identify additional putative members of this enzyme family. Herein, the usefulness of these enzymes for use in synthesis is demonstrated.

SUMMARY ~~OF THE INVENTION~~

The present disclosure relates to polypeptides that are MTR kinases capable of converting ribose and 5-isobutyrylribose to the corresponding 1-phosphate, particularly as part of nucleotide synthesis. In ~~embodiments~~examples, the subject MTR kinases described herein are capable of converting ribose to ribose-1-phosphate or 5-isobutyrylribose to 5-isobutyrylribose-1-phosphate. In particular, the subject MTR kinases described herein may be useful in the preparation of nucleosides, such as uridine 4-oxime 5′-(2-methylpropanoate), and in particular {(2*R*,3*S*,4*R*,5*R*)-3,4-dihydroxy-5-[(4*Z*)-4-(hydroxyimino)-2-oxo-3,4dihydropyrimidin-1(2*H*)-yl]oxolan-2-yl}methyl 2-methylpropanoate. Such nucleosides may be useful as biologically active compounds or as an intermediate for the synthesis of more complex biologically active compounds.

In one aspect, there is provided a polypeptide, wherein said polypeptide comprises a region with an amino acid sequence having at least a 90% sequence identity to residues of any one of SEQ ID NO: 3, SEQ ID NO: 5, SEQ ID NO: 7, SEQ ID NO: 9, SEQ ID NO: 11, or SEQ ID NO: 12.

In another aspect, there is provided a polypeptide, wherein said polypeptide is encoded by a DNA sequence having at least 90% sequence identity to residues of any one of SEQ ID NO: 4, SEQ ID NO: 6, SEQ ID NO: 8, or SEQ ID NO: 10.

Additional examples ~~embodiments~~ describe processes for preparing the subject MTR kinases and processes for using the subject MTR kinases.

Other examples~~embodiments~~, aspects and features of the present disclosure are either further described in or will be apparent from the ensuing description, examples and appended claims.

DETAILED DESCRIPTION OF THE INVENTION

DEFINITIONS

Certain technical and scientific terms are specifically defined below. Unless specifically defined elsewhere in this document, all other technical and scientific terms used herein have the meaning commonly understood by one of ordinary skill in the art to which this

disclosure relates. That is, terms used herein have their ordinary meaning, which is independent at each occurrence thereof. That notwithstanding and except where stated otherwise, the following definitions apply throughout the specification and claims. Chemical names, common names, and chemical structures may be used interchangeably to describe the same structure. If a chemical compound is referred to using both a chemical structure and a chemical name, and an ambiguity exists between the structure and the name, the structure predominates. These definitions apply regardless of whether a term is used by itself or in combination with other

WHAT IS CLAIMED IS:

1. A polypeptide, wherein said polypeptide comprises a region with an amino acid sequence having at least a 90% sequence identity to residues of any one of SEQ ID NO: 3, SEQ ID NO: 5, SEQ ID NO: 7, SEQ ID NO: 9, SEQ ID NO: 11, or SEQ ID NO: 12.

2. The polypeptide according to claim 1, wherein said polypeptide comprises a region with an amino acid sequence having at least a 90% sequence identity to residues of SEQ ID NO: 3.

3. The polypeptide according to claim 1, wherein said polypeptide comprises a region with an amino acid sequence having at least a 90% sequence identity to residues of SEQ ID NO: 5.

4. The polypeptide according to claim 1, wherein said polypeptide comprises a region with an amino acid sequence having at least a 90% sequence identity to residues of SEQ ID NO: 7.

5. The polypeptide according to claim 1, wherein said polypeptide comprises a region with an amino acid sequence having at least a 90% sequence identity to residues of SEQ ID NO: 9.

6. The polypeptide according to claim 1, wherein said polypeptide comprises a region with an amino acid sequence having at least a 90% sequence identity to residues of SEQ ID NO: 11.

7. The polypeptide according to claim 1, wherein said polypeptide comprises a region with an amino acid sequence having at least a 90% sequence identity to residues of SEQ ID NO: 12.

8. A polypeptide, wherein said polypeptide is encoded by a DNA sequence having at least 90% sequence identity to residues of any one of SEQ ID NO: 4, SEQ ID NO: 6, SEQ ID NO: 8, or SEQ ID NO: 10.

9. The polypeptide according to claim 8, wherein said polypeptide is encoded by a DNA sequence having at least a 90% sequence identity to residues of SEQ ID NO: 4.

10. The polypeptide according to claim 8, wherein said polypeptide is encoded by a DNA sequence having at least a 90% sequence identity to residues of SEQ ID NO: 6.

11. The polypeptide according to claim 8, wherein said polypeptide is encoded by a DNA sequence having at least a 90% sequence identity to residues of SEQ ID NO: 8.

12. The polypeptide according to claim 8, wherein said polypeptide is encoded by a DNA sequence having at least a 90% sequence identity to residues of SEQ ID NO: 10.

~~13. An expression vector comprising the polypeptide according to any one of claim 1 through claim 12, operably linked to one or more control sequences suitable for directing expression of the encoded polypeptide in a host cell.~~

~~14. The expression vector of claim 13, wherein the control sequence comprises a promoter.~~

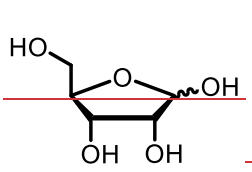
~~15. The expression vector of claim 14, wherein the promoter comprises an *E. coli* promoter.~~

~~16. A host cell comprising the expression vector of claim 13.~~

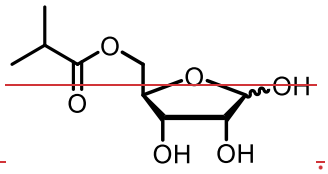
17. The host cell of claim 16, wherein said host cell is *E. coli*.

18. A process for preparing a phosphorylated ribose or phosphorylated ribose derivative, or a salt thereof, said process comprising reacting ribose or a ribose derivative with a phosphate source in the presence of a polypeptide according to any one of claim 1 through claim 12.

19. The process of claim 18, wherein the ribose or ribose derivative is selected from the group consisting of

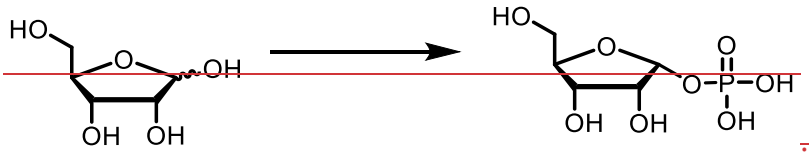


and



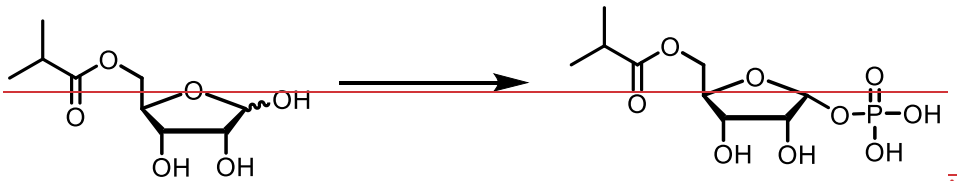
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20. The process of claim 18, wherein the process comprises reacting ribose with a phosphate source in the presence of a polypeptide according to any one of claim 1 through claim 12:



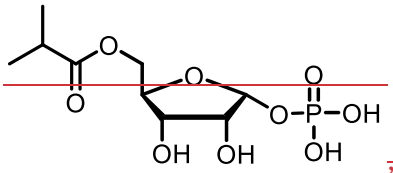
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21. The process of claim 18, wherein the process comprises reacting ribose with a phosphate source in the presence of a polypeptide according to any one of claim 1 through claim 12:



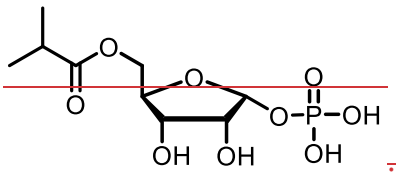
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22. A compound selected from the group consisting of



, and salts thereof.

23. The compound of claim 22, wherein the compound is



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