Reactions

WID	Name
DNADamage_AD_carbamoylmethyl6AD_acetamide	DNA base alkylation (adenine ==> N6-carbamoylmethyladenine; acetamide)
DNADamage_AD_e1AD_DES	DNA base ethylation (adenine ==> 1-ethyladenine; diethyl sulfate)
DNADamage_AD_e1AD_EMS	DNA base ethylation (adenine ==> 1-ethyladenine; ethyl methanesulfonate)
DNADamage_AD_e1AD_ENU	DNA base ethylation (adenine ==> 1-ethyladenine; ethyl nitrosourea)
DNADamage_AD_e3AD_DES	DNA base ethylation (adenine ==> 3-ethyladenine; diethyl sulfate)
DNADamage_AD_e3AD_EMS	DNA base ethylation (adenine ==> 3-ethyladenine; ethyl methanesulfonate)
DNADamage_AD_e3AD_ENU	DNA base ethylation (adenine ==> 3-ethyladenine; ethyl nitrosourea)
DNADamage_AD_e6AD_DES	DNA base ethylation (adenine ==> 6-ethyladenine; diethyl sulfate)
DNADamage_AD_e6AD_EMS	DNA base ethylation (adenine ==> 6-ethyladenine; ethyl methanesulfonate)
DNADamage_AD_e6AD_ENU	DNA base ethylation (adenine ==> 6-ethyladenine; ethyl nitrosourea)
DNADamage_AD_e7AD_DES	DNA base ethylation (adenine ==> 7-ethyladenine; diethyl sulfate)
DNADamage_AD_e7AD_EMS	DNA base ethylation (adenine ==> 7-ethyladenine; ethyl methanesulfonate)
DNADamage_AD_e7AD_ENU	DNA base ethylation (adenine ==> 7-ethyladenine; ethyl nitrosourea)
DNADamage_AD_epsilon1N6AD_chloroethylene_oxide	DNA base alkylation (adenine ==> 1,N6-etheno-adenine; chloroethylene oxide)
DNADamage_AD_FAPyAD_hydroxyl_radical	DNA radiation (gamma-ray) induced base oxidation (adenine ==> 4,6-diamino-5-N...
DNADamage_AD_m1AD_MMS	DNA base methylation (adenine ==> 1-methyladenine; methyl methanesulphonate)
DNADamage_AD_m1AD_MMSO4	DNA base methylation (adenine ==> 1-methyladenine; dimethyl sulfate)
DNADamage_AD_m1AD_MNNG	DNA base methylation (adenine ==> 1-methyladenine; N-methyl-N'-nitro-N-nitros...

DNADamage_AD_m1AD_MNU	DNA base methylation (adenine ==> 1-methyladenine; N-methyl-N-nitrosourea)
DNADamage_AD_m3AD_MMS	DNA base methylation (adenine ==> 3-methyladenine; methyl methanesulphonate)
DNADamage_AD_m3AD_MMSO4	DNA base methylation (adenine ==> 3-methyladenine; dimethyl sulfate)
DNADamage_AD_m3AD_MNNG	DNA base methylation (adenine ==> 3-methyladenine; N-methyl-N'-nitro-N-nitros...
DNADamage_AD_m3AD_MNU	DNA base methylation (adenine ==> 3-methyladenine; N-methyl-N-nitrosourea)
DNADamage_AD_m6AD_CH3	DNA base methylation (adenine ==> 6-methyladenine; Methyl radical)
DNADamage_AD_m7AD_MMS	DNA base methylation (adenine ==> 7-methyladenine; methyl methanesulphonate)
DNADamage_AD_m7AD_MMSO4	DNA base methylation (adenine ==> 7-methyladenine; dimethyl sulfate)
DNADamage_AD_m7AD_MNNG	DNA base methylation (adenine ==> 7-methyladenine; N-methyl-N'-nitro-N-nitros...
DNADamage_AD_m7AD_MNU	DNA base methylation (adenine ==> 7-methyladenine; N-methyl-N-nitrosourea)
DNADamage_AD_n2AD_NH3	DNA base amination (adenine ==> 2-amino-adenine; ammonia)
DNADamage_AD_oxo2AD_hydroxyl_radical	DNA radiation (gamma-ray) induced base oxidation (adenine ==> 2-hydroxyadenin...
DNADamage_AD_oxo8AD_hydroxyl_radical	DNA radiation (gamma-ray) induced base oxidation (adenine ==> 8-hydroxyadenin...
DNADamage_CSN64CSN_CSN64CSN_dewar_UVB_radiation	DNA photoisomerization (2'-deoxycytidine-[6,4]-2'-deoxycytidine ==> 2'-deoxyc...
DNADamage_CSN64THY_CSN64THY_dewar_UVB_radiation	DNA photoisomerization (2'-deoxycytidine-[6,4]-2'-deoxythymidine ==> 2'-deoxy...
DNADamage_CSNCSN_CSN64CSN_UVB_radiation	DNA photodimerization (2'-deoxycytidine-p-2'-deoxycytidine ==> 2'-deoxycytidi...
DNADamage_CSNCSN_cyclobutane_CSNCSN_UVB_radiation	DNA photodimerization (2'-deoxycytidine-p-2'-deoxycytidine ==> cyclobutane 2'...
DNADamage_CSNTHY_CSN64THY_UVB_radiation	DNA photodimerization (2'-deoxycytidine-p-2'-deoxythymidine ==> 2'-deoxycytid...

DNADamage_CSNTHY_cyclobutane_CSNTHY_UVB_radiation	DNA photodimerization (2'-deoxycytidine-p-2'-deoxythymidine ==> cyclobutane 2...
DNADamage_CSN_CSN_GLYC_hydroxyl_radical	DNA radiation (gamma-ray) induced base oxidation (cytosine ==> cytosine glyco...
DNADamage_CSN_e3CSN_DES	DNA base ethylation (cytosine ==> 3-ethylcytosine; diethyl sulfate)
DNADamage_CSN_e3CSN_EMS	DNA base ethylation (cytosine ==> 3-ethylcytosine; ethyl methanesulfonate)
DNADamage_CSN_e3CSN_ENU	DNA base ethylation (cytosine ==> 3-ethylcytosine; ethyl nitrosourea)
DNADamage_CSN_epsilon3N4CSN_chloroethylene_oxide	DNA base alkylation (cytosine ==> 3,N4-etheno-cytosine; chloroethylene oxide)
DNADamage_CSN_ho5CSN_hydroxyl_radical	DNA radiation (gamma-ray) induced base oxidation (cytosine ==> 5-Hydroxycytos...
DNADamage_CSN_m3CSN_MMS	DNA base methylation (cytosine ==> 3-methylcytosine; methyl methanesulphonate)
DNADamage_CSN_m3CSN_MMSO4	DNA base methylation (cytosine ==> 3-methylcytosine; dimethyl sulfate)
DNADamage_CSN_m3CSN_MNNG	DNA base methylation (cytosine ==> 3-methylcytosine; N-methyl-N'-nitro-N-nitr...
DNADamage_CSN_m3CSN_MNU	DNA base methylation (cytosine ==> 3-methylcytosine; N-methyl-N-nitrosourea)
DNADamage_CSN_m4CSN_CH3	DNA base methylation (cytosine ==> 4-methylcytosine; Methyl radical)
DNADamage_CSN_m5CSN_CH3	DNA base methylation (cytosine ==> 5-methylcytosine; Methyl radical)
DNADamage_CSN_O2eCSN_DES	DNA base ethylation (cytosine ==> 2'-O-ethylcytosine; diethyl sulfate)
DNADamage_CSN_O2eCSN_EMS	DNA base ethylation (cytosine ==> 2'-O-ethylcytosine; ethyl methanesulfonate)
DNADamage_CSN_O2eCSN_ENU	DNA base ethylation (cytosine ==> 2'-O-ethylcytosine; ethyl nitrosourea)
DNADamage_CSN_O2mCSN_MNNG	DNA base methylation (cytosine ==> 2'-O-methylcytosine; N-methyl-N'-nitro-N-n...
DNADamage_CSN_O2mCSN_MNU	DNA base methylation (cytosine ==> 2'-O-methylcytosine; N-methyl-N-nitrosourea)
DNADamage_DA_cyclodA_UVB_radiation	DNA photooxidation (2'-deoxyadenosine ==> 8,5'-cyclo-2'-deoxyadenosine; UV-B)

DNADamage_DG_cyclodG_UVB_radiation	DNA photooxidation (2'-deoxyguanosine ==> 8,5'-cyclo-2'-deoxyguanosine; UV-B)
DNADamage_DHURA_ho5Hydantoin_hydroxyl_radical	DNA radiation (gamma-ray) induced base oxidation (5,6-dihydroxyuracil; dialur...
DNADamage_f5URA_c5URA_hydroxyl_radical	DNA radiation (gamma-ray) induced base oxidation (5-formyluracil ==> 5-Carbou...
DNADamage_GammaRadiationInducedStrandBreak	Radiation (gamma-ray) induced strand break
DNADamage_GN_e1GN_DES	DNA base ethylation (guanine ==> 1-ethylguanine; diethyl sulfate)
DNADamage_GN_e1GN_EMS	DNA base ethylation (guanine ==> 1-ethylguanine; ethyl methanesulfonate)
DNADamage_GN_e1GN_ENU	DNA base ethylation (guanine ==> 1-ethylguanine; ethyl nitrosourea)
DNADamage_GN_e3GN_DES	DNA base ethylation (guanine ==> 3-ethylguanine; diethyl sulfate)
DNADamage_GN_e3GN_EMS	DNA base ethylation (guanine ==> 3-ethylguanine; ethyl methanesulfonate)
DNADamage_GN_e3GN_ENU	DNA base ethylation (guanine ==> 3-ethylguanine; ethyl nitrosourea)
DNADamage_GN_e7GN_DES	DNA base ethylation (guanine ==> 7-ethylguanine; diethyl sulfate)
DNADamage_GN_e7GN_EMS	DNA base ethylation (guanine ==> 7-ethylguanine; ethyl methanesulfonate)
DNADamage_GN_e7GN_ENU	DNA base ethylation (guanine ==> 7-ethylguanine; ethyl nitrosourea)
DNADamage_GN_epsilon1N2GN_chloroethylene_oxide	DNA base alkylation (guanine ==> 1,N2-etheno-guanine; chloroethylene oxide)
DNADamage_GN_epsilonN23GN_chloroethylene_oxide	DNA base alkylation (guanine ==> N2,3-etheno-guanine; chloroethylene oxide)
DNADamage_GN_FAPyGN_hydroxyl_radical	DNA radiation (gamma-ray) induced base oxidation (guanine ==> 2,6-diamino-4-h...
DNADamage_GN_m1GN_MMS	DNA base methylation (guanine ==> 1-methylguanine; methyl methanesulphonate)
DNADamage_GN_m1GN_MNU	DNA base methylation (guanine ==> 1-methylguanine; N-methyl-N-nitrosourea)
DNADamage_GN_m3GN_MMS	DNA base methylation (guanine ==> 3-methylguanine; methyl methanesulphonate)
DNADamage_GN_m3GN_MMSO4	DNA base methylation (guanine ==> 3-methylguanine; dimethyl sulfate)

DNADamage_GN_m3GN_MNNG	DNA base methylation (guanine ==> 3-methylguanine; N-methyl-N'-nitro-N-nitros...
DNADamage_GN_m3GN_MNU	DNA base methylation (guanine ==> 3-methylguanine; N-methyl-N-nitrosourea)
DNADamage_GN_m7GN_MMS	DNA base methylation (guanine ==> 7-methylguanine; methyl methanesulphonate)
DNADamage_GN_m7GN_MMSO4	DNA base methylation (guanine ==> 7-methylguanine; dimethyl sulfate)
DNADamage_GN_m7GN_MNNG	DNA base methylation (guanine ==> 7-methylguanine; N-methyl-N'-nitro-N-nitros...
DNADamage_GN_m7GN_MNU	DNA base methylation (guanine ==> 7-methylguanine; N-methyl-N-nitrosourea)
DNADamage_GN_m8GN_CH3	DNA base methylation (guanine ==> 8-methylguanine; Methyl radical)
DNADamage_GN_O6eGN_DES	DNA base ethylation (guanine ==> 6'-O-ethylguanine; diethyl sulfate)
DNADamage_GN_O6eGN_EMS	DNA base ethylation (guanine ==> 6'-O-ethylguanine; ethyl methanesulfonate)
DNADamage_GN_O6eGN_ENU	DNA base ethylation (guanine ==> 6'-O-ethylguanine; ethyl nitrosourea)
DNADamage_GN_O6mGN_MMS	DNA base methylation (guanine ==> 6'-O-methylguanine; methyl methanesulphonate)
DNADamage_GN_O6mGN_MMSO4	DNA base methylation (guanine ==> 6'-O-methylguanine; dimethyl sulfate)
DNADamage_GN_O6mGN_MNNG	DNA base methylation (guanine ==> 6'-O-methylguanine; N-methyl-N'-nitro-N-nit...
DNADamage_GN_O6mGN_MNU	DNA base methylation (guanine ==> 6'-O-methylguanine; N-methyl-N-nitrosourea)
DNADamage_GN_oxo8GN_hydroxyl_radical	DNA radiation (gamma-ray) induced base oxidation (guanine ==> 8-Oxo-guanine; ...
DNADamage_GN_oxoethyl7GN_chloroethylene_oxide	DNA base alkylation (guanine ==> 7-(2'-oxoethyl)-guanine; chloroethylene oxide)
DNADamage_hm5C_glchm5CSN_GLC	DNA base glucosyl transfer (5'-hydroxymethylcytosine ==> beta-D-glucosylhydro...
DNADamage_hm5URA_f5URA_hydroxyl_radical	DNA radiation (gamma-ray) induced base oxidation (5-hydroxymethyluracil ==> 5...
DNADamage_hm5U_dhpURA_butylene_glycol	DNA base alkylation (5-hydroxymethyluracil ==> 5'-dihydroxypentyluracil; 1,2-...

DNADamage_hm5U_glchm5URA_GLC	DNA base glucosyl transfer (5-hydroxymethyluracil ==> beta-D-glucosylhydroxym...
DNADamage_hm5U_gluTHY_GLU	DNA base amination (5-hydroxymethyluracil ==> a-glutamylthymine; L-glutamate)
DNADamage_hm5U_putTHY_PTRC	DNA base amination (5-hydroxymethyluracil ==> alpha-putrescinylthymine; putre...
DNADamage_HYXN_XAN_hydroxyl_radical	DNA radiation (gamma-ray) induced base oxidation (hypoxanthine ==> xanthine; ...
DNADamage_m3CSN_hm3CSN_hydroxyl_radical	DNA radiation (gamma-ray) induced base oxidation (3-methylcytosine ==> 3'-hyd...
DNADamage_m5CSN_hm5CSN_hydroxyl_radical	DNA radiation (gamma-ray) induced base oxidation (5-methylcytosine ==> 5'-hyd...
DNADamage_SpontaneousAbasicSiteStrandBreak	Spontaneous abasic site strand break
DNADamage_SpontaneousBaseDeamination_adenine	Spontaneous base deamination (adenine ==> hypoxanthine)
DNADamage_SpontaneousBaseDeamination_cytosine	Spontaneous base deamination (cytosine ==> uracil)
DNADamage_SpontaneousBaseDeamination_guanine	Spontaneous base deamination (guanine ==> xanthine)
DNADamage_SpontaneousBaseDeamination_m5C	Spontaneous base deamination (5-methylcytosine ==> thymine)
DNADamage_SpontaneousBaseLoss_adenine	Spontaneous base loss (adenine)
DNADamage_SpontaneousBaseLoss_cytosine	Spontaneous base loss (cytosine)
DNADamage_SpontaneousBaseLoss_guanine	Spontaneous base loss (guanine)
DNADamage_SpontaneousBaseLoss_thymine	Spontaneous base loss (thymine)
DNADamage_THY64CSN_THY64CSN_dewar_UVB_radiation	DNA photoisomerization (2'-deoxythymidine-[6,4]-2'-deoxycytidine ==> 2'-deoxy...
DNADamage_THY64THY_THY64THY_dewar_UVB_radiation	DNA photoisomerization (2'-deoxythymidine-[6,4]-2'-deoxythymidine ==> 2'-deox...
DNADamage_THYCSN_cyclobutane_THYCSN_UVB_radiation	DNA photodimerization (2'-deoxythymidine-p-2'-deoxycytidine ==> cyclobutane 2...
DNADamage_THYCSN_THY64CSN_UVB_radiation	DNA photodimerization (2'-deoxythymidine-p-2'-deoxycytidine ==> 2'-deoxythymi...
DNADamage_THYTHY_cyclobutane_THYTHY_UVB_radiation	DNA photodimerization (2'-deoxythymidine-p-2'-deoxythymidine ==> cyclobutane ...

DNADamage_THYTHY_THY64THY_UVB_radiation	DNA photodimerization (2'-deoxythymidine-p-2'-deoxythymidine ==> 2'-deoxythym...
DNADamage_THY_DHTHY_hydrogen_radical	DNA base reduction (thymine ==> 5,6-dihydrothymine; hydrogen radical)
DNADamage_THY_e3THY_DES	DNA base ethylation (thymine ==> 3'-ethylthymine; diethyl sulfate)
DNADamage_THY_e3THY_EMS	DNA base ethylation (thymine ==> 3'-ethylthymine; ethyl methanesulfonate)
DNADamage_THY_e3THY_ENU	DNA base ethylation (thymine ==> 3'-ethylthymine; ethyl nitrosourea)
DNADamage_THY_hm5URA_hydroxyl_radical	DNA radiation (gamma-ray) induced base oxidation (thymine ==> 5-hydroxymethyl...
DNADamage_THY_ho5ho6THY_hydroxyl_radical	DNA radiation (gamma-ray) induced base oxidation (thymine ==> 5-hydroxy-6-hyd...
DNADamage_THY_m3THY_MMS	DNA base methylation (thymine ==> 3'-methylthymine; methyl methanesulphonate)
DNADamage_THY_m3THY_MNU	DNA base methylation (thymine ==> 3'-methylthymine; N-methyl-N-nitrosourea)
DNADamage_THY_O2eTHY_DES	DNA base ethylation (thymine ==> 2'-O-ethylthymine; diethyl sulfate)
DNADamage_THY_O2eTHY_EMS	DNA base ethylation (thymine ==> 2'-O-ethylthymine; ethyl methanesulfonate)
DNADamage_THY_O2eTHY_ENU	DNA base ethylation (thymine ==> 2'-O-ethylthymine; ethyl nitrosourea)
DNADamage_THY_O2mTHY_MNNG	DNA base methylation (thymine ==> 2'-O-methylthymine; N-methyl-N'-nitro-N-nit...
DNADamage_THY_O2mTHY_MNU	DNA base methylation (thymine ==> 2'-O-methylthymine; N-methyl-N-nitrosourea)
DNADamage_THY_O4eTHY_DES	DNA base ethylation (thymine ==> 4'-O-ethylthymine; diethyl sulfate)
DNADamage_THY_O4eTHY_EMS	DNA base ethylation (thymine ==> 4'-O-ethylthymine; ethyl methanesulfonate)
DNADamage_THY_O4eTHY_ENU	DNA base ethylation (thymine ==> 4'-O-ethylthymine; ethyl nitrosourea)
DNADamage_THY_O4mTHY_MNNG	DNA base methylation (thymine ==> 4'-O-methylthymine; N-methyl-N'-nitro-N-nit...
DNADamage_THY_O4mTHY_MNU	DNA base methylation (thymine ==> 4'-O-methylthymine; N-methyl-N-nitrosourea)

DNADamage_THY_THY_GLYC_hydroxyl_radical	DNA radiation (gamma-ray) induced base oxidation (thymine ==> thymine glycol;...
DNADamage_URA_DHURA_hydroxyl_radical	DNA radiation (gamma-ray) induced base oxidation (uracil ==> 5,6-dihydroxyura...
DNADamage_URA_ho5ho6URA_hydroxyl_radical	DNA radiation (gamma-ray) induced base oxidation (uracil ==> 5-hydroxy-6-hydr...
DNADamage_URA_ho5URA_hydroxyl_radical	DNA radiation (gamma-ray) induced base oxidation (uracil ==> 5-hydroxyuracil;...