

ALU91789.1

CP913737.1:5462895-5479697

Herbaspirillum rubrisubalbicans M1

ATB41603.1

CP822098.1:8866459-8872279

Cystobacter fuscus

EFC51063.1

ACE092000015.1:3294-5672

Neisseria subflava NJ9703

GKW09570.1

BRC091000006.1:106871-108553

Pectobacterium carotovorum subsp. *carotovorum*

HAS39835.1

DMX101000082.1:22578-32509

Microscillaceae bacterium

HEW98350.1

DQW01000253.1:7706-12867

Beggiatoa sp.

HID09115.1

DTY01000167.1:1-1-2363

Thiotrichaceae bacterium

HIP24826.1

DQSV01000749.1:2858-5596

Rhodobacteraceae bacterium

KEZ94304.1

JP3101000022.1:3799-5770

Nonlabens ulvanivorans

MBE5981388.1

SVDU01000027.1:65272-69847

Paenibacillaceae bacterium

MBE7163208.1

JADCRY010000594.1:1-1-1947

Williamsia herbiopolensis

MBF2067245.1

JACYLQ01000044.1:93055-113124

Calothrix sp. C42_A2020_038

MBK6408924.1

JAD1ZL010000001.1:1038772-1042335

Flavobacteriales bacterium

MBK9585481.1

JADKES010000004.1:13169-16658

Alphaproteobacteria bacterium

MBL8944634.1

JAEUJU010000845.1:47-9479

Myxococcales bacterium

MBQ6850011.1

JAFU010000212.1:1-1-1875

Lachnospiraceae bacterium

MBR1675052.1

JAFUYW010000018.1:1-1-4560

Eubacterium sp.

MBS4924346.1

JAC2W4010000001.1:26303-29963

Ruminococcus bicirculans (ex Wegman et al. 2014)

MCD0453019.1

JAJLQY01000013.1:130638-136131

Actinocoralia sp. API 0066

MCF3124860.1

JADDTM010000166.1:8500-13642

Streptomyces arenae

MCH2176915.1

JAKVBE010000030.1:20871-22985

Leptisphaeria bacterium

MCK5522214.1

JAGLHR010000147.1:514-3565

Thiomargarita sp.

MCL2982027.1

WRAY01000020.1:5097-10628

Bacillota bacterium

MCP3996505.1

JAAELV010000687.1:1343-5184

bacterium *Bacteria*.

MCP4494114.1

JAAEPW010000623.1:14-1322

Gammaproteobacteria bacterium

MCP9960969.1

JAJQLL010000001.1:1206534-1214907

Streptomyces somaliensis

NJN059531.1

JAAUQG010000224.1:169-2819

Rhodobacteraceae bacterium

NOT61490.1

JABFSD010000611.1:8615-13462

Acidobacteria bacterium

NOW06150.1

JABFUE010000001.1:4016120-4019239

Clostridium beijerinckii

NQZ39477.1

JABSPD010000038.1:808-2797

Crocinitomicaceae bacterium

OPX41839.1

MZGX010000664.1:1111-1234

Ruminiclostridium hungatei

OAR31102.1

CP835107.1:1492000-1495755

Ornithobacterium rhinotracheale

QDG52120.1

CP041186.1:4238730-4256742

Persicimonas caeni

QKW10678.1

CP934918.1:1538422-1543394

Streptomyces sp. NA04227

RNB54214.1

RHHS01000042.1:1441-4609

Brevibacillus gelatinii

RYH21042.1

SDYD01001638.1:1-1-948

Alcaligenaceae bacterium

RYZ15004.1

SECM01000524.1:1-1-1351

Myxococcaceae bacterium

RYZ19920.1

SEAK01000195.1:1-5659

Chitinophagaceae bacterium

SDB43153.1

FMXX01000043.1:14259-17056

Fusobacterium necrophorum

TQJ92999.1

VFNC010000001.1:4223095-4237879

Streptomyces sp. SLBN-31

TZF75727.1

VTSO01000295.1:1-1-357

Salmonella enterica subsp. *enterica* serovar *Typhimurium*

WP_002661229.1

NZ_JH179942.1:4402799-4409185

Saprosira grandis DSM 2844

WP_002896314.1

NZ_CP054570.1:1566209-1568671

Streptococcus sanguinis

WP_070265247.1

NZ_MKPS01000017.1:518-5083

Listeria monocytogenes

WP_004622597.1

NZ_RACX020000022.1:1-1-6176

Ruminiclostridium papyrosolvens DSM 2782

WP_227071311.1

NZ_CAXSMJ010000011.1:51298-61713

Bacteroides cellulosilyticus CL02T12C19

WP_217428494.1

NZ_WHUF010000007.1:301586-304882

Rugamonas rivulii

WP_010506499.1

NZ_JH636435.1:1387412-1393008

Schlesneria paludicola DSM 18645

WP_255344596.1

NZ_KE992172.1:28141-30157

Capnocytophaga sp. oral taxon 863 str. F0517

WP_246509108.1

NZ_VCMG01000016.1:123655-129177

Vibrio rhizosphaerae DSM 18581

WP_200882974.1

NZ_KN266214.1:17-9116

Cellvibrio mixtus subsp. *mixtus* J3-8

WP_056719464.1

NZ_LMKC010000001.1:533672-543665

Caulobacter sp. Root655

WP_154916160.1

NZ_CABG01010000031.1:58946-60507

Klebsiella grimontii

WP_134434026.1

NZ_BCZW010000007.1:25812-28616

Pseudomonas azotoformans NBRC 12693

WP_057639374.1

NZ_CP016076.1:1307989-1322739

Actinoboloteichus fjordicus

WP_079420672.1

NZ_MBTG010000062.1:8299-11294

Paenibacillus terrarius

WP_087532853.1

NZ_PXOF010000025.1:59106-62489

Pseudalteromonas sp. A601

WP_175501158.1

NZ_FOLC010000055.1:1-2618

Collimonas sp. OK412

WP_201290312.1

NZ_CACS06010000064.1:1-720

Tenacibaculum maritimum

WP_207658158.1

NZ_QKMR01000045.1:1-4602

Ruminiclostridium sufflavum DSM 19573

WP_162873066.1

NZ_CP031447.1:3540795-3543664

Austwickia chelonae

WP_245168034.1

NZ_CP139210.1:2338940-2344879

Streptococcus sp. VEG10

WP_137341823.1

NZ_BSQH010000002.1:45108-57293

Dyadobacter frigoris

WP_139489609.1

NZ_VCNA010000003.1:566807-571080

Brevibacillus dissolubilis

WP_146777177.1

NZ_LCZB010000051.1:265048-266621

Pseudomonas fluorescens

WP_161917725.1

NZ_JAACY1010000013.1:100381-103421

Cellulomonas sp. APG4

WP_164417350.1

NZ_JANJFM010000027.1:64735-69184

Pseudomonas viridiflava

WP_237000752.1

NZ_CP081381.1:4731212-4741663

Amycolatopsis sp. FU40

WP_183484887.1

NZ_JACHY5010000004.1:397190-408865

Mitsuraria sp. BK037

WP_190110526.1

NZ_BHV801000009.1:215814-225800

Streptomyces cinnamomeus

WP_202856279.1

NZ_JAEUGD010000038.1:1-1-2354

Fulvivirga marina

WP_211619238.1

NZ_CP072378.1:993459-996020

Leptotrichia sp. oral taxon 221

WP_249926752.1

NZ_JALRMO100000001.1:3549796-3553847

Paenibacillus hamauzensis

WP_255574291.1

NZ_JAHPZL010000003.1:650458-653530

Austwickia sp. TV5 96-490-7B

WP_222384569.1

NZ_JAINW010000003.1:977235-988682

Flagellimonas meishanensis

WP_223950918.1

NZ_CP082922.1:3240561-3247453

Nocardioides rotundus

N_methyl-
CPO3537.1:478316-481178
TreTu> dTDP_sugar_isom -> ?

HTH_21 rve rve_2 Macro
Fil_haemagg_2 Fil_haemagg_2 TreTu> TPS FilH FilH FilH Fil_haemagg_2 Fil_haemagg_2 Ntox21 Sh18 POTRA_2

zf-ISL3 HTH_Tnp_ISL3 DDE_Tnp_ISL3 HTH_17 TreTu> ADH_N ADH_zinc_N Acetylase

-> ANK TreTu> -> -> ->

RHS RHS TreTu> -> SymE_toxin

IG Ig_7 Ig_7 Ig_7 DUF6443 RHS RHS TPR TPR RHS TreTu> -> ->

HPT Receiver GGDEF EAL TreTu> -> Metal_resist

TreTu> -> SUFU

Transglut_core2 -> RHS TreTu> -> GDRESOLVASE-HTH GDResolvase

Macro -> -> RHS TreTu>

-> DEDD_Tnp_IS110 Transposase_20 TreTu> -> ->

RHS_repeat RHS_repeat RHS TreTu>

Macro -> -> IG Cadherin Cadherin Cadherin Cadherin Cadherin IG HfIG IG DUF6531 RHS_repeat RHS RHS RHS_repeat RHS RHS RHS_repeat RHS HINT TreTu> -> Gspa-ATPase

RHS RHS TreTu> -> HTH_Tnp_IS1 DDE_Tnp_IS1

-> -> TreTu> RHS Imm1

SUKH-> DUF6531 RHS_repeat RHS_repeat RHS RHS TreTu> -> VgrG DUF234->

TreTu> -> ->

RHS RHS RHS RHS TreTu> -> Band-7

GATase_6 SIS SIS VYM-VanZ-1 HINT TreTu> -> HINT

adh_short_C2 -> -> HINT TreTu> Sigma70_r4_2 Sigma70_r2 -> ->

Trypsin -> -> DUF6531 RHS_repeat RHS RHS RHS_repeat RHS TreTu>

-> -> RHS TreTu> ->

Lp1 TreTu> -> ->

-> -> RHS TreTu> -> Glyco_tran_28_C Glyco_transf_28

-> Acylphosphatase RHS TreTu> -> IstB_IS21

RHS TreTu> ->

Ribosomal_L2ip -> -> PT-HINT TreTu> SPVB ->

-> RHS TreTu> RHS ->

-> RHS RHS_repeat RHS TreTu> ->

Macro -> -> TreTu> RHS RHS_repeat RHS RHS

RHS TreTu> -> Macro

TreTu> ->

-> -> TreTu> -> ->

VRP1 ABC_toxin_N Neuraminidase TcA_TcB_BD -> SpvB BetaPropeller TcdB_toxin_midC RHS TreTu> -> Excalibur

-> -> -> Methyltransf_11 RHS TreTu>

-> RHS TreTu> ->

RHS TreTu>

RHS HINT TreTu>

RHS RHS TreTu> -> SPVB BetaPropeller

Ntox49 -> TreTu> -> Ntox19

SF2-DUF3427A Y_Y_Y LamininG LamininG SPVB RHS RHS TreTu> -> RepLic_Relax

RHS TreTu>

RHS -> -> RHS TreTu> RHS DUF4896

-> -> TreTu> Imm5a Imm5a

-> -> -> AbiH LXG TreTu>

RHS PG_binding_1 -> RHS TreTu> -> Macro

-> -> DUF6563 PPC SPVB BetaPropeller TcdB_toxin_midN RHS RHS RHS RHS TreTu>

AhpC-TSA 1-cysPrx_C -> Na -> TreTu>

-> TreTu> LysM PepX_C Peptidase_S15 GDPD

CoLE? -> -> -> RHS TreTu>

CARD8 -> FAD-NAD-dep-oxidoreductase tRNA-synt_1b RHS TreTu>

SPVB IG RHS RHS adh_short -> RHS TreTu> SymE_toxin

G_glu_transpept RHS RHS RHS RHS TreTu> -> ->

-> TreTu> ->

HTH -> -> -> TreTu>

AMP_N Peptidase_M24 Tachylectin DUF6531 LamininG RHS RHS RHS_repeat RHS_repeat RHS RHS RHS RHS HINT TreTu> -> ->

-> TreTu> RHS ->

-> TreTu> Transposase_20 DEDD_Tnp_IS110 -> RHS

-> -> TreTu>

-> TreTu>

-> Transposase_mut -> RHS TreTu>

PTS_2-RNA ODE_Tnp_4 HTH_Tnp_4 Endonuclease_5 cHTH TreTu>

Imm24 -> PT-TG Ribonuclease RHS SHH RHS TreTu>

-> -> SPVB BetaPropeller RHS RHS RHS_repeat RHS DUF637 DUF637 TreTu> NUDIX_AraR_C CBM_6 Cytochrom_C IG GSDH ThuA

-> RHS TreTu> -> DUF6250 Ntox20

-> TreTu> ->

-> -> RHS TreTu>

Tox-Dean TreTu> -> Pentapeptide_4 DUF637N DUF637 ParB-CE

-> PAS_8 GAF SpoIIE Receiver His-Kinase GAF_2 HAMP HAMP HAMP HAMP HAMP HAMP HAMP HAMP HAMP HAMP TreTu> Transposase_mut

Big7 IG Big7 SPVB BetaPropeller RHS_repeat RHS_repeat RHS Stox-59 -> TreTu> -> ->

ALF ALF ALF ALF ALF ALF ALF ALF ALF HINT TreTu> -> SUN Glyco_hydro_92 Glyco_hydro_92N DUF595b ->

-> TreTu> -> Cu_amine_oxid_3

-> -> TreTu> -> ->

TnpW Resolvase Recombinase Zn_ribbon_recom DUF436b -> -> TreTu>

-> -> -> TreTu> RHS

Macro -> Cu-binding_MopE PKD_6 DUF6443 RHS RHS TreTu> SPVB RHS Concanavalin-like IG

HNH -> DUF6531 RHS_repeat RHS_repeat RHS_repeat RHS_repeat RHS_repeat RHS_repeat RHS_repeat RHS_repeat RHS_repeat RHS TreTu> -> MTAse