Pyrrolidine Compounds

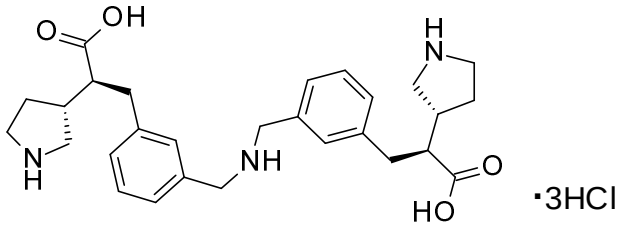
This invention relates to Pyrrolidine compounds, pharmaceutically acceptable salts thereof, pharmaceutical compositions, and therapeutic uses of the compounds.

There have been significant advances in treating cardiovascular disease (CVD). Despite treatment advances, patients continue to experience cardiovascular disease events such as angina, myocardial infarction, and stroke, which if untreated, lead to death. Lipid disorder or dyslipidemia remains a major risk factor for CVD. Lipid disorders can be divided into four general risk factors: elevated low-density lipoprotein cholesterol (LDL-c), low high-density lipoprotein cholesterol (HDL-c), elevated triglycerides (TG), and elevated lipoprotein(a) (Lp(a)). There are a variety of treatment regimens targeting elevated LDL-c, low HDL-c, and elevated triglycerides. There are few approved treatment options for patients with elevated Lp(a) concentrations. In some cases, apheresis may be used to filter the blood to remove LDL and Lp(a); however, the effects are temporary and typically need to be repeated every two weeks. There is no pharmaceutical treatment approved to lower Lp(a) levels. The physiological function of Lp(a) is complex; however, it is reported that elevated Lp(a) plasma level is an independent risk factor for CVD. There is a need for a pharmaceutical treatment for patients with elevated Lp(a)1.

Additional treatment options are desired for patients suffering from cardiovascular diseases and, in particular, patients suffering from lipid disorders or dyslipidemia. There is a need for additional treatment options for patients whose cardiovascular risks are not adequately managed using current standard of care therapies, such as, diet, exercise and/or the use of one or more drugs such as statins, fibrates, and niacin. The present invention offers another treatment option for patients suffering from CVD. There is a need for pharmaceutically acceptable compounds and treatment options to reduce plasma Lp(a) levels.

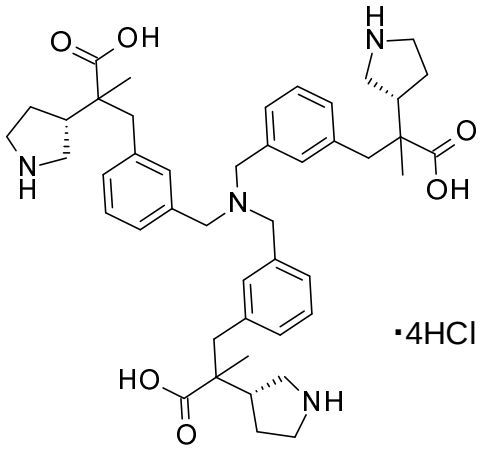
Summary

In an aspect, there is provided a compound of the formula:



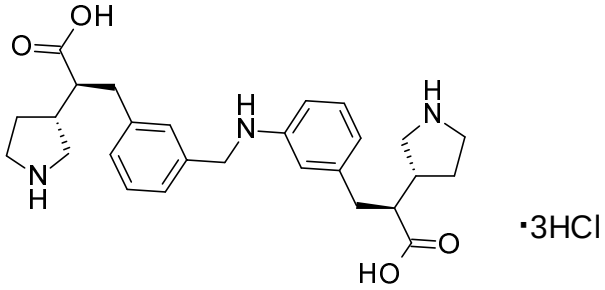
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In another aspect, there is provided a compound of the formula:



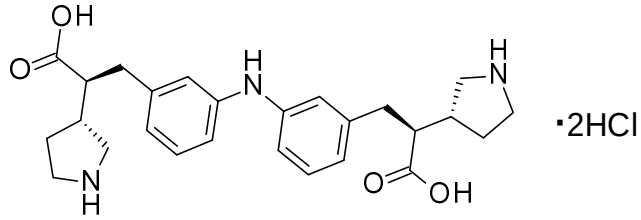
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In another aspect, there is provided a compound of the formula:



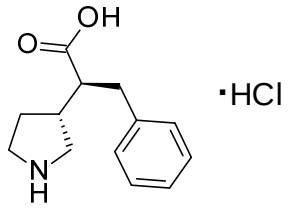
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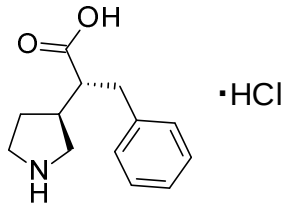
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In another aspect, there is provided a compound of the formula:



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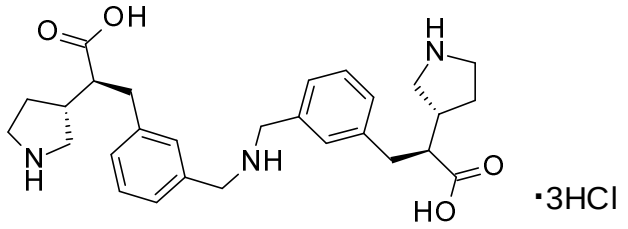
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Detailed Description

Provided is a compound of formula I':

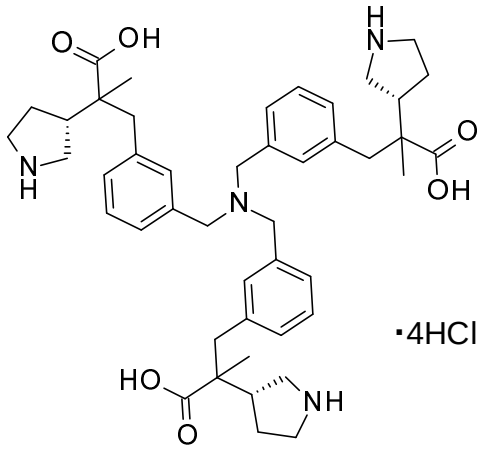
We claim:

1. A compound of the formula:



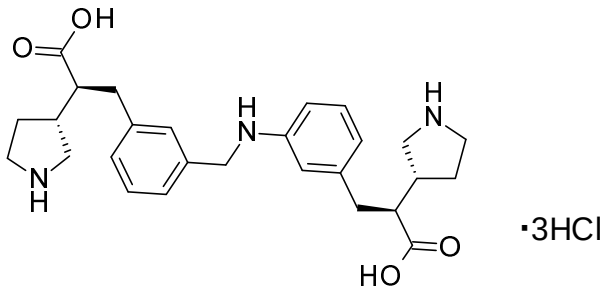
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2. A compound of the formula:



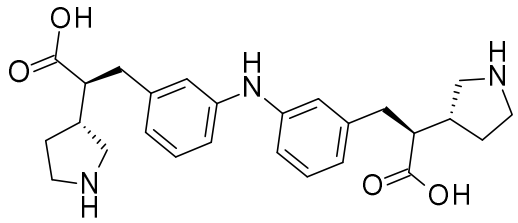
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3. A compound of the formula:



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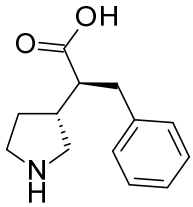
4. A compound of the formula:



·2HCl

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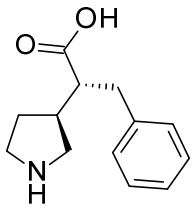
5. A compound of the formula:



·HCl

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6. A compound of the formula:



·HCl

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