What Is Claimed Is:

1. A mutant CYP102A1 enzyme capable of catalyzing conjugation between 2-oxo thienopyridine and heterocyclic thiols in the presence of a reducing reagent.

2. The mutant CYP102A1 enzyme of claim 1, wherein the catalyzing of conjugation between 2-oxo thienopyridine and heterocyclic thiols in the presence of a reducing reagent results in the generation of mixed disulfide conjugates of thienopyridine compounds.

3. The mutant CYP102A1 enzyme of claim 1, wherein the catalyzing of conjugation between 2-oxo thienopyridine and heterocyclic thiols in the presence of a reducing reagent selectively generates cis stereoisomers of the mixed disulfide conjugates of thienopyridine compounds.

4. The mutant CYP102A1 enzyme of claim 1, wherein the reducing agent is NADPH or NADH.

5. The mutant CYP102A1 enzyme of claim 1, wherein the enzyme comprises one or more of the following amino acid mutations within SEQ ID NO: 2: A82F, L188Q, R47L, F87V, T365N, H116Q, K31T, S56R, A135S, V299D, I458F, P481H, and W1046A.

6. The mutant CYP102A1 enzyme of claim 1, wherein the enzyme comprises an amino acid sequence having a specific set of mutations recited in Table 2.

7. The mutant CYP102A1 enzyme of claim 1, wherein the enzyme comprises nucleic acid having at least 99% homology with SEQ ID NO: 1.

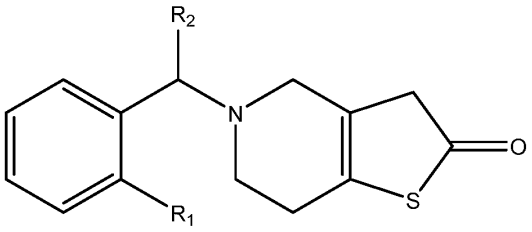
8. The mutant CYP102A1 enzyme of claim 1, wherein the enzyme comprises nucleic acid having at least 100% homology with SEQ ID NO: 3.

9. A method for synthesizing cis stereoisomers of mixed disulfide conjugates of thienopyridine compounds, comprising mixing a 2-oxo thienopyridine moiety, a heterocyclic

thiol moeity, and the mutant CYP102A1 enzyme of claim 1 in the presence of a reducing reagent.

10. The method of claim 9, wherein the reducing agent is NADPH or NADH.

11. The method of claim 9, wherein the 2-oxo thienopyridine moiety is represented by



; wherein R1 is either Chlorine or Fluorine; wherein R2 is H, COOCH3, or COCHCH2CH2.

12. The method of claim 9, wherein the heterocyclic thiol moiety is represented by R3-SH; wherein R3 is selected from 3-nitropyridine-2-thiol, 2-mercaptopyridine, 2-mercapto-6-methylpyridine, 5-chloropyridine-2-thiol, 2-mercapto-5-trifluoromethyl-pyridine, 3-(trifluoromethyl)pyridine-2-thiol, 2-mercaptopyridine-3-carbonitrile, 4,6-dimethyl-2-thioxo-1,2-dihydropyridine-3-carbonitrile, 2-quinolinethiol, 1-amino-3-mercaptoisoquinoline, 6-chloropyridazine-3-thiol, and 2,5-dimethylfuran-3-thiol.

13. The method of claim 9, wherein the mixing occurs at ambient temperature.

14. The method of claim 9, wherein the mixing occurs for a time period between twenty and sixty minutes.

15. The method of claim 9, wherein the mutant CYP102A1 enzyme is comprised within a bacterial cytosolic fraction.

16. The method of claim 9, wherein the amount of mutant CYP102A1 enzyme is between approximately 0.1 and 1 μM.

17. The method of claim 9, wherein the mixing results in the generation of approximately 100 mg of cis stereoisomers of mixed disulfide conjugates of thienopyridine compounds per

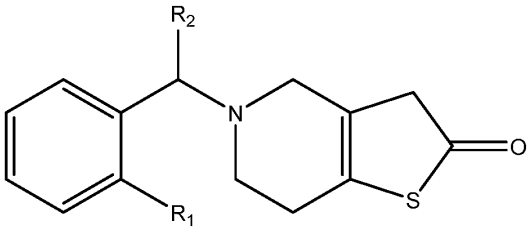
liter of the 2-oxo thienopyridine moiety, the heterocyclic thiol moeity, the mutant CYP102A1 enzyme, and the reducing agent.

18. A kit comprising a 2-oxo thienopyridine moiety, a heterocyclic thiol moeity, and the mutant CYP102A1 enzyme of claim 1.

19. The kit of claim 18, further comprising a reducing reagent.

20. The kit of claim 19, wherein the reducing agent is NADPH or NADH.

21. The method of claim 18, wherein the 2-oxo thienopyridine moiety is represented by



; wherein R1 is either Chlorine or Fluorine; wherein R2 is H, COOCH3, or COCHCH2CH2.

22. The method of claim 18, wherein the heterocyclic thiol moiety is represented by R3-SH; wherein R3 is selected from 3-nitropyridine-2-thiol, 2-mercaptopyridine, 2-mercapto-6-methylpyridine, 5-chloropyridine-2-thiol, 2-mercapto-5-trifluoromethyl-pyridine, 3-(trifluoromethyl)pyridine-2-thiol, 2-mercaptopyridine-3-carbonitrile, 4,6-dimethyl-2-thioxo-1,2-dihydropyridine-3-carbonitrile, 2-quinolinethiol, 1-amino-3-mercaptoisoquinoline, 6-chloropyridazine-3-thiol, and 2,5-dimethylfuran-3-thiol.

23. A pharmaceutical composition comprising a compound generated with the method of claim 9 and a pharmaceutically acceptable carrier.

24. The pharmaceutical composition of claim 23, wherein said pharmaceutical composition is configured for intravenous administration.

25. A method of treating, ameliorating, or preventing a cardiovascular disease in a patient comprising administering to said patient a therapeutically effective amount of a compound generated with the method of claim 9.

26. The method of claim 25, wherein said administration is selected from the group consisting of oral administration and intravenous administration.

27. The method of claim 25, wherein said cardiovascular disease is selected from the group consisting of coronary artery disease, peripheral vascular disease, atherothrombosis, and cerebrovascular disease.

28. The method of claim 25, wherein said compound reduces aggregation of platelets.

29. The method of claim 28, wherein said reduces aggregation of said platelets occurs through irreversible binding to $P2Y_{12}$ receptors.

30. The method of claim 28, wherein said reduces aggregation of said platelets occurs through blocking ADP receptors.

31. The method of claim 25, further comprising co-administration of at least one agent selected from the group consisting of a HMG-CoA reductase inhibitor, an ACE Inhibitor, a Calcium Channel Blocker, a Platelet Aggregation Inhibitor, a Polyunsaturated Fatty Acid, Fibric Acid Derivative, a Bile Acid Sequestrant, an Antioxidant, a Thrombolytic Agent, and an Antianginal Agent.