

[0082] “Product” in the context of a biocatalyst mediated process refers to the compound or molecule resulting from the action of the biocatalyst. For example, an exemplary product for a TdT biocatalyst used in a process disclosed herein is an oligo acceptor extension product, as depicted in Schemes 1 and 2.

[0083] “Alkyl” refers to saturated hydrocarbon groups of from 1 to 18 carbon atoms inclusively, either straight chained or branched, more preferably from 1 to 8 carbon atoms inclusively, and most preferably 1 to 6 carbon atoms inclusively. An alkyl with a specified number of carbon atoms is denoted in parenthesis (e.g., (C₁-C₆)alkyl refers to an alkyl of 1 to 6 carbon atoms).

[0084] “Alkenyl” refers to hydrocarbon groups of from 2 to 12 carbon atoms inclusively, either straight or branched containing at least one double bond but optionally containing more than one double bond.

[0085] “Alkynyl” refers to hydrocarbon groups of from 2 to 12 carbon atoms inclusively, either straight or branched containing at least one triple bond but optionally containing more than one triple bond, and additionally optionally containing one or more double bonded moieties.

[0086] “Heteroalkyl,” “heteroalkenyl,” and “heteroalkynyl,” refer respectively, to alkyl, alkenyl and alkynyl as defined herein in which one or more of the carbon atoms are each independently replaced with the same or different heteroatoms or heteroatomic groups. Heteroatoms and/or heteroatomic groups which can replace the carbon atoms include, but are not limited to -O-, -S-, -S-O-, -NR^γ-, -PH-, -S(O)-, S(O)₂-, -S(O)NR^γ-, -S(O)₂NR^γ, and the like, including combinations thereof, where each R^γ is independently selected from hydrogen, alkyl, cycloalkyl, heterocycloalkyl, aryl, and heteroaryl.

[0087] “Amino” refers to the group -NH₂. Substituted amino refers to the group -NHR^η, NR^ηR^η, and NR^ηR^ηR^η, where each R^η is independently selected from substituted or unsubstituted alkyl, cycloalkyl, cycloheteroalkyl, alkoxy, aryl, heteroaryl, heteroarylalkyl, acyl, alkoxycarbonyl, sulfanyl, sulfinyl, sulfonyl, and the like. Typical amino groups include, but are limited to, dimethylamino, diethylamino, trimethylammonium, triethylammonium, methylsulfonylamino, furanyl-oxy-sulfamino, and the like.

[0088] “Aminoalkyl” refers to an alkyl group in which one or more of the hydrogen atoms are replaced with one or more amino groups, including substituted amino groups.

[0089] “Aminocarbonyl” refers to -C(O)NH₂. Substituted aminocarbonyl refers to -C(O)NR^ηR^η, where the amino group NR^ηR^η is as defined herein.

[0090] “Oxy” refers to a divalent group -O-, which may have various substituents to form different oxy groups, including ethers and esters.

[0091] “Alkoxy” or “alkyloxy” are used interchangeably herein to refer to the group -OR^ζ, wherein R^ζ is an alkyl group, including optionally substituted alkyl groups.

[0092] “Carboxy” refers to -COOH.

[0093] “Carbonyl” refers to -C(O)-, which may have a variety of substituents to form different carbonyl groups including acids, acid halides, aldehydes, amides, esters, and ketones.

[0094] “Carboxyalkyl” refers to an alkyl in which one or more of the hydrogen atoms are replaced with one or more carboxy groups.

[0095] “Aminocarbonylalkyl” refers to an alkyl substituted with an aminocarbonyl group, as defined herein.

[0096] “Halogen” or “halo” refers to fluoro, chloro, bromo and iodo.

[0097] “Haloalkyl” refers to an alkyl group in which one or more of the hydrogen atoms are replaced with a halogen. Thus, the term “haloalkyl” is meant to include monohaloalkyls, dihaloalkyls, trihaloalkyls, etc. up to perhaloalkyls. For example, the expression “(C₁ - C₂) haloalkyl” includes 1-fluoromethyl, difluoromethyl, trifluoromethyl, 1-fluoroethyl, 1,1-difluoroethyl, 1,2-difluoroethyl, 1,1,1 trifluoroethyl, perfluoroethyl, etc.

[0098] “Hydroxy” refers to -OH.

[0099] “Hydroxyalkyl” refers to an alkyl group in which one or more of the hydrogen atoms are replaced with one or more hydroxy groups.

[0100] “Thiol” or “sulfanyl” refers to -SH. Substituted thiol or sulfanyl refers to -S-Rⁿ, where Rⁿ is an alkyl, aryl or other suitable substituent.

[0101] “Sulfonyl” refers to -SO₂-. Substituted sulfonyl refers to -SO₂-Rⁿ, where Rⁿ is an alkyl, aryl or other suitable substituent.

[0102] “Alkylsulfonyl” refers to -SO₂-R^ζ, where R^ζ is an alkyl, which can be optionally substituted. Typical alkylsulfonyl groups include, but are not limited to, methylsulfonyl, ethylsulfonyl, n-propylsulfonyl, and the like.

[0103] “Phosphate” as used herein refers to a functional group comprised of an orthophosphate ion (phosphorous atom covalently linked to four oxygen atoms). The orthophosphate ion is commonly found with one or more hydrogen atoms or organic groups.

[0104] “Phosphorylated” as used herein refers to the addition or presence of one or more phosphoryl groups (phosphorous atom covalently linked to the three oxygen atoms).

[0105] “Optionally substituted” as used herein with respect to the foregoing chemical groups means that positions of the chemical group occupied by hydrogen can be substituted with another atom (unless otherwise specified) exemplified by, but not limited to carbon, oxygen, nitrogen, or sulfur, or a chemical group, exemplified by, but not limited to, hydroxy, oxo, nitro, methoxy, ethoxy, alkoxy, substituted alkoxy, trifluoromethoxy, haloalkoxy, fluoro, chloro, bromo, iodo, halo, methyl, ethyl, propyl, butyl, alkyl, alkenyl, alkynyl, substituted alkyl, trifluoromethyl, haloalkyl, hydroxyalkyl, alkoxyalkyl, thio, alkylthio, acyl, carboxy, alkoxycarbonyl, carboxamido, substituted carboxamido, alkylsulfonyl, alkylsulfinyl, alkylsulfonylamino, sulfonamido, substituted sulfonamido, cyano, amino, substituted amino, alkylamino, dialkylamino, aminoalkyl, acylamino, amidino, amidoximo, hydroxamoyl, phenyl, aryl, substituted aryl, aryloxy, arylalkyl, arylalkenyl, arylalkynyl, pyridyl, imidazolyl, heteroaryl, substituted heteroaryl, heteroaryloxy, heteroarylalkyl, heteroarylalkenyl, heteroarylalkynyl, cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cycloalkyl, cycloalkenyl, cycloalkylalkyl, substituted cycloalkyl, cycloalkyloxy, pyrrolidinyl, piperidinyl, morpholino, heterocycle, (heterocycle)oxy, and (heterocycle)alkyl; where preferred heteroatoms are oxygen, nitrogen, and sulfur. Additionally, where open valences exist on these