simvastatin.

Example 4

[0008] Following Example 2, guinea pigs were fed $10 \text{ mg kg}^{-1} \text{ day}^{-1}$ of Atorvastatin.

Example 5

[0009] The blood cholesterol level of the guinea pigs was determined at the end of the procedures described in Examples 1-4. The cholesterol levels of the animals treated with pentaerythritol tetranitrate were more than 30% lower when compared with the control group of Example 1. This lies within the range of the specifically indicated hypolipidemics Simvastatin and Atorvastatin. Thus, pentaerythritol tetranitrate can be used in the reduction of high cholesterol levels.

Claims

1. The use of pentaerythritol tetra-, di-, tri- or mononitrate for lowering the cholesterol levels in the tissues and fluids of organisms.
2. The use in Claim 1, wherein the concentration of cholesterol in the human organism is lowered.
3. The use in Claims 1 and 2, wherein the concentration of cholesterol in the blood is lowered.
4. The use of pentaerythritol tetra-, di-, tri- or mononitrate in the manufacture of pharmaceutical agents for the lowering of the concentration of cholesterol in the tissues and fluids of the human organism.
5. Pharmaceutical agents for the lowering of concentration of cholesterol in the tissues and fluids of the human organism which contain pentaerythritol tetra-, di-, tri- or mononitrate.

*Technical Translation by
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