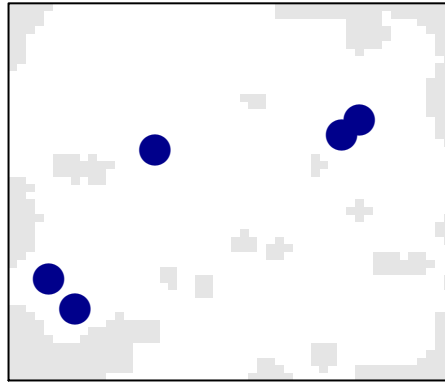


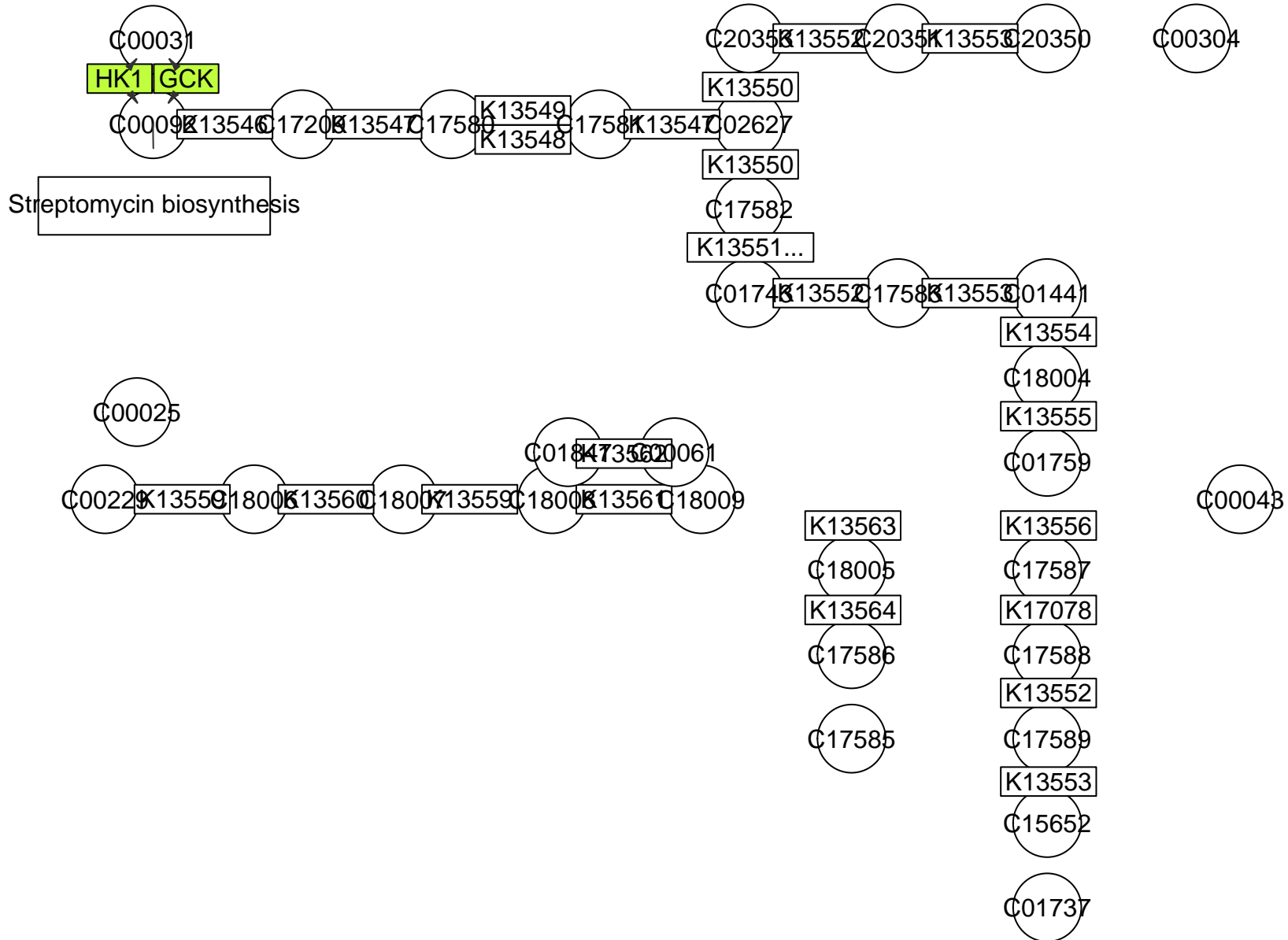
# Butirosin and neomycin biosynthesis

all genes



maximum = 1

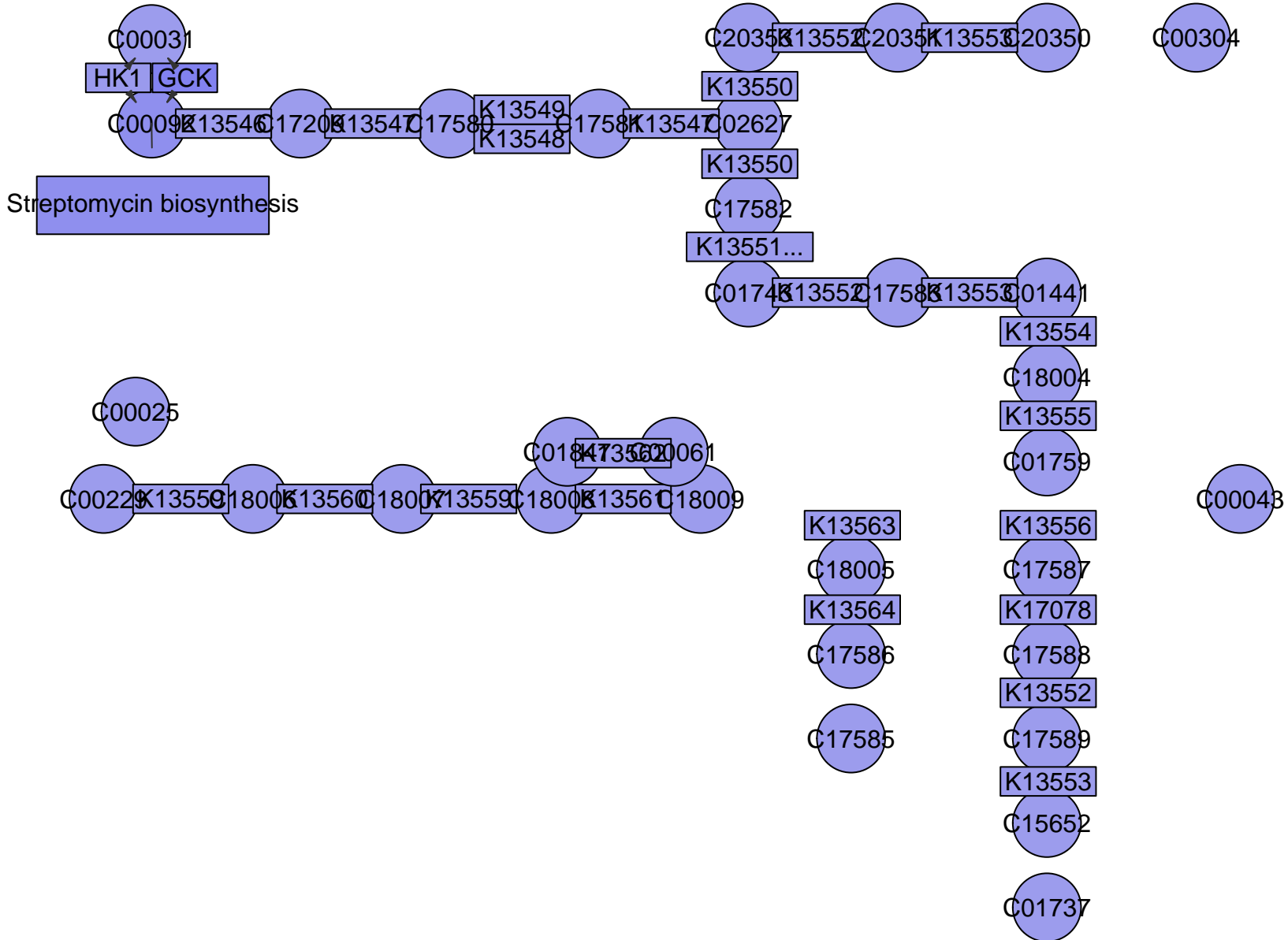
Butirosin and  
neomycin biosynthesis  
(genes with data)



Amino sugar and  
nucleotide sugar metabolism



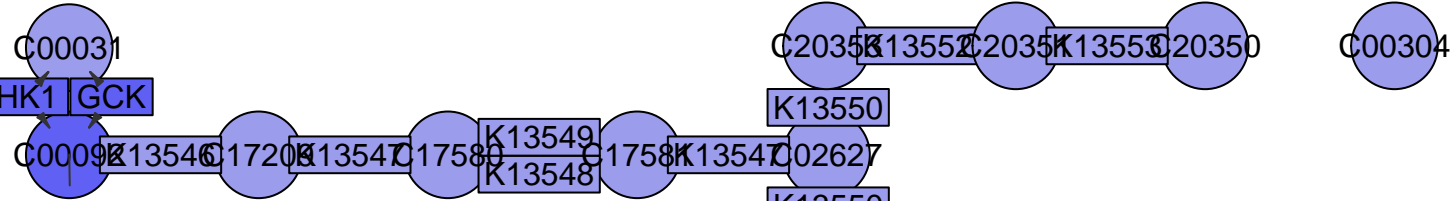
Butirosin and  
neomycin biosynthesis  
MPI-001



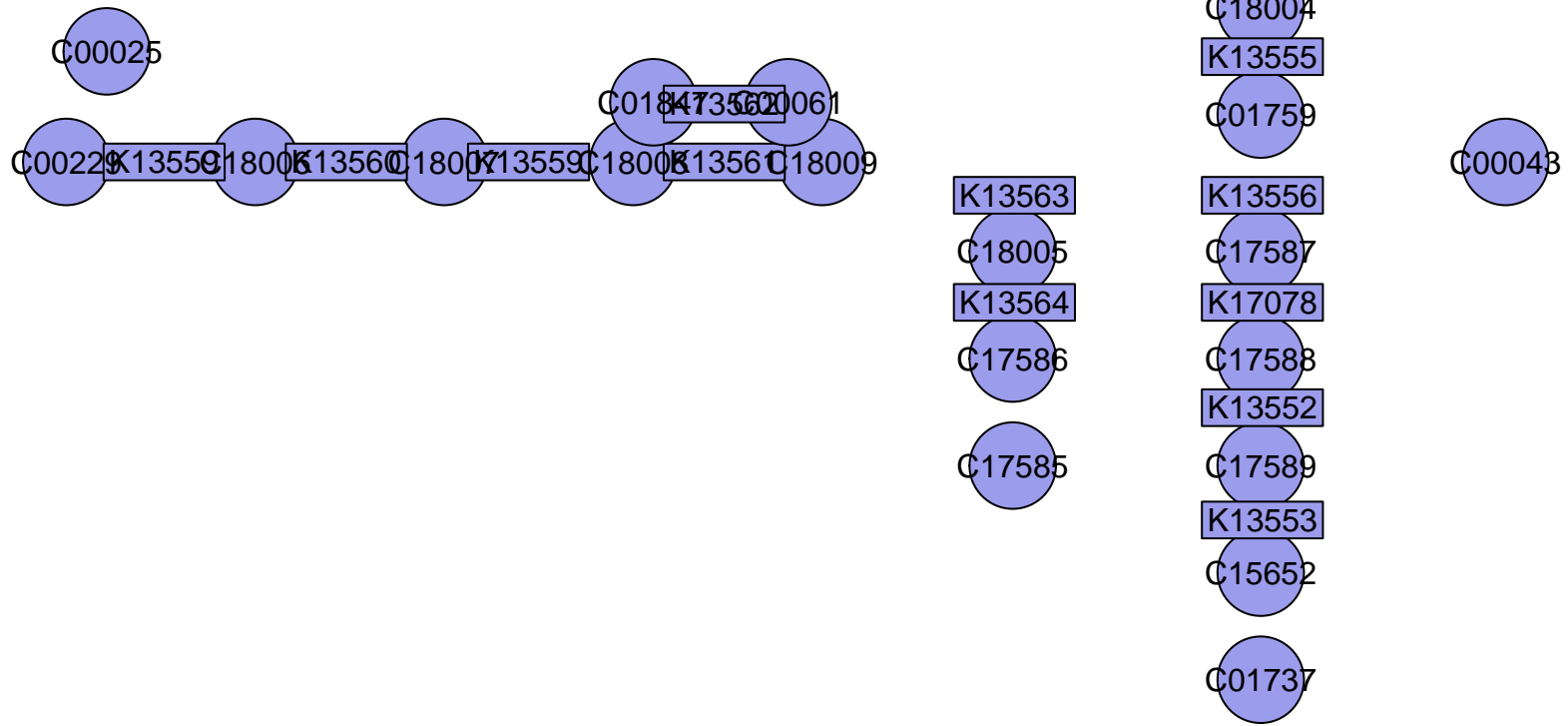
Streptomycin biosynthesis

Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-002



Streptomycin biosynthesis



Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-003

C00031

HK1 GCK

C00091

K13546

C17208

K13547

C17580

K13549  
K13548

C17581

K13547

C02627

K13550

C17582

K13551...

C01748

K13552

C17583

K13553

C01441

K13554

C18004

K13555

C01759

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

C01737

C20358

K13552

C20359

K13553

C20350

C00304

Streptomycin biosynthesis

C00025

C00229

K13559

C18006

K13560

C18007

K13559

C18008

K13561

C18009

C01847  
K13562

C01848

C01061

K13563

C18005

K13564

C17586

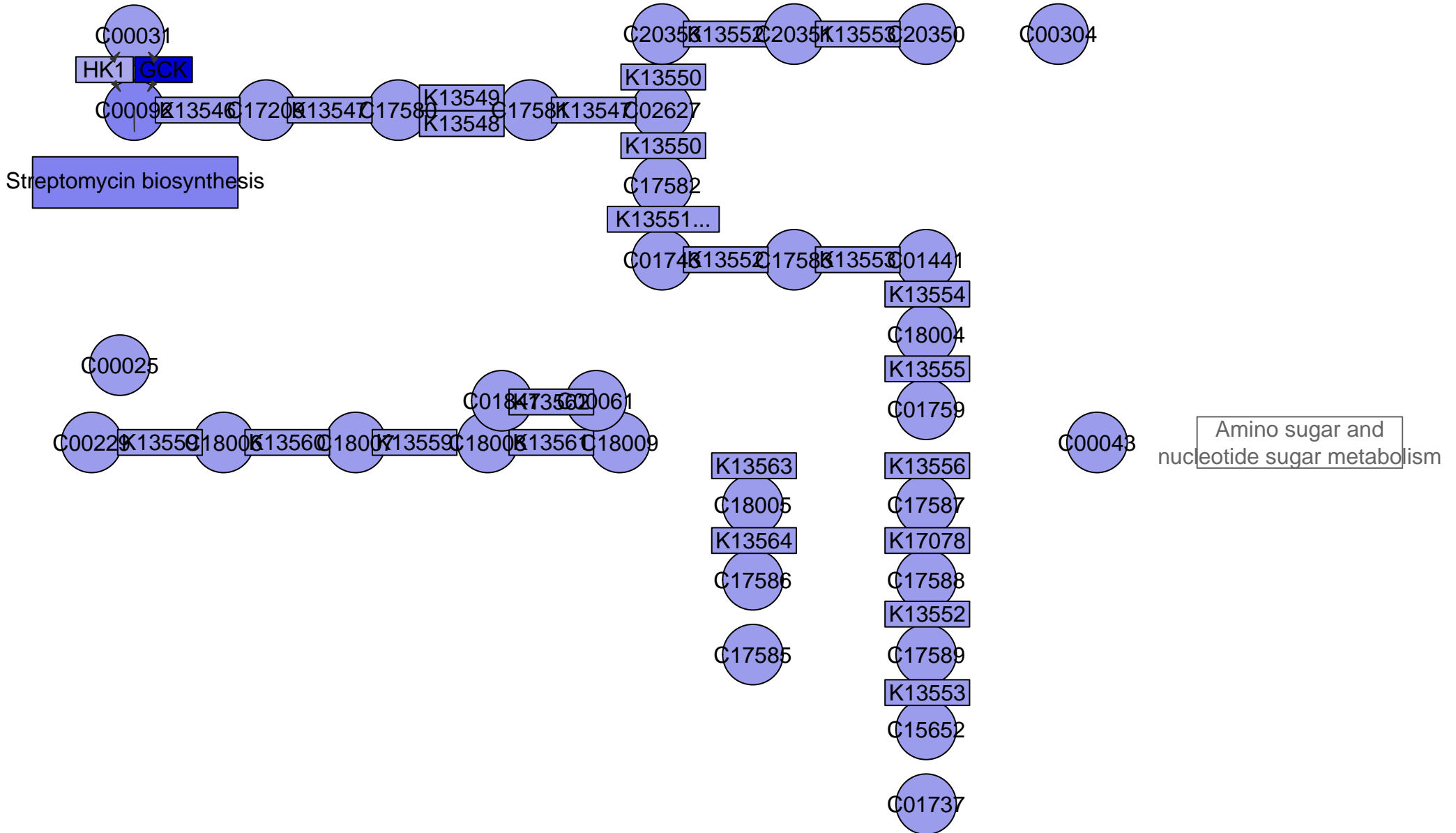
C17585

C00043

Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-006





Butirosin and  
neomycin biosynthesis  
MPI-016

C00031  
HK1 GCK

C00099

K13546

C17208

K13547

C17580

K13549  
K13548

C17581

K13547

C02627

K13550

K13551...

C01748

K13552

C17583

K13553

C01441

K13554

C18004

K13555

C01759

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

C01737

C20358

K13552

C20359

K13553

C20350

C00304

Streptomycin biosynthesis

C00025

C00229

K13559

C18006

K13560

C18007

K13559

C18008

K13561

C18009

C01847  
K13562

C18008

K13561

C18009

K13563

C18005

K13564

C17586

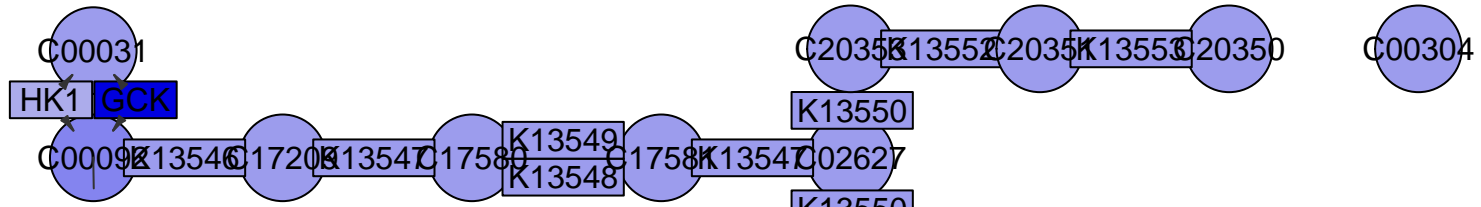
C17585

C00043

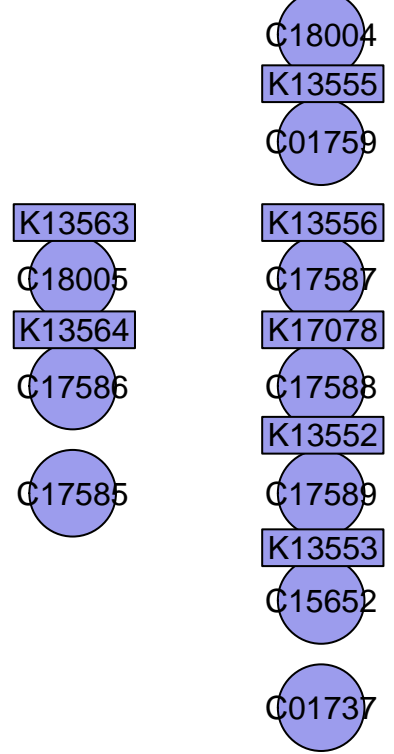
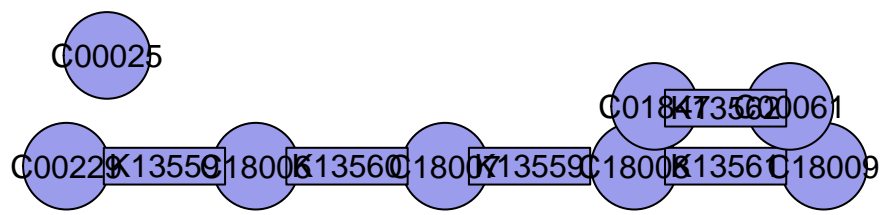
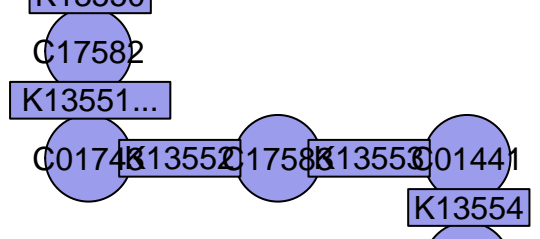
Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-018



Streptomycin biosynthesis



Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-027

C00031

HK1 | GCK

C00099

K13546

C17208

K13547

C17589

K13549  
K13548

C17588

K13547

C02627

C20358

K13552

C20358

K13553

C20350

C00304

K13550

K13550

C17582

K13551...

C01748

K13552

C17588

K13553

C01441

K13554

C18004

K13555

C01759

C00025

C01847

K13562

C01061

C00229

K13559

C18006

K13560

C18007

K13559

C18008  
K13561

K13563

C18005

K13564

C17586

C17585

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

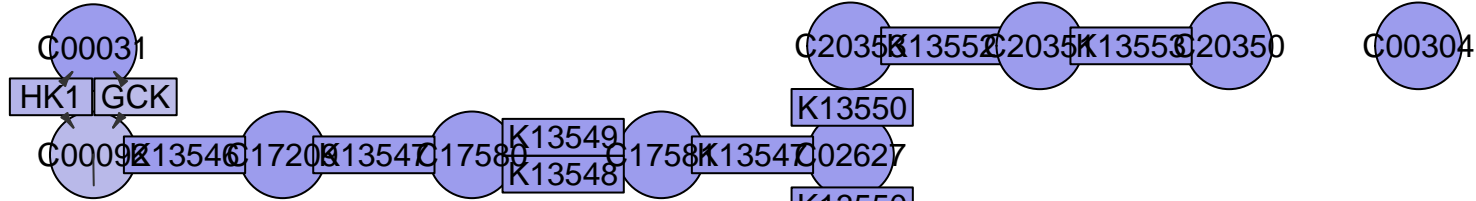
C01737

C00043

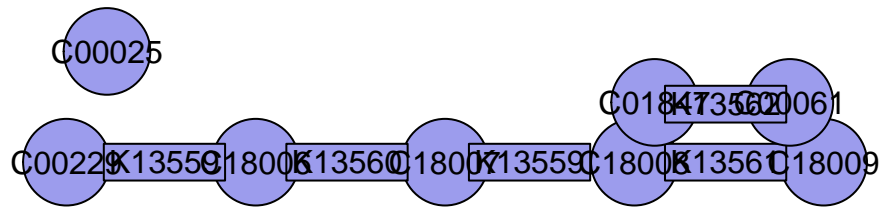
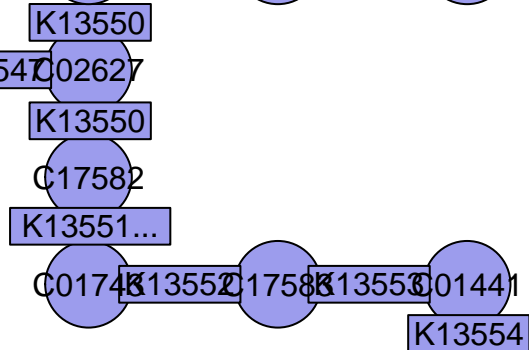
Amino sugar and  
nucleotide sugar metabolism

Streptomycin biosynthesis

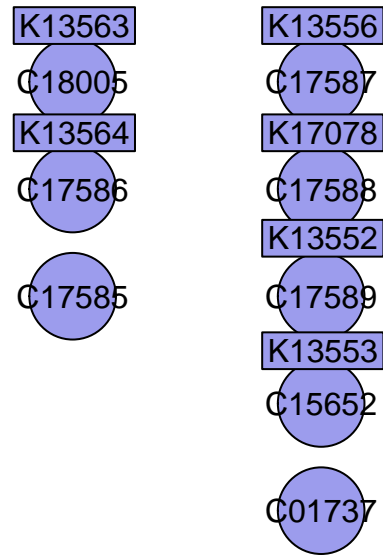
Butirosin and  
neomycin biosynthesis  
MPI-028



Streptomycin biosynthesis

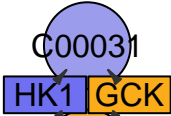


Amino sugar and  
nucleotide sugar metabolism

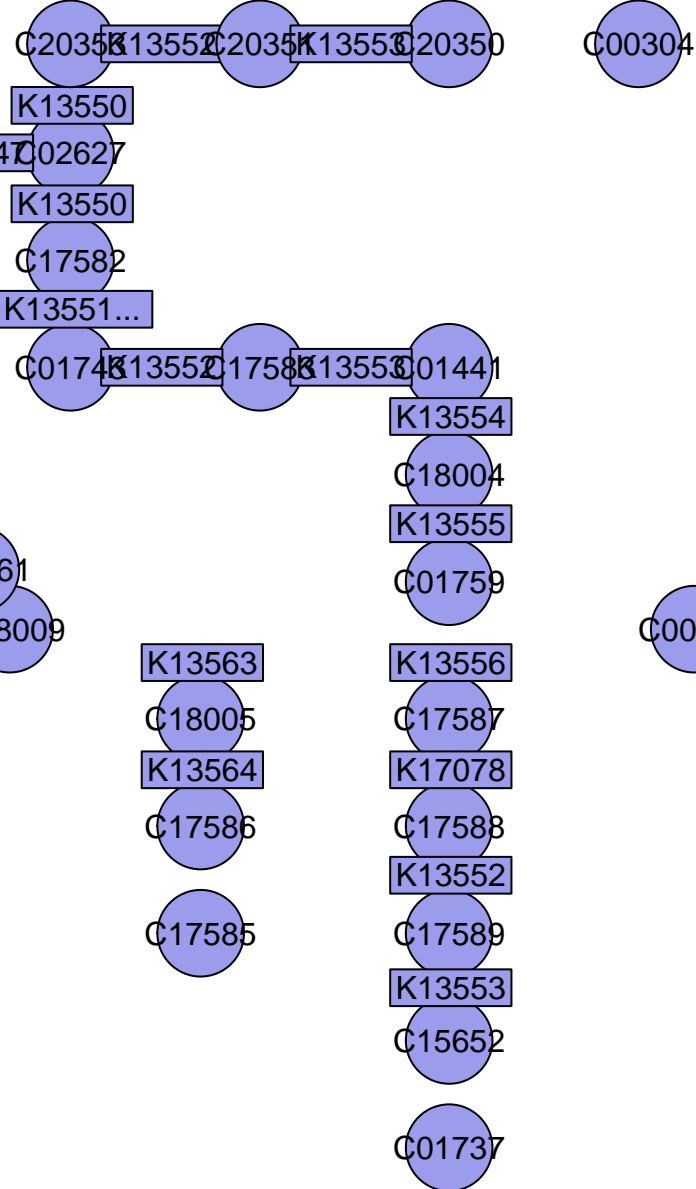
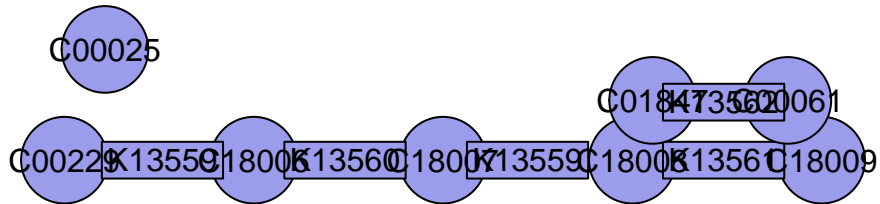




Butirosin and  
neomycin biosynthesis  
MPI-033

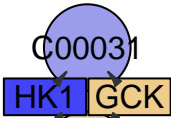


Streptomycin biosynthesis



Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-034



C00031

C00099



C00099

K13546

C17208

K13547

C17580

K13549

K13548

C17581

K13547

C02627

K13550

K13550

C17582

K13551...

C01748

K13552

C17583

K13553

C01441

K13554

C18004

K13555

C01759

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

C01737

C20358

K13552

C20359

K13553

C20350

C00304

Streptomycin biosynthesis

C00025

C00229

K13559

C18006

K13560

C18007

K13559

C18008

K13561

C18009

C01847

K13562

C01061

K13563

C18005

K13564

C17586

C17585

C00043

Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-043

C00031

HK1 GCK

C00099

K13546

C17208

K13547

C17580

K13549

K13548

C17581

K13547

C02627

K13550

C17582

K13551...

C01748

K13552

C17583

K13553

C01441

K13554

C18004

K13555

C01759

C00043

K13556

C17587

K13563

C18005

K13564

C17586

C17585

C17588

K13552

C17589

K13553

C15652

C01737

C20358

K13552

C20359

K13553

C20350

C00304

K13550

K13550

C17582

K13551...

C01748

K13552

C17583

K13553

C01441

K13554

C18004

K13555

C01759

C00043

K13556

C17587

K13563

C18005

K13564

C17586

C17585

C17588

K13552

C17589

K13553

C15652

C01737

Streptomycin biosynthesis

Amino sugar and  
nucleotide sugar metabolism

C00025

C00229

K13559

C18006

K13560

C18007

K13559

C18008

K13562

C18009

C01847

K13562

C01848

K13561

C01849

K13562

C01850

K13561

C01851

K13562

C01852

K13561

C01853

K13562

C01854

K13561

C01855

K13562

C01856

K13561

C01857

K13562

C01858

K13561

C01859

K13562

C01860

K13561

C01861

K13562

C01862

K13561

C01863

K13562

C01864

K13561

C01865

K13562

C01866

K13561

C01867

K13562

C01868

K13561

C01869

K13562

C01870

K13561

C01871

K13562

C01872

K13561

C01873

K13562

C01874

K13561

C01875

K13562

C01876

K13561

C01877

K13562

C01878

K13561

C01879

K13562

C01880

K13561

C01881

K13562

C01882

K13561

C01883

K13562

C01884

K13561

C01885

K13562

C01886

K13561

C01887

K13562

C01888

K13561

C01889

K13562

C01890

K13561

C01891

K13562

C01892

K13561

C01893

K13562

C01894

K13561

C01895

K13562

C01896

K13561

C01897

K13562

C01898

K13561

C01899

K13562

C01900

K13561

C01901

K13562

C01902

K13561

C01903

K13562

C01904

K13561

C01905

K13562

C01906

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C01907

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C01908

K13561

C01909

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C01910

K13561

C01911

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C01912

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C01913

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C01914

K13561

C01915

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C01916

K13561

C01917

K13562

C01918

K13561

C01919

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C01920

K13561

C01921

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C01922

K13561

C01923

K13562

C01924

K13561

C01925

K13562

C01926

K13561

C01927

K13562

C01928

K13561

C01929

K13562

C01930

K13561

C01931

K13562

C01932

K13561

C01933

K13562

C01934

K13561

C01935

K13562

C01936

K13561

C01937

K13562

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C01941

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C01942

K13561

C01943

K13562

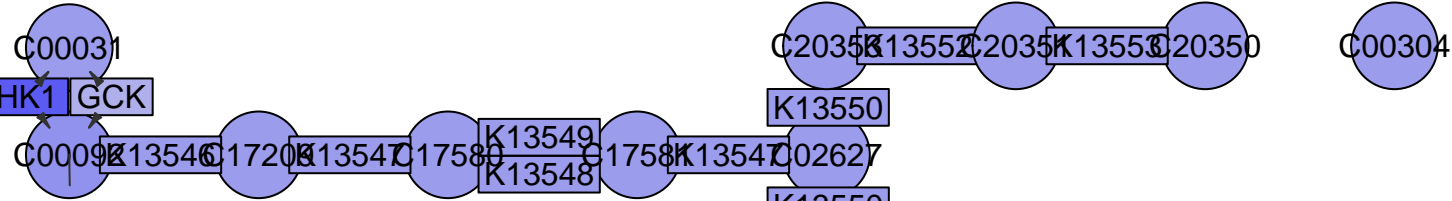
C01944

K13561

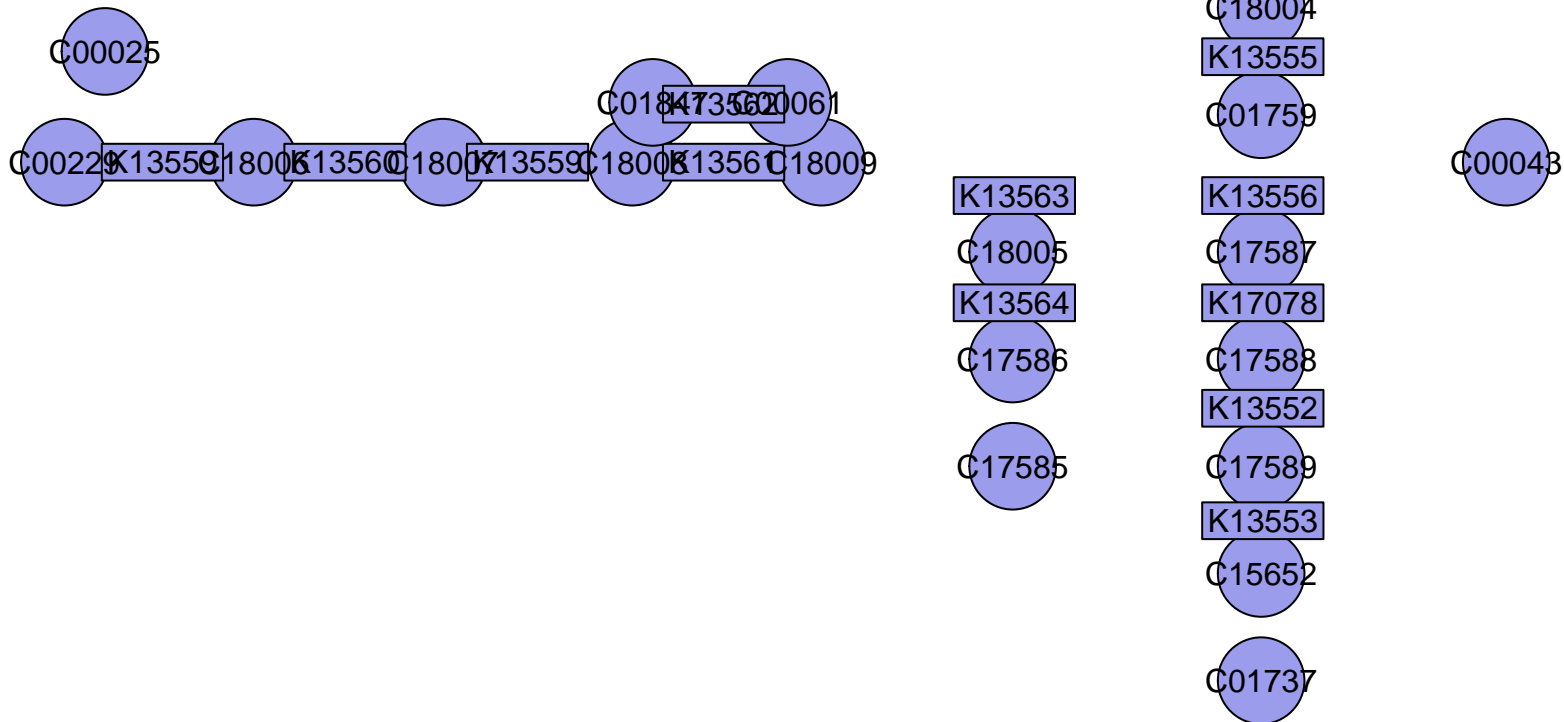
C01945

K13562

Butirosin and  
neomycin biosynthesis  
MPI-044



Streptomycin biosynthesis



Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-048

C00031

HK1 GCK

C00099

K13546

C17208

K13547

C17589

K13549  
K13548

C17588

K13547

C02627

K13550

C17582

K13551...

C01748

K13552

C17588

K13553

C01441

K13554

C18004

K13555

C01759

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

C01737

C00304

C20358

K13552

C20358

K13553

C20350

Streptomycin biosynthesis

C00025

C00229

K13559

C18006

K13560

C18007

K13559

C18008

K13561

C18009

C01847  
K13562

C01847

K13562

K13563

C18005

K13564

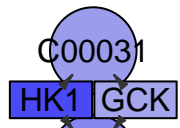
C17586

C17585

C00043

Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-055



C00031

C00091

K13546

C17206

K13547

C17589

K13548

C17588

K13549

C17587

K13547

C02627

K13550

K13550

C17582

K13551...

C01748

K13552

C17583

K13553

C01441

K13554

K13554

C18004

K13555

C01759

K13556

K13563

C18005

K13564

C17586

C17585

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

C01737

C00304

Streptomycin biosynthesis

C00025

C00229

K13559

C18006

K13560

C18007

K13559

C18008

K13561

C18009

C01847

K13562

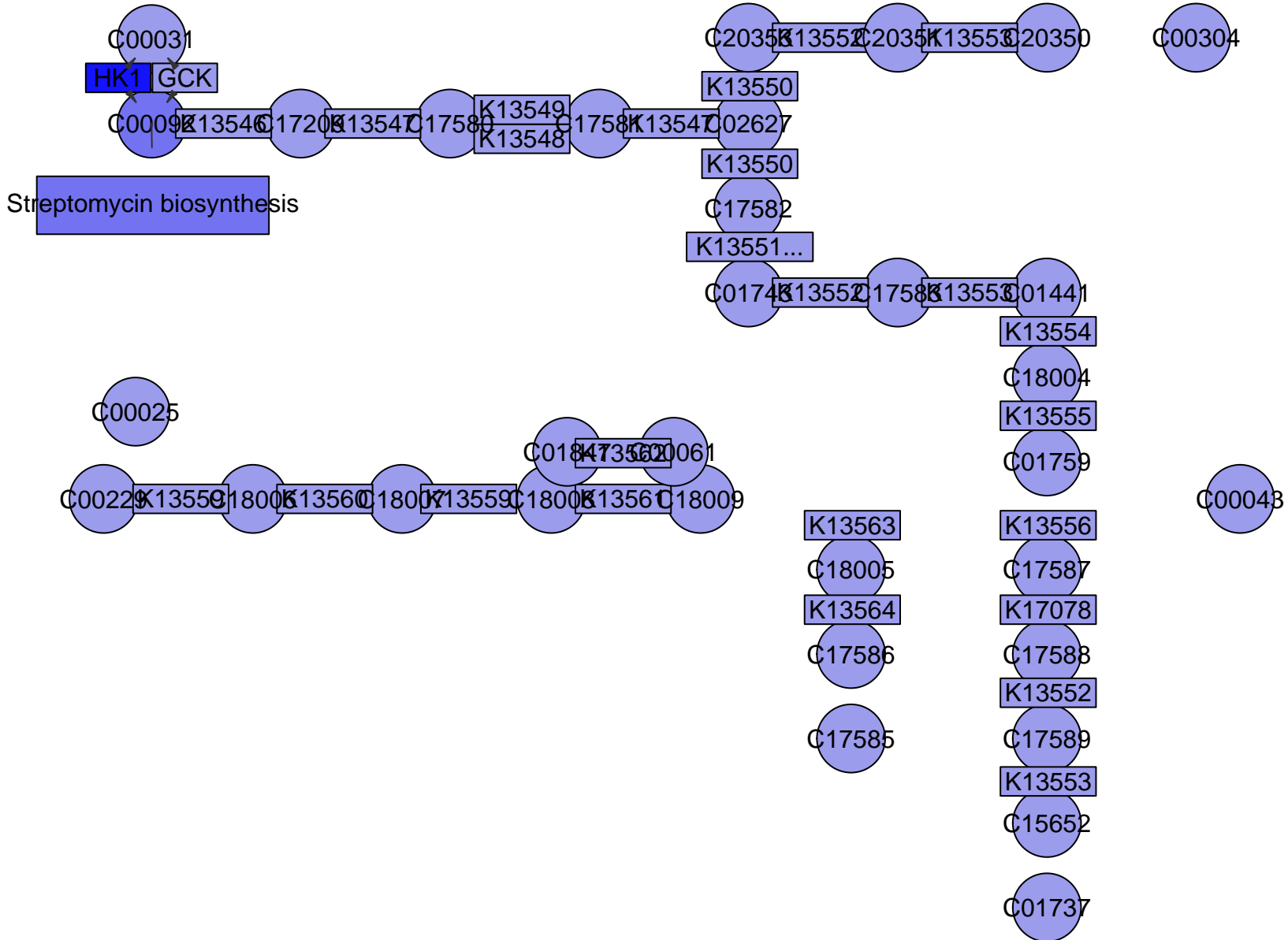
C01061

C00043

Amino sugar and  
nucleotide sugar metabolism

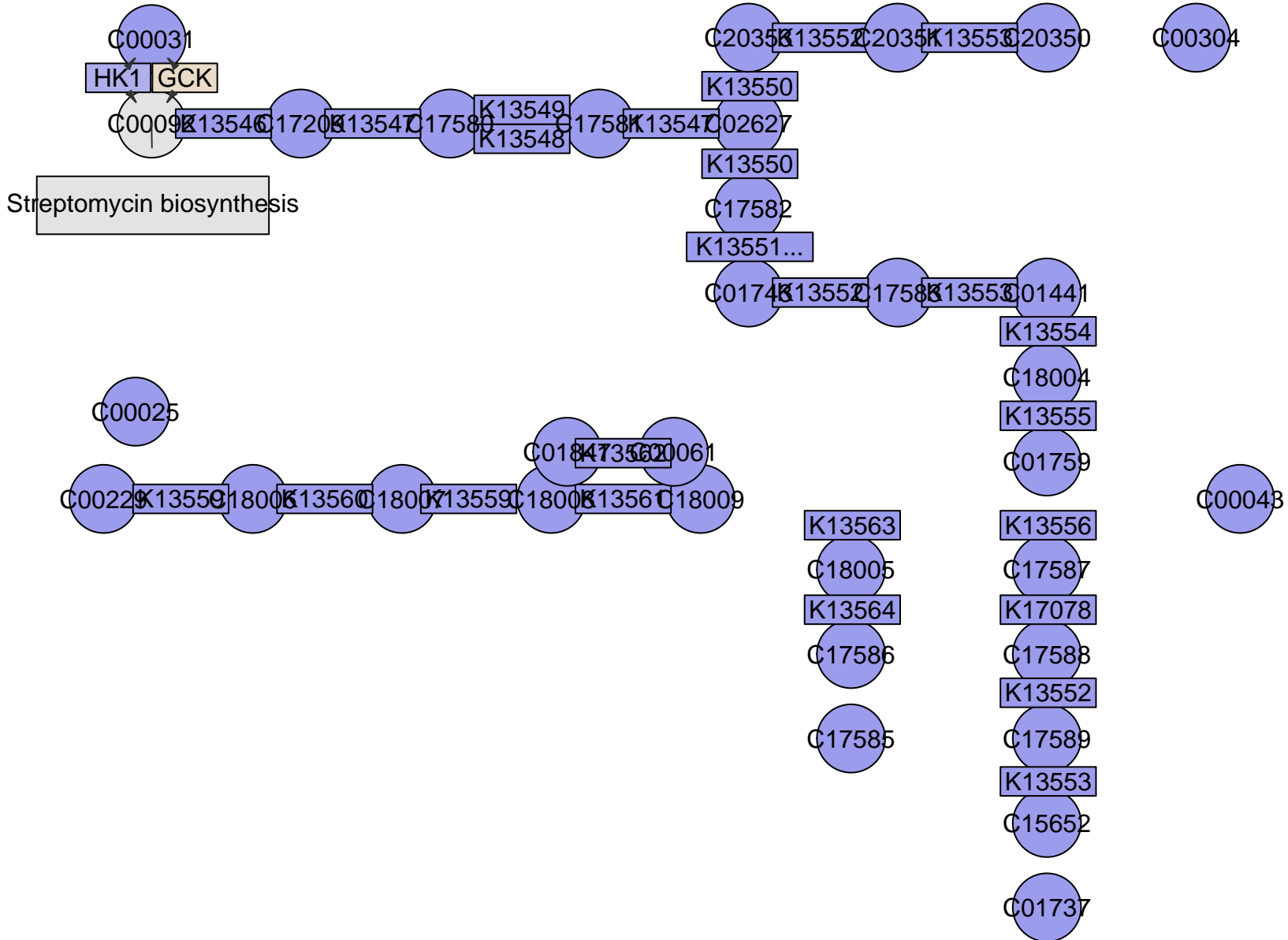


Butirosin and  
neomycin biosynthesis  
MPI-071





Butirosin and  
neomycin biosynthesis  
MPI-077



Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-078

C00031  
HK1 GCK

C00099

K13546

C17208

K13547

C17580

K13549  
K13548

C17581

K13547

C02627

K13550

C17582

K13551...

C01748

K13552

C17583

K13553

C01441

K13554

C18004

K13555

C01759

C00043

Streptomycin biosynthesis

C00025

C00229

K13559

C18006

K13560

C18007

K13559

C18008

K13561

C18009

C01847  
K13562

K13563

C18005

K13564

C17586

C17585

K13556

C17587

K17078

C17588

K13552

C17589

K13553

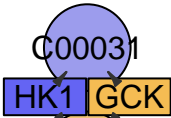
C15652

C01737

Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-080



C00031

C00099

K13546

C17208

K13547

C17580

K13549

K13548

C17581

K13547

C02627

K13550

C20358

K13552

C20359

K13553

C20350

C00304

Streptomycin biosynthesis

K13550

K13550

K13551...

C17582

C01748

K13552

C17583

K13553

C01441

K13554

C18004

K13555

C01759

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

C01737

C00025

C00229

K13559

C18006

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C18009

C01847

K13562

C01061

K13563

C18005

K13564

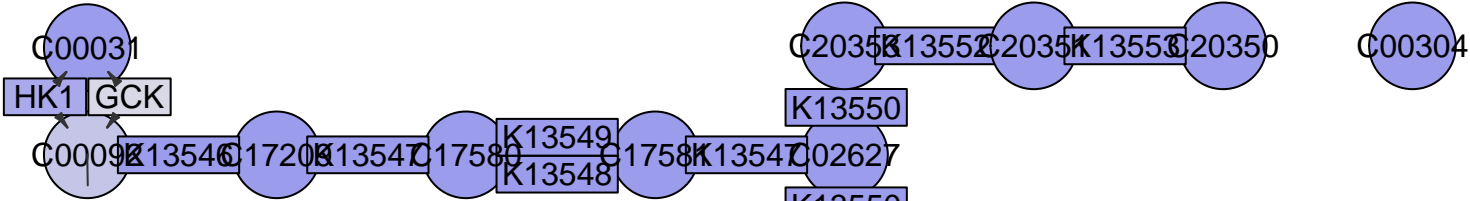
C17586

C17585

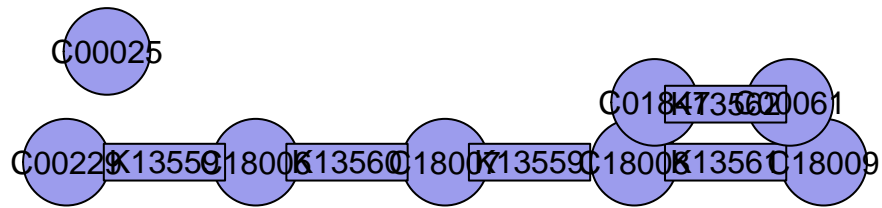
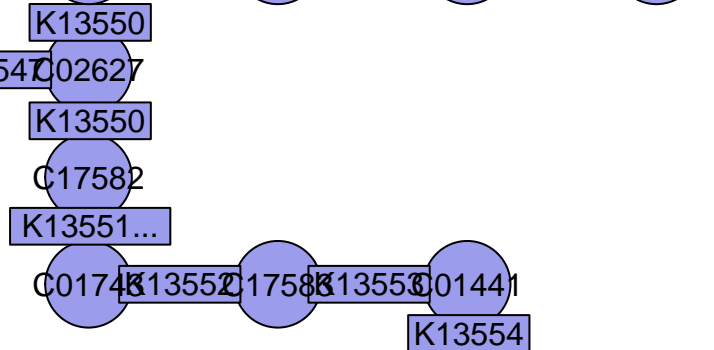
C00043

Amino sugar and  
nucleotide sugar metabolism

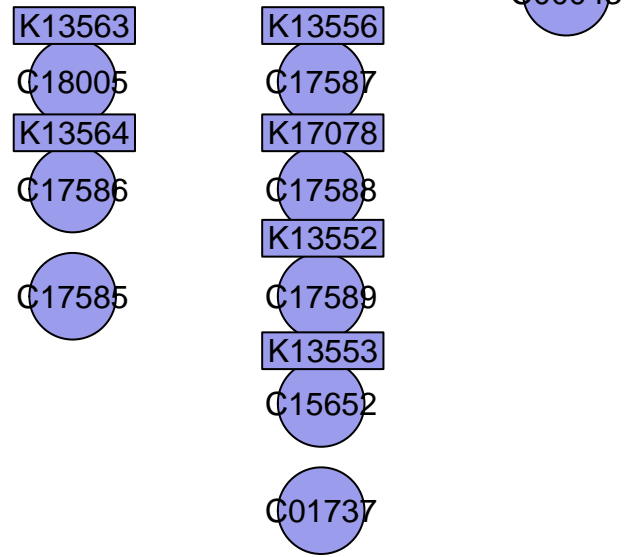
Butirosin and  
neomycin biosynthesis  
MPI-081



Streptomycin biosynthesis



Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-082

C00031  
HK1 GCK

C00099

K13546

C17208

K13547

C17580

K13549  
K13548

C17581

K13547

C02627

K13550

C17582

K13551...

C01748

K13552

C17583

K13553

C01441

K13554

C18004

K13555

C01759

C00025

C00229

K13556

C18006

K13560

C18007

K13559

C18008

K13562

C01809

K13561

C01806

K13562

C01807

K13562

C01806

K13562

C01806

K13562

C01806

K13562

C01806

K13562

C01806

K13562

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C01806

K13562

C01806

K13562

C01806

K13562

C01806

K13562

C01806

K13562

C01806

K13562

Streptomycin biosynthesis

C17582

K13551...

C01748

K13552

C17583

K13553

C01441

K13554

C18004

K13555

C01759

C00043

Amino sugar and  
nucleotide sugar metabolism

K13563

C18005

K13564

C17586

C17585

K13556

C17587

K17078

C17588

K13552

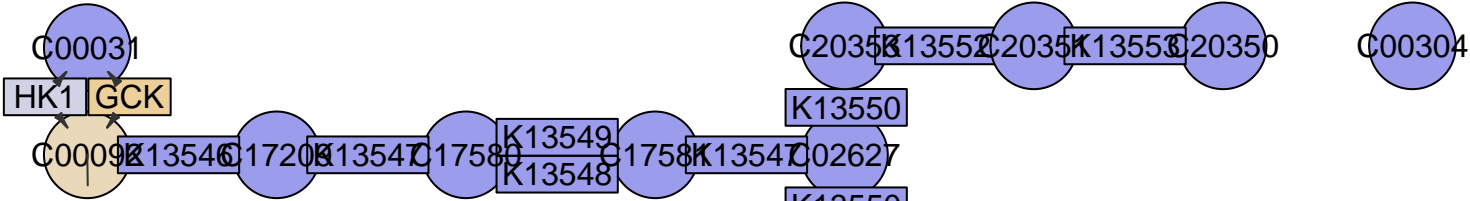
C17589

K13553

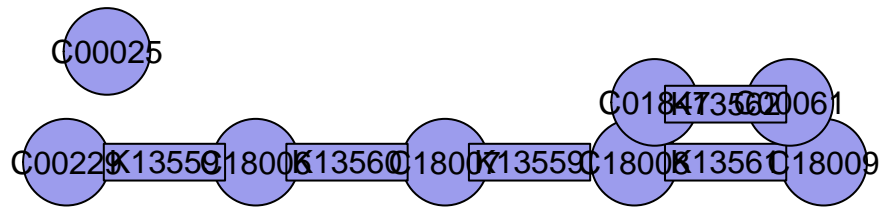
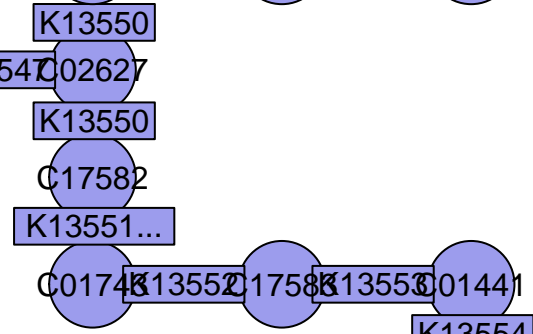
C15652

C01737

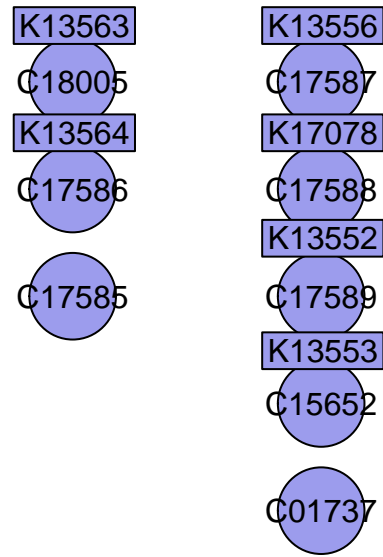
Butirosin and  
neomycin biosynthesis  
MPI-084



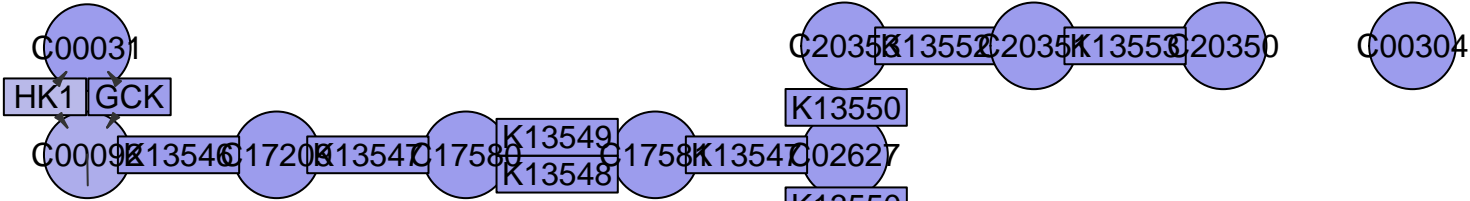
Streptomycin biosynthesis



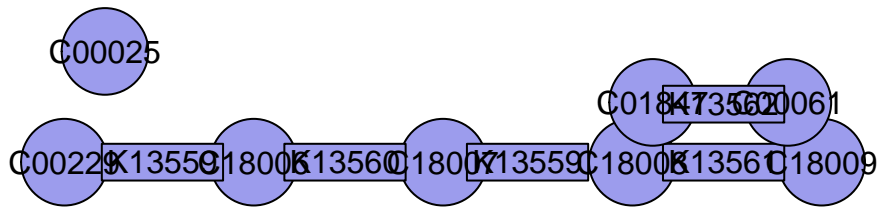
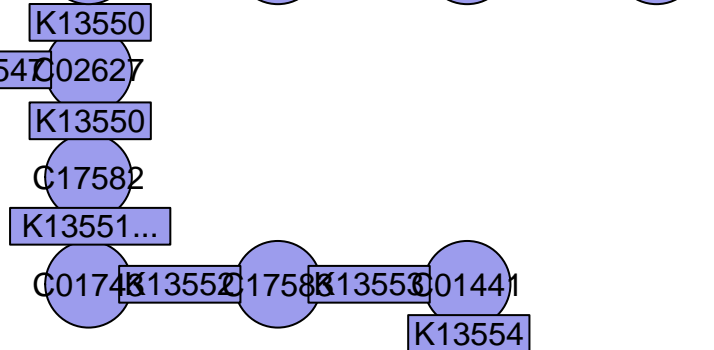
Amino sugar and  
nucleotide sugar metabolism



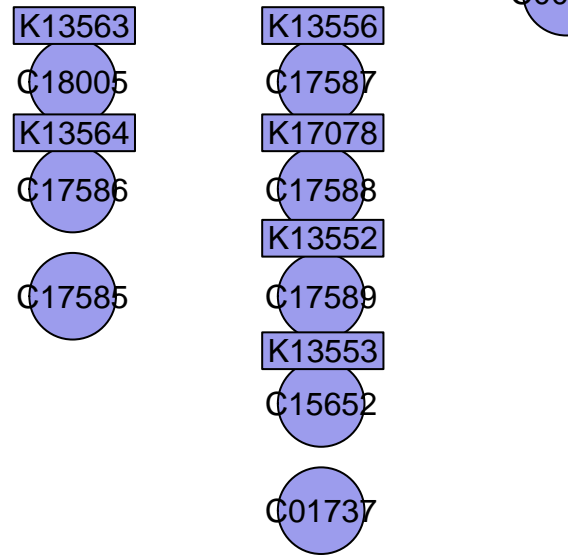
Butirosin and  
neomycin biosynthesis  
MPI-085



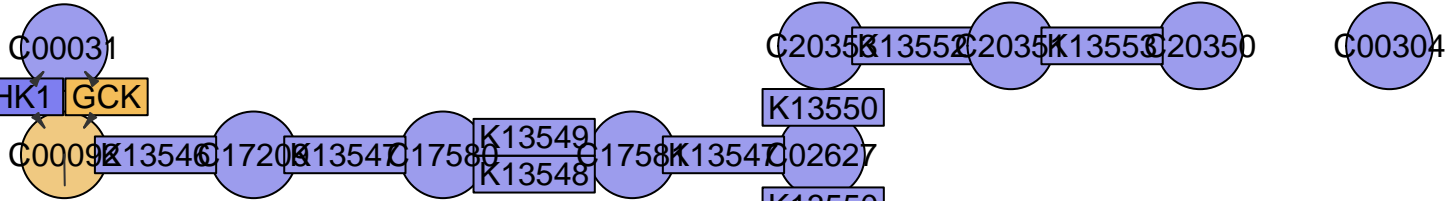
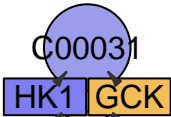
Streptomycin biosynthesis



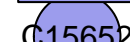
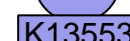
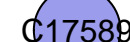
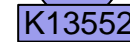
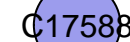
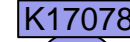
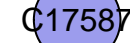
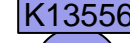
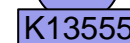
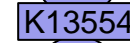
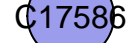
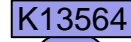
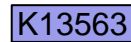
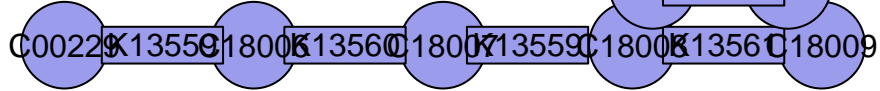
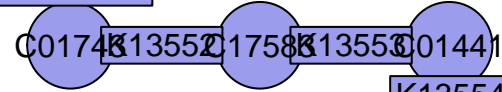
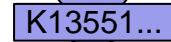
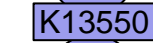
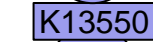
Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-086



Streptomycin biosynthesis



Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-087

C00031  
HK1 GCK

C00099

K13546

C17208

K13547

C17580

K13549

K13548

C17581

K13547

C02627

K13550

K13550

C17582

K13551...

C01748

K13552

C17583

K13553

C01441

K13554

C18004

K13555

C01759

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

C01737

C00304

Streptomycin biosynthesis

C00025

C00229

K13559

C18006

K13560

C18007

K13559

C18008

K13561

C18009

C01847

K13562

K13563

C18005

K13564

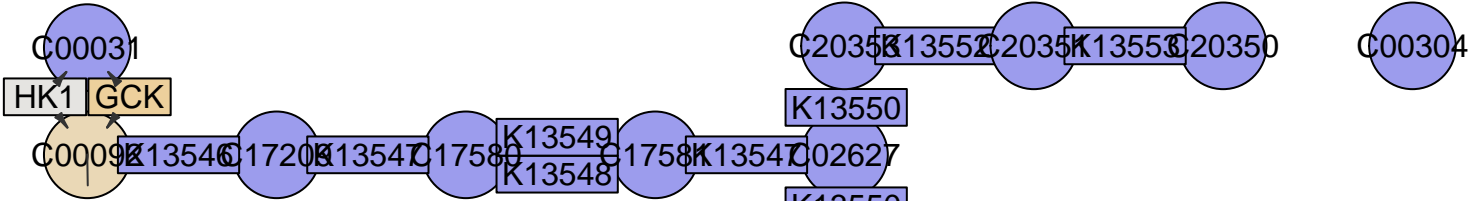
C17586

C17585

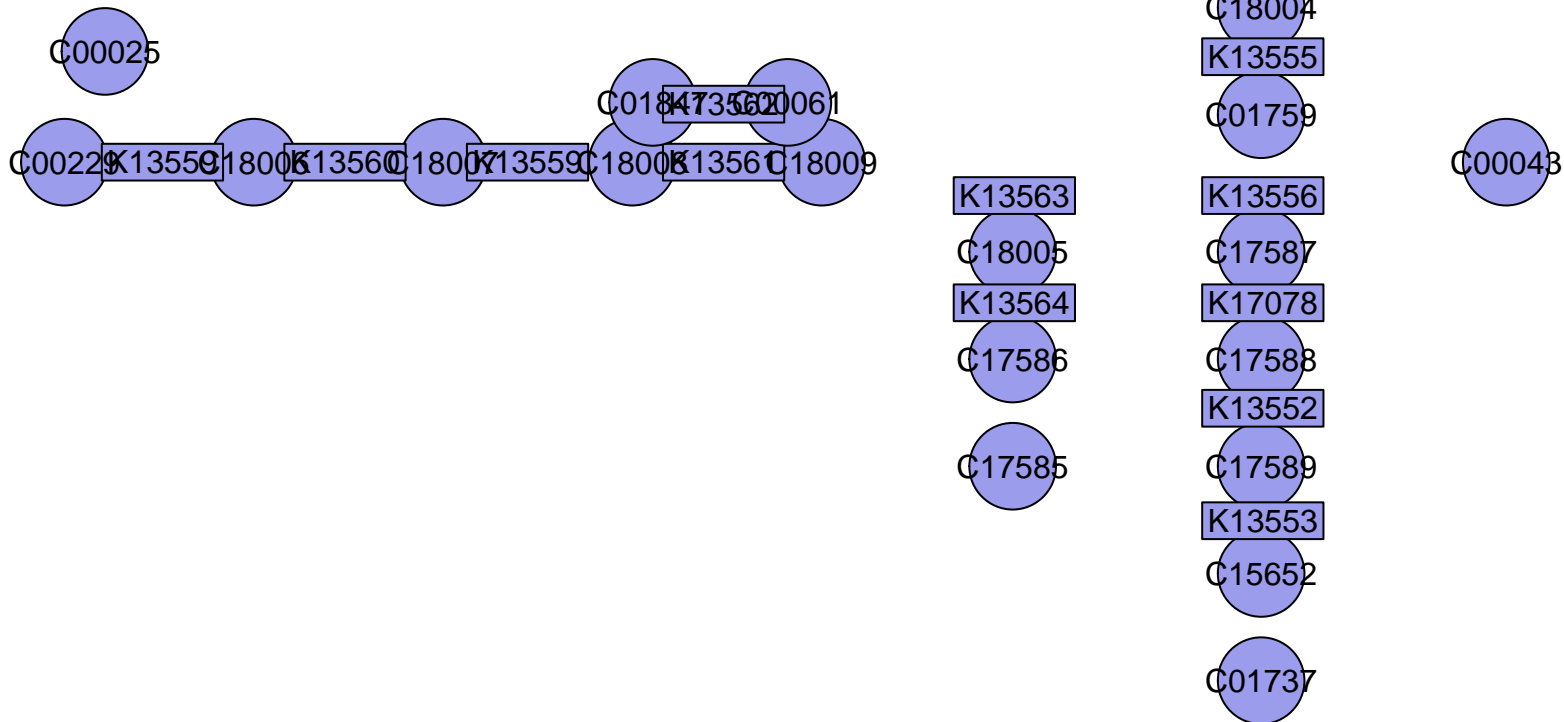
C00043

Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-089



Streptomycin biosynthesis



Amino sugar and  
nucleotide sugar metabolism





Butirosin and  
neomycin biosynthesis  
MPI-095

C00031  
HK1 GCK

C00099

K13546

C17208

K13547

C17580

K13549  
K13548

C17581

K13547

C02627

K13550

K13551...

C01748

K13552

C17583

K13553

C01441

K13554

C18004

K13555

C01759

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

C01737

C20358

K13552

C20359

K13553

C20350

C00304

Streptomycin biosynthesis

C00025

C00229

K13559

C18006

K13560

C18007

K13559

C18008

K13561

C18009

C01847  
K13562

C01848

C01061

K13563

C18005

K13564

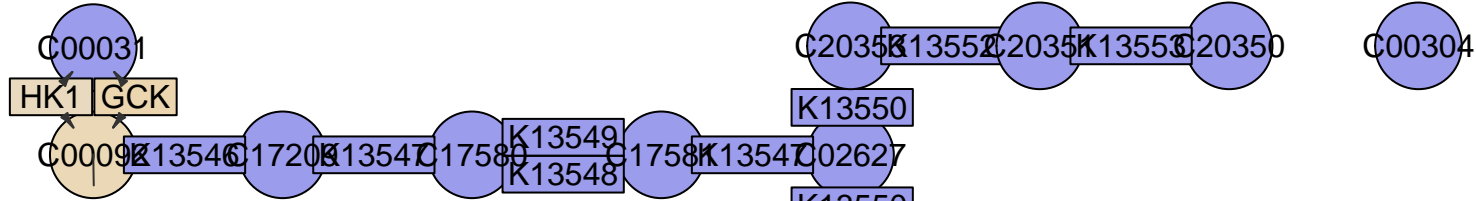
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C17585

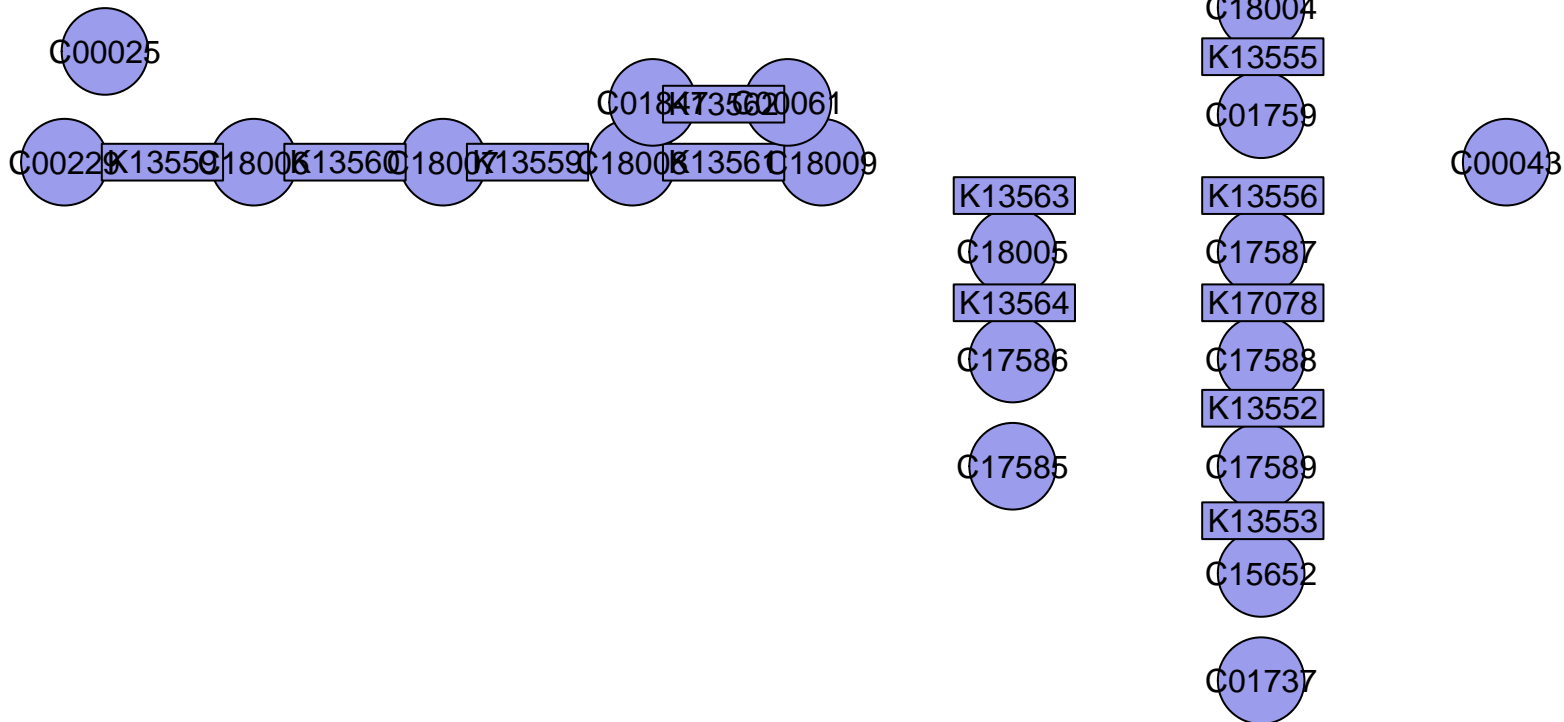
C00043

Amino sugar and  
nucleotide sugar metabolism

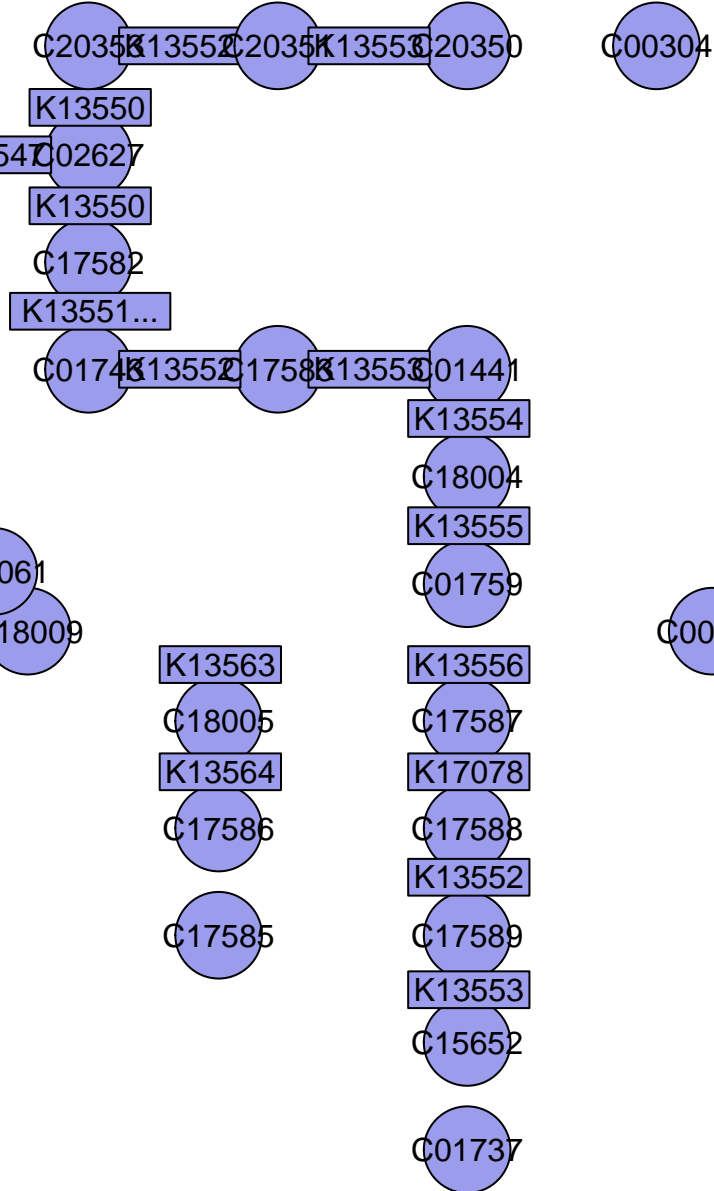
Butirosin and  
neomycin biosynthesis  
MPI-101



Streptomycin biosynthesis

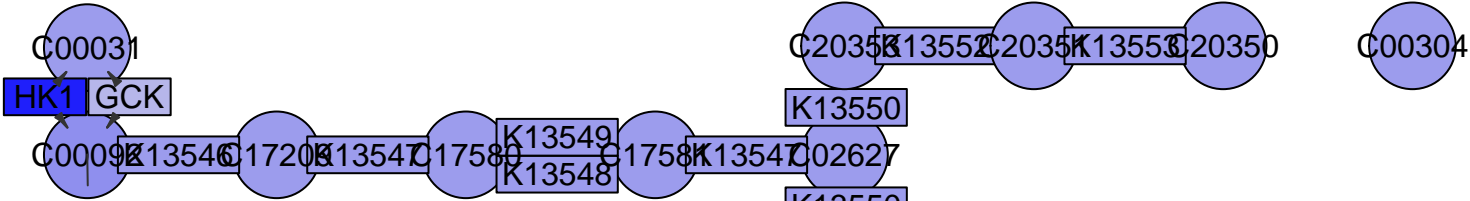


Amino sugar and  
nucleotide sugar metabolism

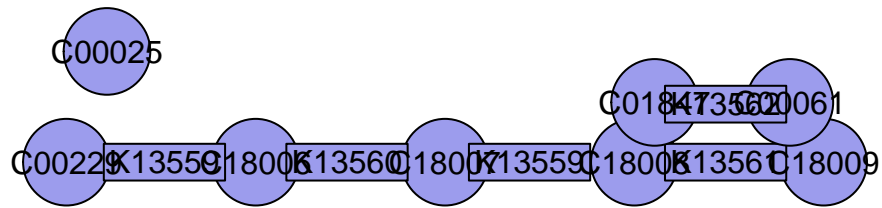
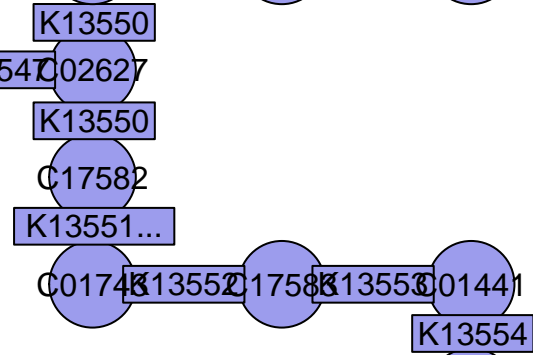




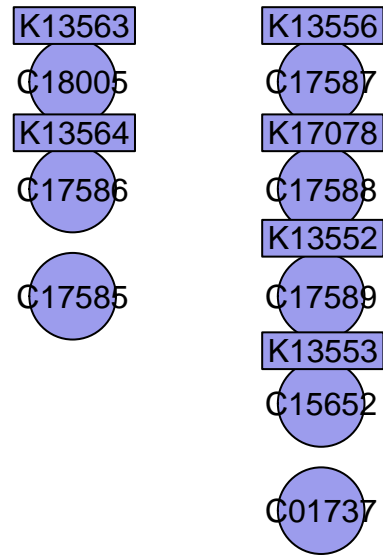
Butirosin and  
neomycin biosynthesis  
MPI-123



Streptomycin biosynthesis



Amino sugar and  
nucleotide sugar metabolism





Butirosin and  
neomycin biosynthesis  
MPI-138

C00031

HK1 GCK

C00099

K13546

C17208

K13547

C17580

K13549  
K13548

C17581

K13547

C02627

C20358

K13552

C20359

K13553

C20350

C00304

Streptomycin biosynthesis

K13550

K13550

C17582

K13551...

C01748

K13552

C17583

K13553

C01441

C00025

C01847  
K13562

C01061

C00229

K13559

C18006

K13560

C18007

K13559

C18008  
K13561

C18009

K13554

C18004

K13555

C01759

C00043

Amino sugar and  
nucleotide sugar metabolism

K13563

C18005

K13564

C17586

C17585

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

C01737

Butirosin and  
neomycin biosynthesis  
MPI-139

C00031

HK1 GCK

C00099

K13546

C17208

K13547

C17589

K13549  
K13548

C17588

K13547

C02627

K13550

C17582

K13551...

C01748

K13552

C17588

K13553

C01441

K13554

C18004

K13555

C01759

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

C01737

C00304

C20358

K13552

C20358

K13553

C20350

Streptomycin biosynthesis

C00025

C00229

K13559

C18006

K13560

C18007

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C18008

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C18009

C01847

K13562

C01061

K13563

C18005

K13564

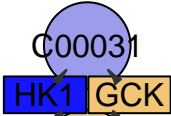
C17586

C17585

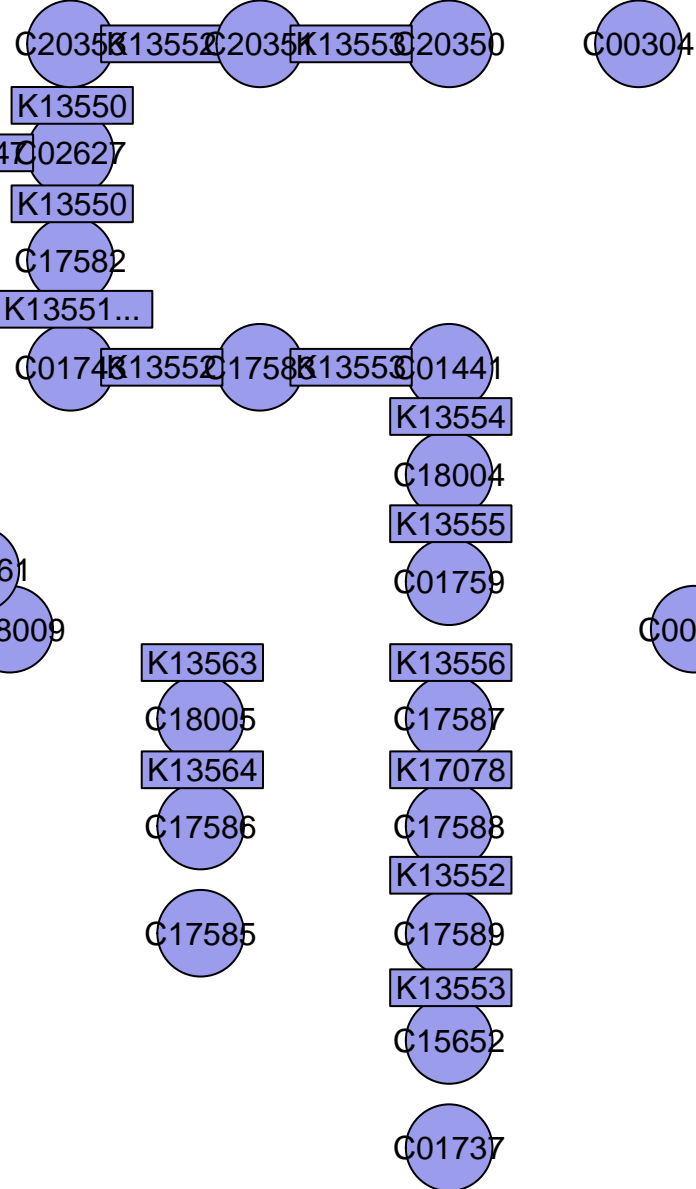
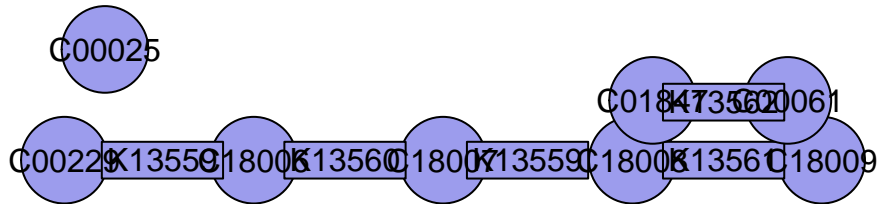
C00043

Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-140



Streptomycin biosynthesis



Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-144

C00031

HK1 GCK

C00099

K13546

C17208

K13547

C17589

K13549  
K13548

C17588

K13547

C02627

C20358

K13552

C20359

K13553

C20350

C00304

K13550

K13550

C17582

K13551...

C01748

K13552

C17583

K13553

C01441

K13554

C18004

K13555

C01759

C00025

C01847

K13560

C01061

C00229

K13559

C18006

K13560

C18007

K13559

C18008  
K13561

K13563

C18005

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C17586

C17585

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

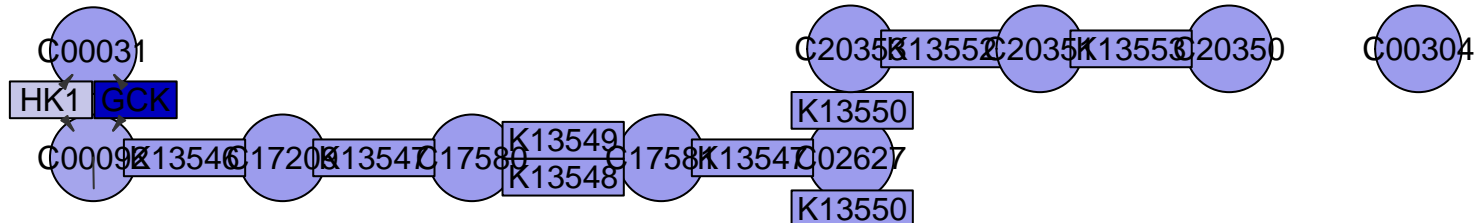
C01737

C00043

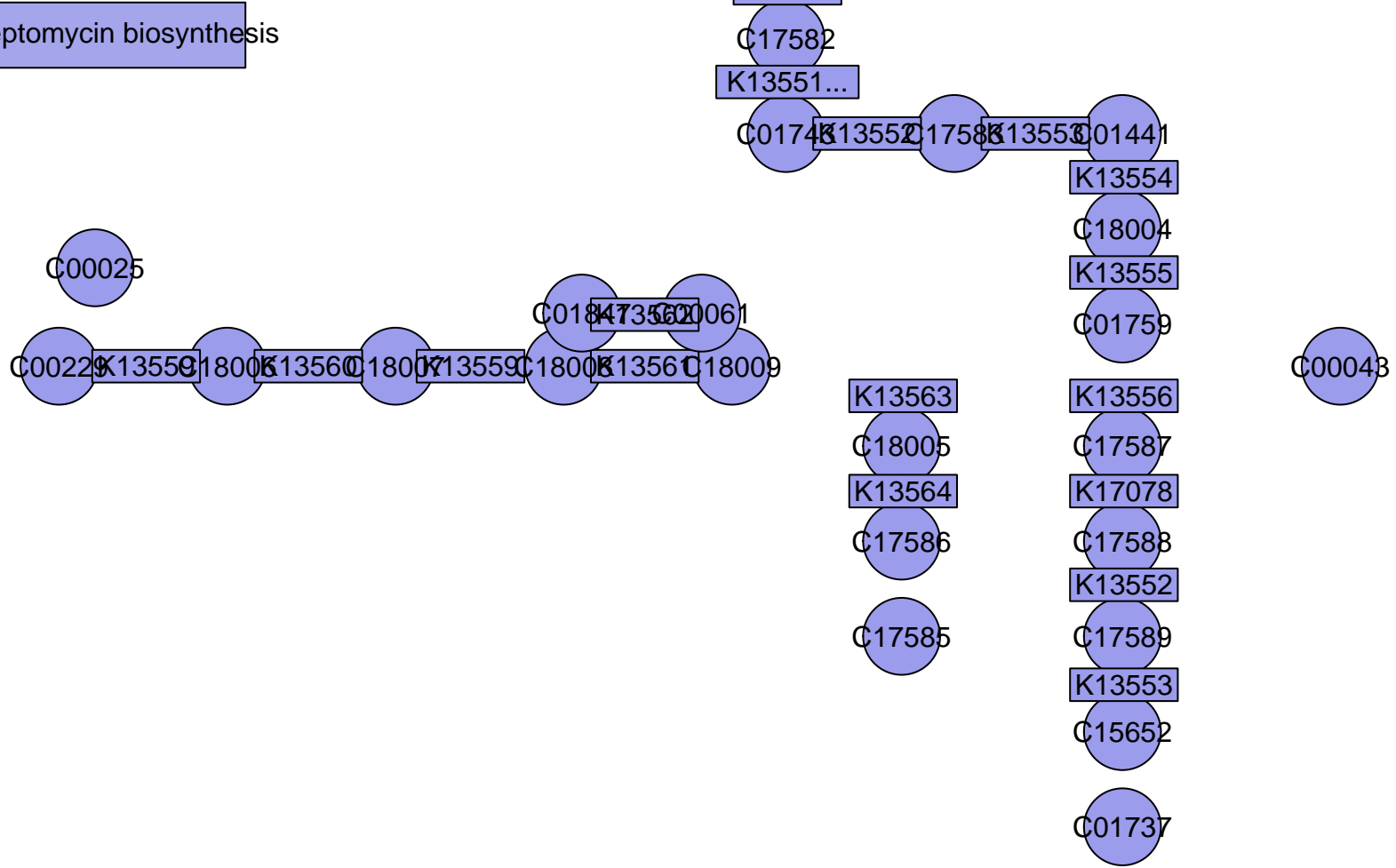
Amino sugar and  
nucleotide sugar metabolism

Streptomycin biosynthesis

Butirosin and  
neomycin biosynthesis  
MPI-147

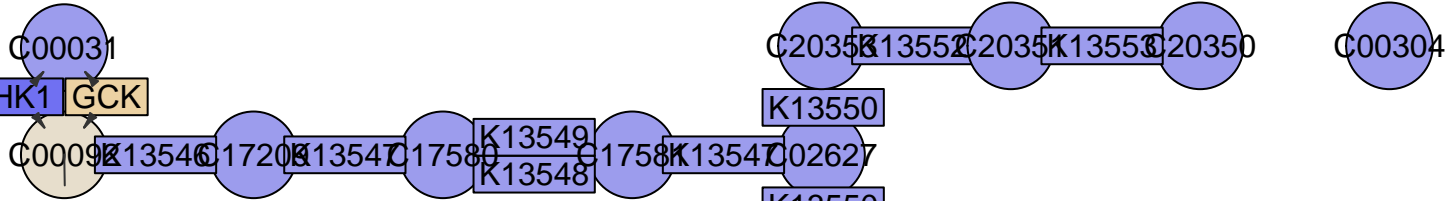
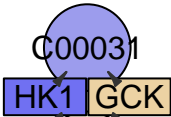


Streptomycin biosynthesis

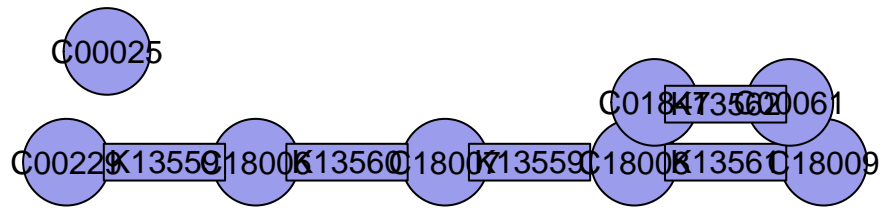
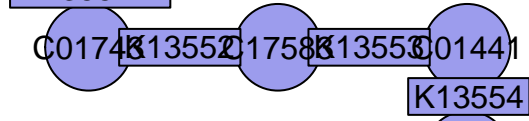
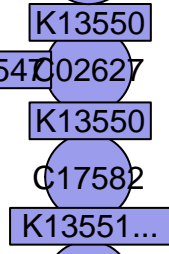


Amino sugar and  
nucleotide sugar metabolism

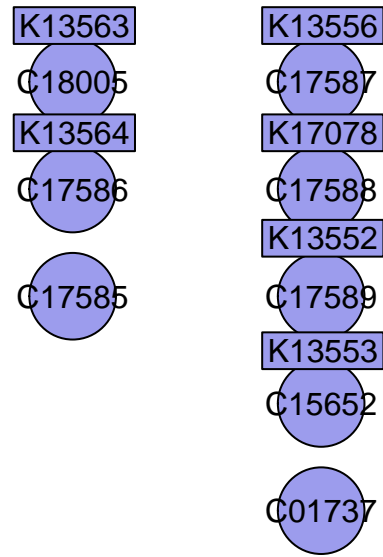
Butirosin and  
neomycin biosynthesis  
MPI-171



Streptomycin biosynthesis

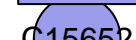
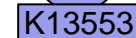
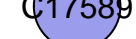
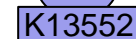
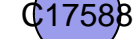
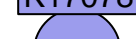
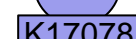
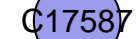
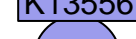
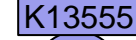
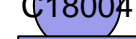
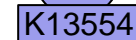
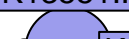
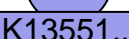
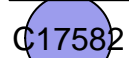
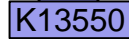
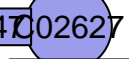
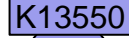
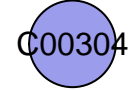
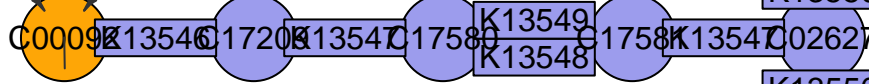
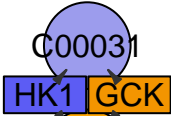


C01804 K13562 C01061

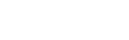
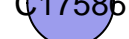
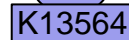
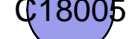
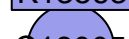
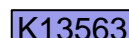
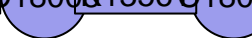
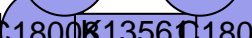
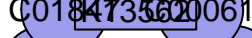
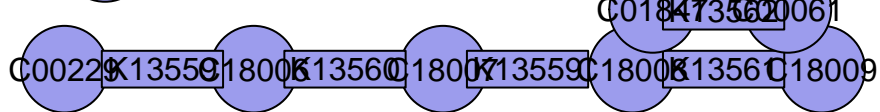
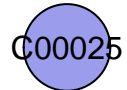


C00043 Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-172



Streptomycin biosynthesis



Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-007

C00031

HK1 GCK

C00091

K13546

C17208

K13547

C17589

K13549  
K13548

C17588

K13547

C02627

K13550

C17582

K13551...

C01748

K13552

C17583

K13553

C01441

K13554

C18004

K13555

C01759

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

C01737

C20358

K13552

C20359

K13553

C20350

C00304

Streptomycin biosynthesis

C00025

C00229

K13559

C18006

K13560

C18007

K13559

C18008

K13561

C18009

C01847  
K13562

C01848

K13562

C01061

K13563

C18005

K13564

C17586

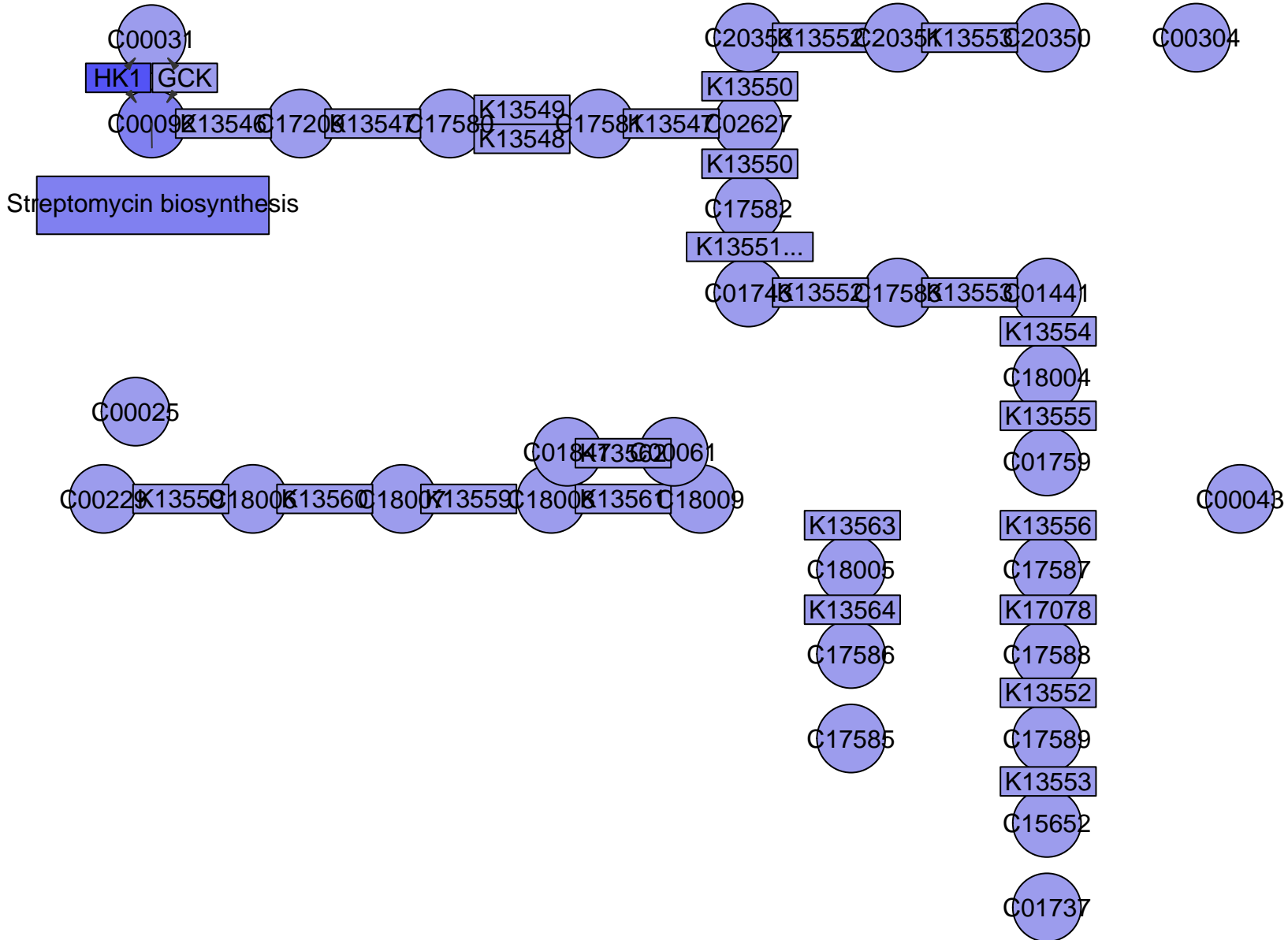
C17585

C00043

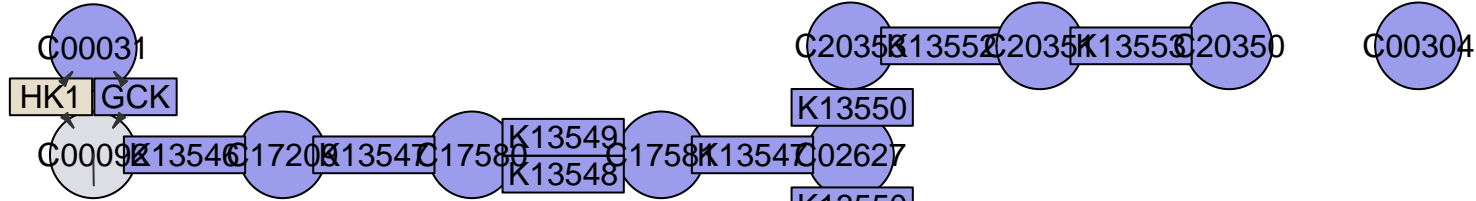
Amino sugar and  
nucleotide sugar metabolism



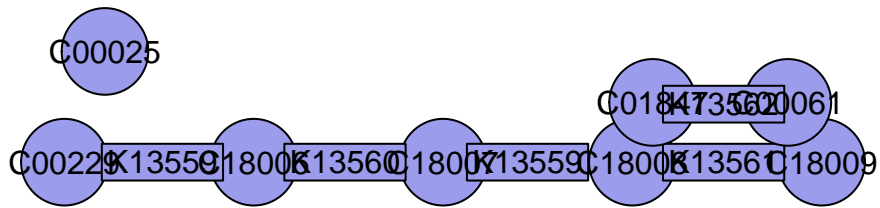
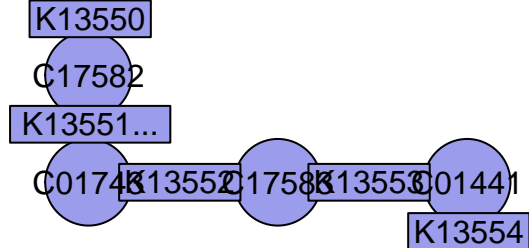
Butirosin and  
neomycin biosynthesis  
MPI-011



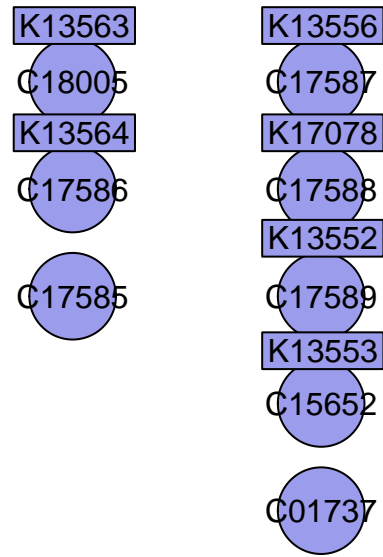
Butirosin and  
neomycin biosynthesis  
MPI-024



Streptomycin biosynthesis



Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-026

C00031  
HK1 GCK

C00099 K13546

C17208 K13547

C17580 K13549  
K13548

C17581 K13547

C02627

K13550

C20355 K13552

C20356 K13553

C20350

C00304

Streptomycin biosynthesis

C17582  
K13551...

C01748 K13552

C17583 K13553

C01441

K13554

C18004

K13555

C01759

C00025

C01847 K13560

C01061

C00229 K13559

C18006 K13560

C18007 K13559

C18008 K13560

C18009

C18009

C00043

Amino sugar and  
nucleotide sugar metabolism

K13563

C18005

K13564

C17586

C17585

K13556

C17587

K17078

C17588

K13552

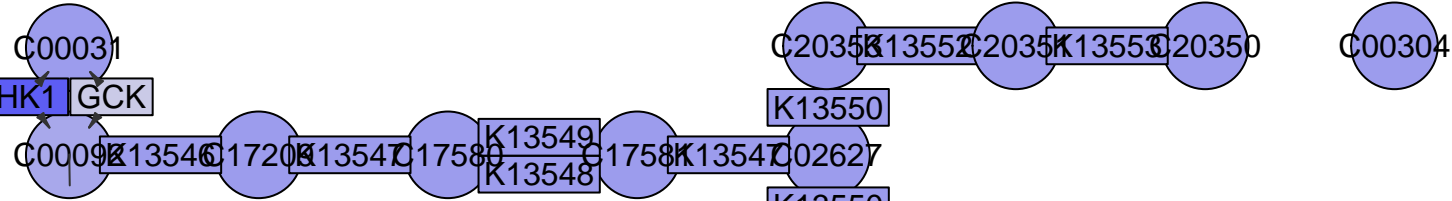
C17589

K13553

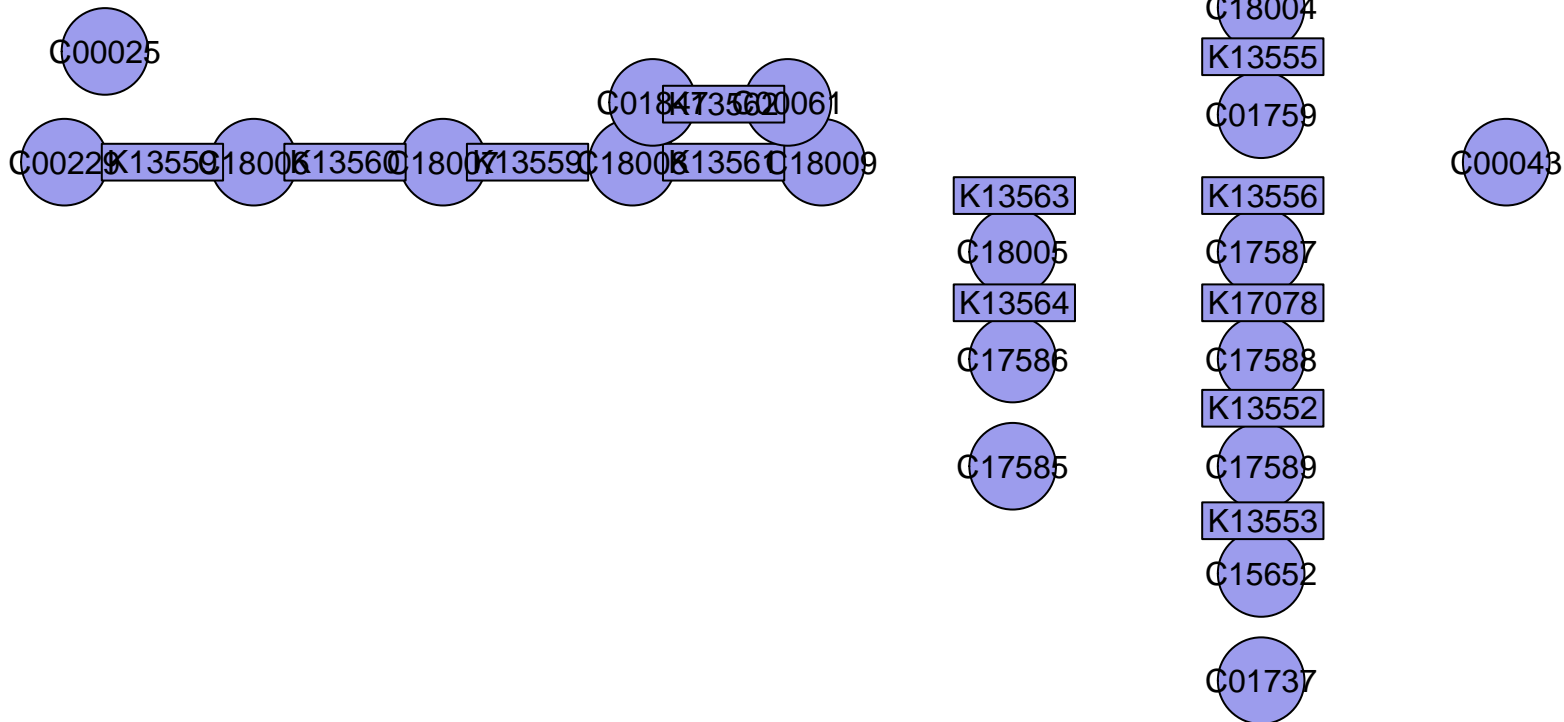
C15652

C01737

Butirosin and  
neomycin biosynthesis  
MPI-036



Streptomycin biosynthesis

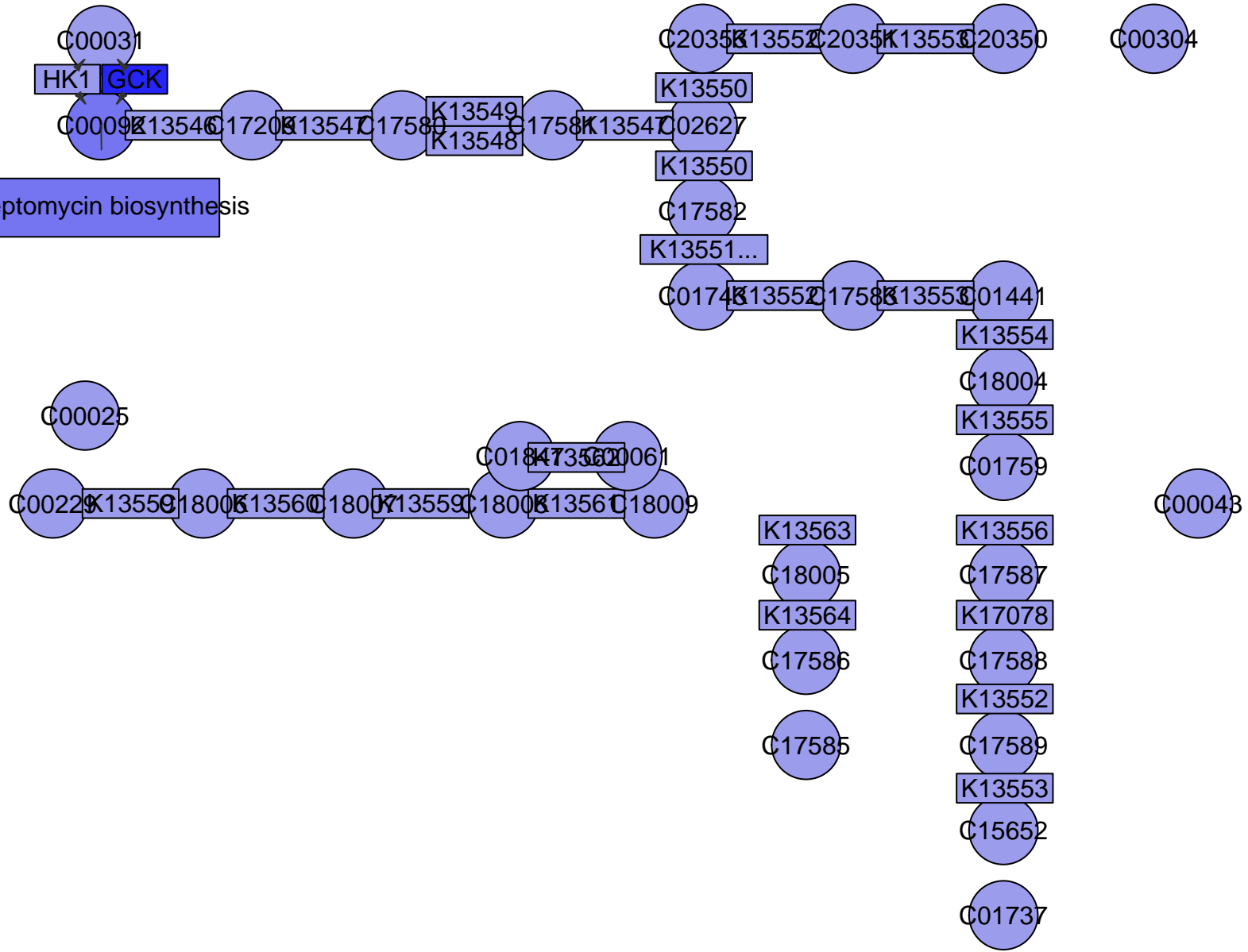


Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-037

Streptomycin biosynthesis

Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-038

C00031

HK1 GCK

C00099

K13546

C17208

K13547

C17589

K13549  
K13548

C17588

K13547

C02627

K13550

C17582

K13551...

C01748

K13552

C17583

K13553

C01441

K13554

C18004

K13555

C01759

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

C01737

C00304

Streptomycin biosynthesis

C00025

C00229

K13559

C18006

K13560

C18007

K13559

C18008

K13561

C18009

C01847

K13562

C01061

K13563

C18005

K13564

C17586

C17585

C00043

Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-041

C00031

HK1 GCK

C00099

K13546

C17208

K13547

C17589

K13549  
K13548

C17588

K13547

C02627

K13550

C17582

K13551...

C01748

K13552

C17583

K13553

C01441

K13554

C18004

K13555

C01759

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

C01737

C00304

C20358

K13552

C20359

K13553

C20350

Streptomycin biosynthesis

C00025

C00229

K13559

C18006

K13560

C18007

K13559

C18008

K13562

C18009

K13563

C18005

K13564

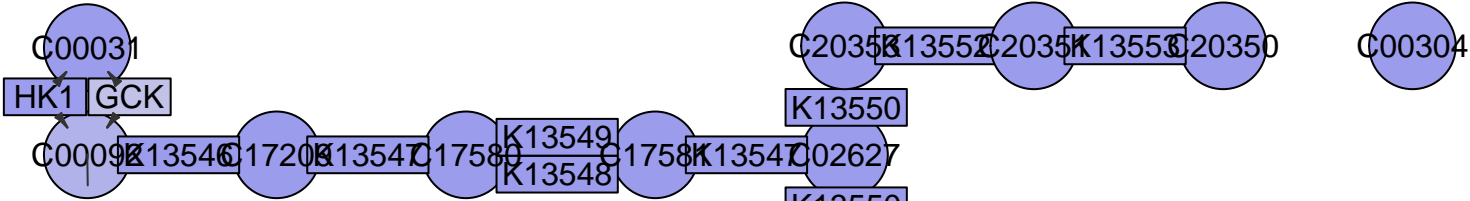
C17586

C17585

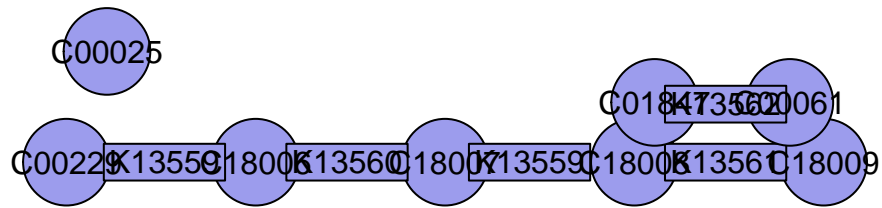
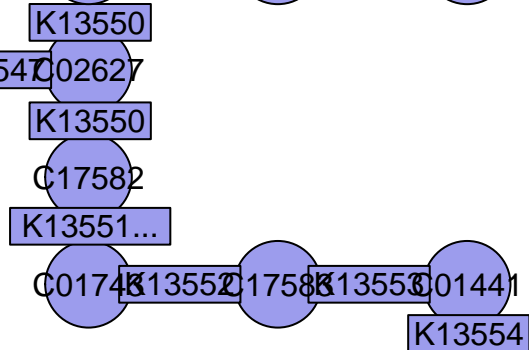
C00043

Amino sugar and  
nucleotide sugar metabolism

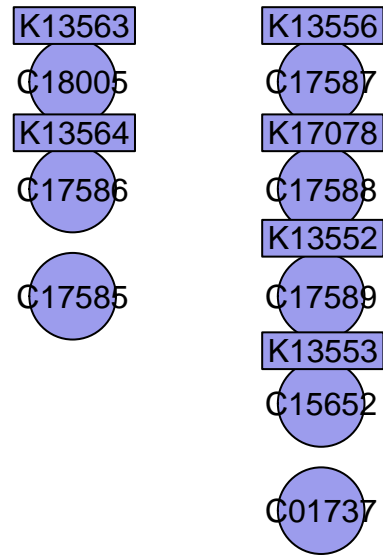
Butirosin and  
neomycin biosynthesis  
MPI-046



Streptomycin biosynthesis

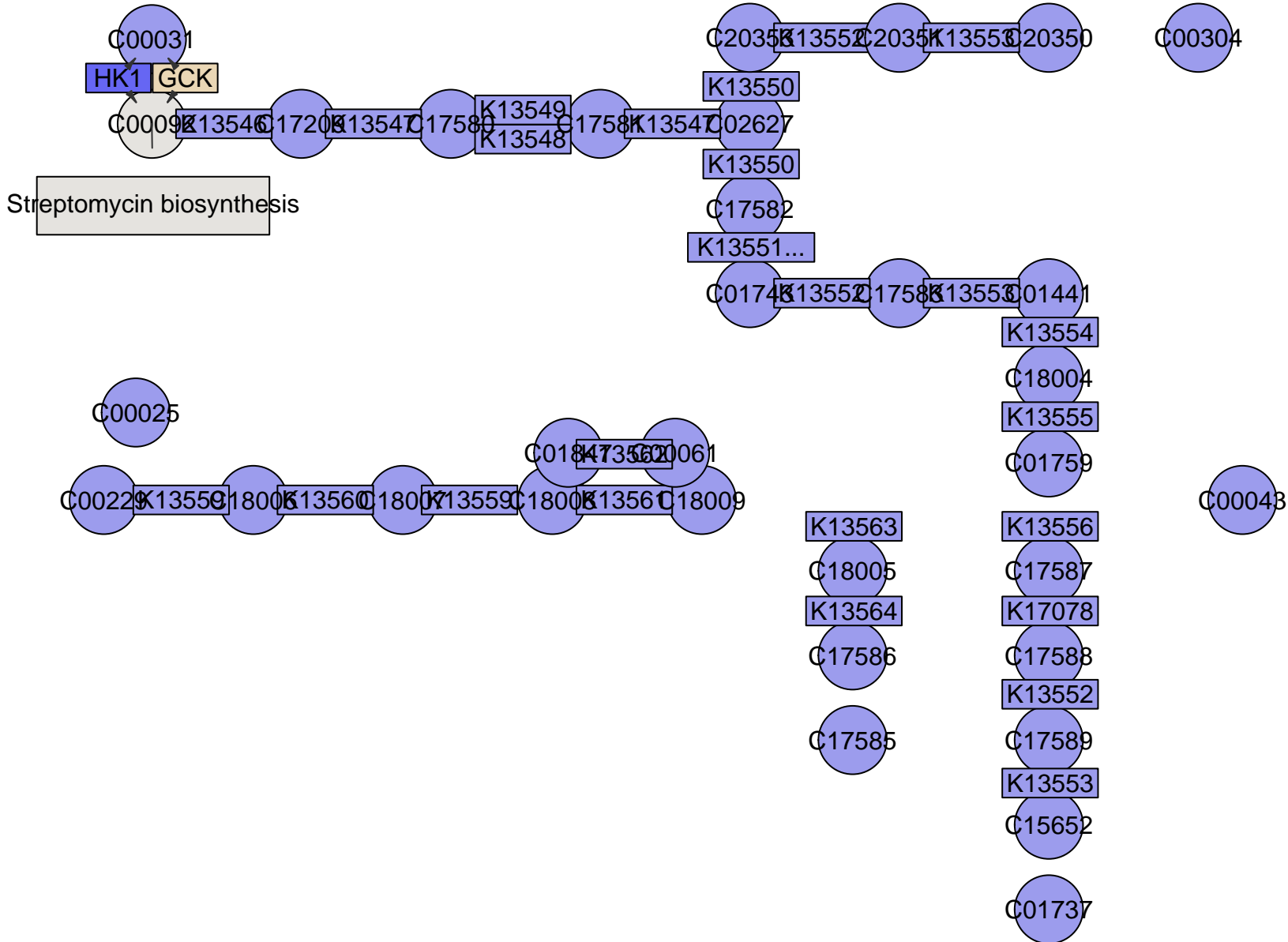


Amino sugar and  
nucleotide sugar metabolism

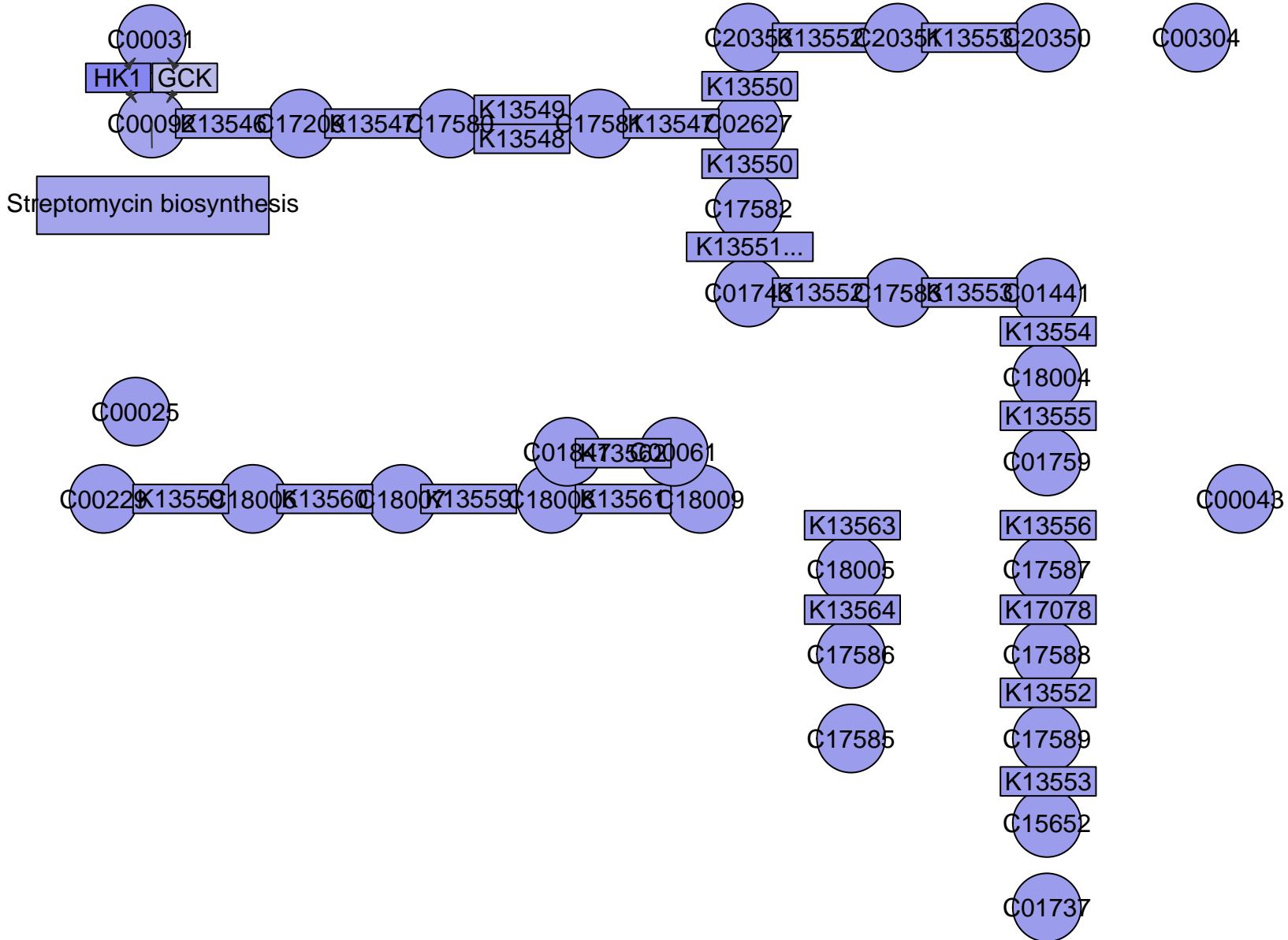




Butirosin and  
neomycin biosynthesis  
MPI-050



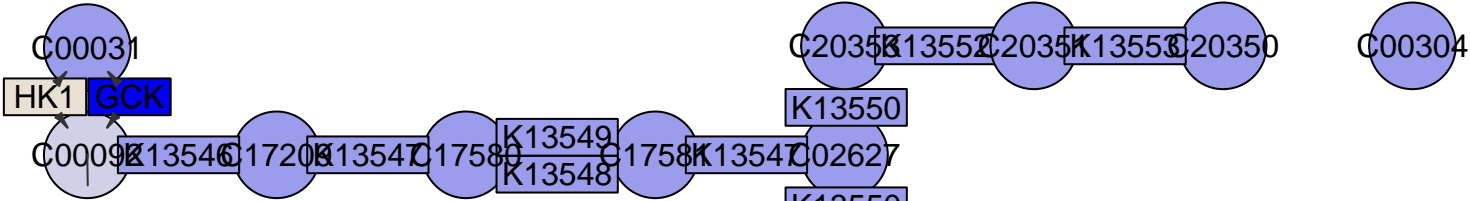
Butirosin and  
neomycin biosynthesis  
MPI-051



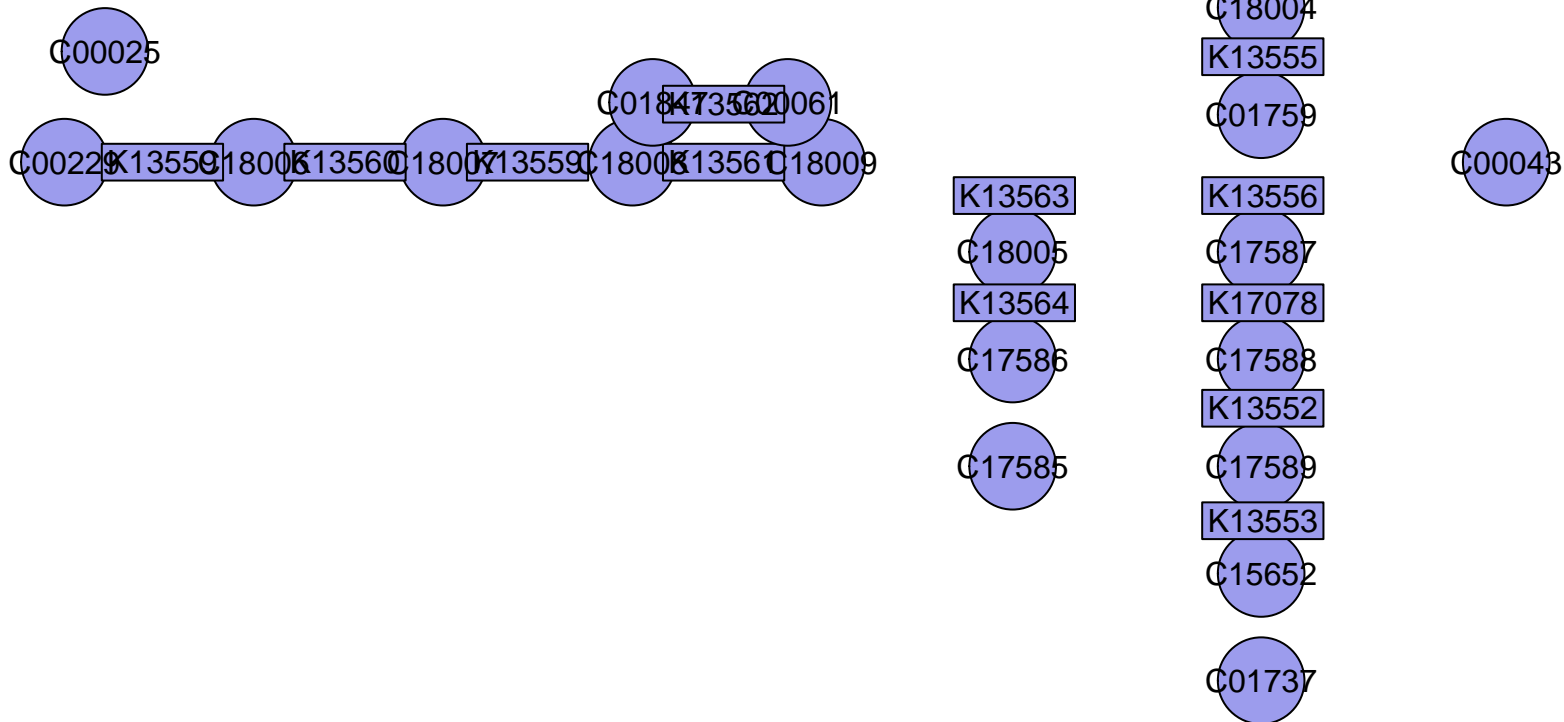




Butirosin and  
neomycin biosynthesis  
MPI-060

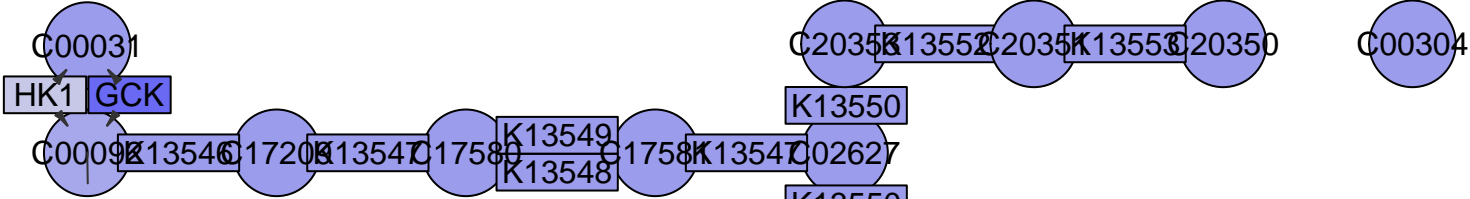


Streptomycin biosynthesis

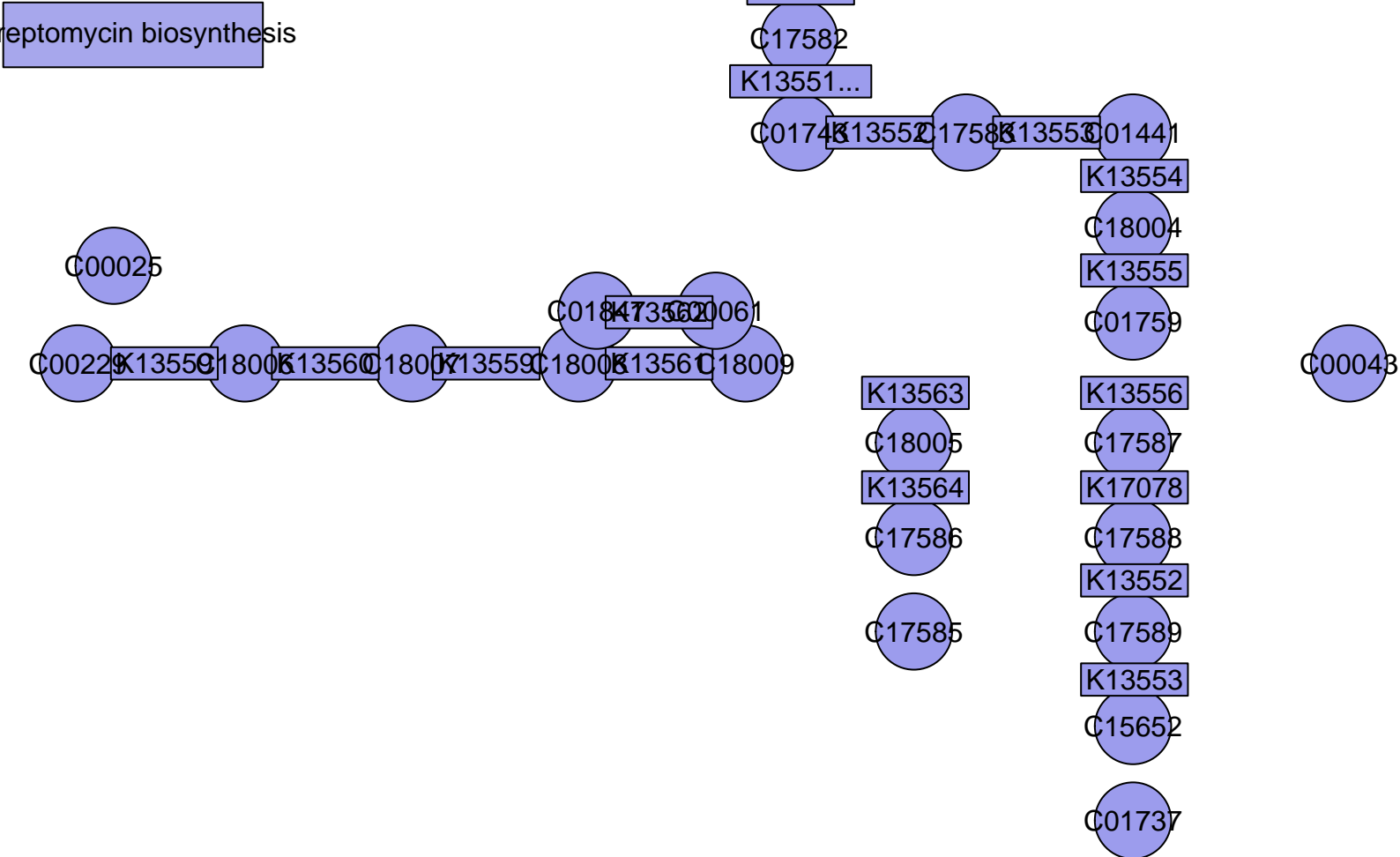


Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-061



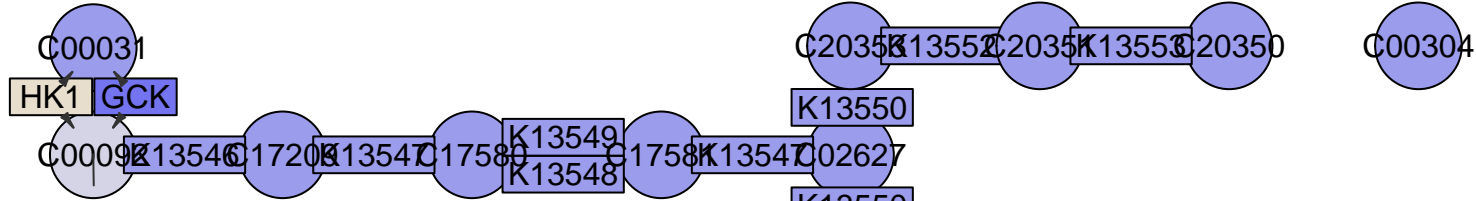
Streptomycin biosynthesis



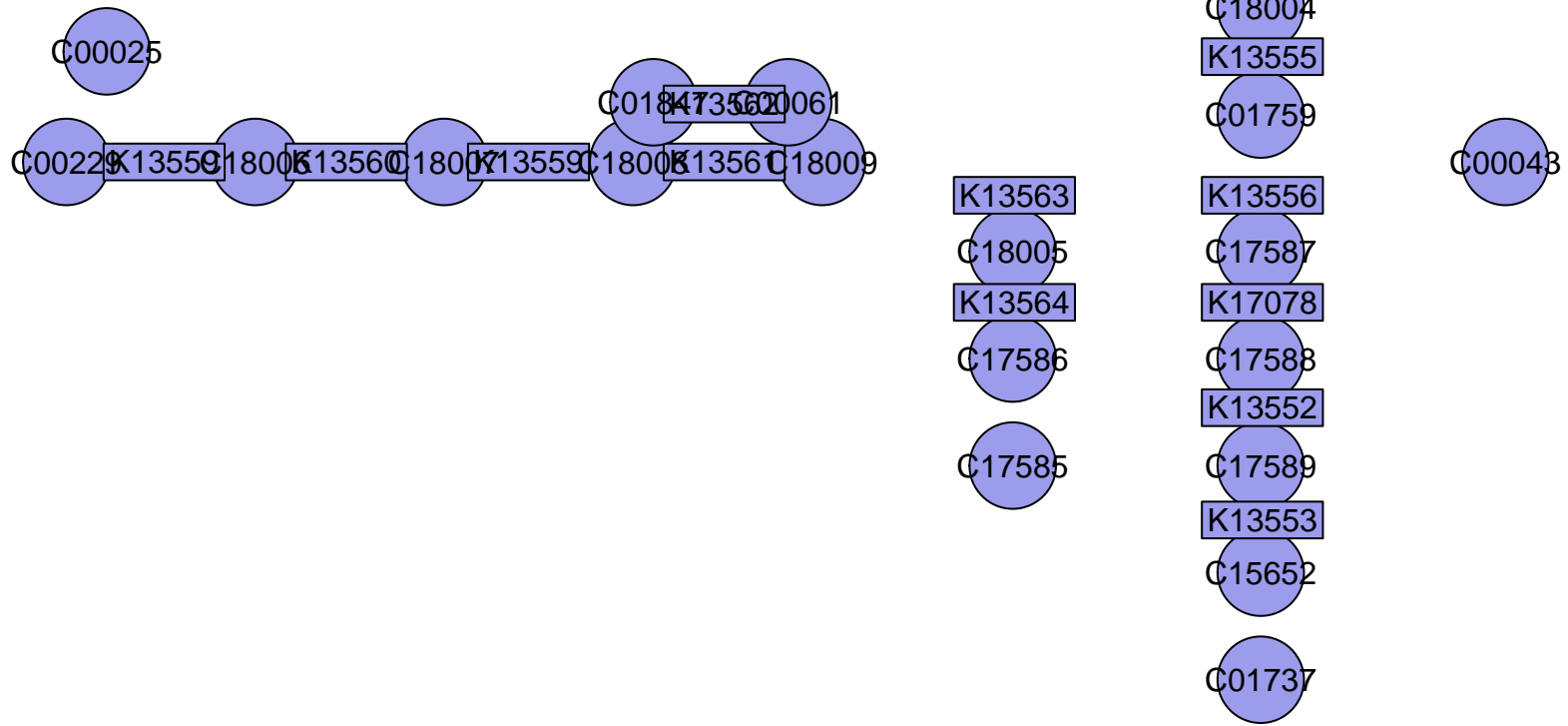
Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-070



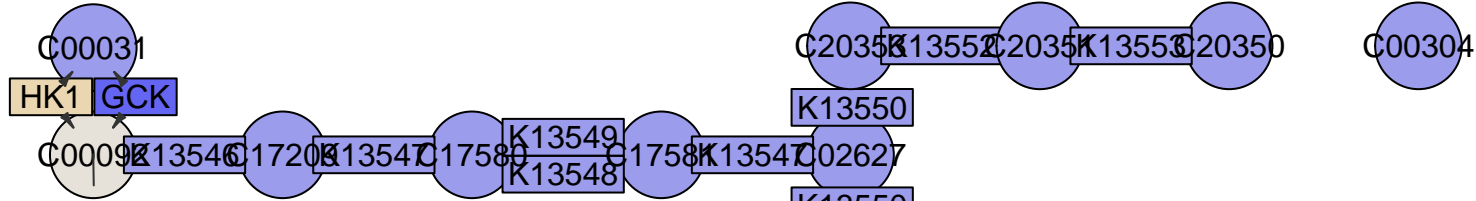
Streptomycin biosynthesis



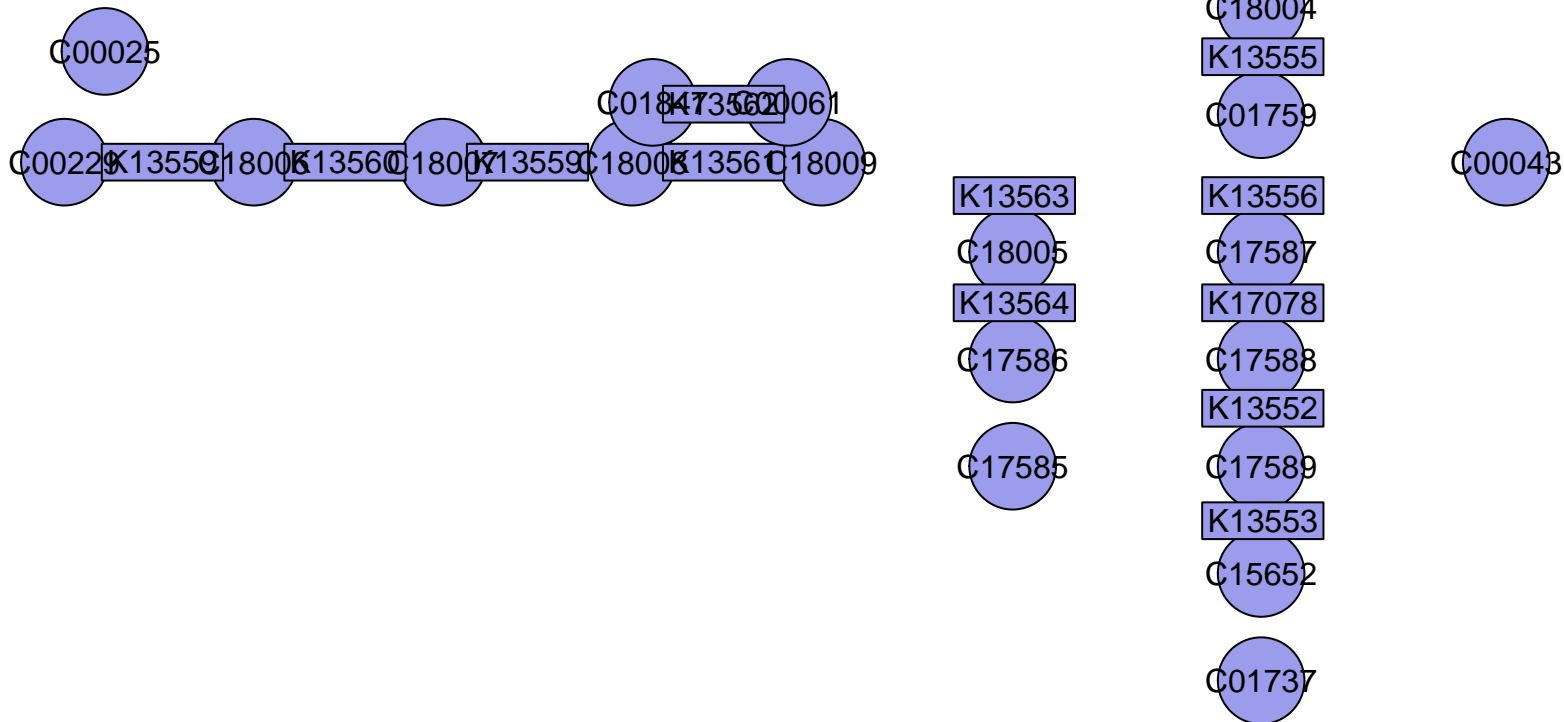
Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-072



Streptomycin biosynthesis



Butirosin and  
neomycin biosynthesis  
MPI-093

C00031

HK1 GCK

C00099

K13546

C17208

K13547

C17580

K13549  
K13548

C17581

K13547

C02627

C20358

K13552

C20359

K13550

C20350

C00304

Streptomycin biosynthesis

K13550

C17582

K13551...

C01748

K13552

C17583

K13550

C01441

C00025

C01847  
K13562

C01848

C01061

C00229

K13559

C18006

K13560

C18007

K13559

C18008  
K13561

C18009

K13554

C18004

K13555

C01759

C00043

Amino sugar and  
nucleotide sugar metabolism

K13563

C18005

K13564

C17586

C17585

K13556

C17587

K17078

C17588

K13552

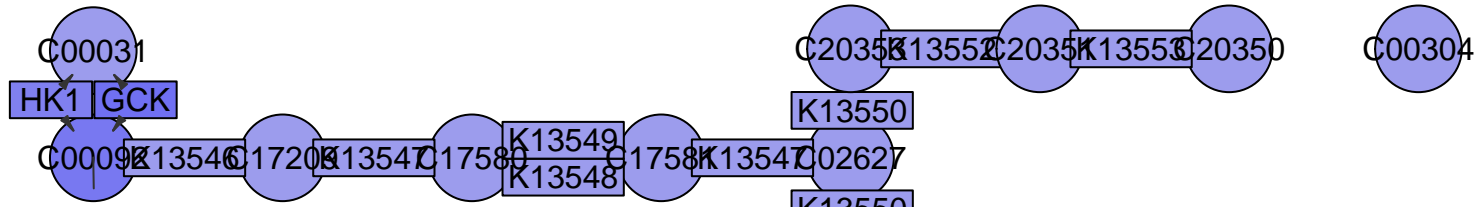
C17589

K13553

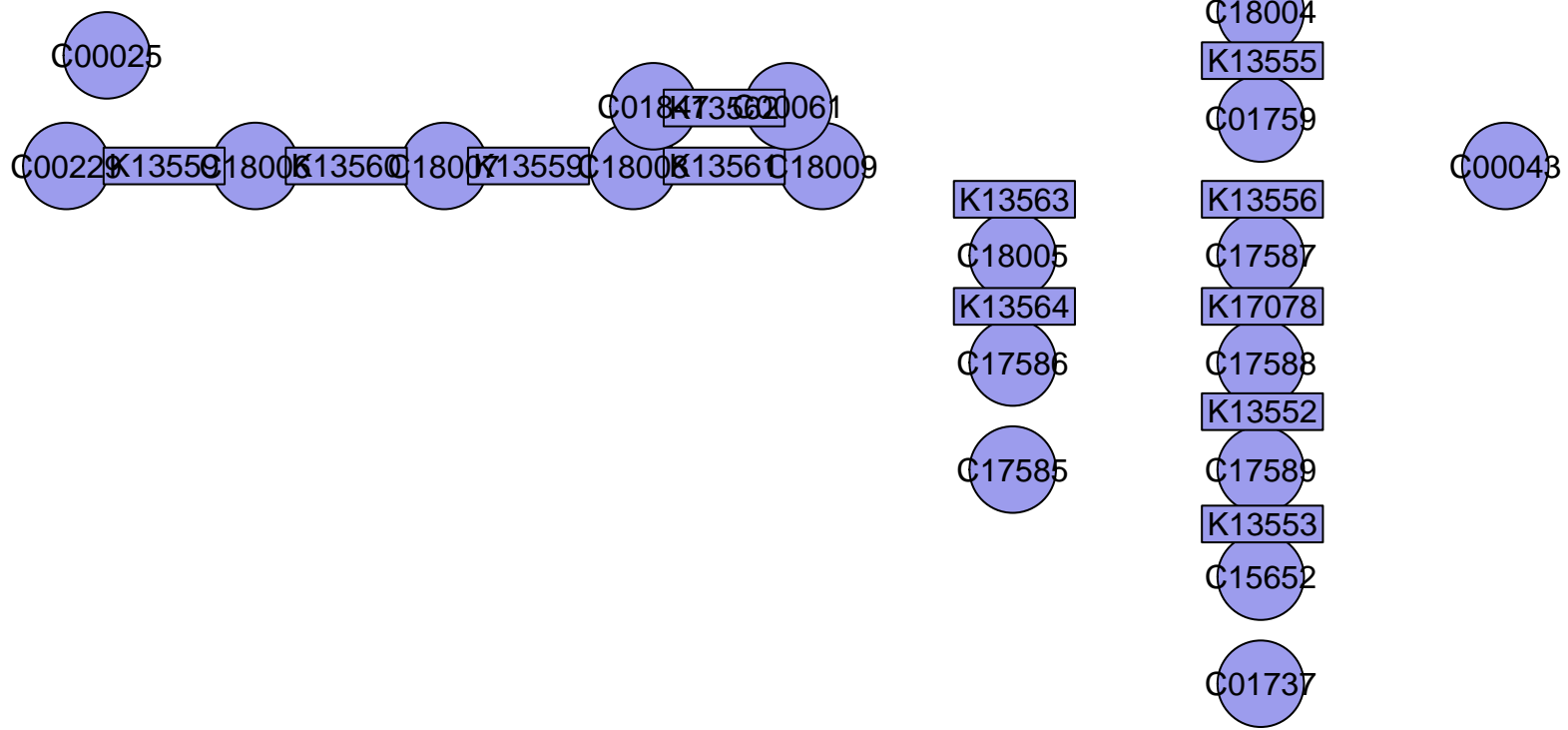
C15652

C01737

Butirosin and  
neomycin biosynthesis  
MPI-094



Streptomycin biosynthesis



Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-099

C00031  
HK1 GCK

C00099

K13546

C17208

K13547

C17580

K13549  
K13548

C17581

K13547

C02627

K13550

K13550

C17582

K13551...

C01748

K13552

C17583

K13553

C01441

K13554

C18004

K13555

C01759

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

C01737

C00304

Streptomycin biosynthesis

C00025

C00229

K13559

C18006

K13560

C18007

K13559

C18008

K13561

C18009

C01847  
K13562

C01848

C01061

K13563

C18005

K13564

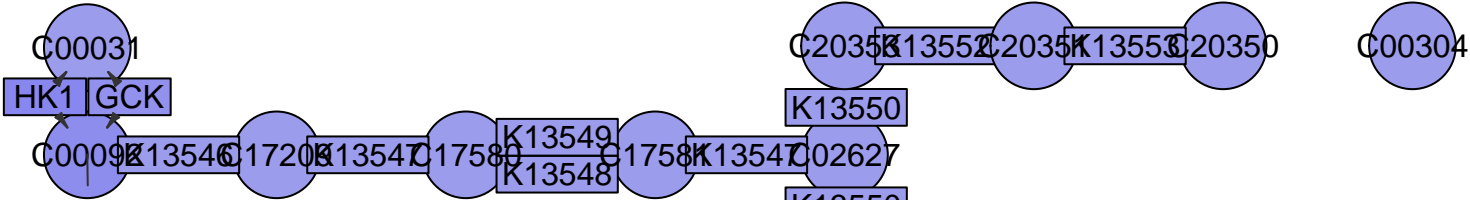
C17586

C17585

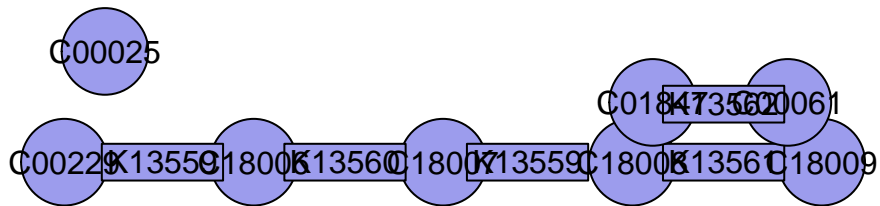
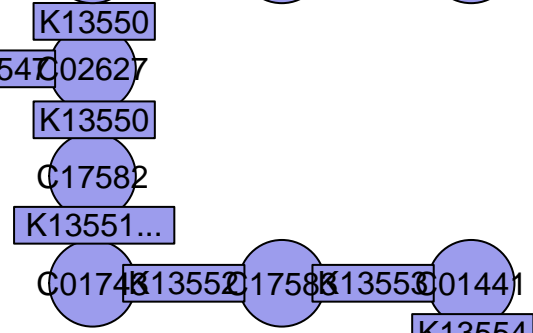
C00043

Amino sugar and  
nucleotide sugar metabolism

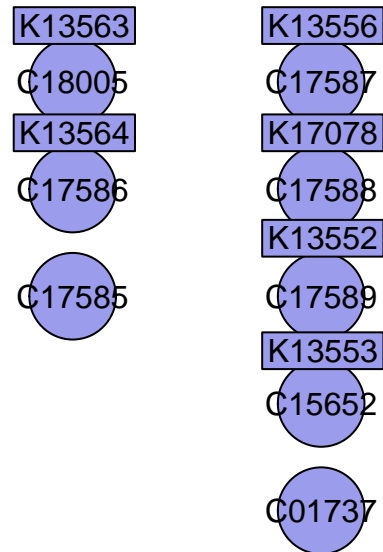
Butirosin and  
neomycin biosynthesis  
MPI-104



Streptomycin biosynthesis



Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-107

C00031  
HK1 GCK

C00099 K13546 C1720 K13547 C17580 K13549 K13548 C17581 K13547 C02627

C20355 K13552 C20355 K13553 C20350

C00304

K13550

C17582

K13550

Streptomycin biosynthesis

K13551...

C01748 K13552 C17581 K13553 C01441

K13554

C18004

K13555

C00025

C01847 K13562 C01061

C01759

C00043

Amino sugar and  
nucleotide sugar metabolism

C00229 K13559 C18006 K13560 C18007 K13559 C18008 K1356 C18009

K13556

K13563

K13556

C18005

C17587

K13564

K17078

C17586

C17588

K13552

C17585

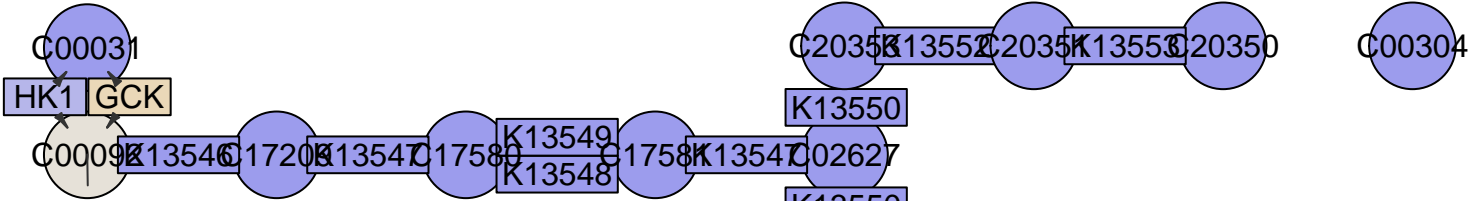
C17589

K13553

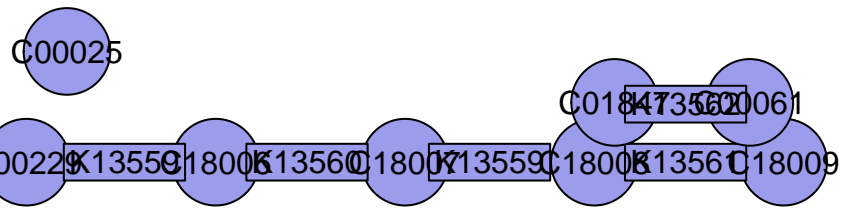
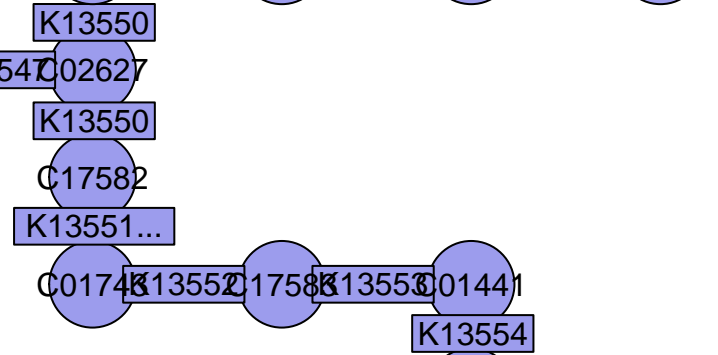
C15652

C01737

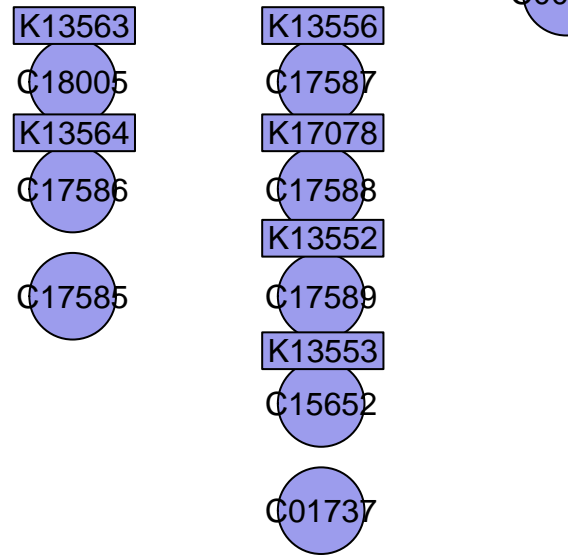
Butirosin and  
neomycin biosynthesis  
MPI-112



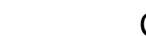
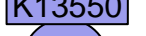
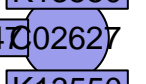
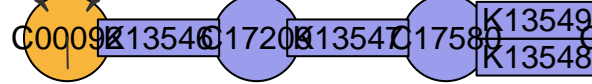
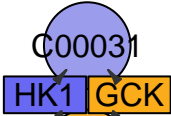
Streptomycin biosynthesis



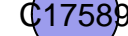
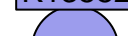
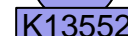
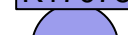
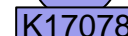
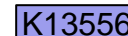
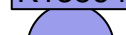
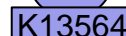
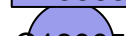
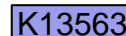
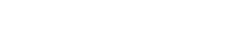
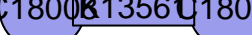
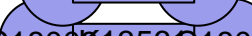
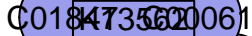
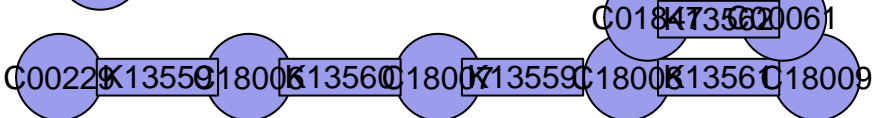
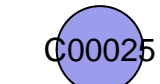
Amino sugar and  
nucleotide sugar metabolism



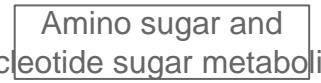
Butirosin and  
neomycin biosynthesis  
MPI-116



Streptomycin biosynthesis

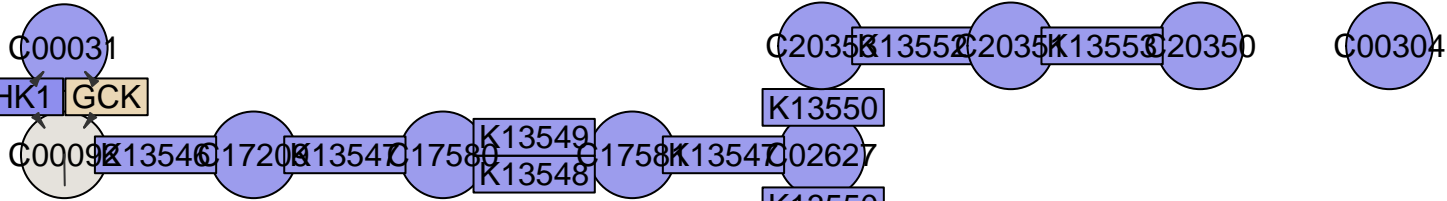
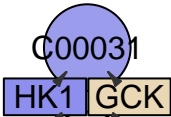


Amino sugar and  
nucleotide sugar metabolism

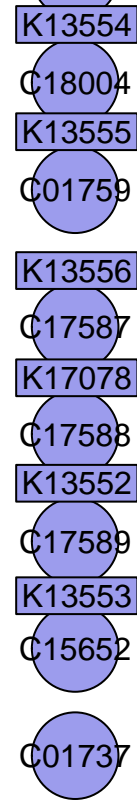
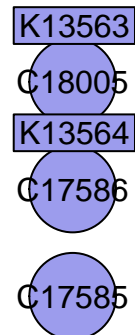
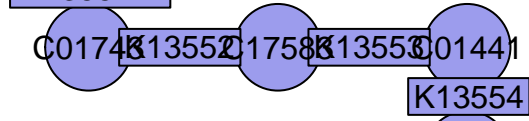
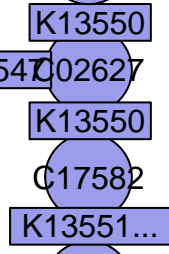




Butirosin and  
neomycin biosynthesis  
MPI-117

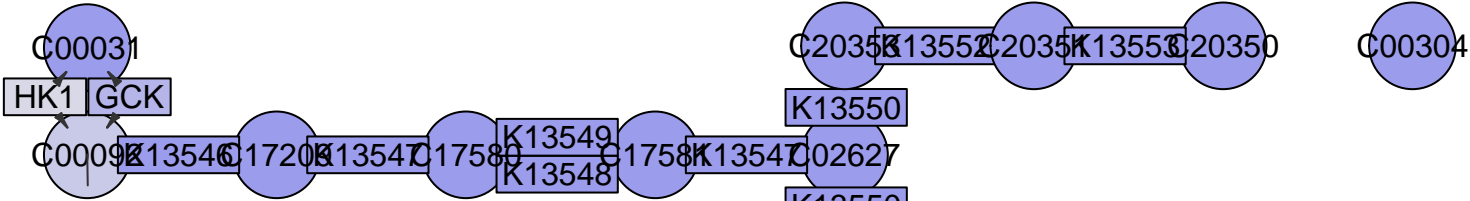


Streptomycin biosynthesis

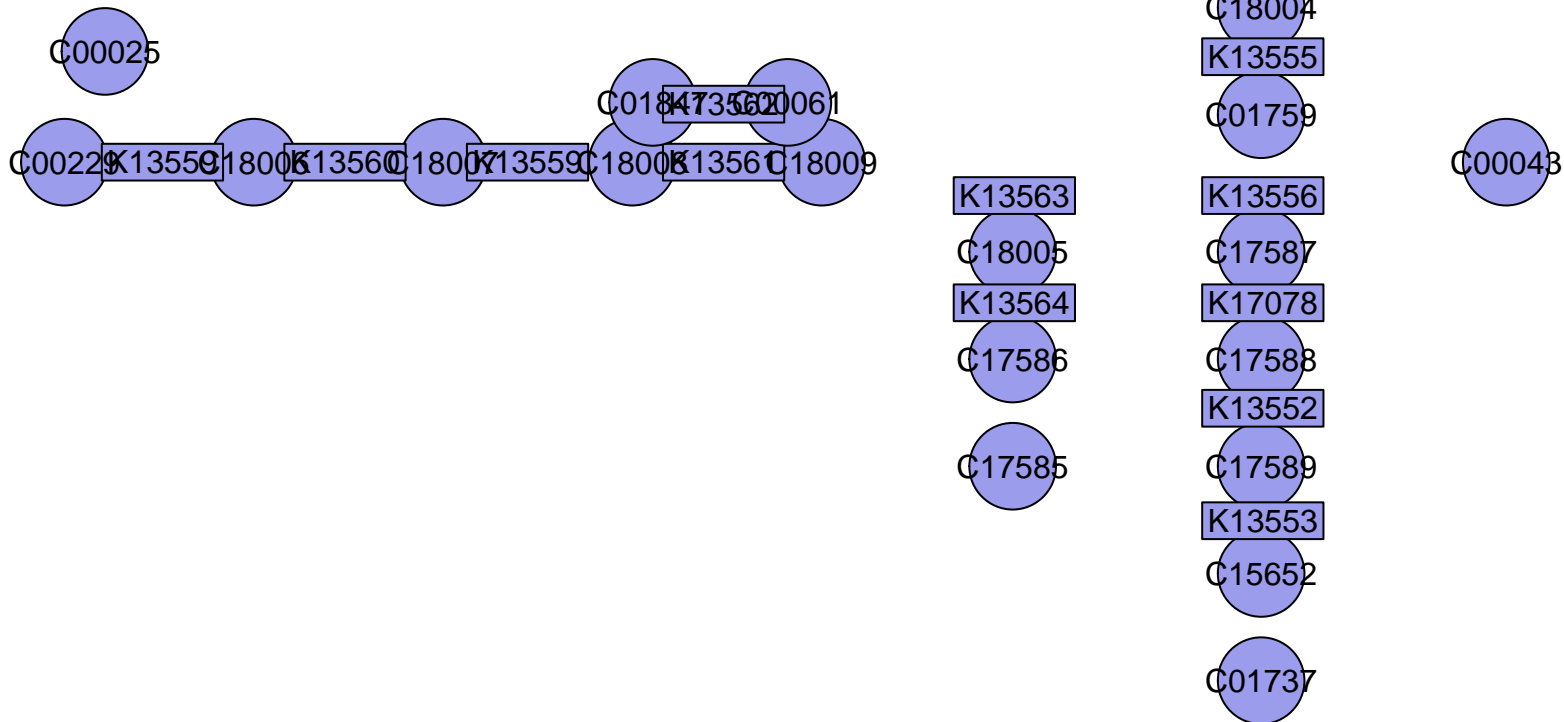


Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-120

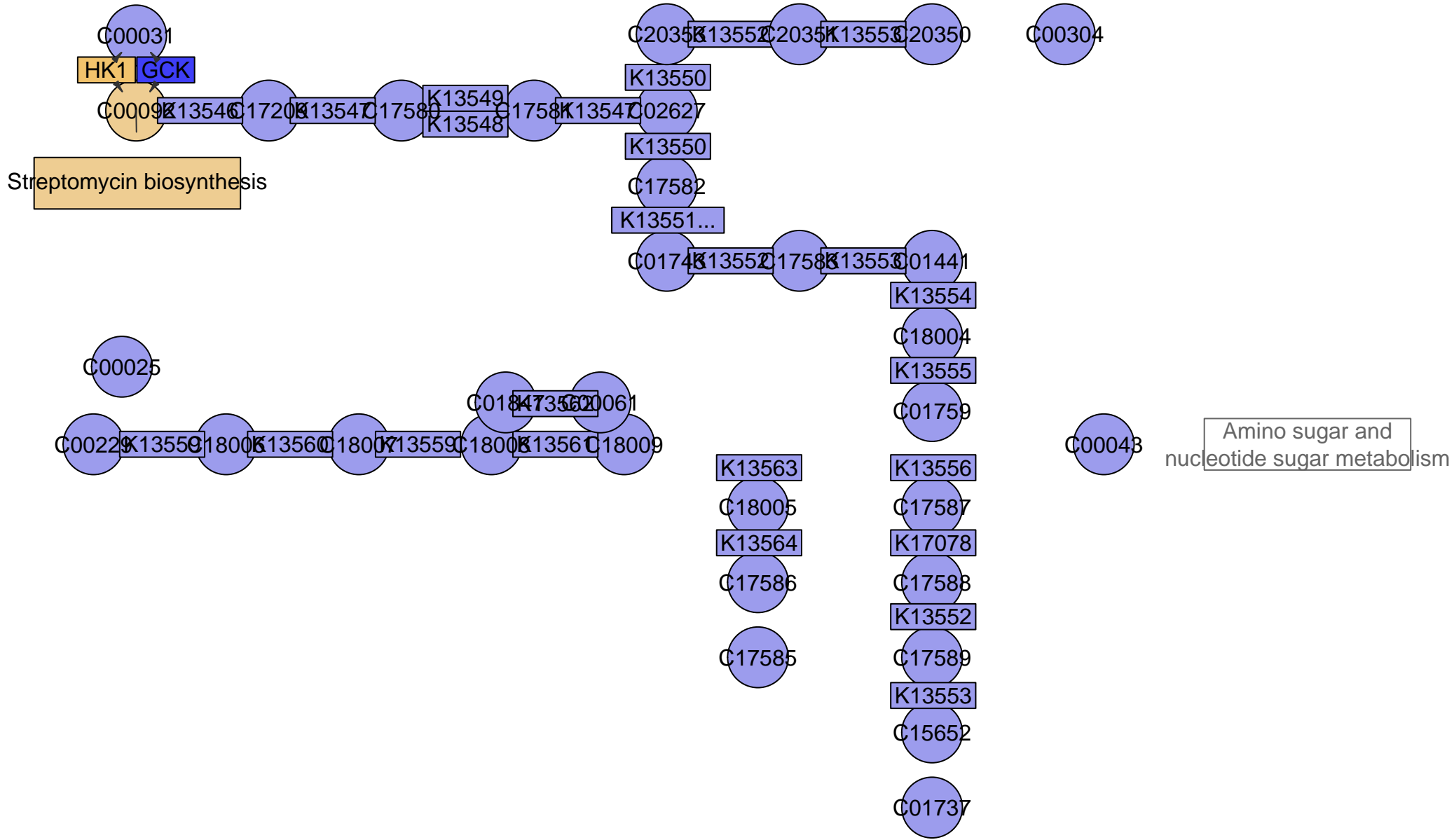


Streptomycin biosynthesis



Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-121



Butirosin and  
neomycin biosynthesis  
MPI-124

C00031

HK1 GCK

C00099

K13546

C17208

K13547

C17589

K13549  
K13548

C17588

K13547

C02627

C20358

K13552

C20358

K13553

C20350

C00304

Streptomycin biosynthesis

K13550

K13550

C17582

K13551...

C01748

K13552

C17588

K13553

C01441

C00025

C00229

K13559

C18006

K13560

C18007

K13559

C18008

K13562

C18009

C01847

K13554

C18004

K13555

C01759

C00043

Amino sugar and  
nucleotide sugar metabolism

K13563

C18005

K13564

C17586

C17585

K13556

C17587

K17078

C17588

K13552

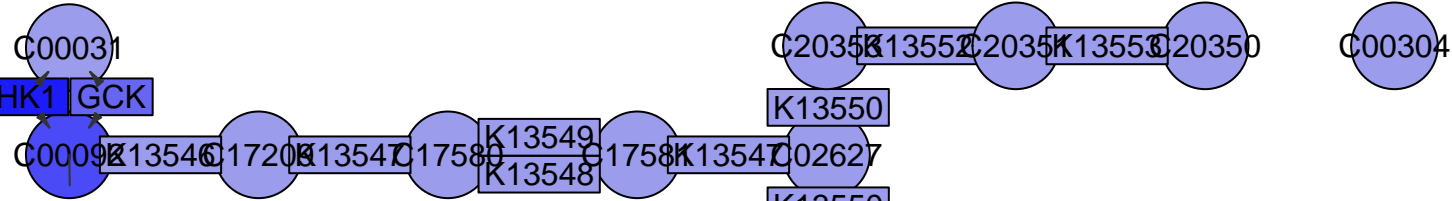
C17589

K13553

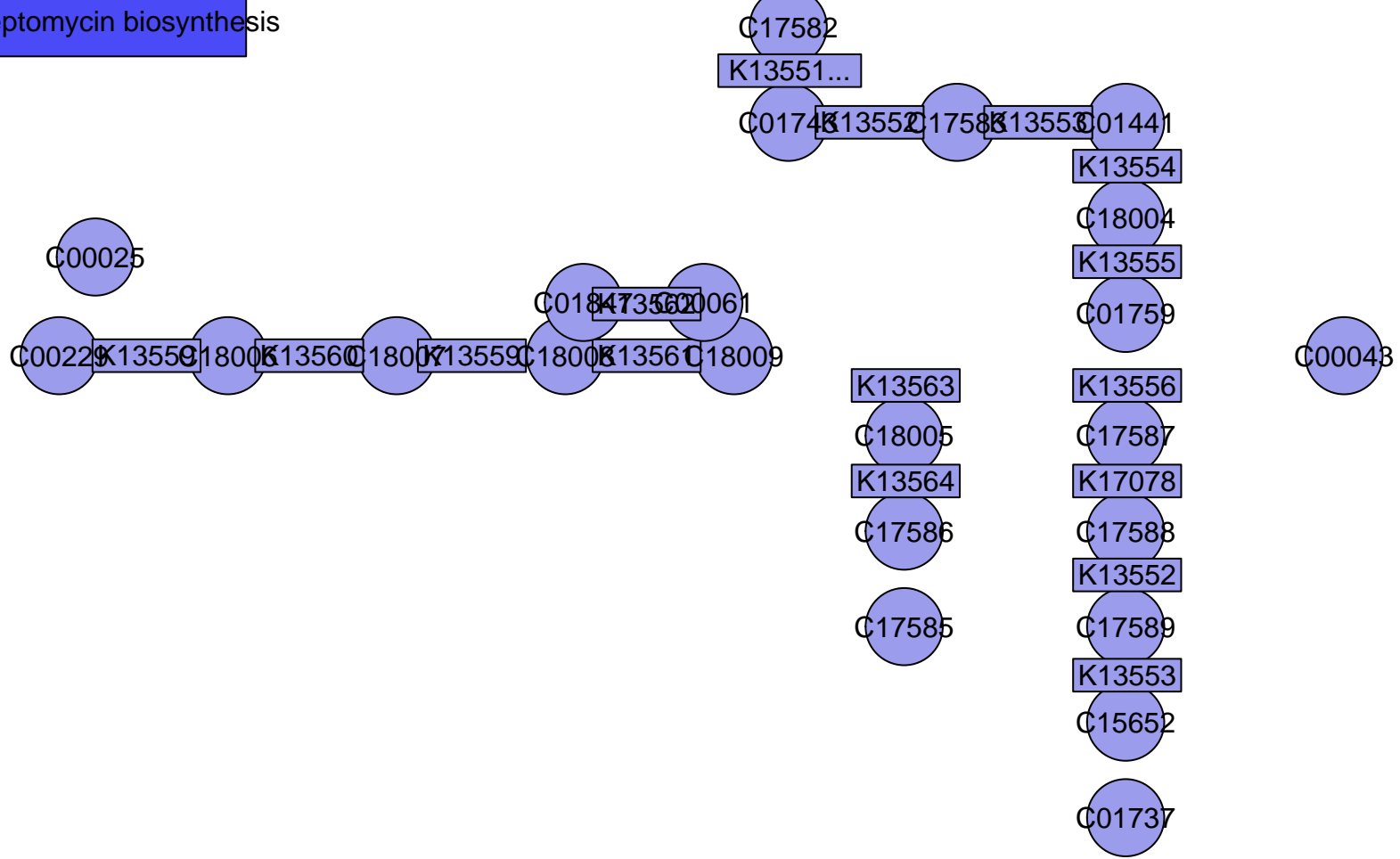
C15652

C01737

Butirosin and  
neomycin biosynthesis  
MPI-126

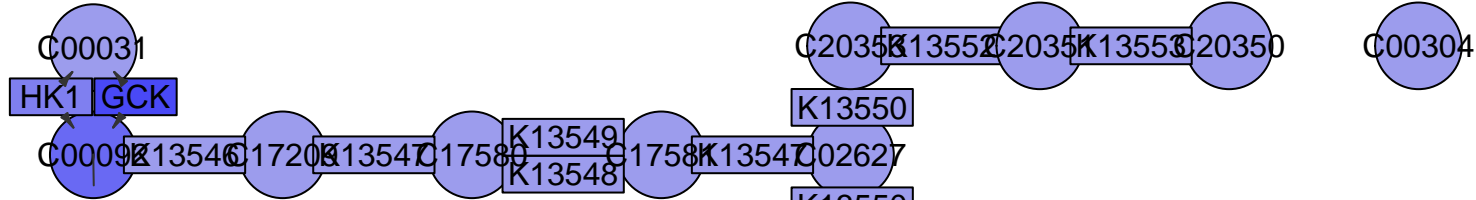


Streptomycin biosynthesis

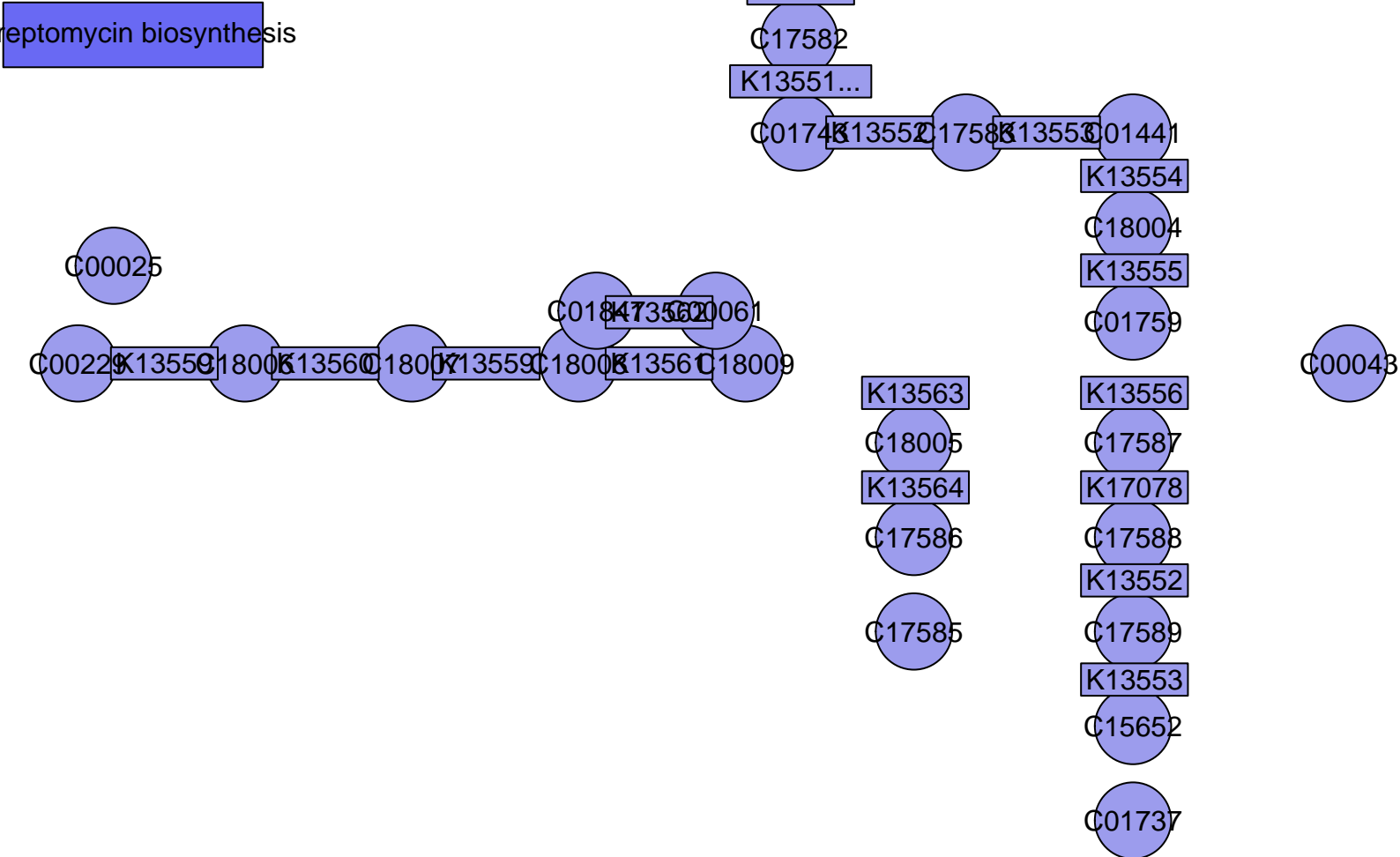


Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-131



Streptomycin biosynthesis



Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-143

C00031  
HK1 GCK

C00099

K13546

C17208

K13547

C17580

K13549  
K13548

C17581

K13547

C02627

K13550

Streptomycin biosynthesis

C17582

K13551...

C01748

K13552

C17583

K13553

C01441

K13554

C18004

K13555

C01759

C00025

C01847  
K13560

C01061

C00229

K13559

C18006

K13560

C18007

K13559

C18008

K13561

C18009

C00043

Amino sugar and  
nucleotide sugar metabolism

K13563

C18005

K13564

C17586

C17585

K13556

C17587

K17078

C17588

K13552

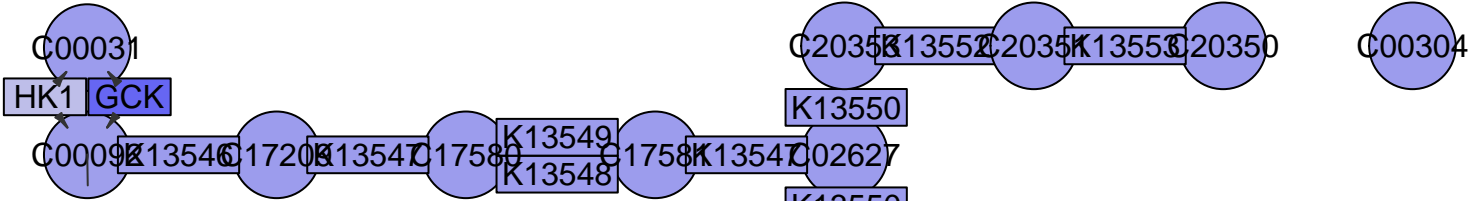
C17589

K13553

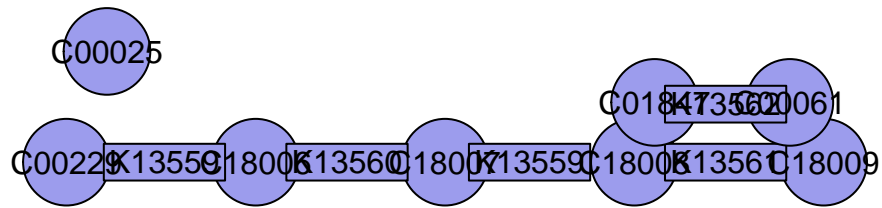
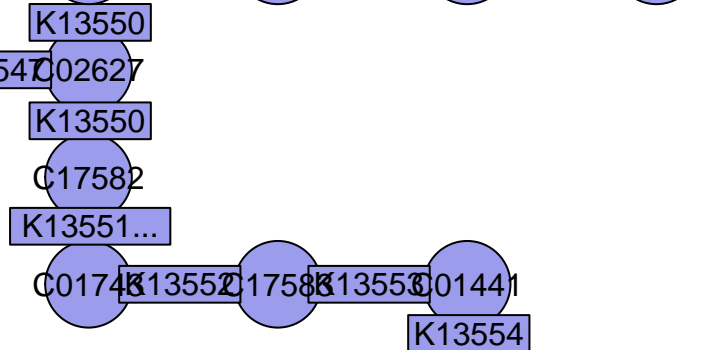
C15652

C01737

Butirosin and  
neomycin biosynthesis  
MPI-148



Streptomycin biosynthesis



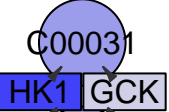
Amino sugar and  
nucleotide sugar metabolism







Butirosin and  
neomycin biosynthesis  
MPI-165



C00031

C00099

C17208

C17580

C17580

K13549  
K13548

C17580

C17580

C02627

C20355

C20355

C20355

C20355

C20355

C00304

Streptomycin biosynthesis

K13550

K13550

K13551...

C17582

C01748

C17582

C17582

C01441

C00025

C00229

C18006

C18006

C18006

C18006

C18006

C18009

C18009

C01847

C01847

C01847

K13563

C18005

K13564

C17586

C17585

K13554

C18004

K13555

C01759

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

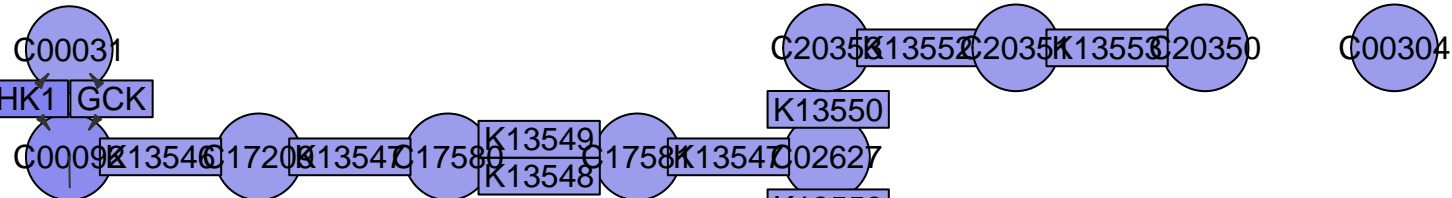
C01737

C00043

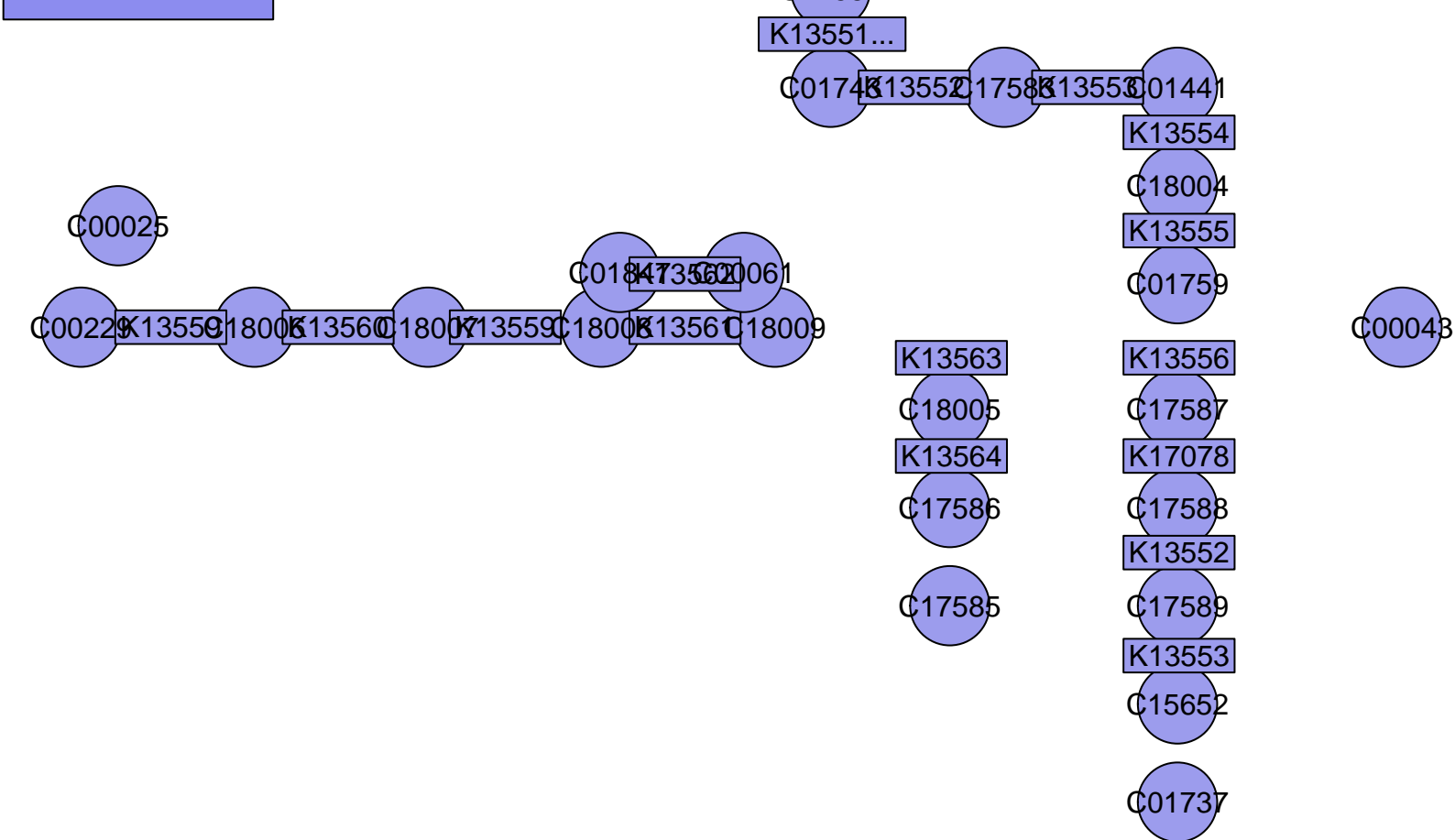
Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-175



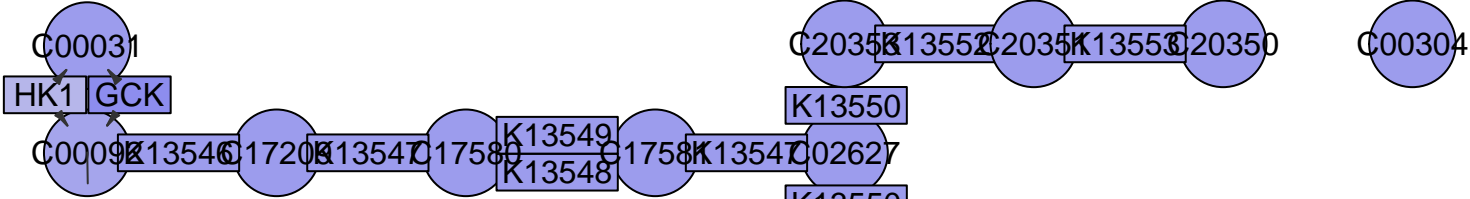
Streptomycin biosynthesis



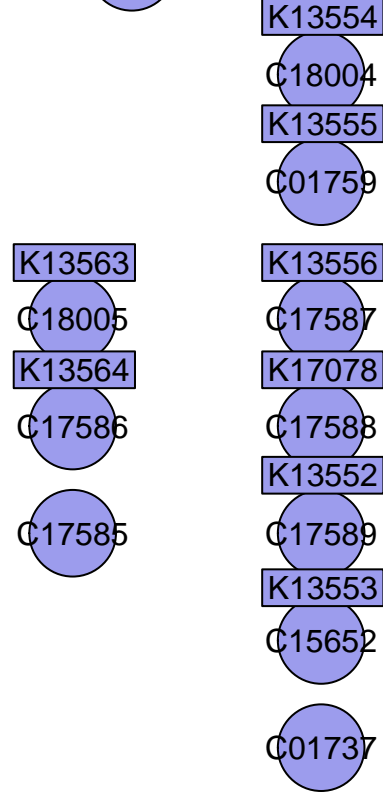
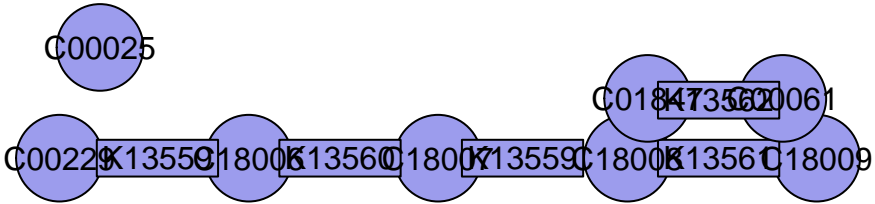
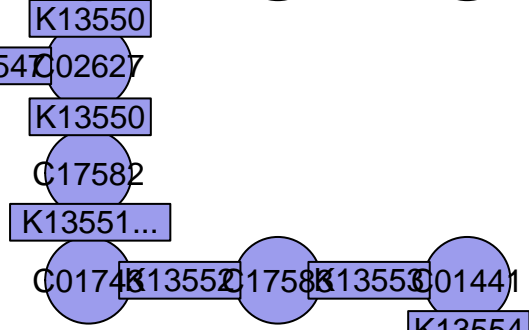
Amino sugar and  
nucleotide sugar metabolism



Butirosin and neomycin biosynthesis  
MPI-187



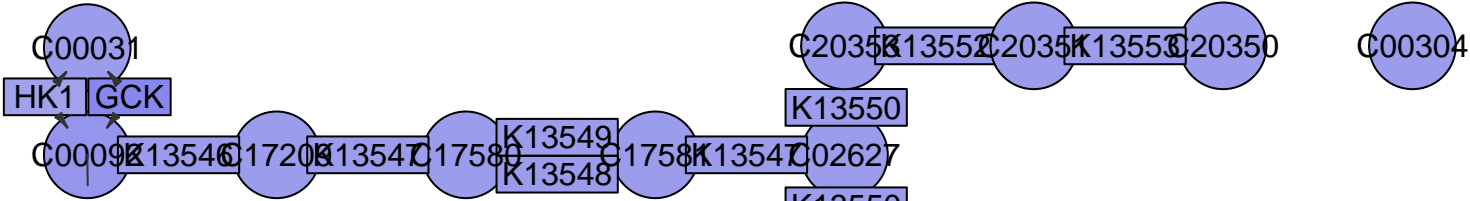
Streptomycin biosynthesis



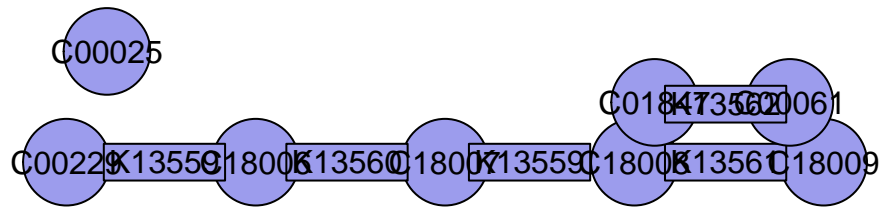
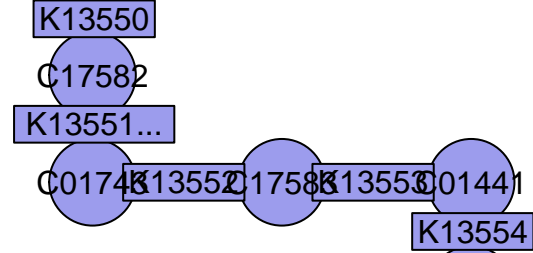
Amino sugar and nucleotide sugar metabolism



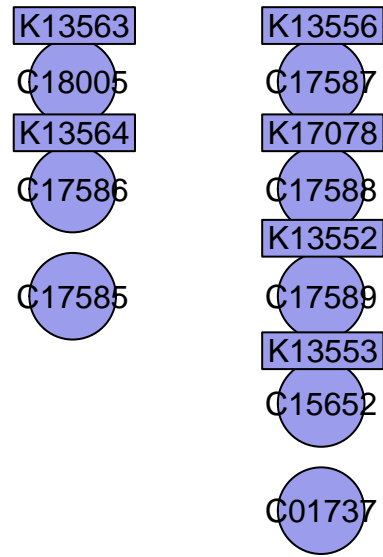
Butirosin and  
neomycin biosynthesis  
MPI-193



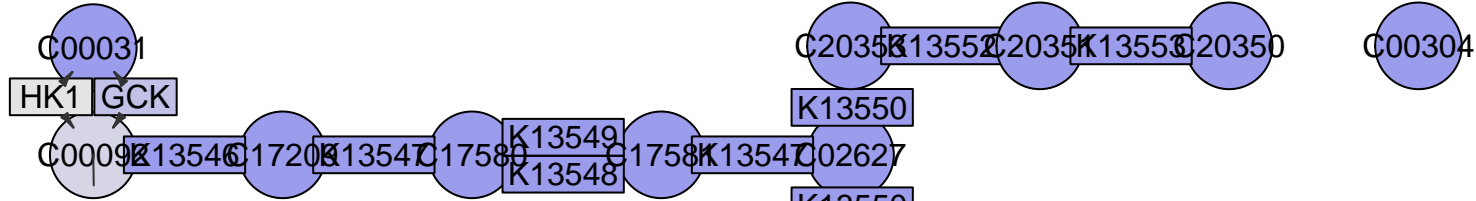
Streptomycin biosynthesis



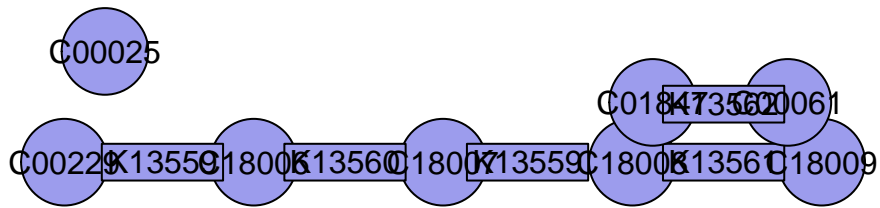
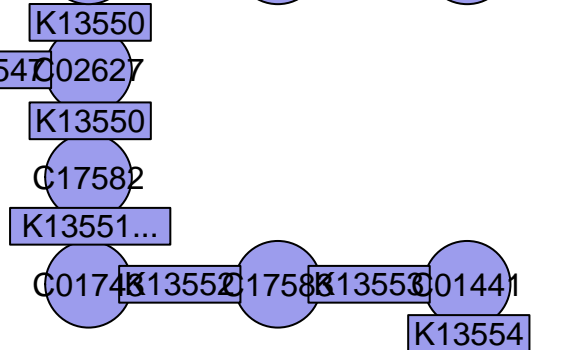
Amino sugar and  
nucleotide sugar metabolism



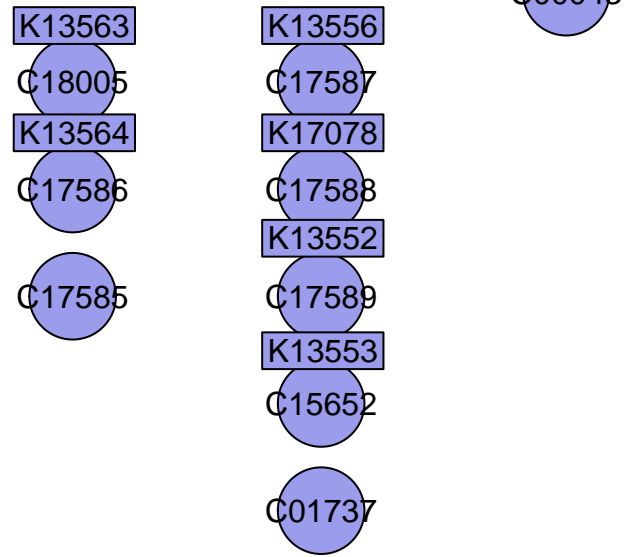
Butirosin and  
neomycin biosynthesis  
MPI-216



Streptomycin biosynthesis



Amino sugar and  
nucleotide sugar metabolism





Butirosin and  
neomycin biosynthesis  
MPI-222

C00031

HK1 GCK

C00099

K13546

C17208

K13547

C17589

K13549  
K13548

C17588

K13547

C02627

K13550

C17582

K13551...

C01748

K13552

C17583

K13553

C01441

K13554

C18004

K13555

C01759

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

C01737

C00304

C20358

K13552

C20359

K13553

C20350

Streptomycin biosynthesis

C00025

C00229

K13559

C18006

K13560

C18007

K13559

C18008

K13561

C18009

C01847  
K13562

K13563

C18005

K13564

C17586

C17585

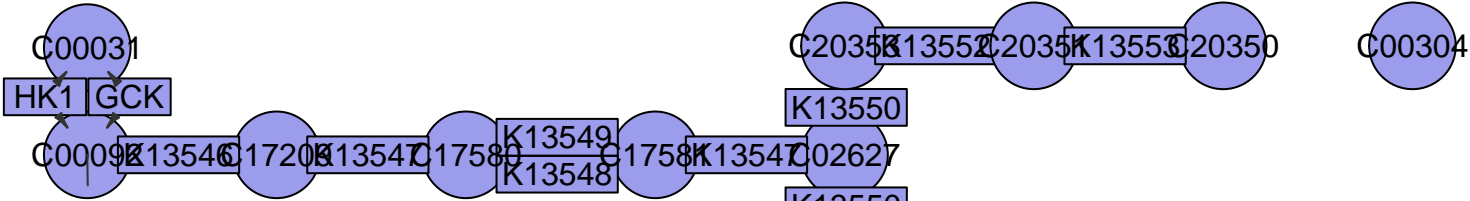
C00043

Amino sugar and  
nucleotide sugar metabolism

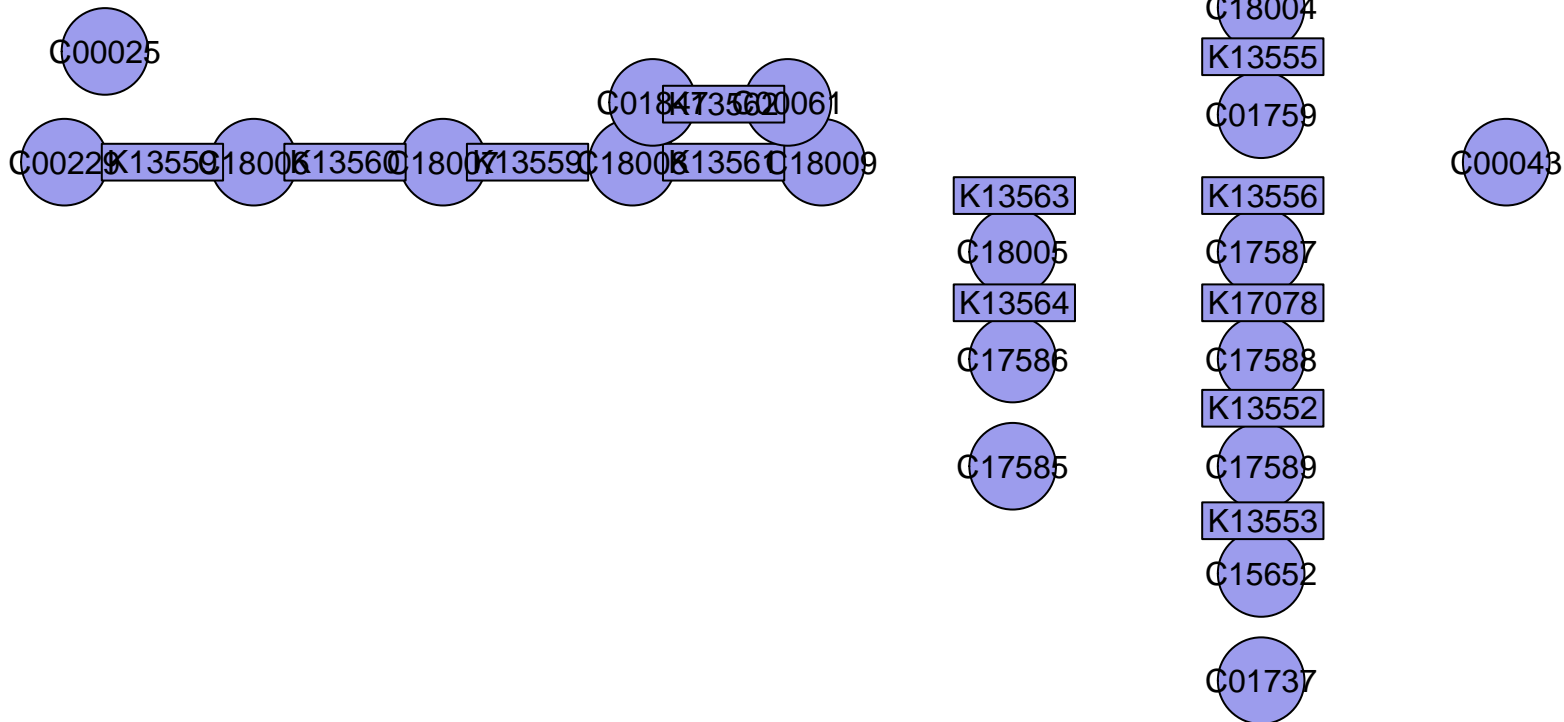




Butirosin and  
neomycin biosynthesis  
MPI-245

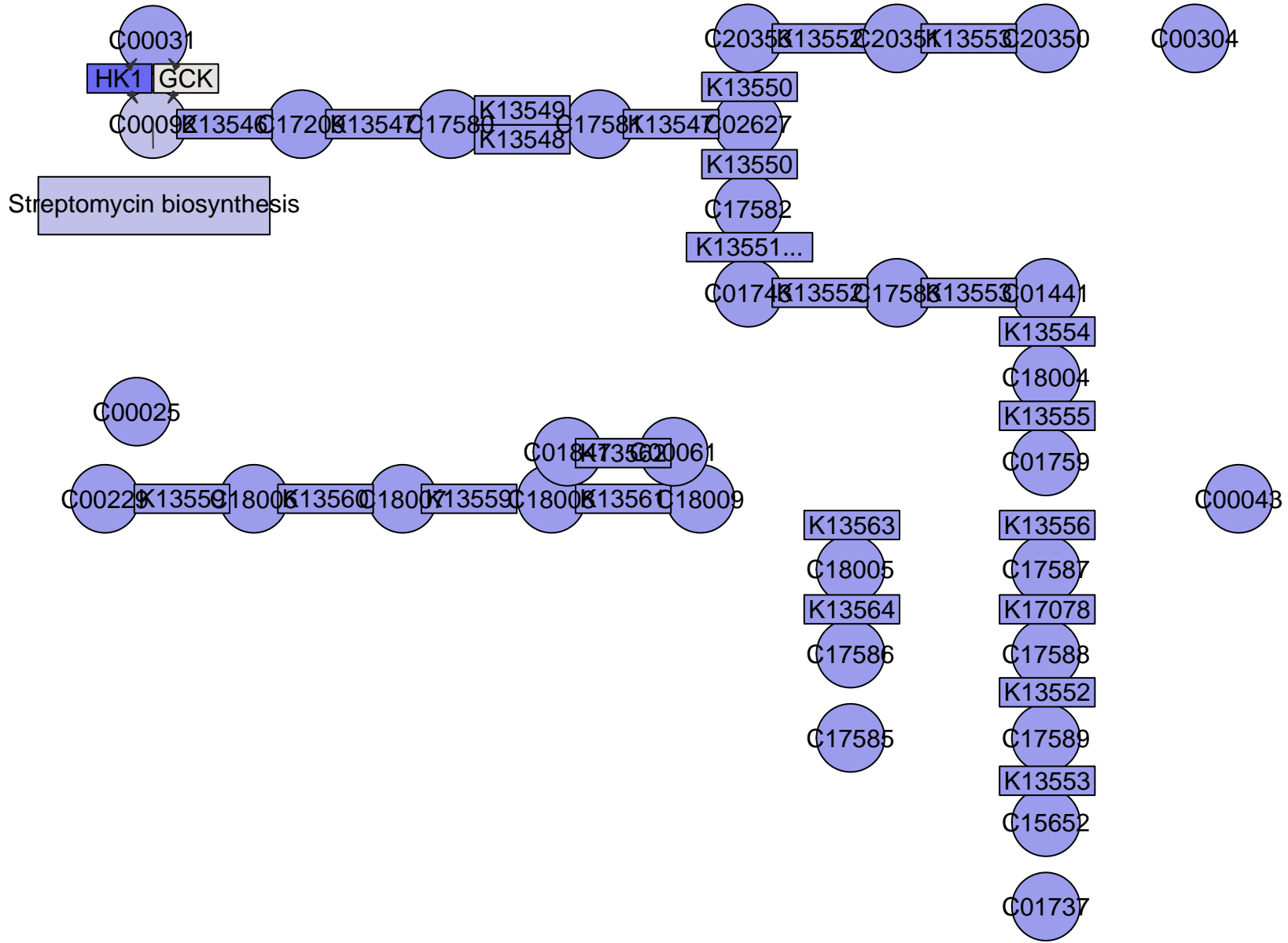


Streptomycin biosynthesis



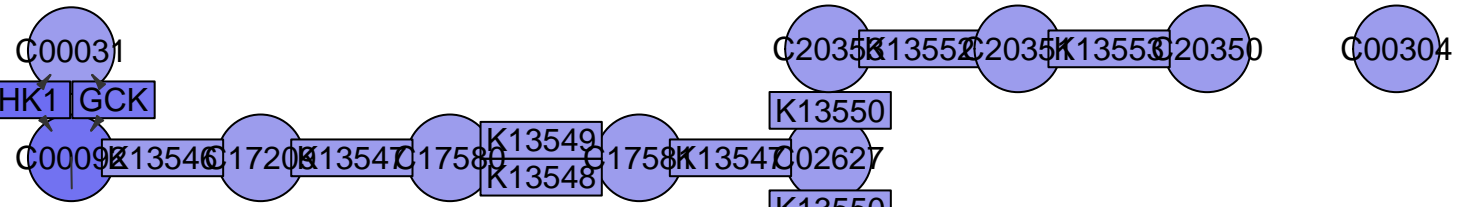
Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-248

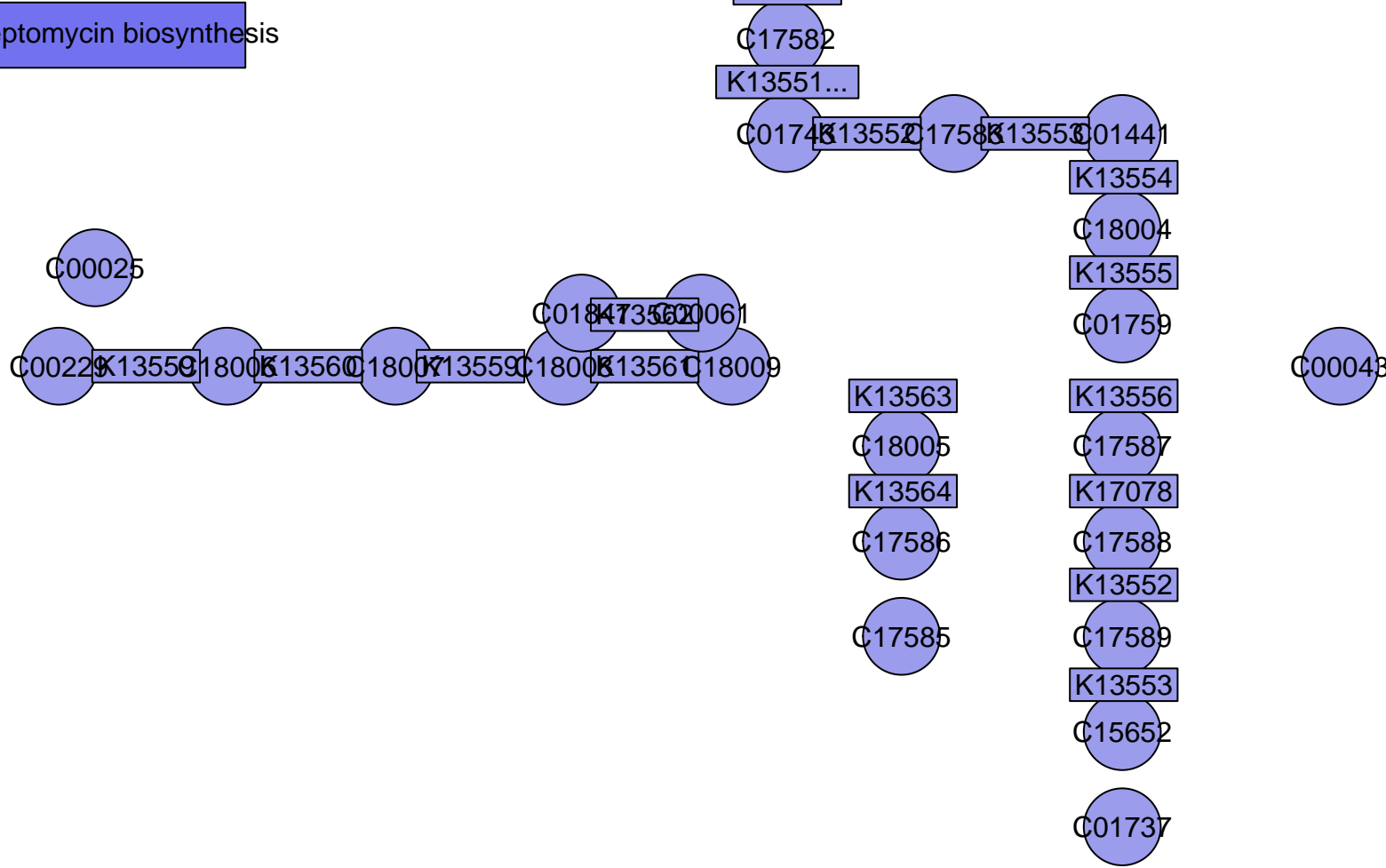


Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-249



Streptomycin biosynthesis



Amino sugar and  
nucleotide sugar metabolism





Butirosin and  
neomycin biosynthesis  
MPI-008

C00031

HK1 GCK

C00099

K13546

C17208

K13547

C17580

K13549  
K13548

C17581

K13547

C02627

K13550

K13550

C17582

K13551...

C01748

K13552

C17583

K13553

C01441

K13554

C18004

K13555

C01759

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

C01737

C00304

C20358

K13552

C20359

K13553

C20350

Streptomycin biosynthesis

C00025

C00229

K13559

C18006

K13560

C18007

K13559

C18008

K13561

C18009

C01847

K13562

C01061

K13563

C18005

K13564

C17586

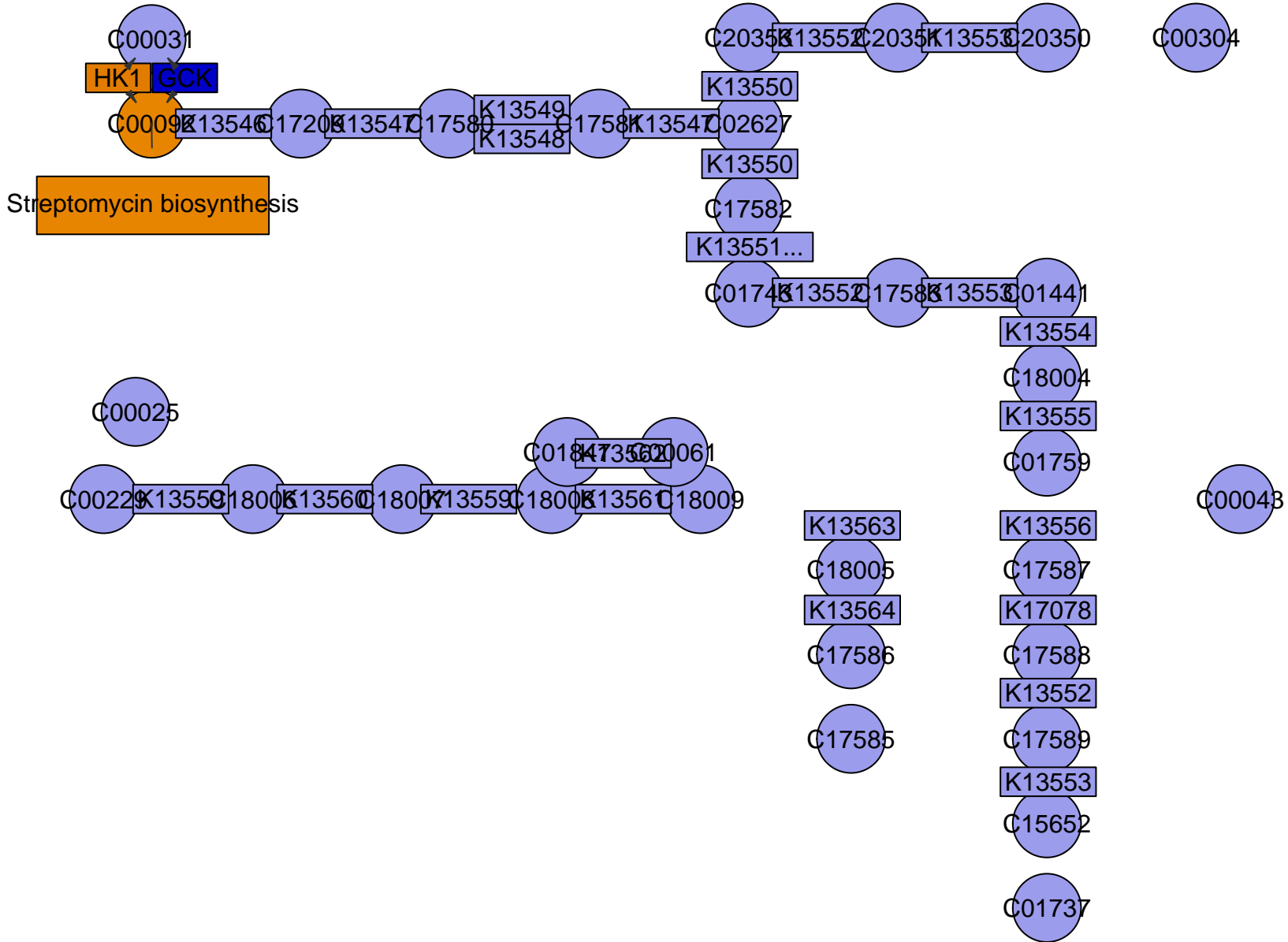
C17585

C00043

Amino sugar and  
nucleotide sugar metabolism

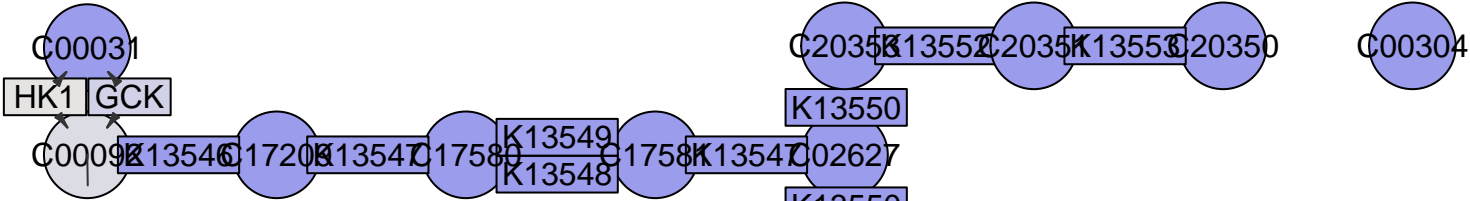


Butirosin and  
neomycin biosynthesis  
MPI-009

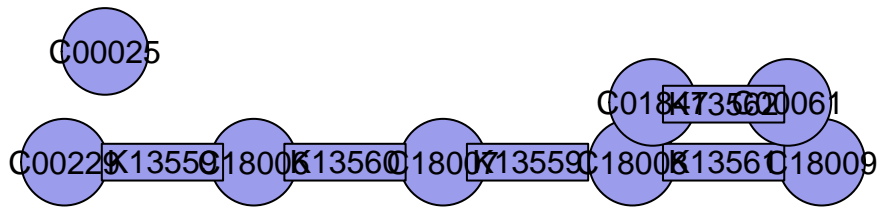
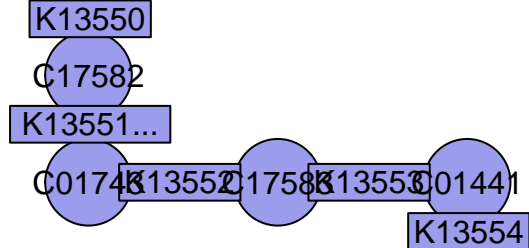




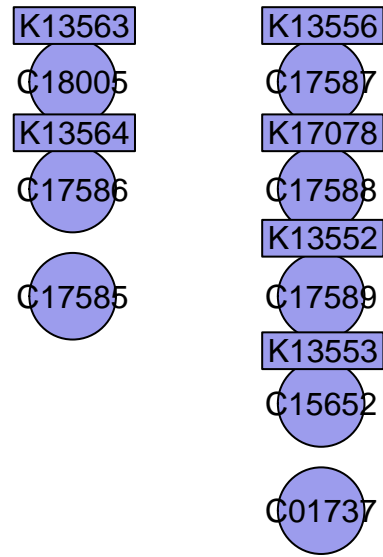
Butirosin and  
neomycin biosynthesis  
MPI-012



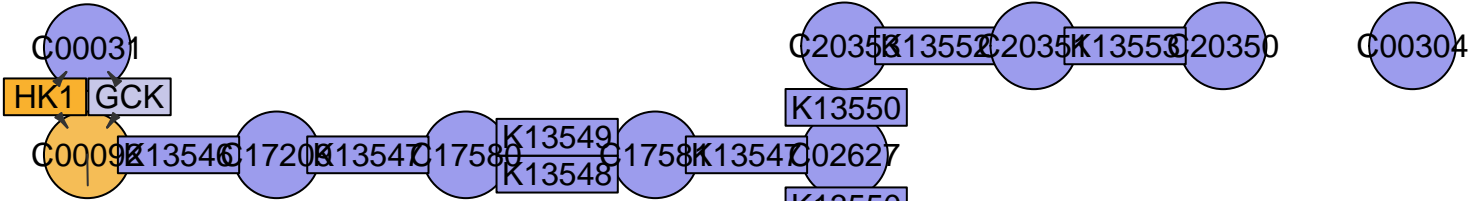
Streptomycin biosynthesis



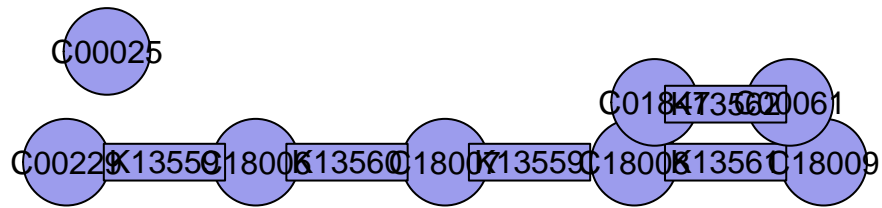
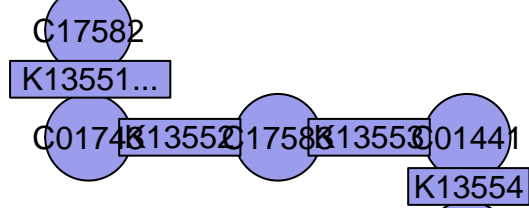
Amino sugar and  
nucleotide sugar metabolism



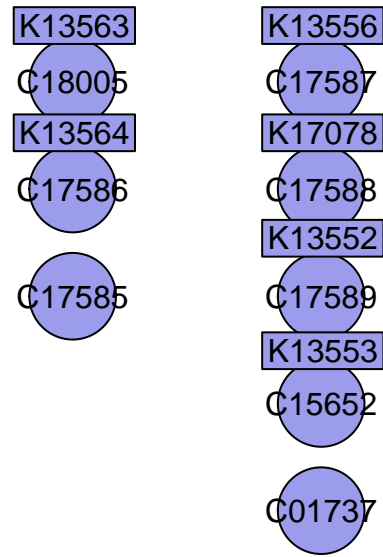
Butirosin and  
neomycin biosynthesis  
MPI-013



Streptomycin biosynthesis



Amino sugar and  
nucleotide sugar metabolism





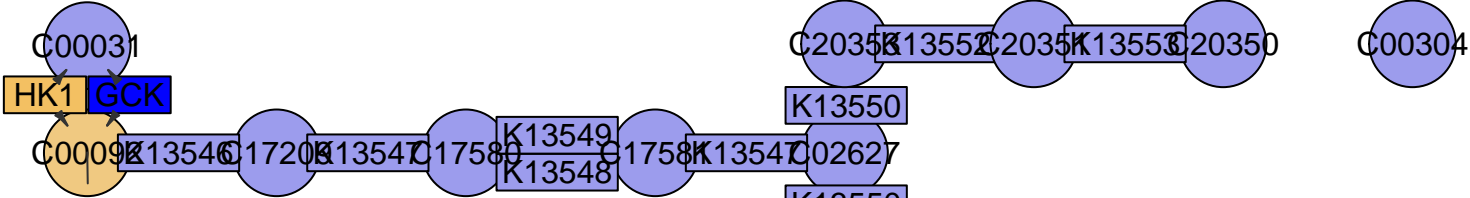




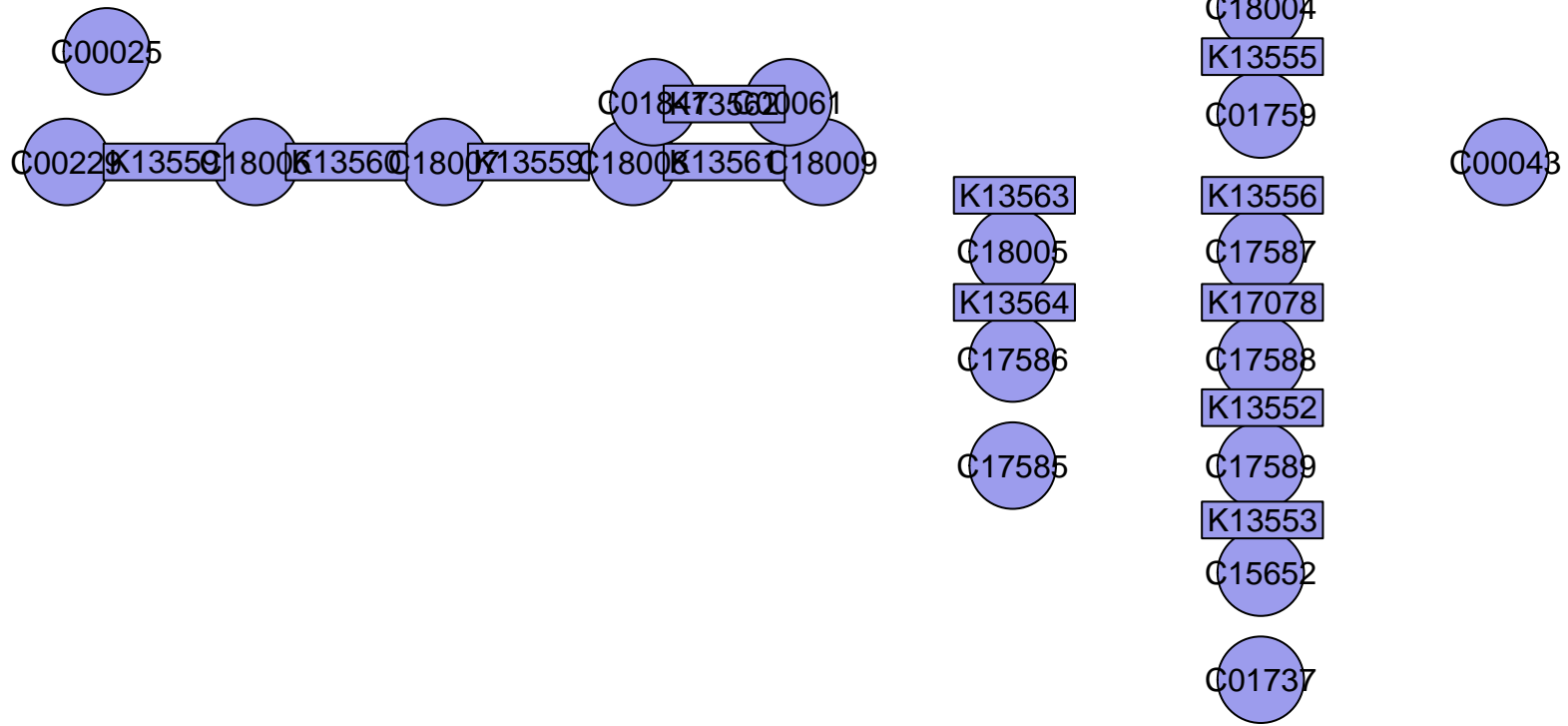




Butirosin and  
neomycin biosynthesis  
MPI-025



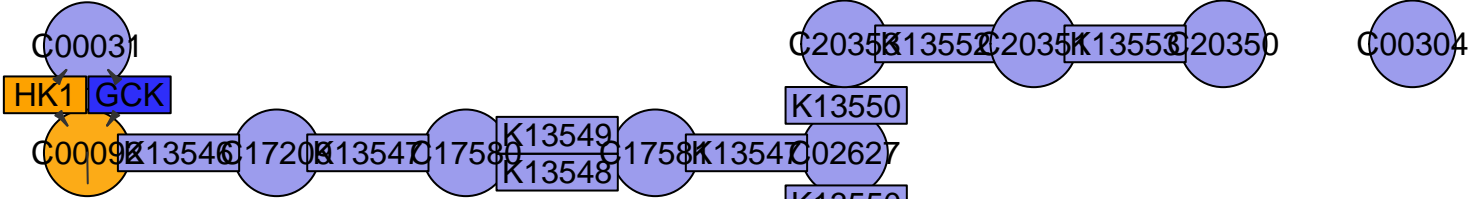
Streptomycin biosynthesis



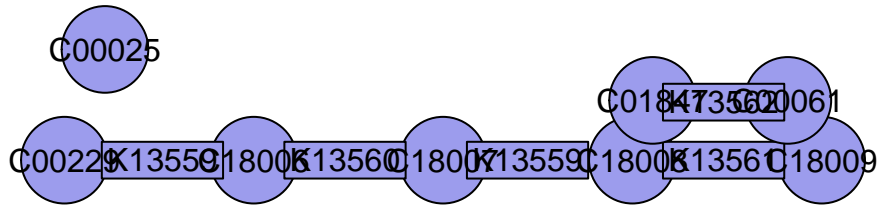
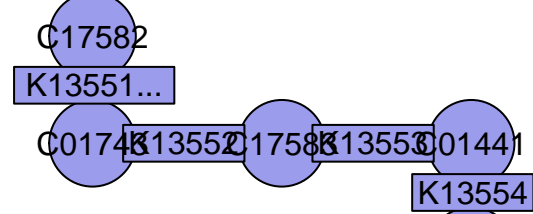
Amino sugar and  
nucleotide sugar metabolism



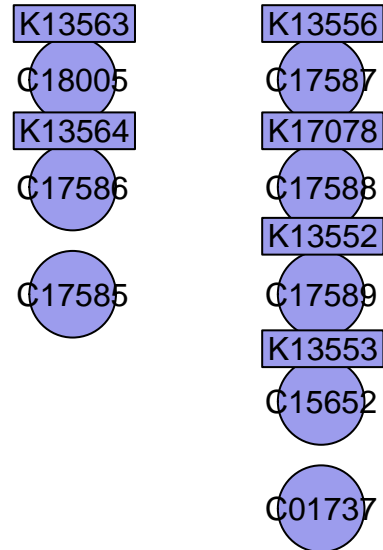
Butirosin and  
neomycin biosynthesis  
MPI-029



Streptomycin biosynthesis



Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-030

C00031

HK1 GCK

C00097

K13546

C17208

K13547

C17580

K13549  
K13548

C17581

K13547

C02627

C20355

K13552

C20356

K13553

C20350

C00304

Streptomycin biosynthesis

K13550

K13550

C17582

K13551...

C01748

K13552

C17583

K13553

C01441

C00025

C01847  
K13562

C01061

C00229

K13559

C18006

K13560

C18007

K13559

C18008  
K13561

C18009

K13554

C18004

K13555

C01759

K13563

C18005

K13564

C17586

C17585

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

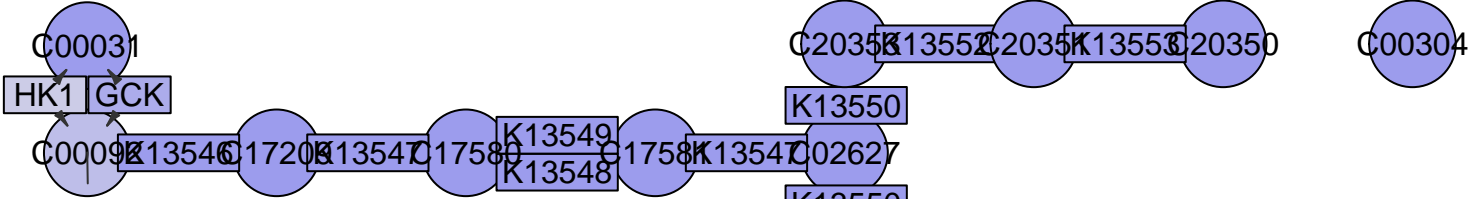
C01737

C00043

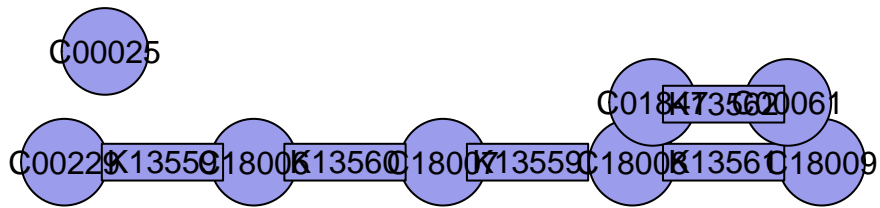
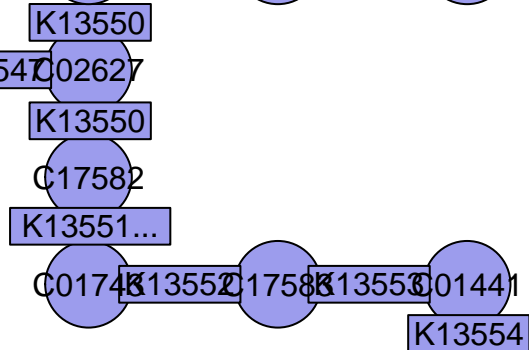
Amino sugar and  
nucleotide sugar metabolism



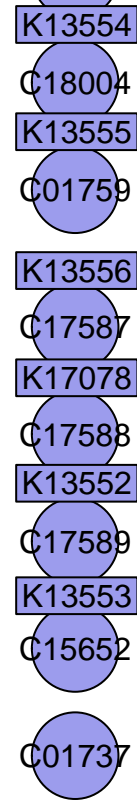
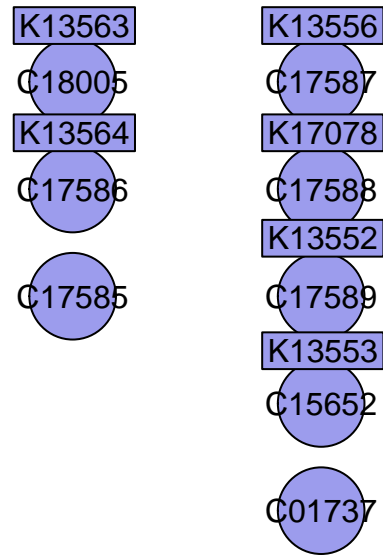
Butirosin and  
neomycin biosynthesis  
MPI-039



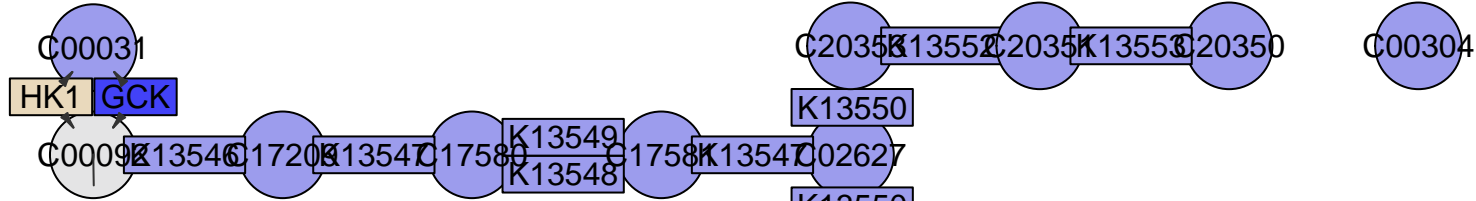
Streptomycin biosynthesis



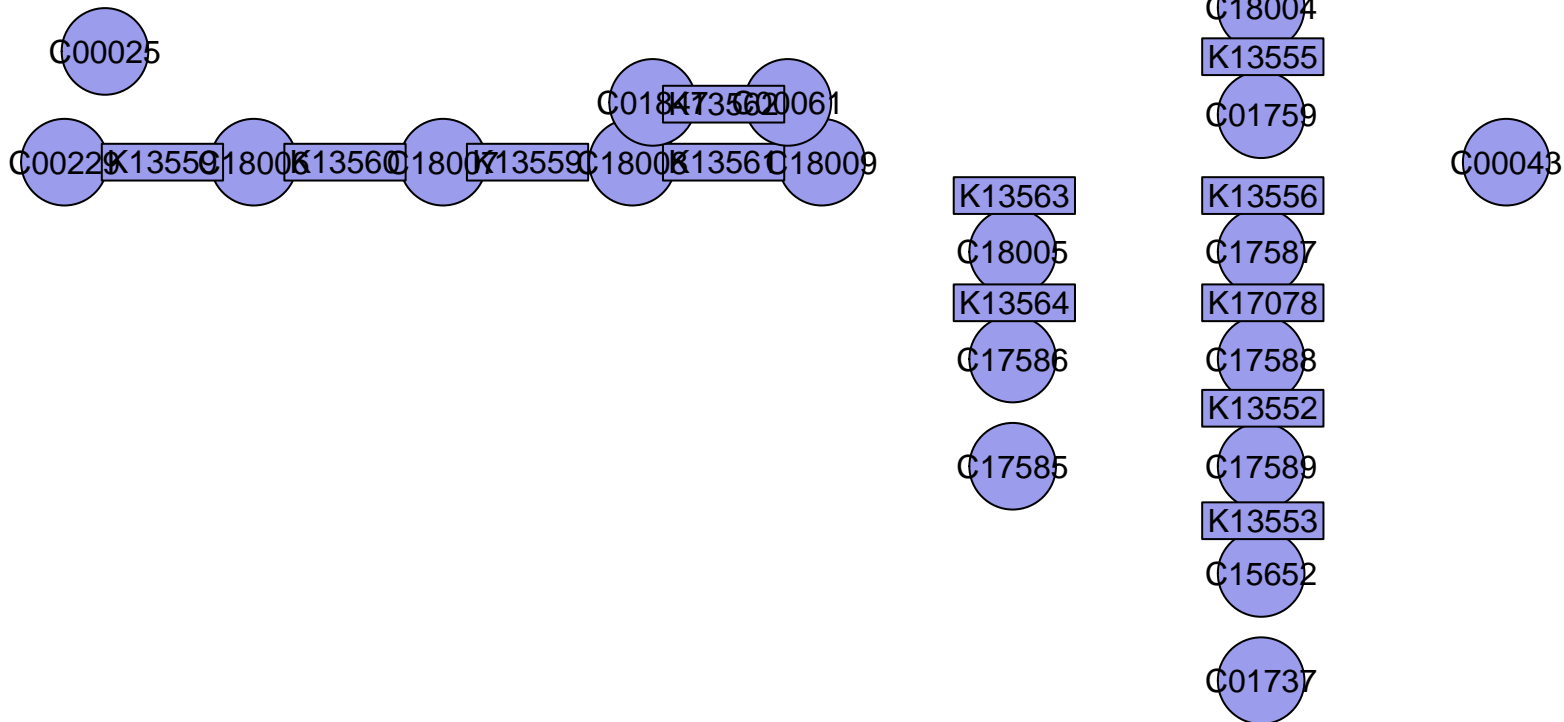
Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-040

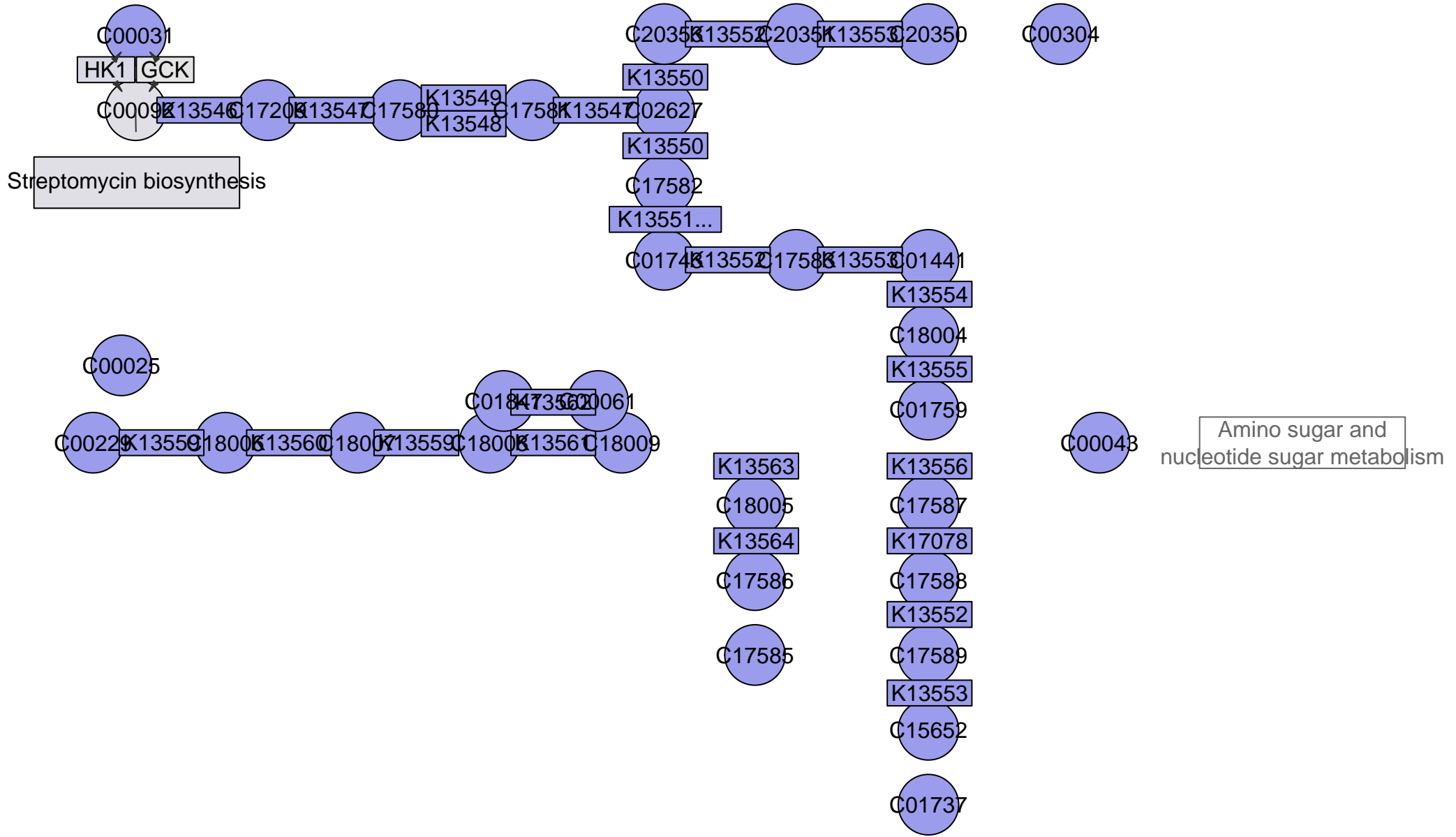


Streptomycin biosynthesis



Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-045



Butirosin and  
neomycin biosynthesis  
MPI-047

C00031  
HK1 GCK

C00099

K13546

C17208

K13547

C17580

K13549

K13548

C17581

K13547

C02627

K13550

C17582

K13551...

C01748

K13552

C17583

K13553

C01441

K13554

C18004

K13555

C01759

K13556

C18005

K13564

C17586

C17585

K13563

C18005

K13564

C17586

C17585

K13563

C17587

K17078

C17588

K13552

C17589

K13553

C15652

C01737

C20358

K13552

C20359

K13553

C20350

K13554

C00304

K13555

C00043

K13556

C00043

K13557

C00043

K13558

C00043

K13559

C00043

K13560

C00043

K13561

C00043

K13562

C00043

K13563

C00043

K13564

C00043

K13565

C00043

K13566

C00043

K13567

C00043

K13568

C00043

Streptomycin biosynthesis

C00025

C00229

K13559

C18006

K13560

C18007

K13561

C18008

K13562

C01847

K13563

C01061

C00043

Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-053

C00031  
HK1 GCK

C00099

K13546

C17208

K13547

C17580

K13549  
K13548

C17581

K13547

C02627

K13550

K13551...

C01748

K13552

C17583

K13553

C01441

K13554

C18004

K13555

C01759

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

C01737

C00304

Streptomycin biosynthesis

C00025

C00229

K13559

C18006

K13560

C18007

K13559

C18008

K13561

C18009

K13563

C18005

K13564

C17586

C17585

C00043

Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-062

C00031  
HK1 GCK

C00091

K13546

C17208

K13547

C17589

K13549  
K13548

C17588

K13547

C02627

K13550

K13550

C17582

K13551...

C01748

K13552

C17583

K13553

C01441

K13554

C18004

K13555

C01759

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

C01737

C00304

Streptomycin biosynthesis

C00025

C00229

K13559

C18006

K13560

C18007

K13559

C18008

K13561

C18009

C01847  
K13562

K13563

C18005

K13564

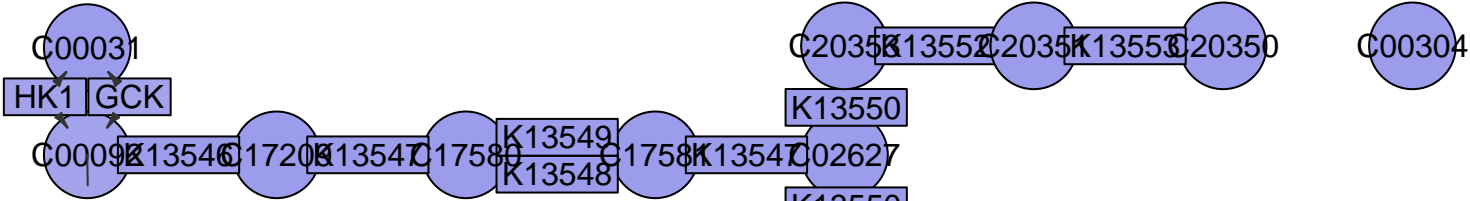
C17586

C17585

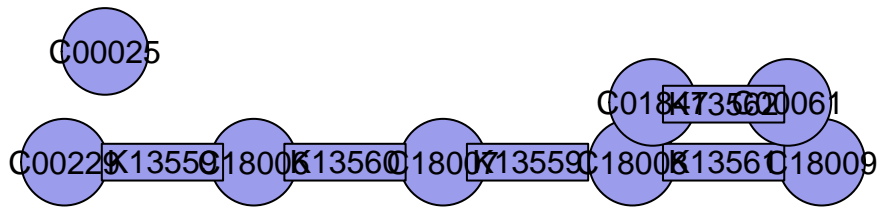
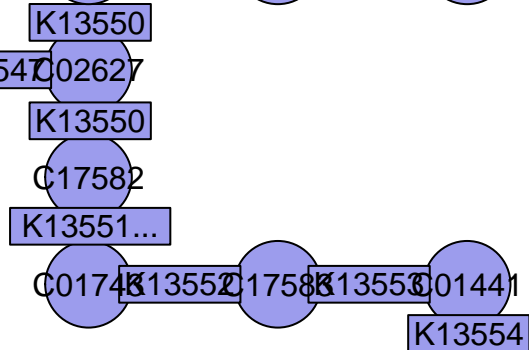
C00043

Amino sugar and  
nucleotide sugar metabolism

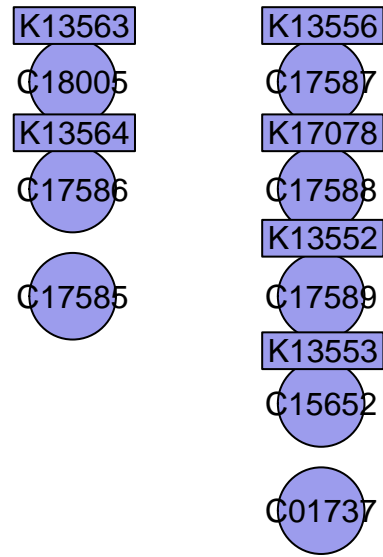
Butirosin and  
neomycin biosynthesis  
MPI-063



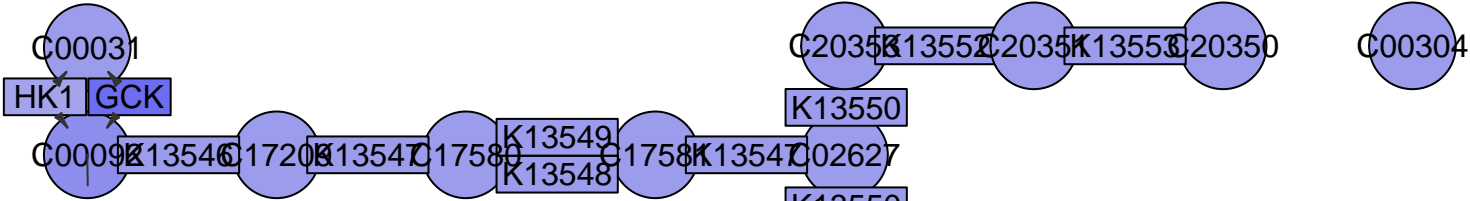
Streptomycin biosynthesis



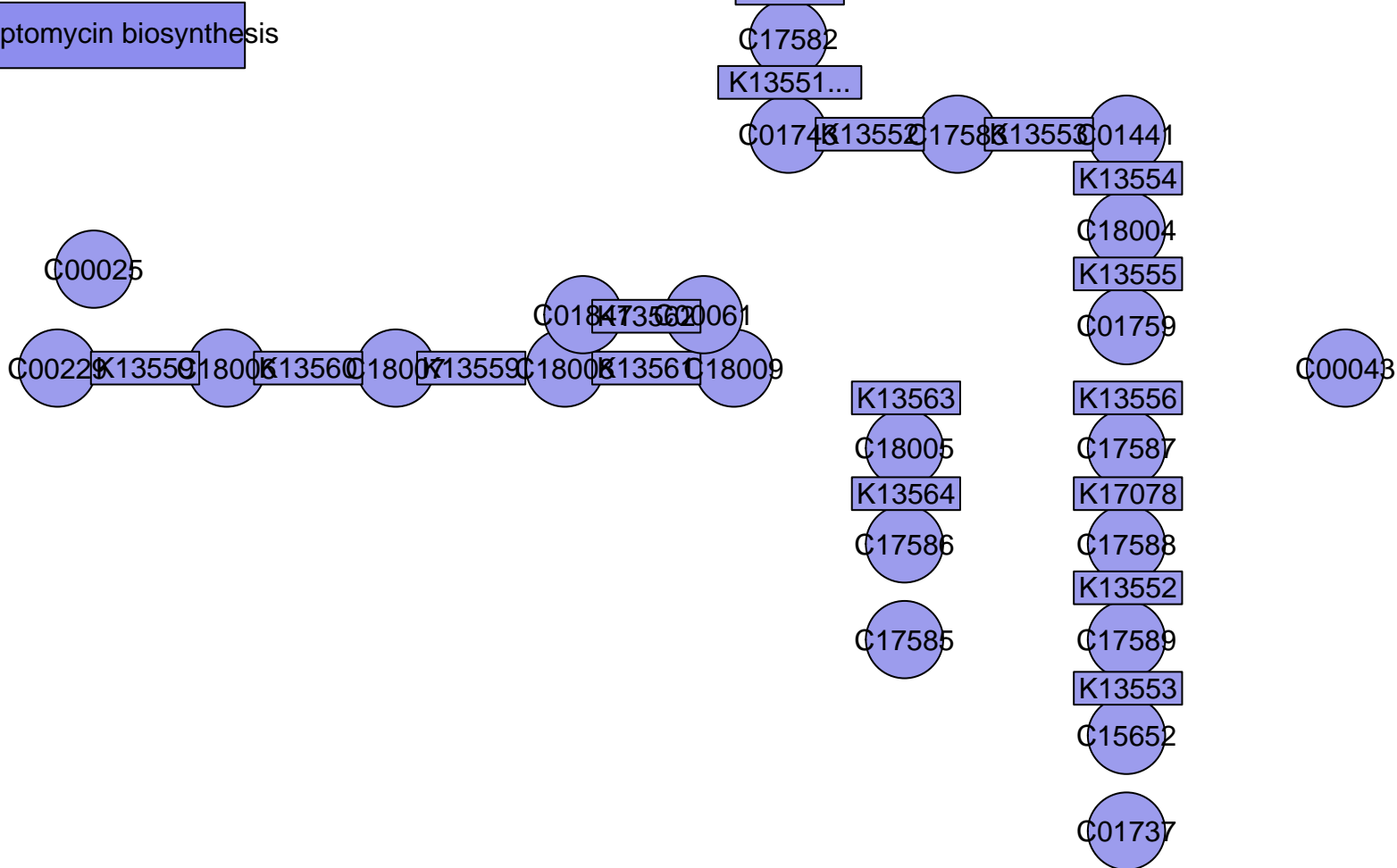
Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-069



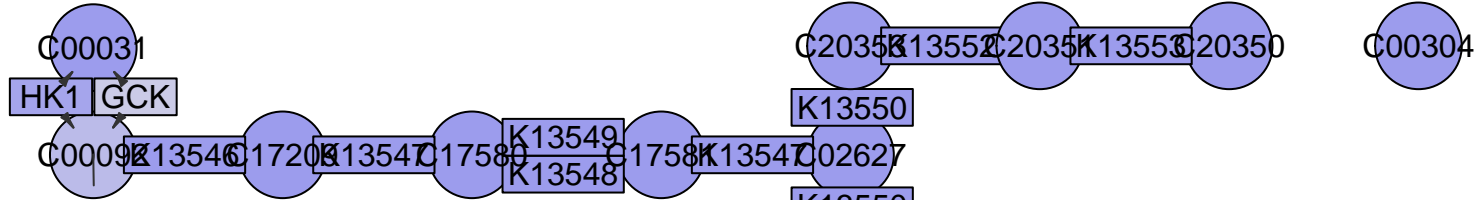
Streptomycin biosynthesis



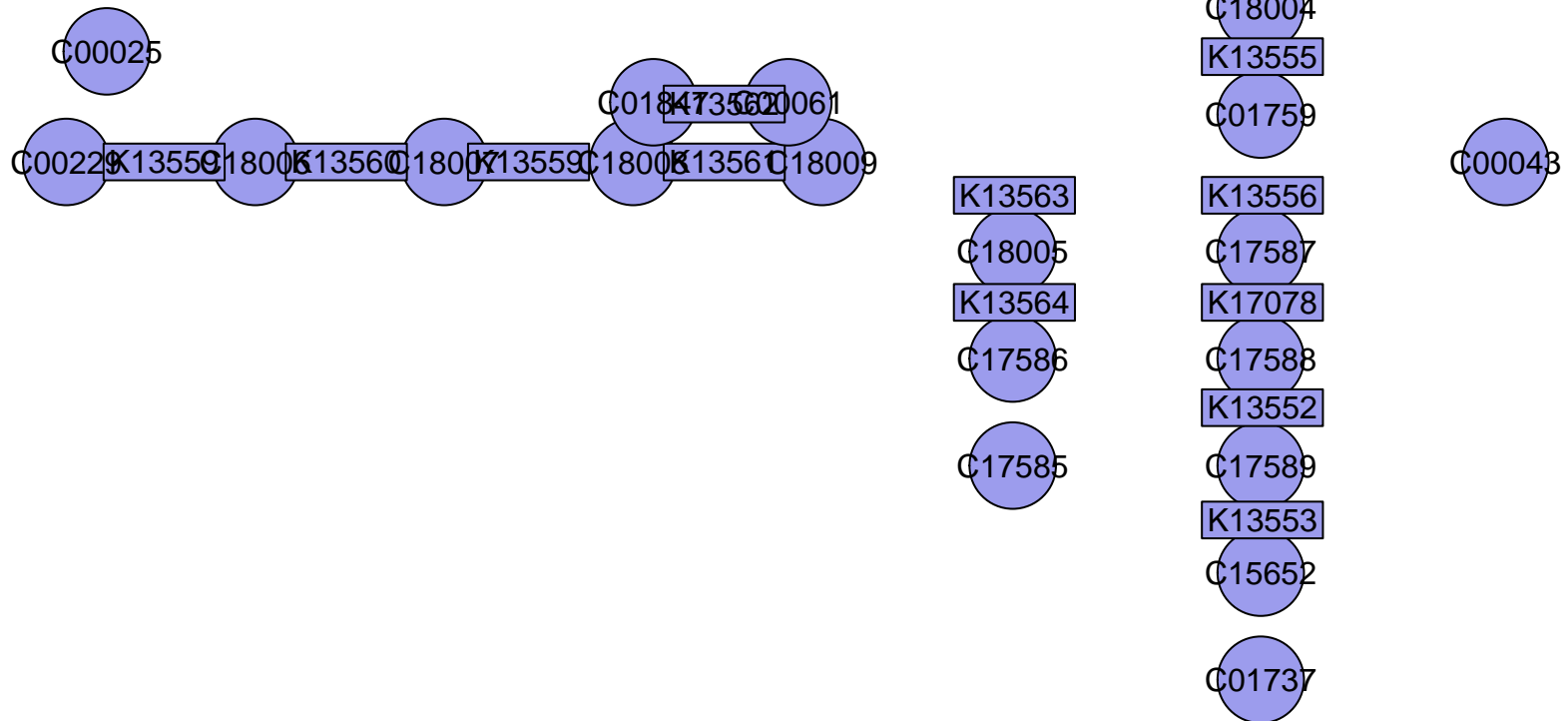
Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-073

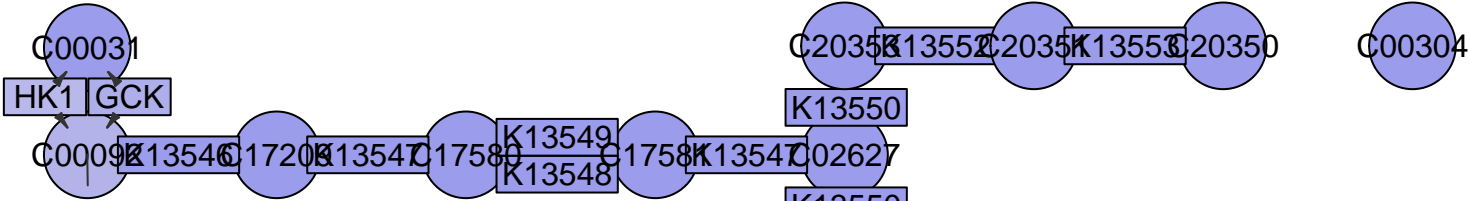


Streptomycin biosynthesis

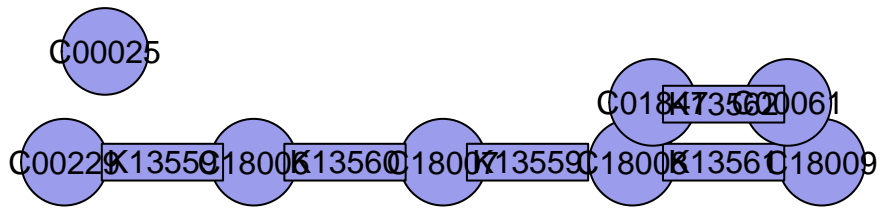
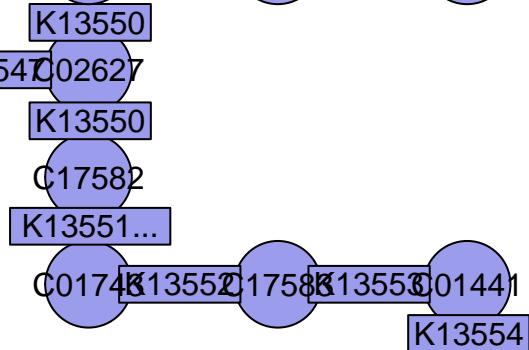


Amino sugar and  
nucleotide sugar metabolism

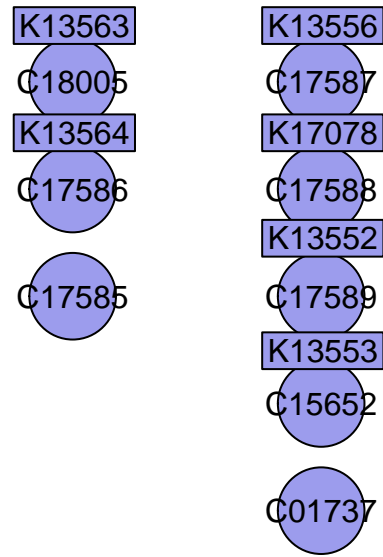
Butirosin and  
neomycin biosynthesis  
MPI-074



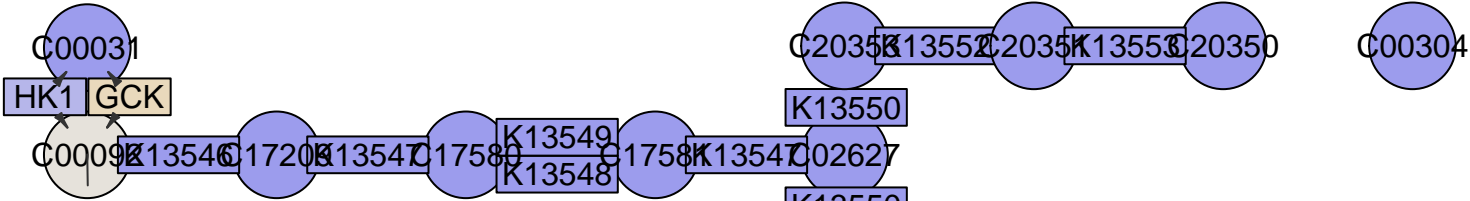
Streptomycin biosynthesis



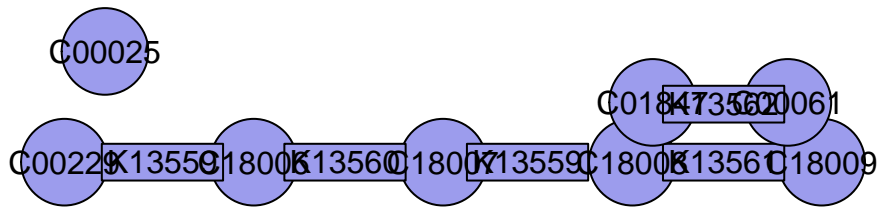
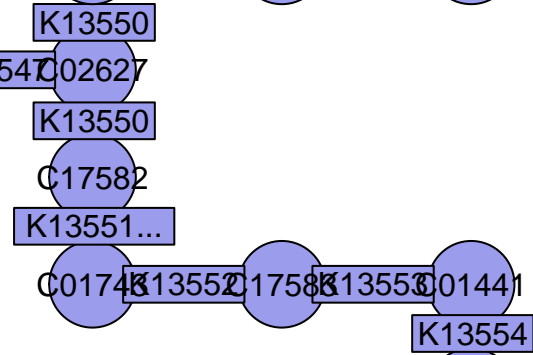
Amino sugar and  
nucleotide sugar metabolism



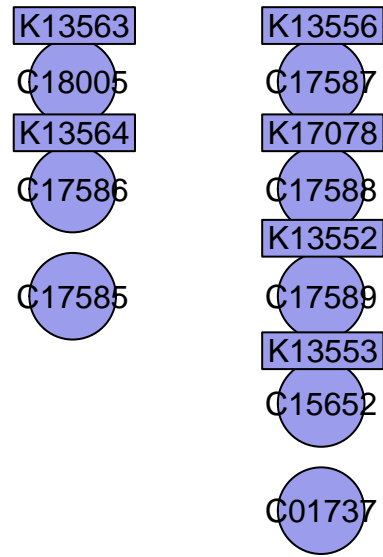
Butirosin and  
neomycin biosynthesis  
MPI-076



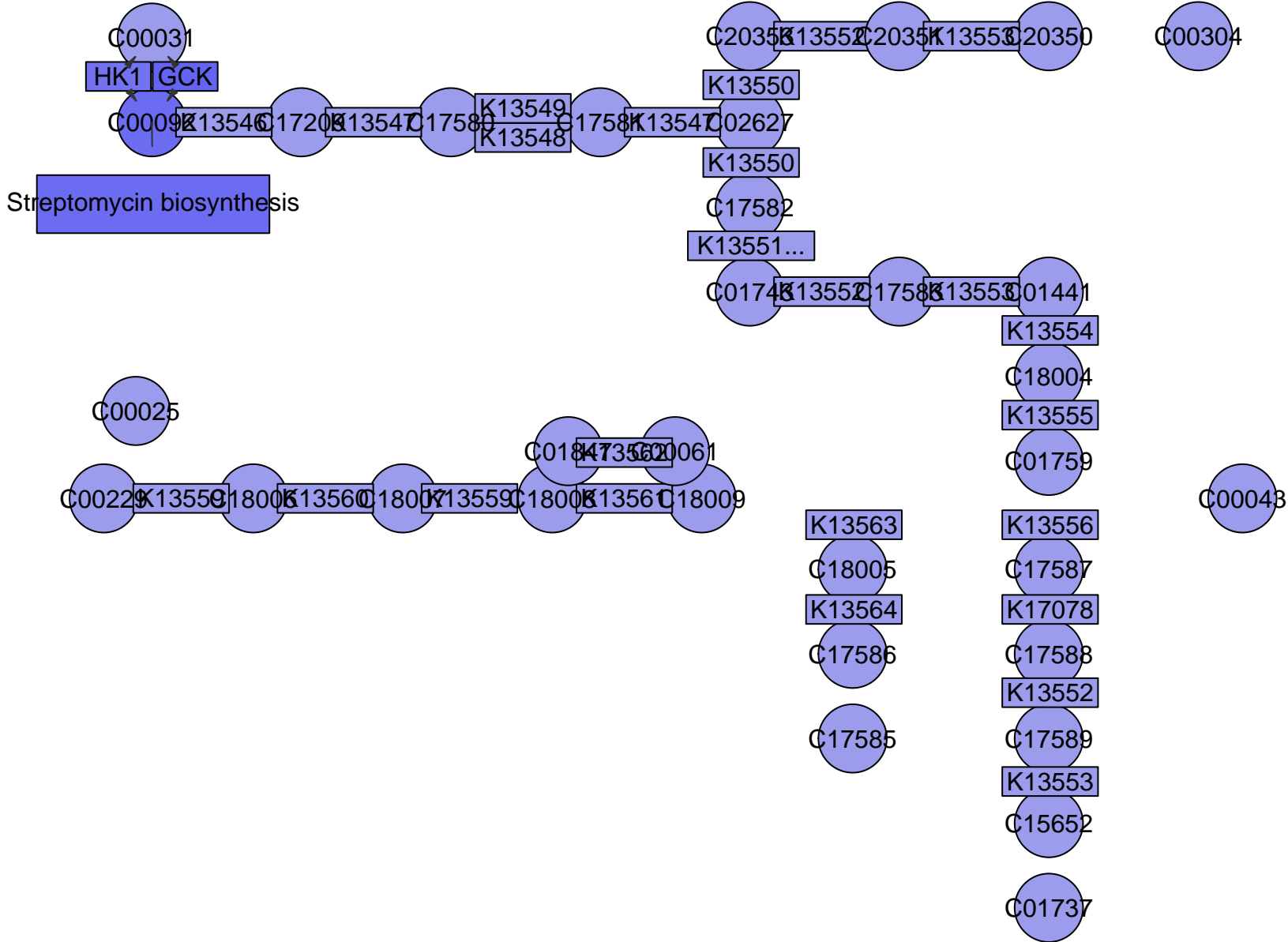
Streptomycin biosynthesis



Amino sugar and  
nucleotide sugar metabolism

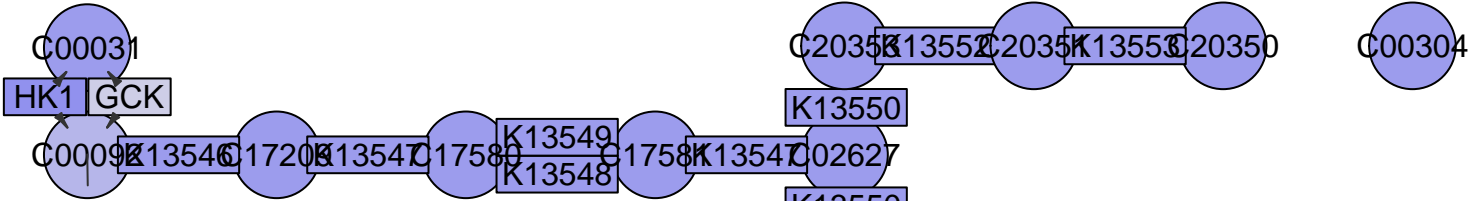


Butirosin and  
neomycin biosynthesis  
MPI-083

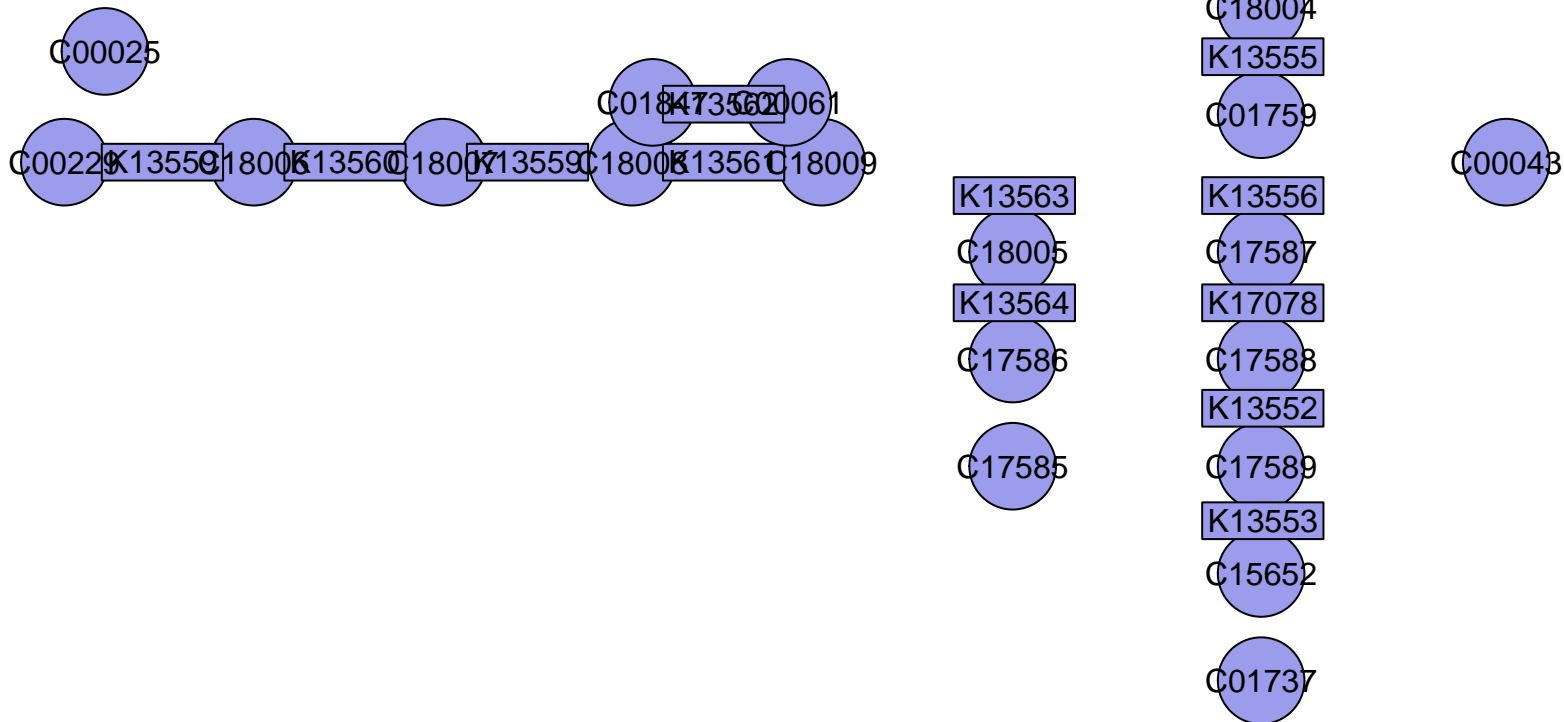




Butirosin and  
neomycin biosynthesis  
MPI-088

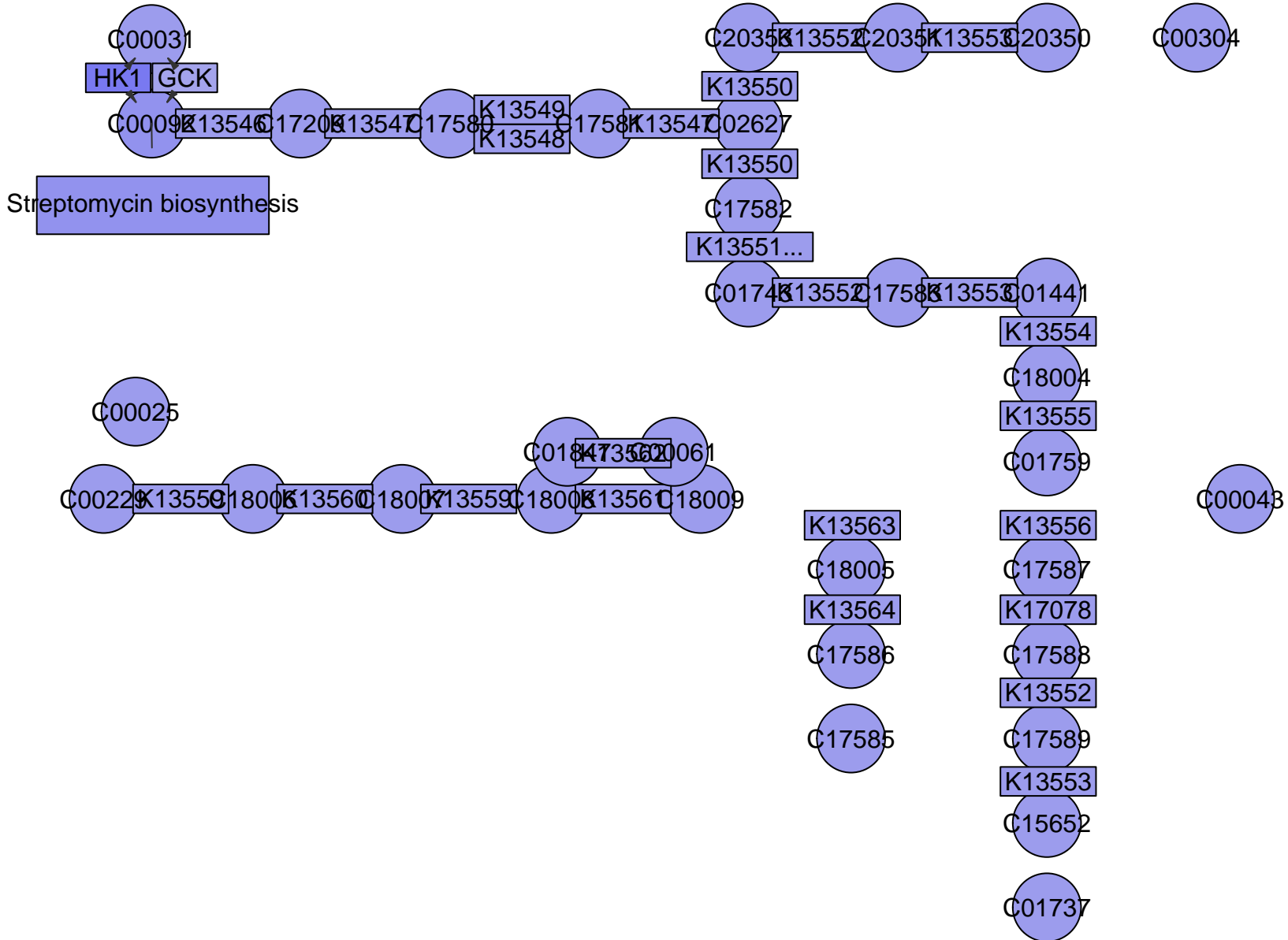


Streptomycin biosynthesis

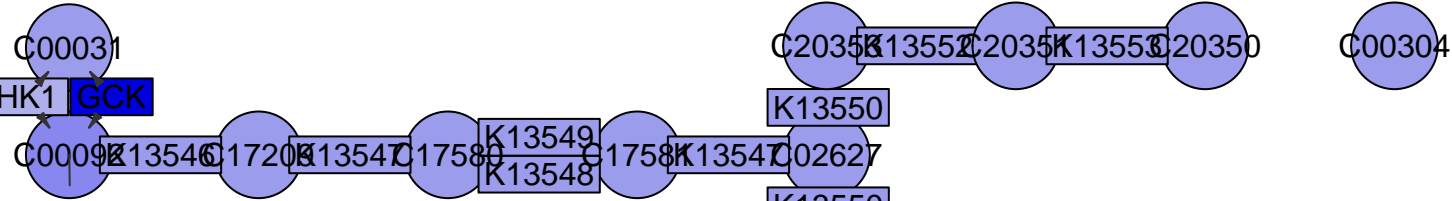


Amino sugar and  
nucleotide sugar metabolism

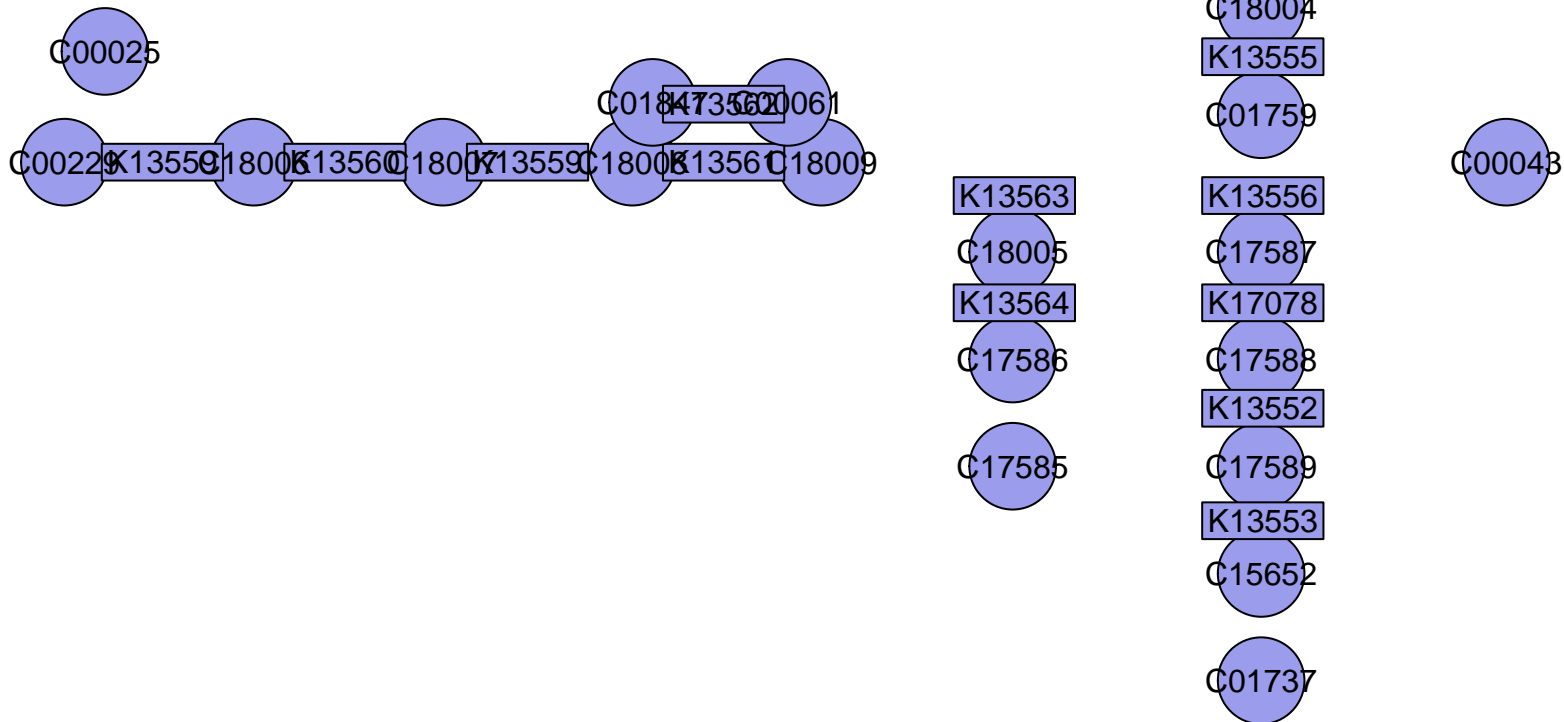
Butirosin and  
neomycin biosynthesis  
MPI-092



Butirosin and  
neomycin biosynthesis  
MPI-096



Streptomycin biosynthesis

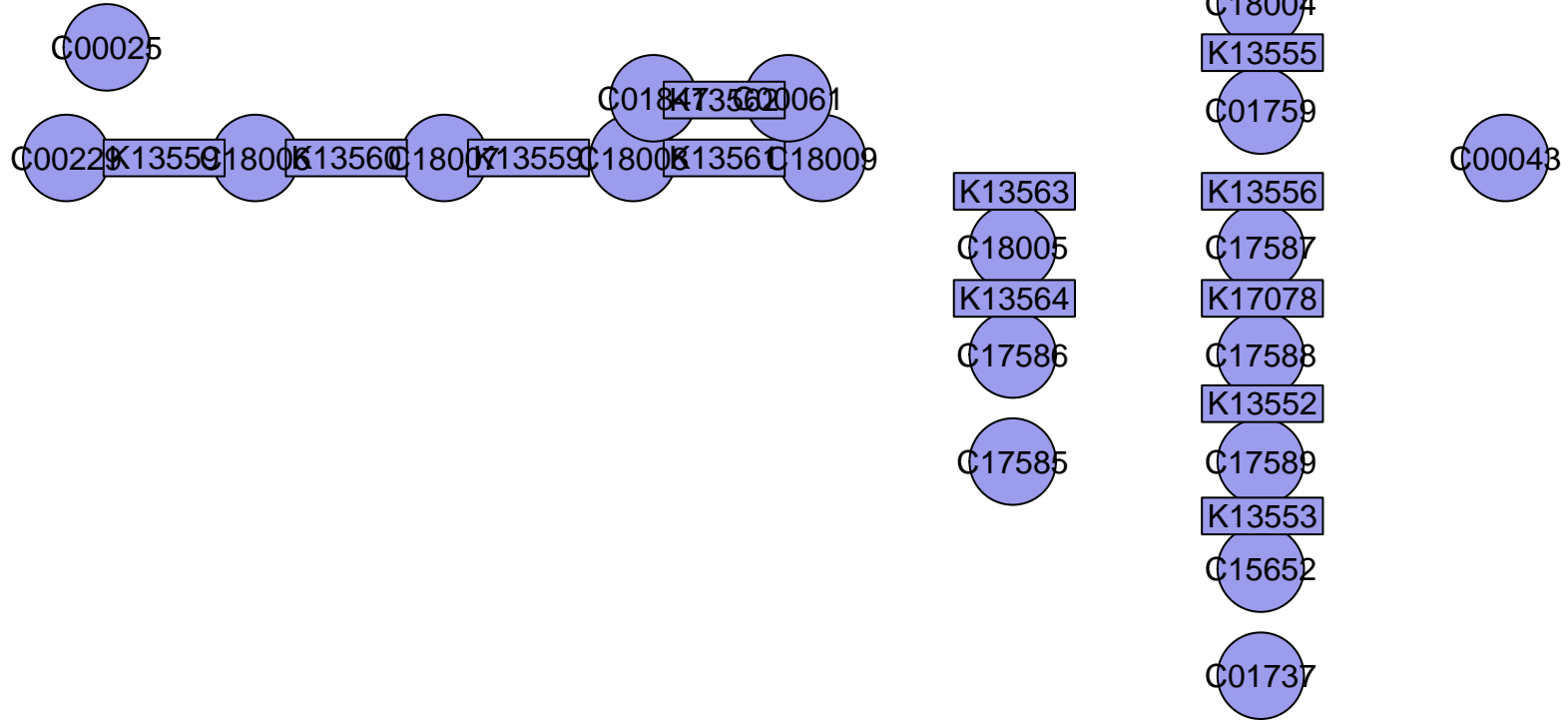


Amino sugar and  
nucleotide sugar metabolism

Butirosin and neomycin biosynthesis  
MPI-098

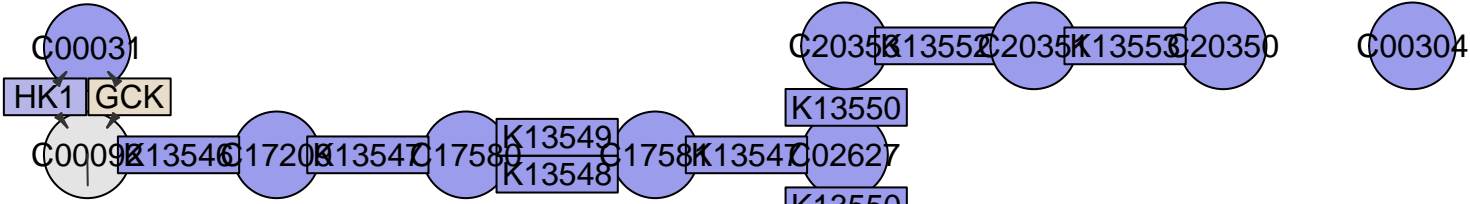


Streptomycin biosynthesis

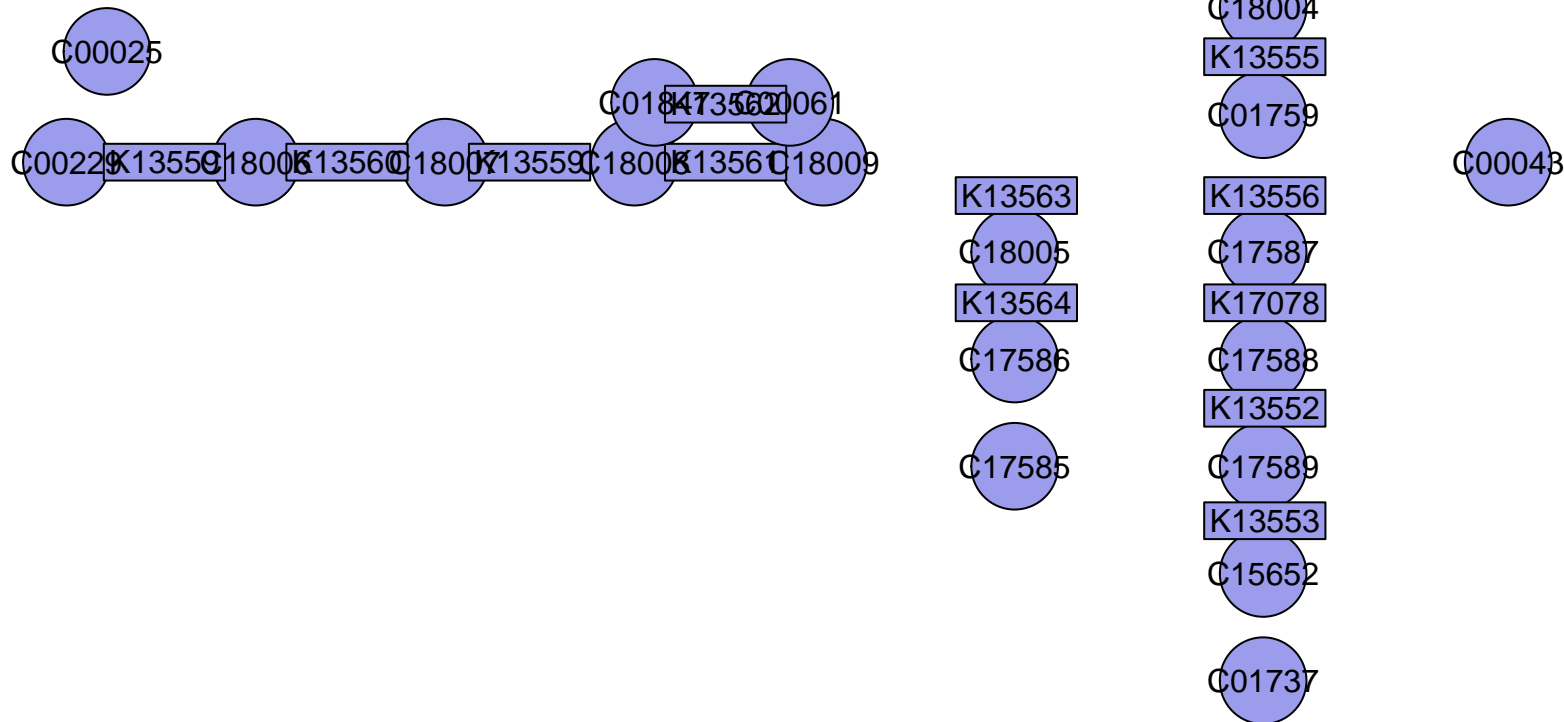


Amino sugar and nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-100

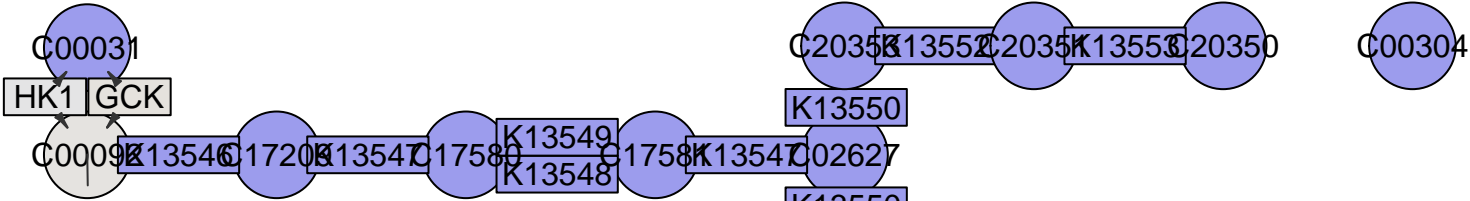


Streptomycin biosynthesis

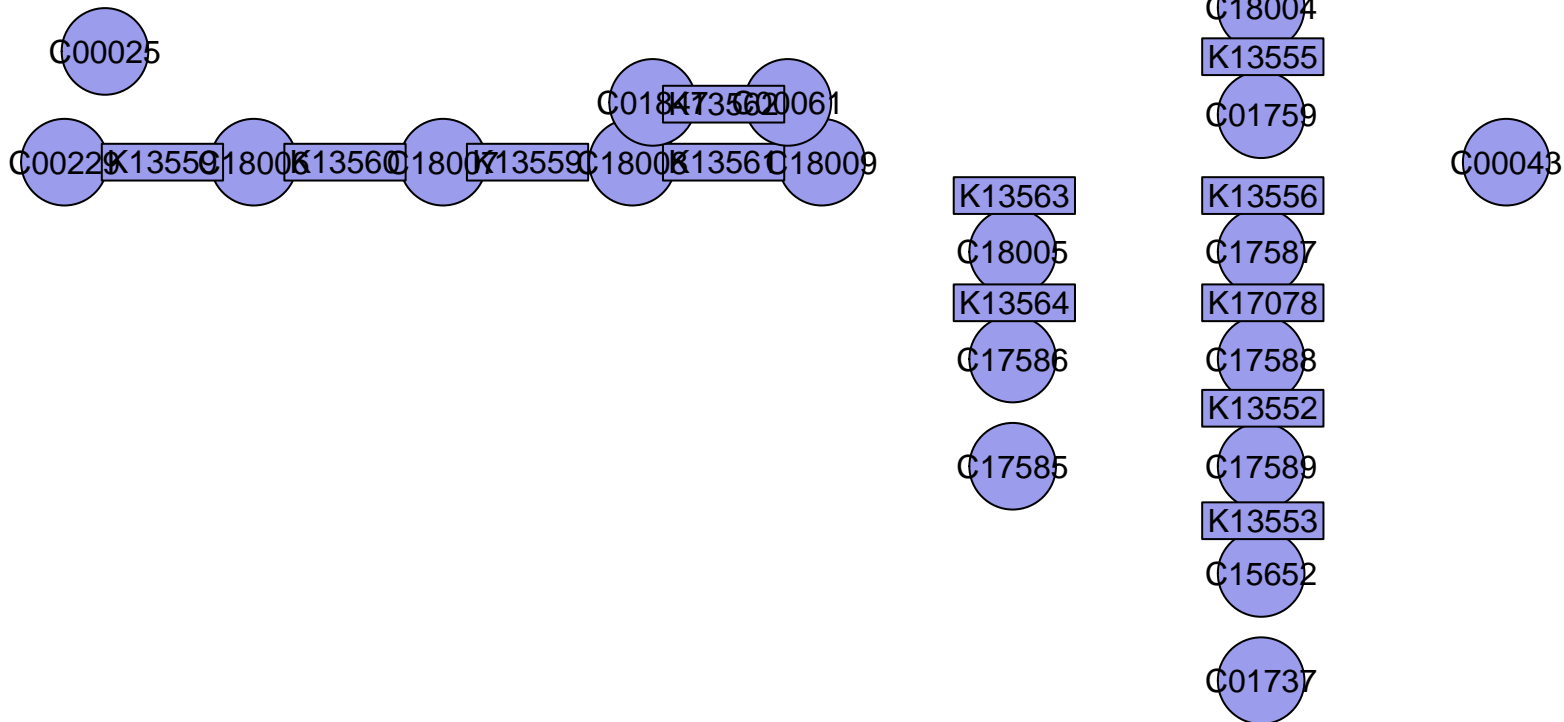


Amino sugar and  
nucleotide sugar metabolism

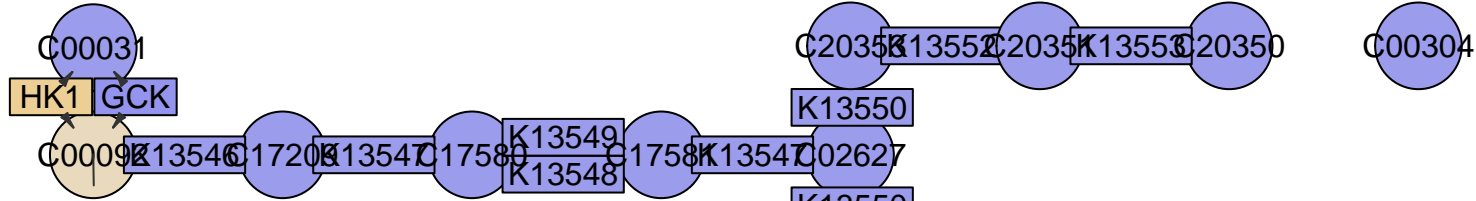
Butirosin and  
neomycin biosynthesis  
MPI-105



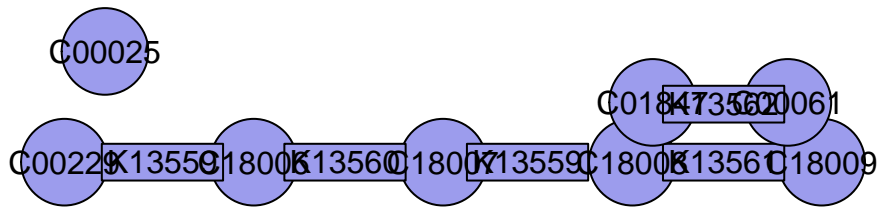
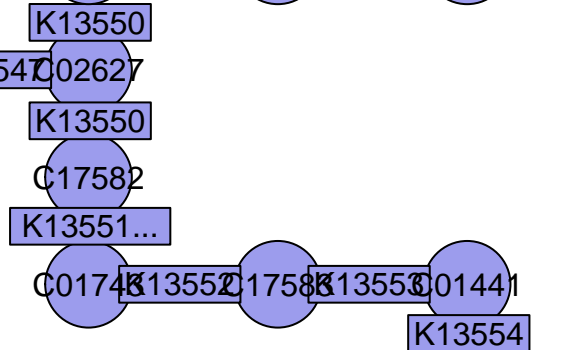
Streptomycin biosynthesis



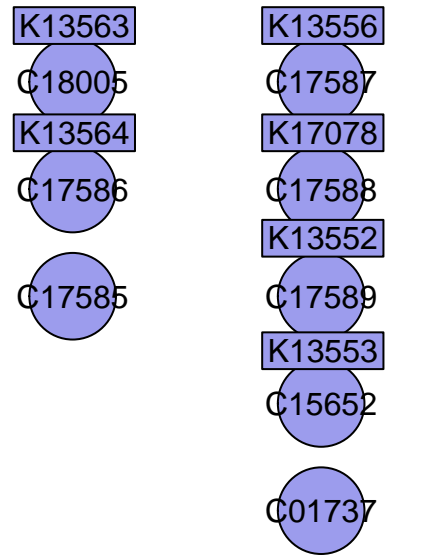
Butirosin and  
neomycin biosynthesis  
MPI-106



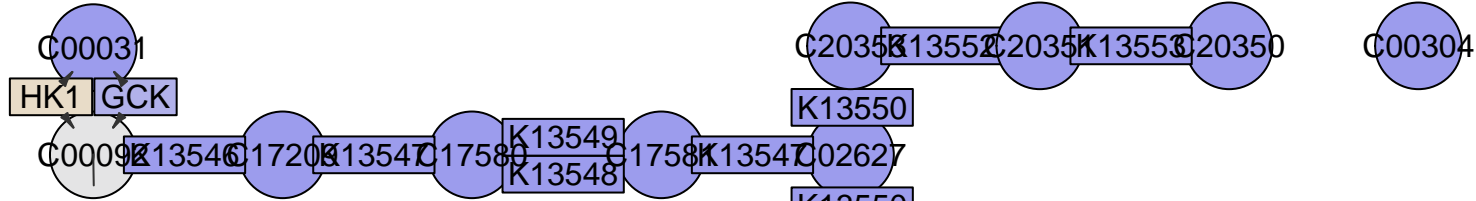
Streptomycin biosynthesis



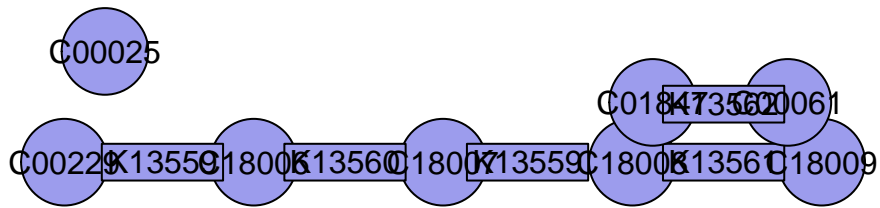
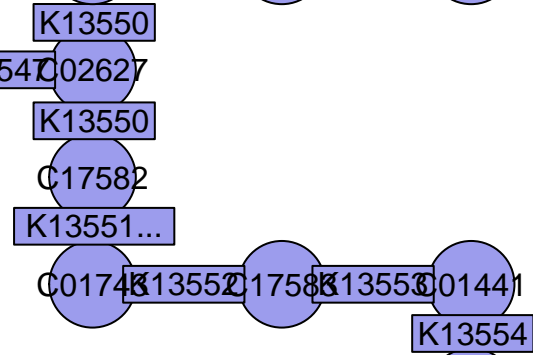
Amino sugar and  
nucleotide sugar metabolism



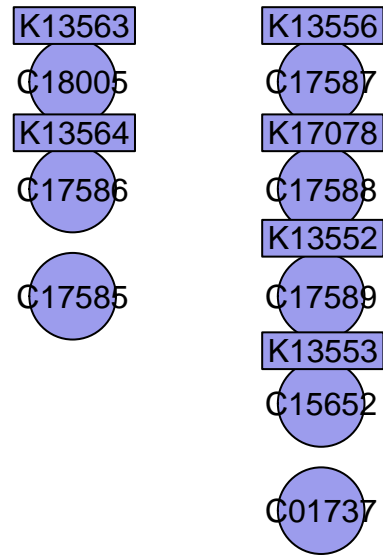
Butirosin and  
neomycin biosynthesis  
MPI-108



Streptomycin biosynthesis

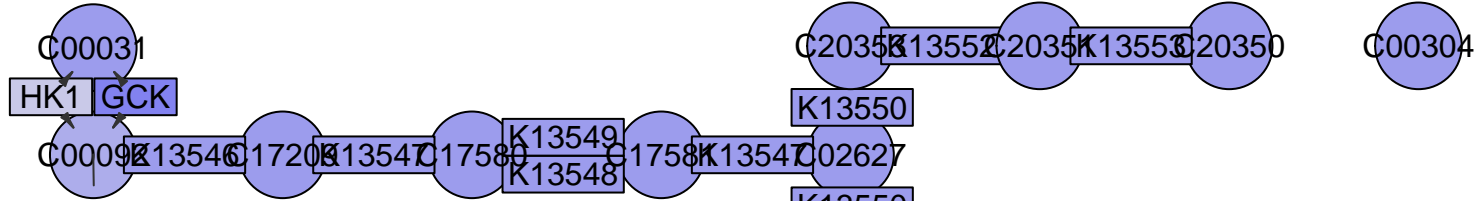


Amino sugar and  
nucleotide sugar metabolism

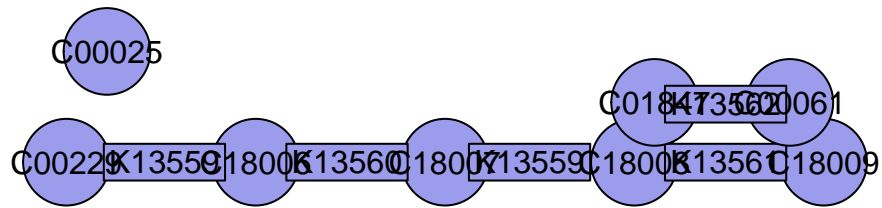
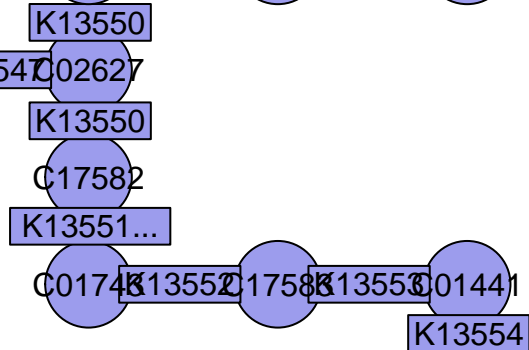




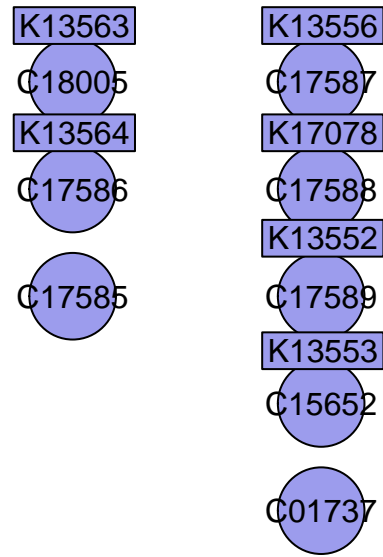
Butirosin and  
neomycin biosynthesis  
MPI-109



Streptomycin biosynthesis

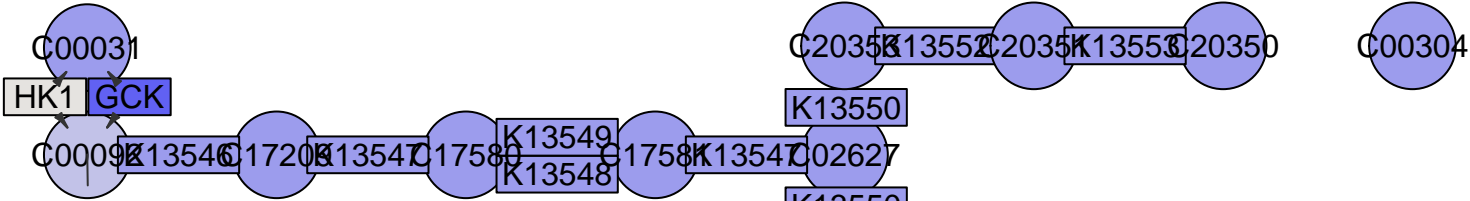


Amino sugar and  
nucleotide sugar metabolism

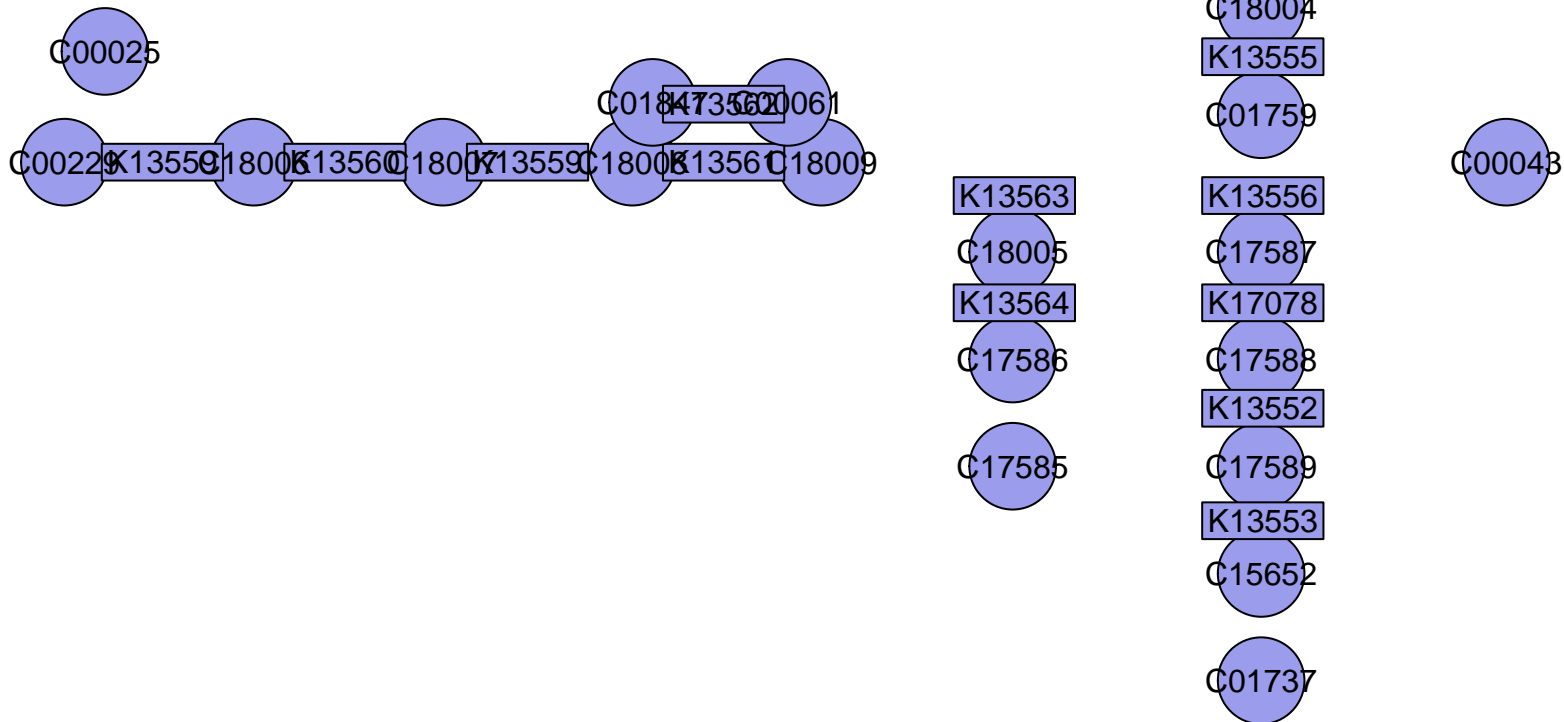




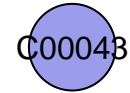
Butirosin and  
neomycin biosynthesis  
MPI-111



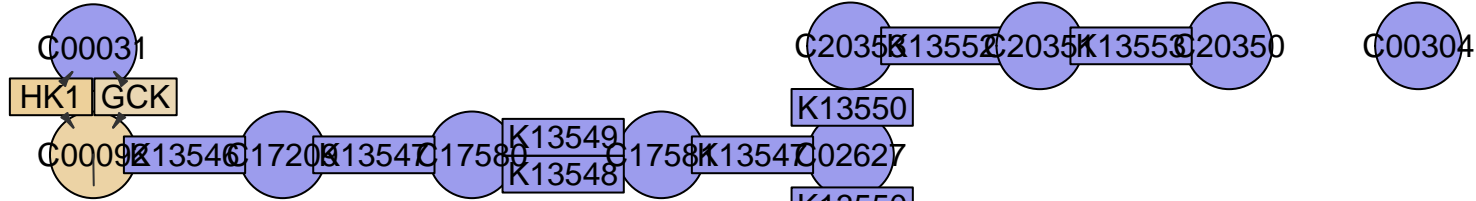
Streptomycin biosynthesis



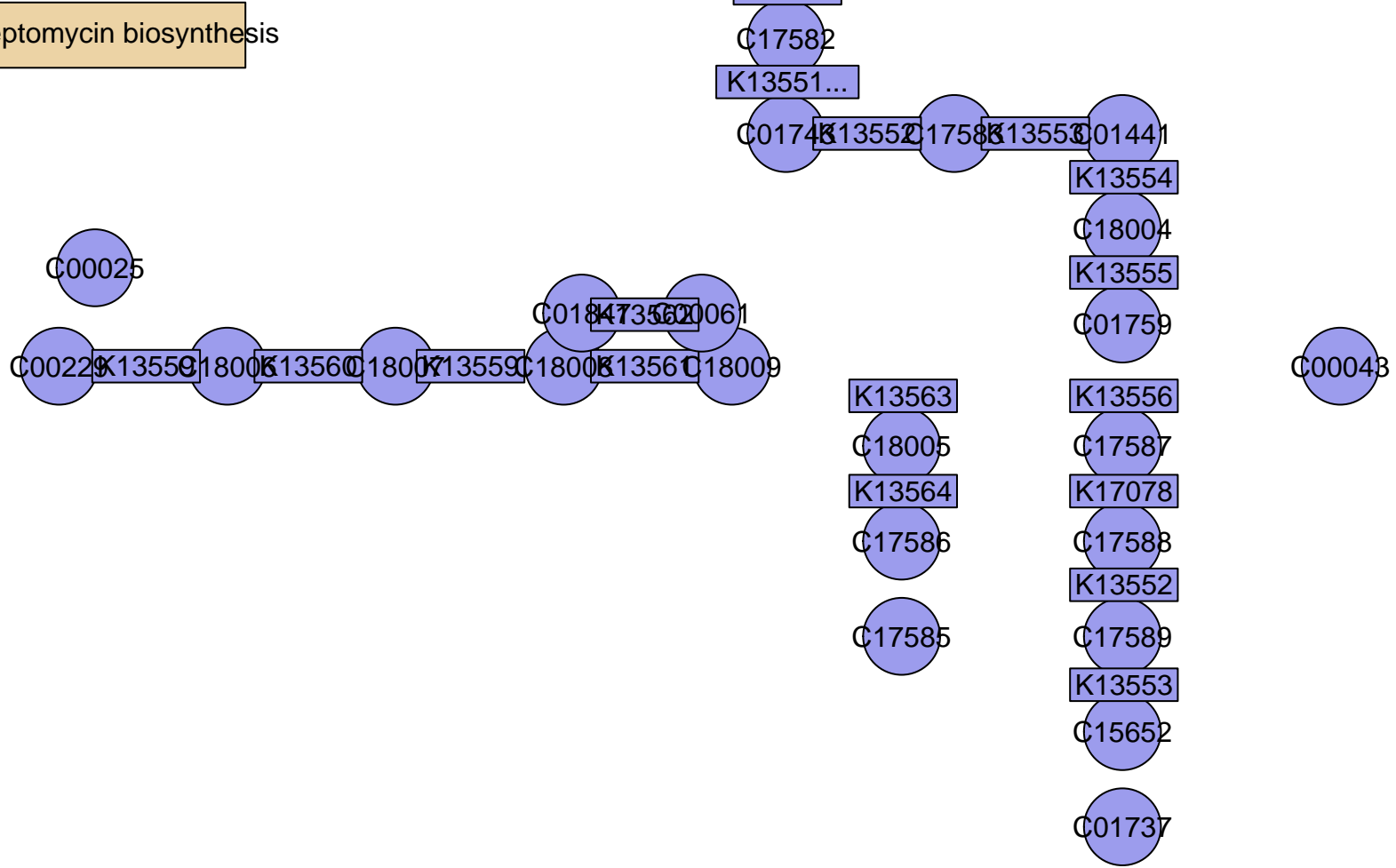
Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-113



Streptomycin biosynthesis

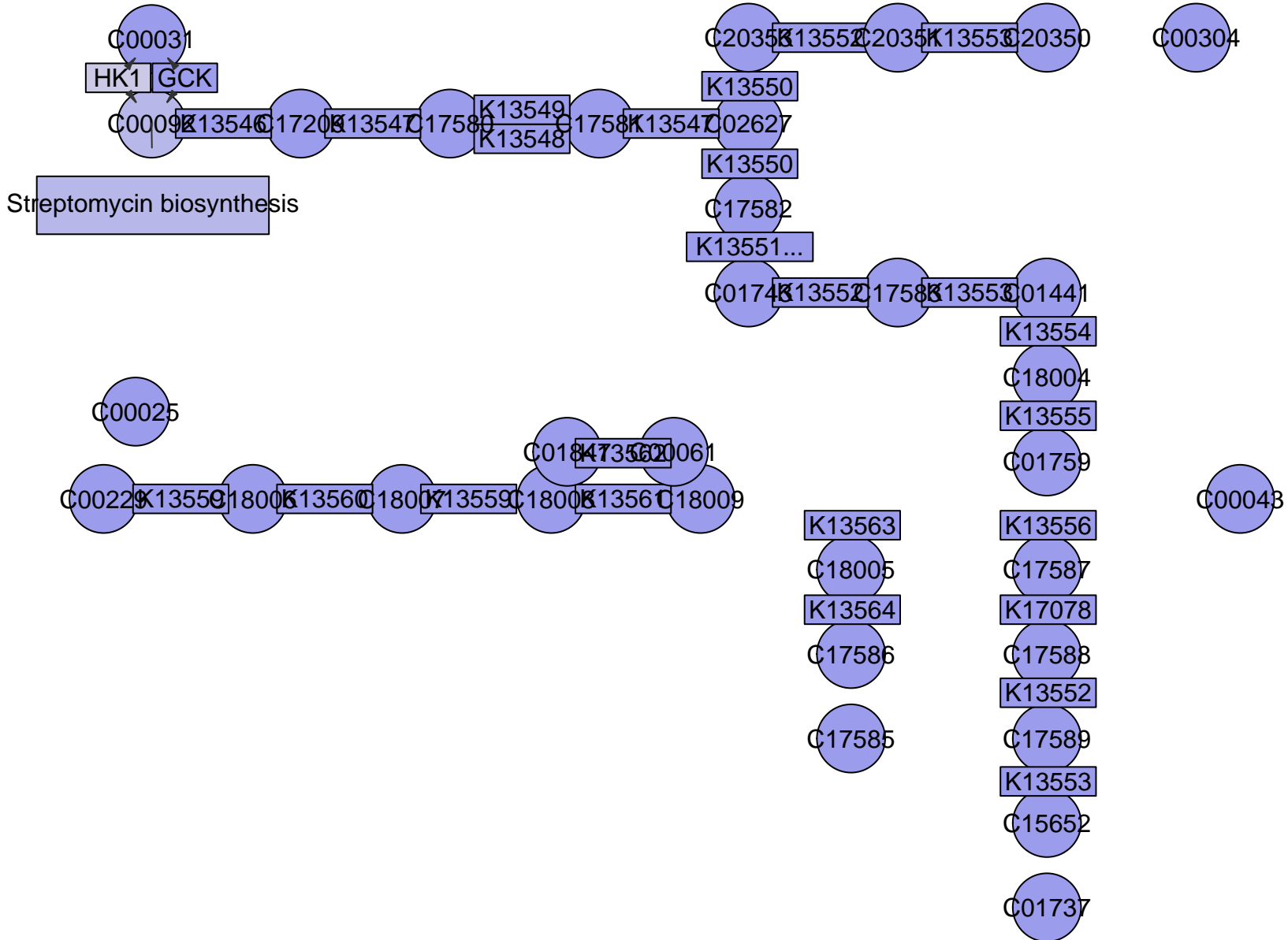


Amino sugar and  
nucleotide sugar metabolism



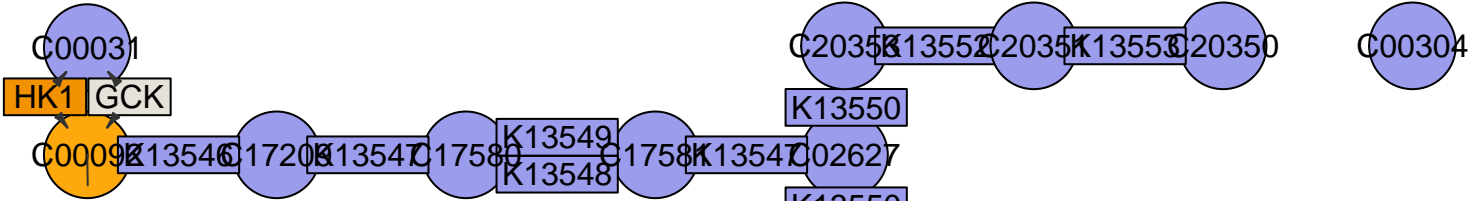


Butirosin and  
neomycin biosynthesis  
MPI-118



Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-119



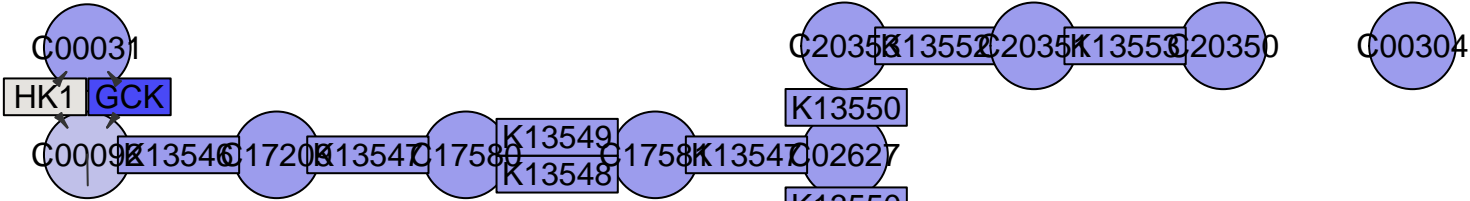
Streptomycin biosynthesis

Amino sugar and  
nucleotide sugar metabolism

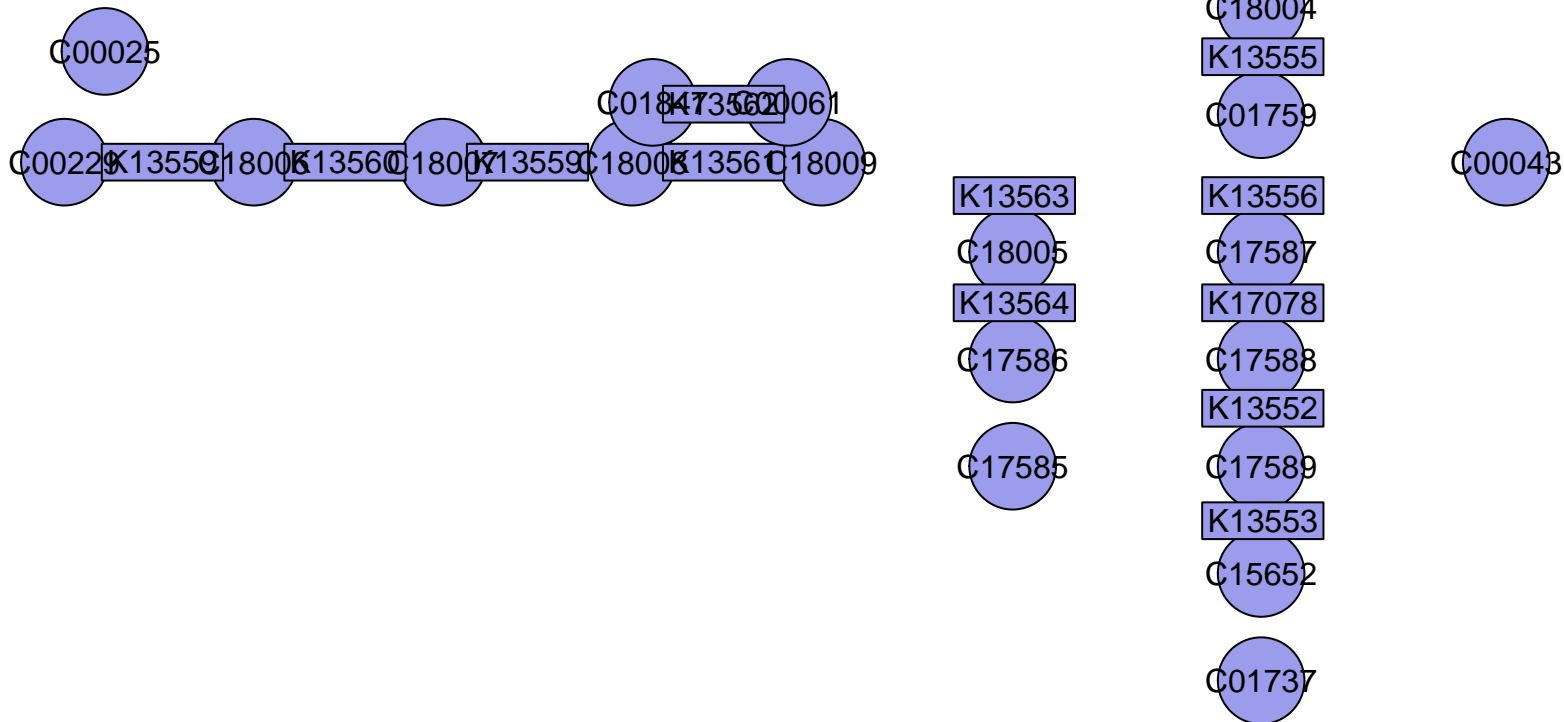




Butirosin and  
neomycin biosynthesis  
MPI-127

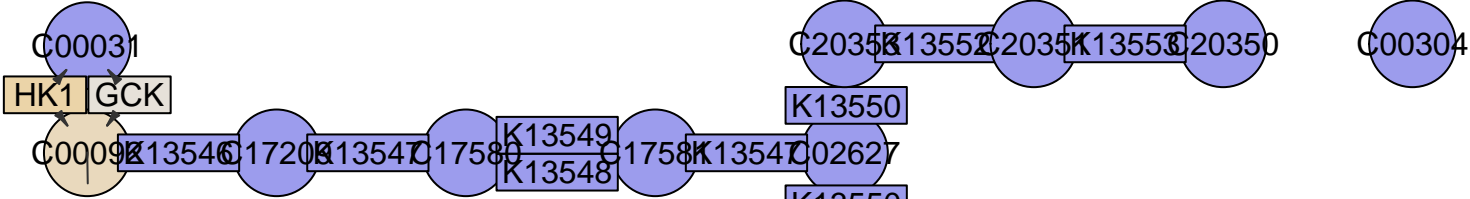


Streptomycin biosynthesis

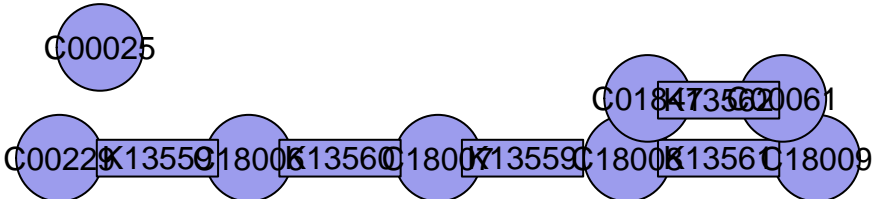
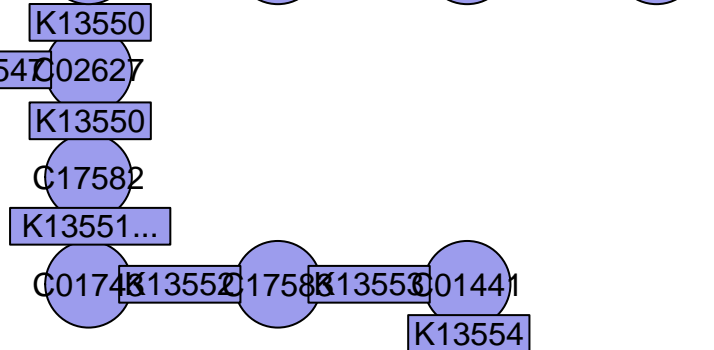


Amino sugar and  
nucleotide sugar metabolism

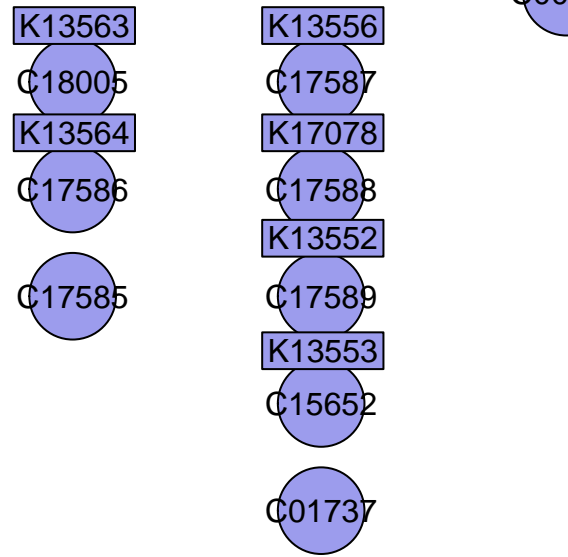
Butirosin and  
neomycin biosynthesis  
MPI-128



Streptomycin biosynthesis

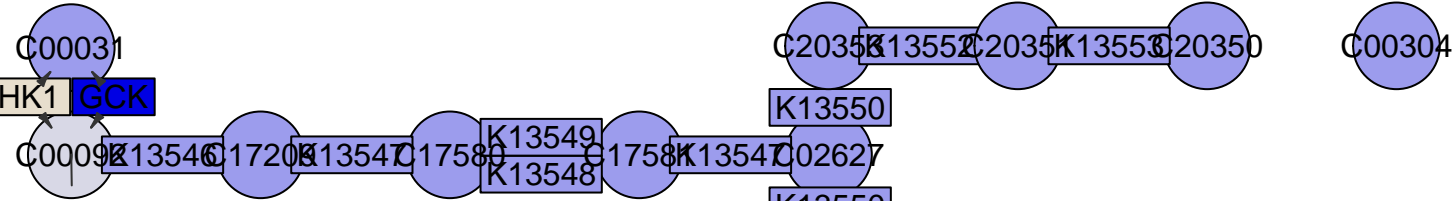


Amino sugar and  
nucleotide sugar metabolism

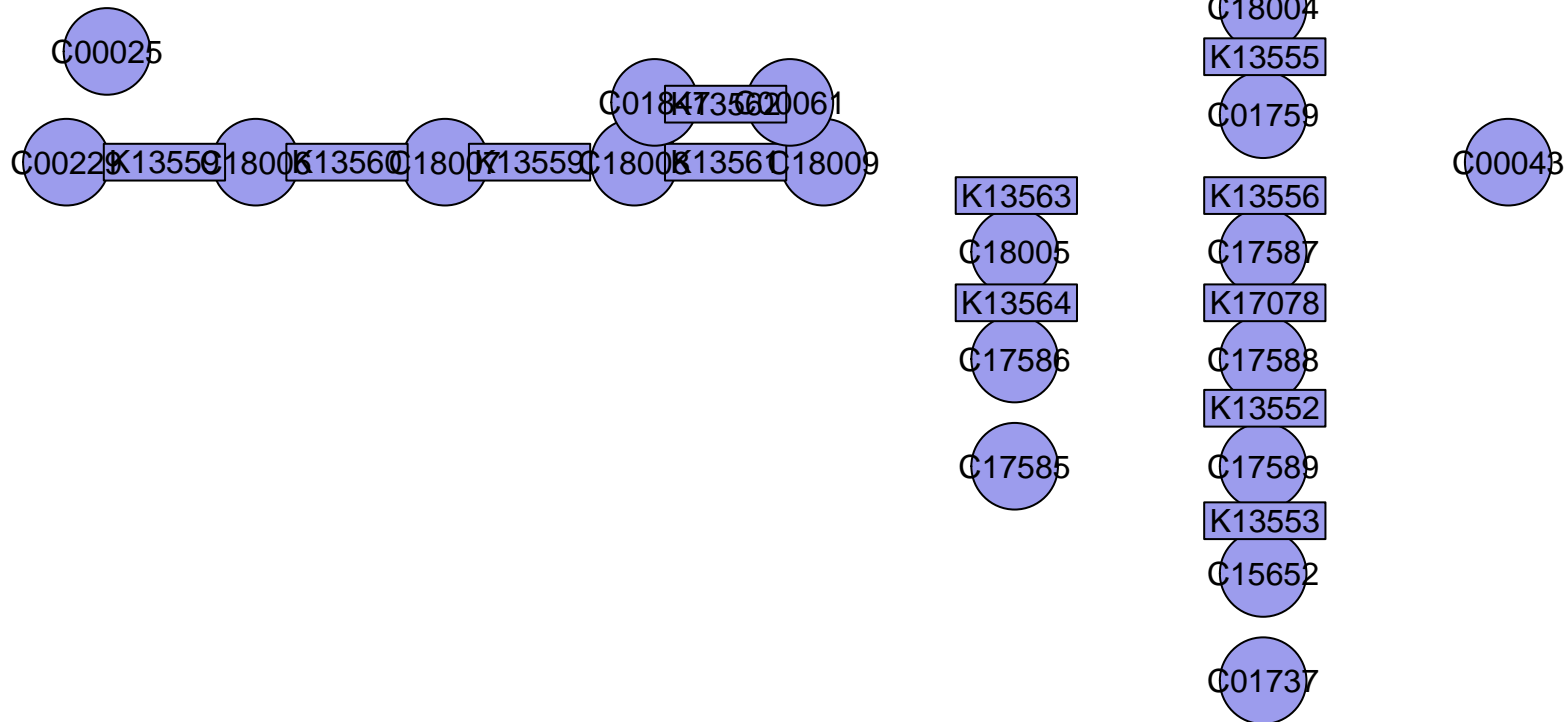




Butirosin and  
neomycin biosynthesis  
MPI-130



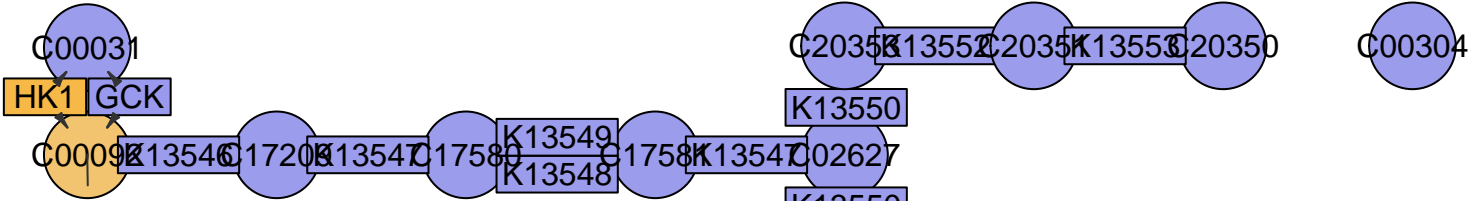
Streptomycin biosynthesis



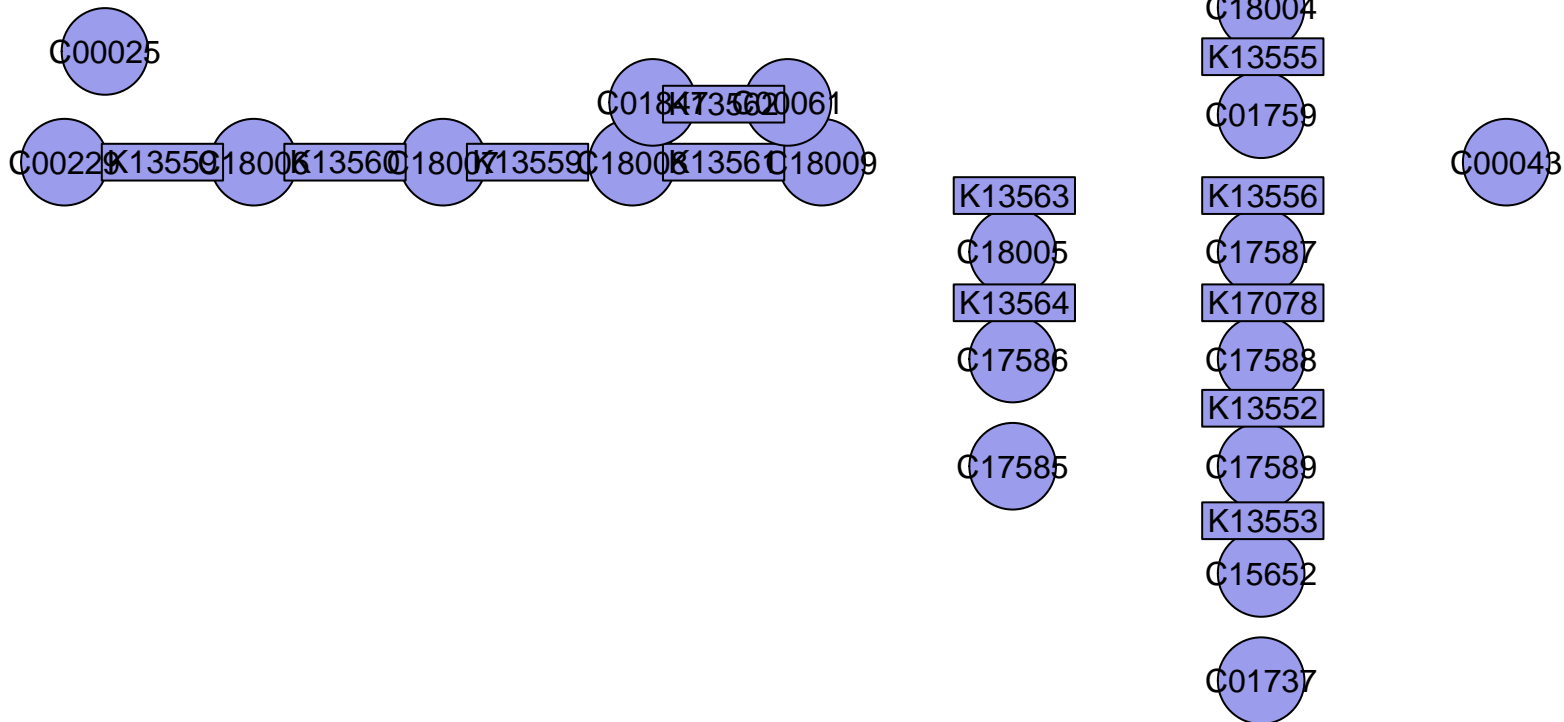
Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-133

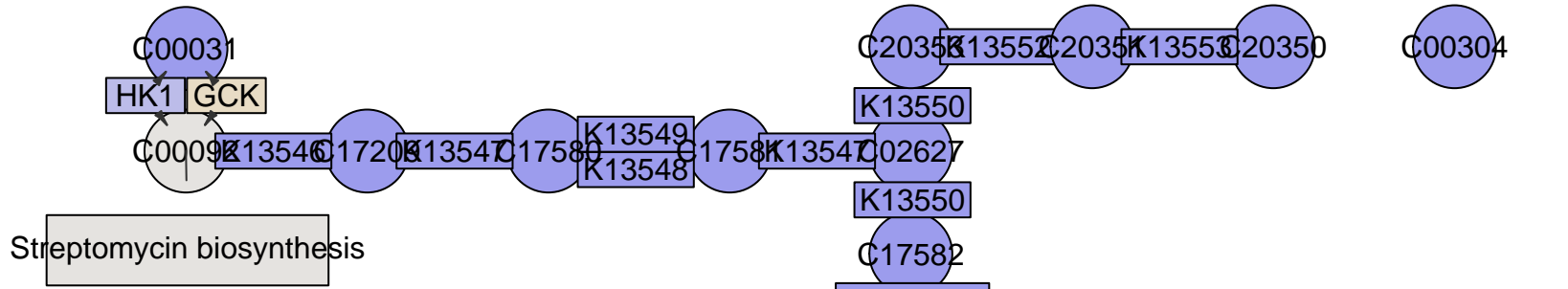


Streptomycin biosynthesis

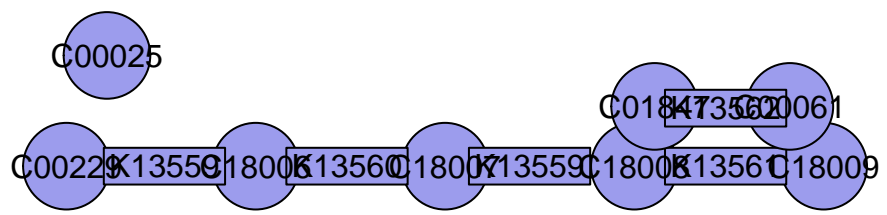


Amino sugar and  
nucleotide sugar metabolism

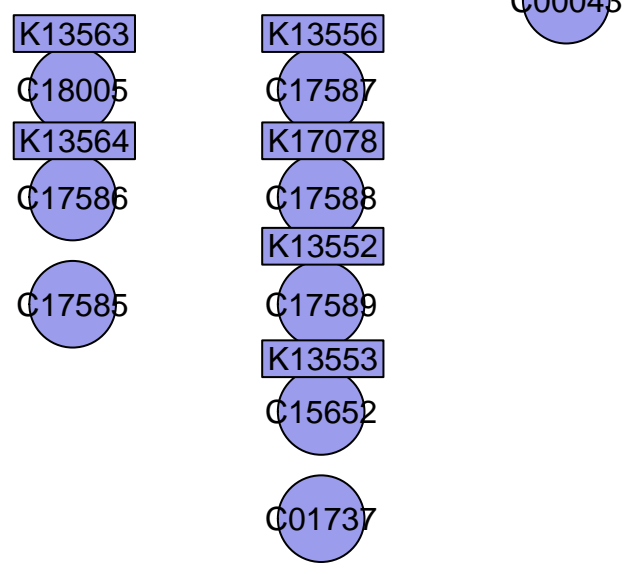
Butirosin and  
neomycin biosynthesis  
MPI-134



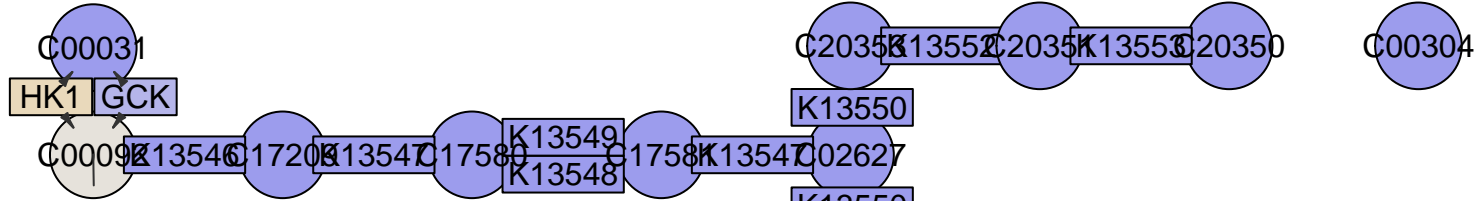
Streptomycin biosynthesis



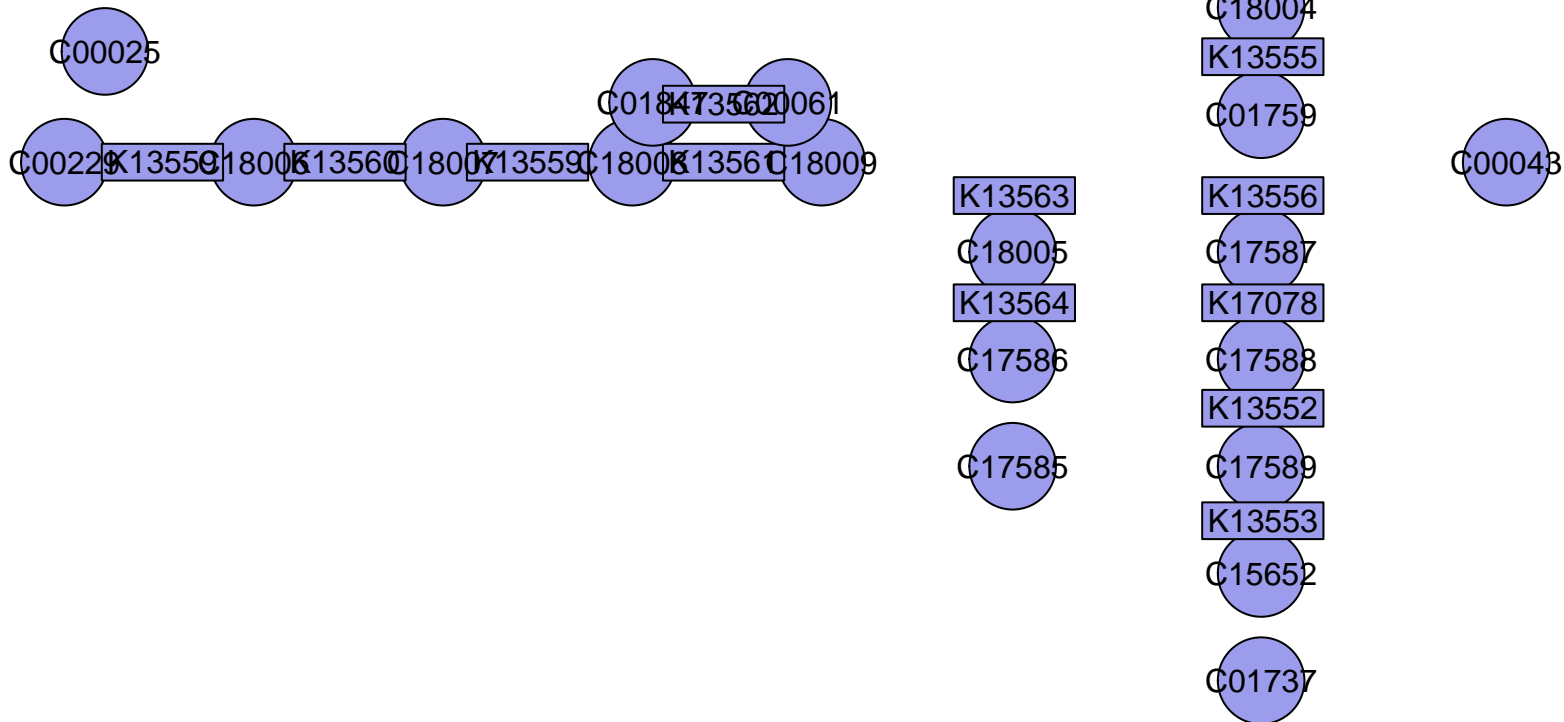
Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-135



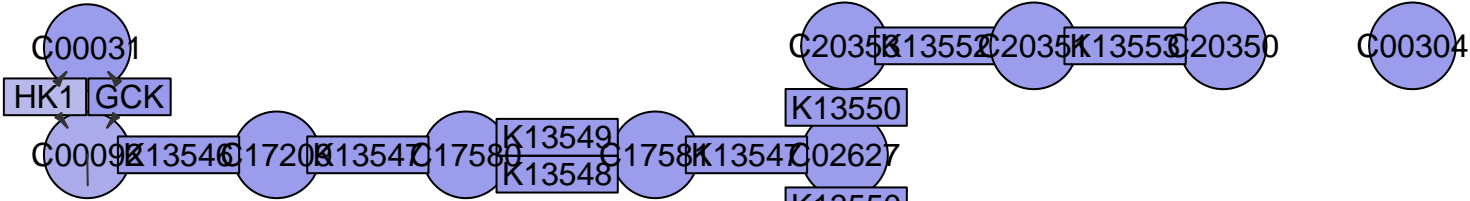
Streptomycin biosynthesis



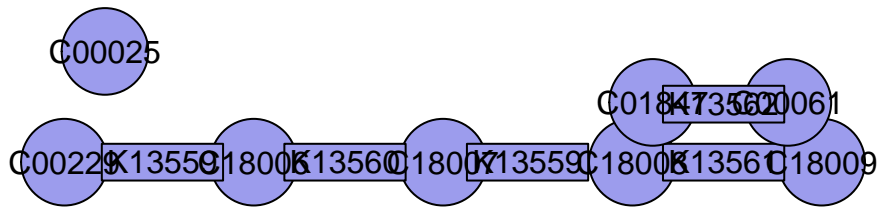
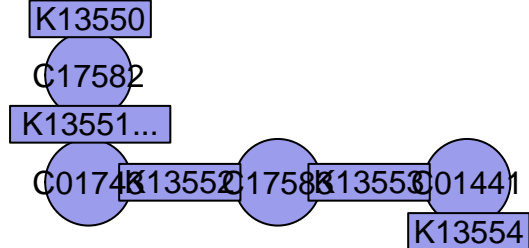
Amino sugar and  
nucleotide sugar metabolism



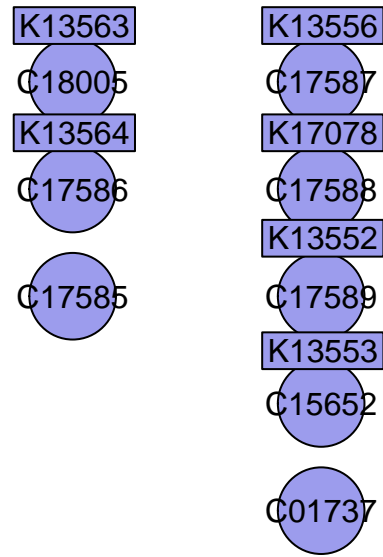
Butirosin and  
neomycin biosynthesis  
MPI-136



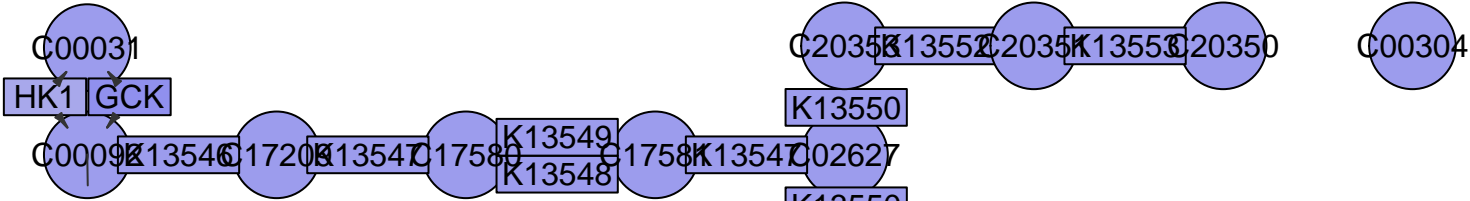
Streptomycin biosynthesis



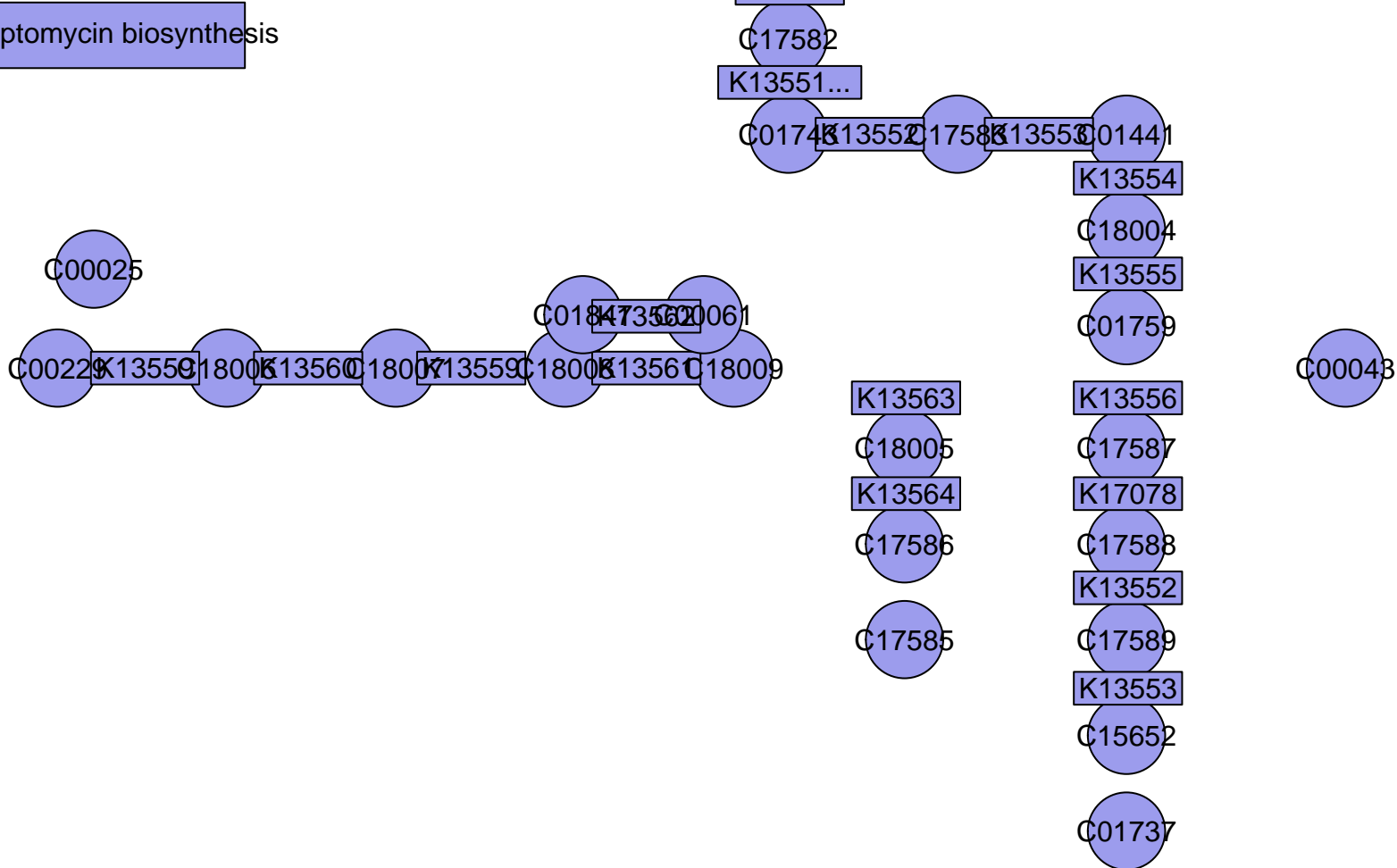
Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-141

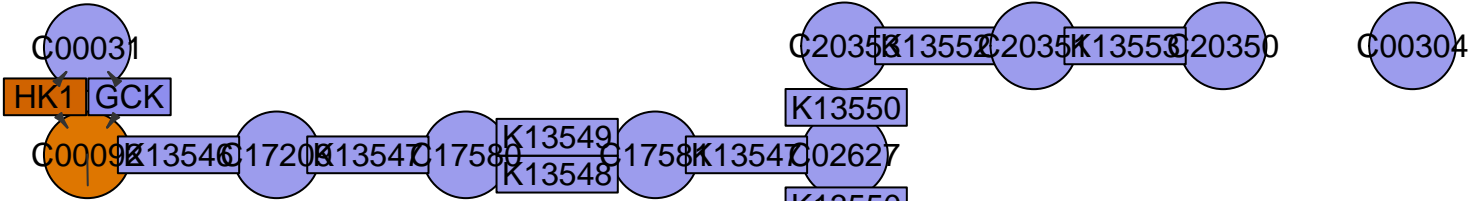


Streptomycin biosynthesis



Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-142



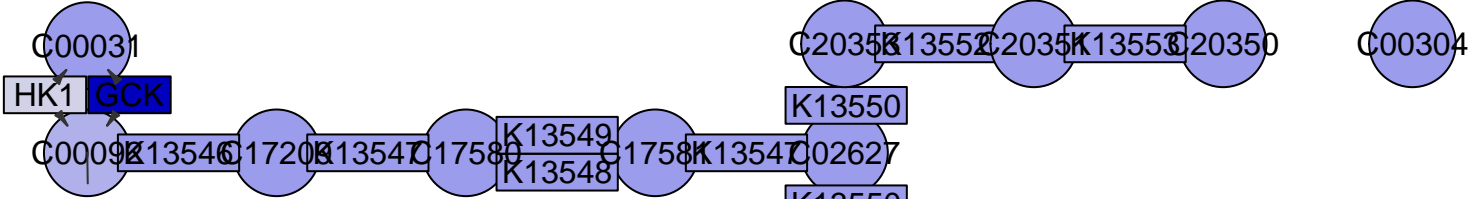
Streptomycin biosynthesis

Amino sugar and  
nucleotide sugar metabolism

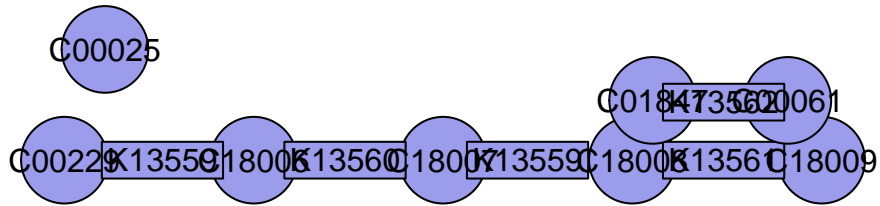
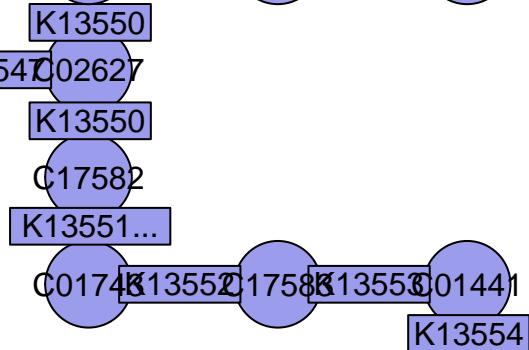




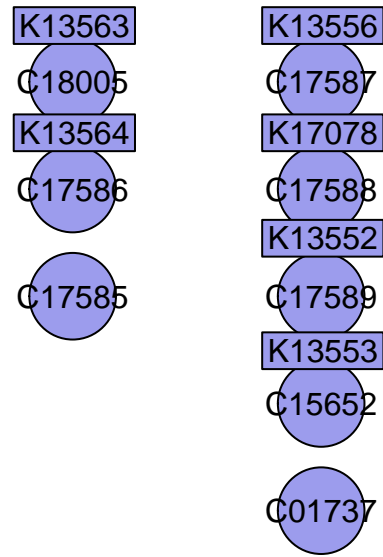
Butirosin and  
neomycin biosynthesis  
MPI-149



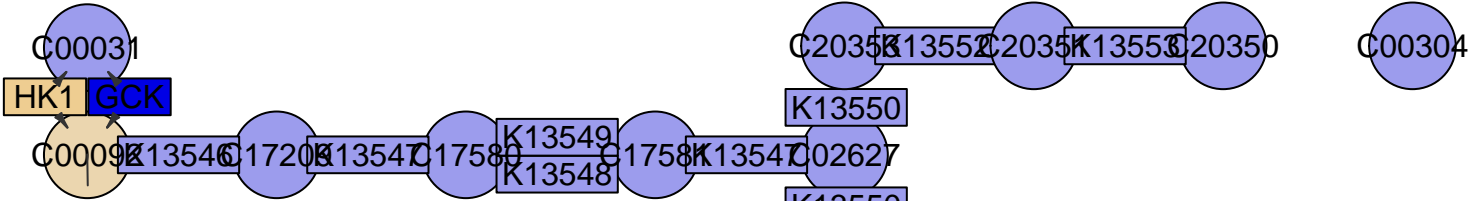
Streptomycin biosynthesis



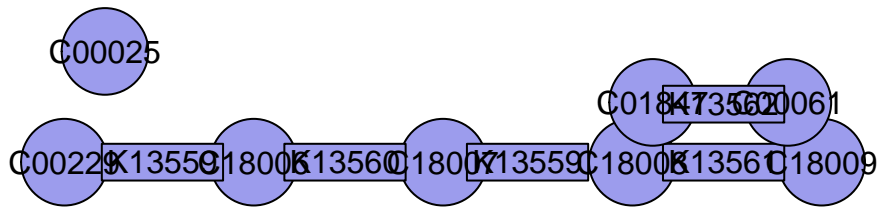
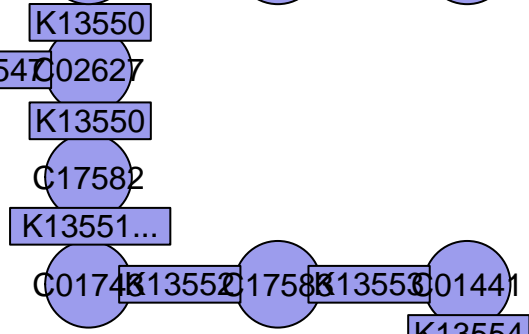
Amino sugar and  
nucleotide sugar metabolism



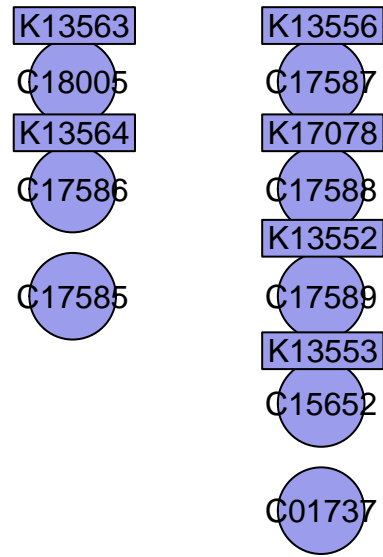
Butirosin and  
neomycin biosynthesis  
MPI-150



Streptomycin biosynthesis



Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-151

C00031  
HK1 GCK

C00099

Streptomycin biosynthesis

C00025

C00229

K13559

C18006

K13560

C18007

K13559

C18008

K13561

C18009

C01847  
K13562

C01061

K13563

C18005

K13564

C17586

C17585

K13550

K13550

C17582

K13551...

C01748

K13552

C17583

K13553

C01441

K13554

C18004

K13555

C01759

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

C01737

C20354

K13552

C20355

K13553

C20350

C00304

C00043

Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-152

C00031

HK1 GCK

C00091

K13546

C17206

K13547

C17589

K13549  
K13548

C17588

K13547

C02627

K13550

K13550

C17582

K13551...

C01748

K13552

C17583

K13553

C01441

K13554

C18004

K13555

C01759

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

C01737

C00304

Streptomycin biosynthesis

C00025

C00229

K13559

C18006

K13560

C18007

K13559

C18008

K13561

C18009

C01847

K13562

C01061

K13563

C18005

K13564

C17586

C17585

C00043

Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-153

C00031

HK1 GCK

C00099

K13546

C17208

K13547

C17589

K13549  
K13548

C17588

K13547

C02627

K13550

C17582

K13551...

C01748

K13552

C17588

K13553

C01441

K13554

C18004

K13555

C01759

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

C01737

C00304

C20358

K13552

C20358

K13553

C20350

Streptomycin biosynthesis

C00025

C00229

K13559

C18006

K13560

C18007

K13559

C18008

K13561

C18009

C01847

K13562

C01061

K13563

C18005

K13564

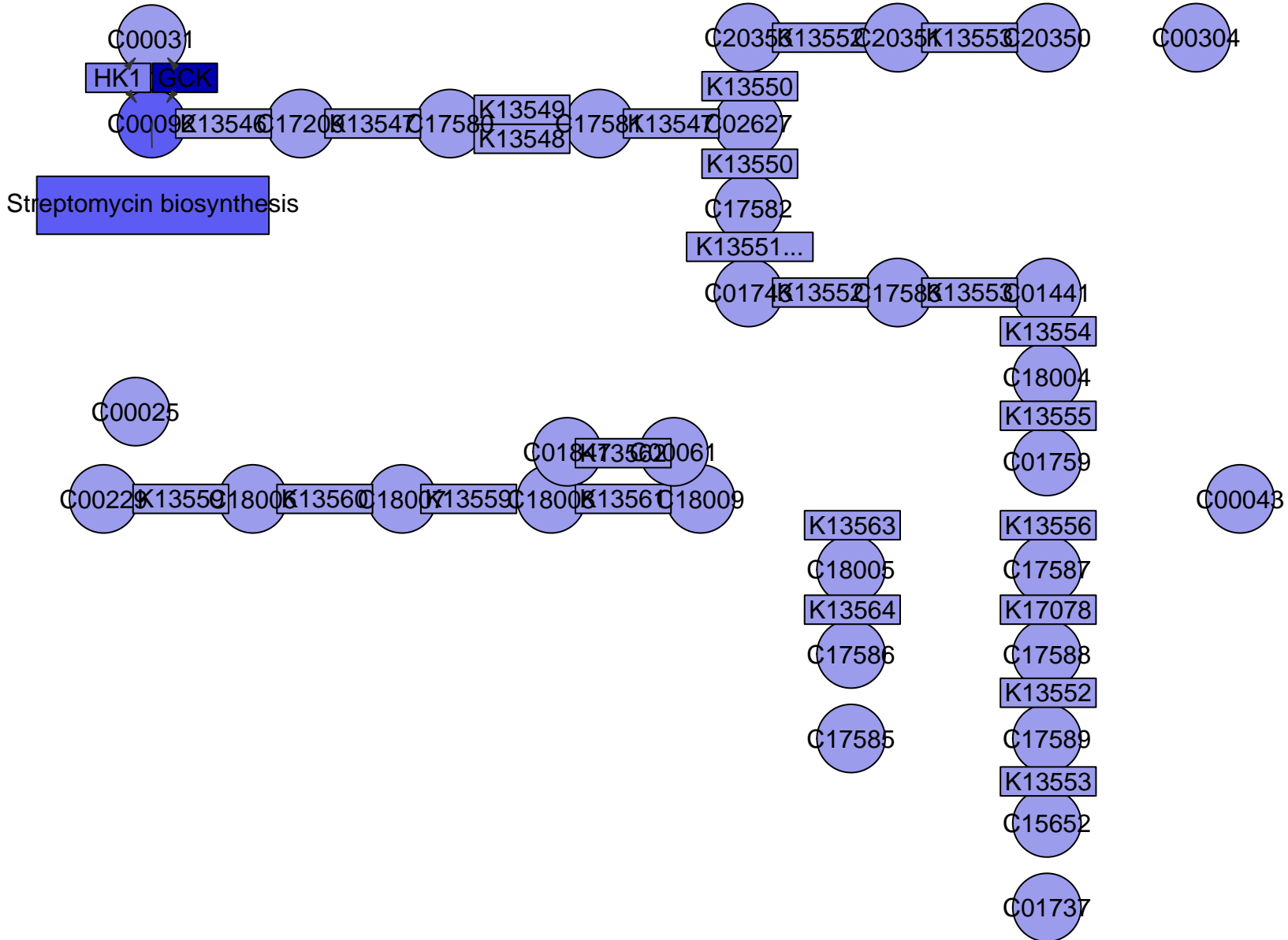
C17586

C17585

C00043

Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-154



Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-155

C00031

HK1 GCK

C00091

K13546

C17206

K13547

C17580

K13549  
K13548

C17581

K13547

C02627

K13550

C17582

K13551...

C01741

K13552

C17583

K13553

C01441

K13554

C18004

K13555

C01759

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

C01737

C00304

C20351

K13552

C20351

K13553

C20350

Streptomycin biosynthesis

C00025

C00229

K13559

C18006

K13560

C18007

K13559

C18008

K13562

C18009

C01847

K13563

C18005

K13564

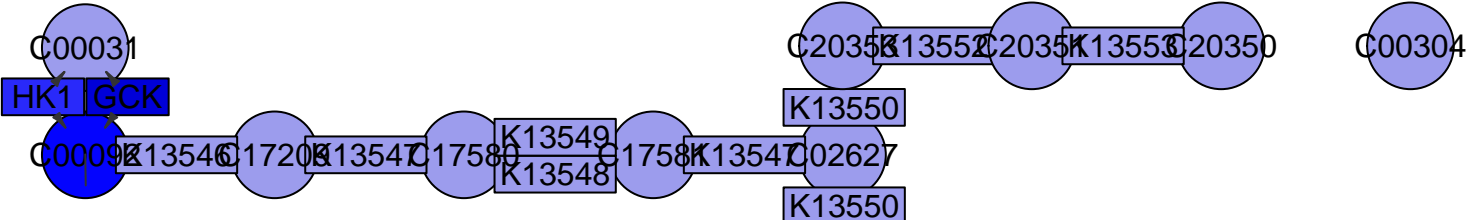
C17586

C17585

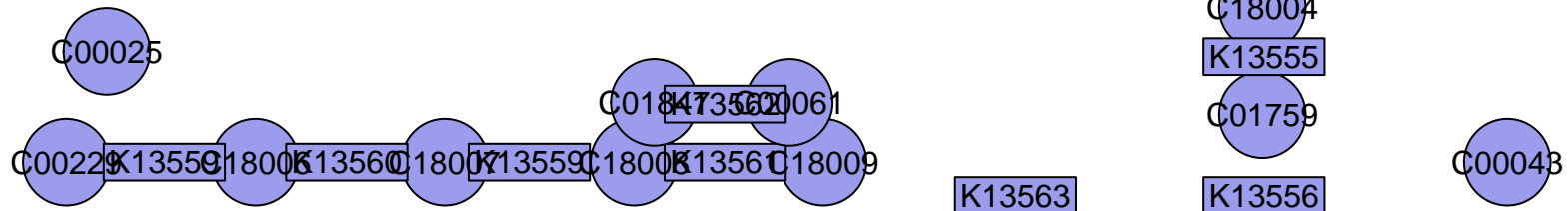
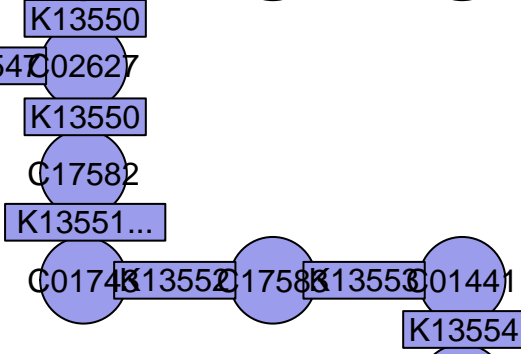
C00043

Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-159

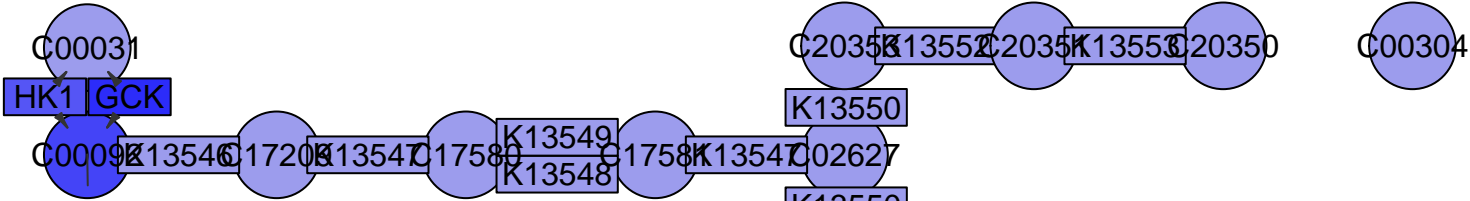


Streptomycin biosynthesis

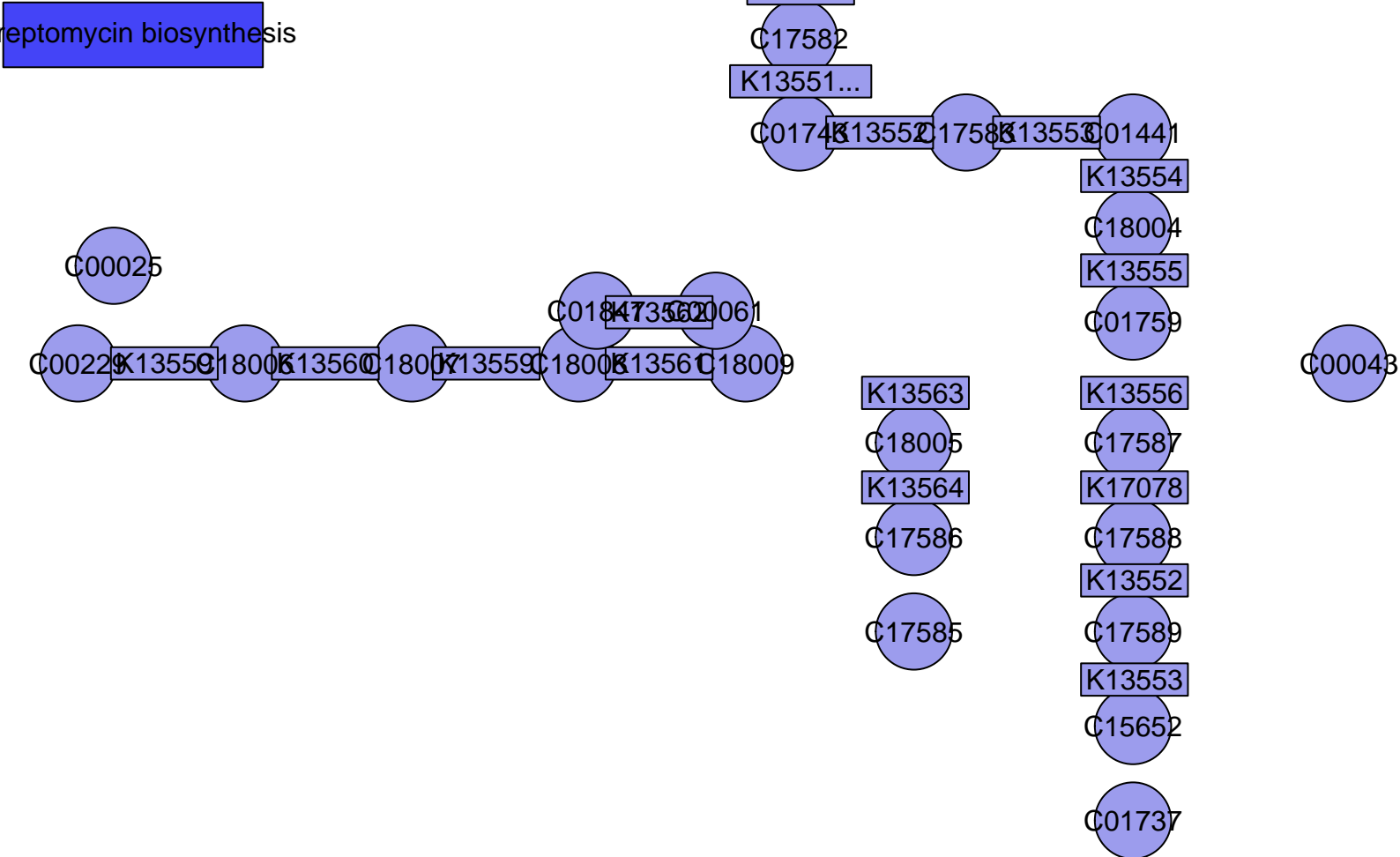


Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-163

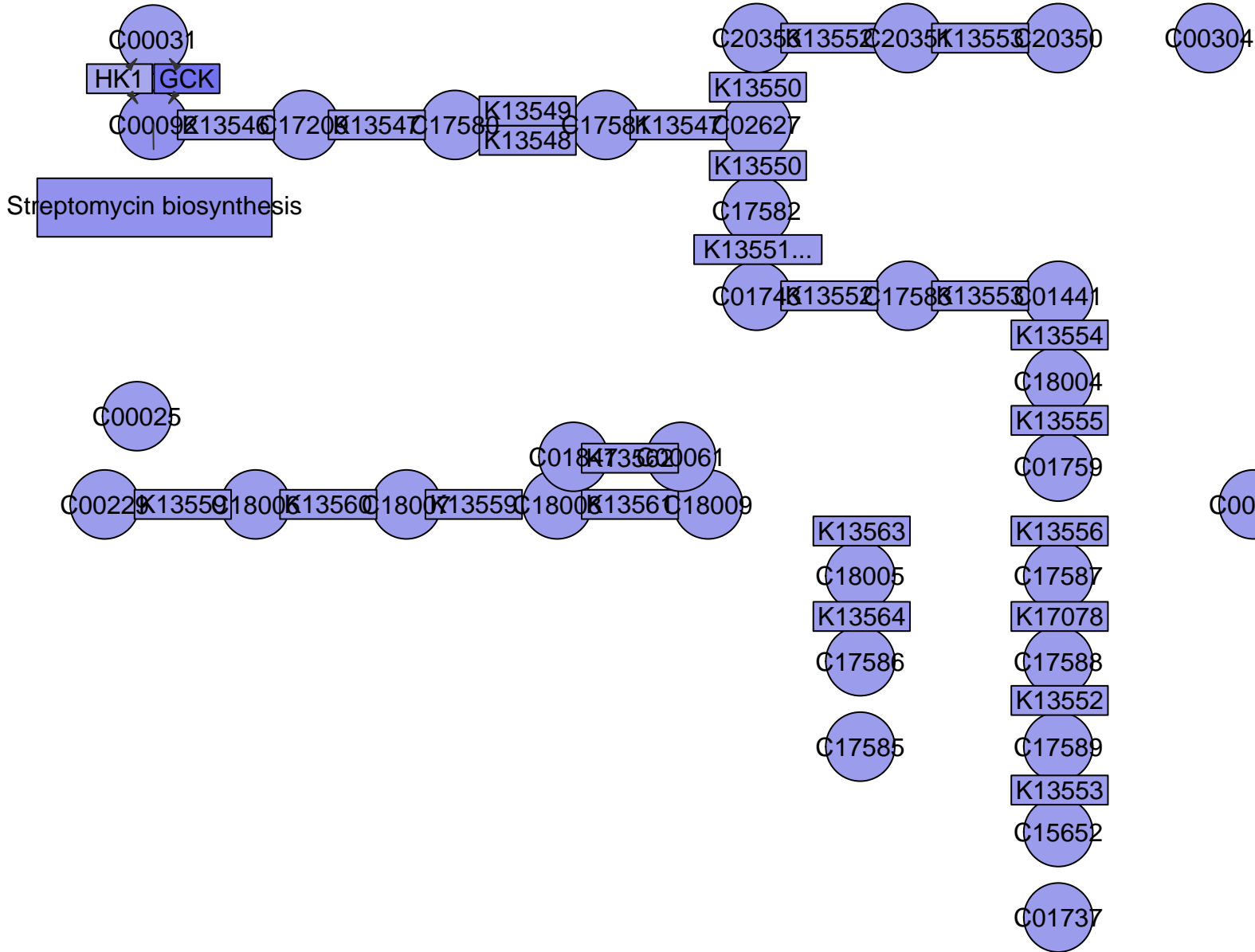


Streptomycin biosynthesis



Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-164



Amino sugar and  
nucleotide sugar metabolism

Butirosin and neomycin biosynthesis  
MPI-166

C00031  
HK1 GCK

C00099

Streptomycin biosynthesis

C00025

C00229

K13559

C18006

K13560

C18007

K13559

C18008

K13556

C18009

C01847 K13562 C18061

K13563

C18005

K13564

C17586

C17585

K13550

K13550

C17582

K13551...

C01748

K13552

C18004

K13555

C01759

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

C01737

C20358

K13552

C20359

K13553

C20350

K13554

C01441

K13554

C18004

K13555

C01759

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

C01737

C20358

K13552

C20359

K13553

C20350

K13554

C01441

K13554

C18004

K13555

C01759

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

C01737

C20358

K13552

C20359

K13553

C20350

K13554

C01441

K13554

C18004

K13555

C01759

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

C01737

C00304

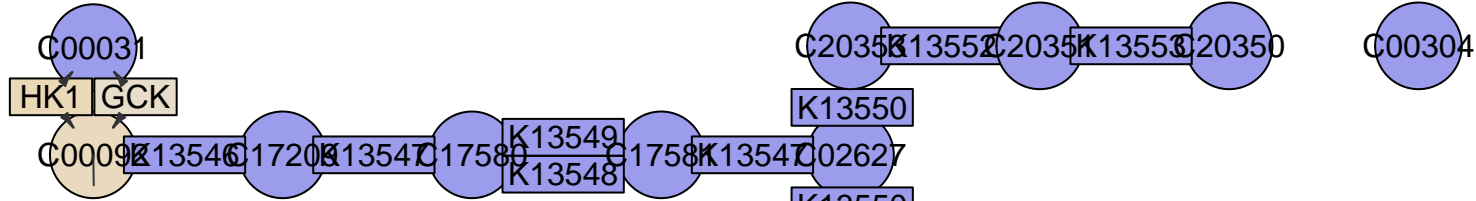
C01737

C00043

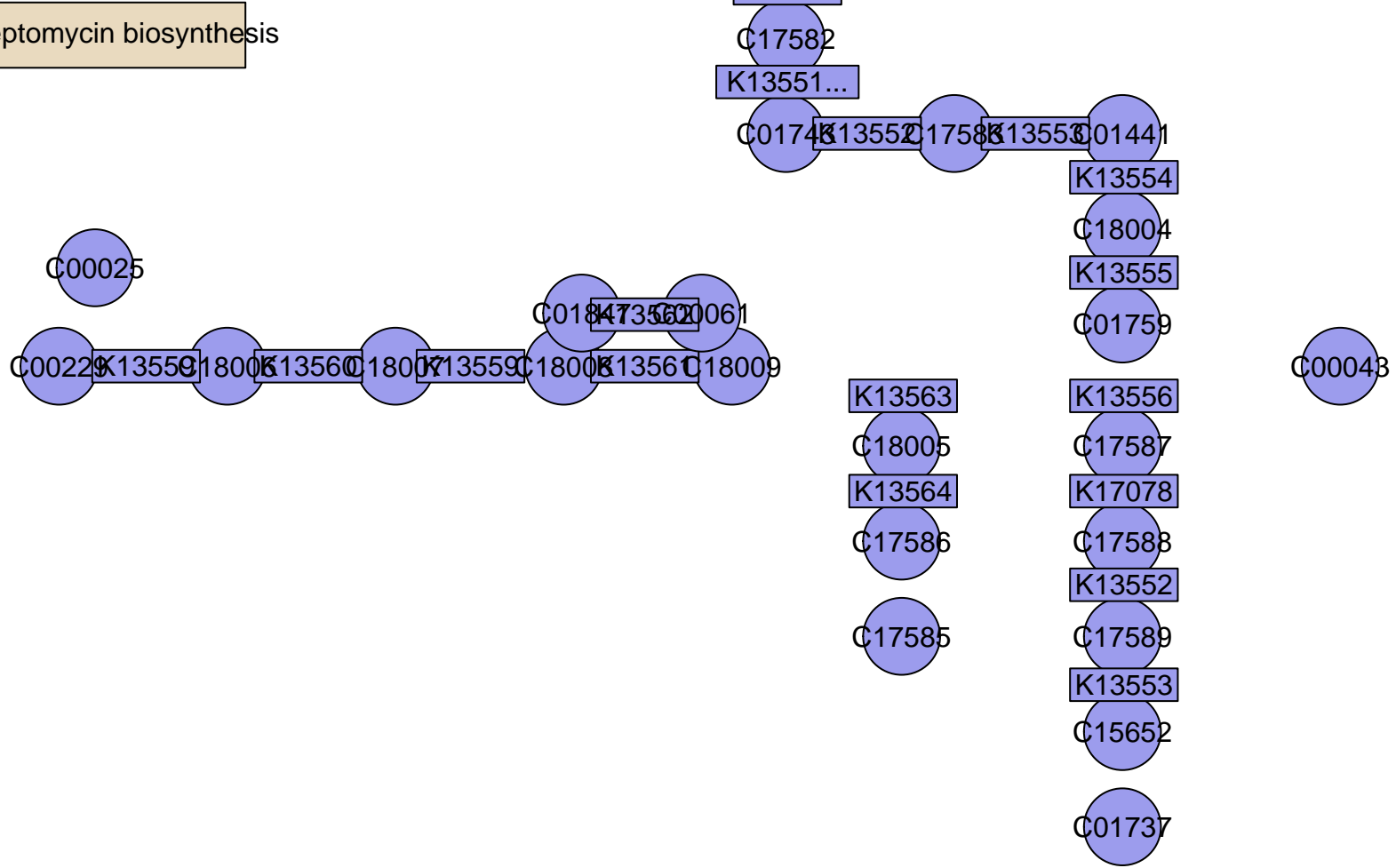
Amino sugar and nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-167



Streptomycin biosynthesis



Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-168

C00031

HK1 GCK

C00099

K13546

C17208

K13547

C17580

K13549  
K13548

C17581

K13547

C02627

K13550

K13550

C17582

K13551...

C01748

K13552

C17583

K13553

C01441

K13554

C18004

K13555

C01759

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

C01737

C20358

K13552

C20359

K13553

C20350

C00304

Streptomycin biosynthesis

C00025

C00229

K13559

C18006

K13560

C18007

K13559

C18008

K13561

C18009

C01847  
K13562

K13563

C18005

K13564

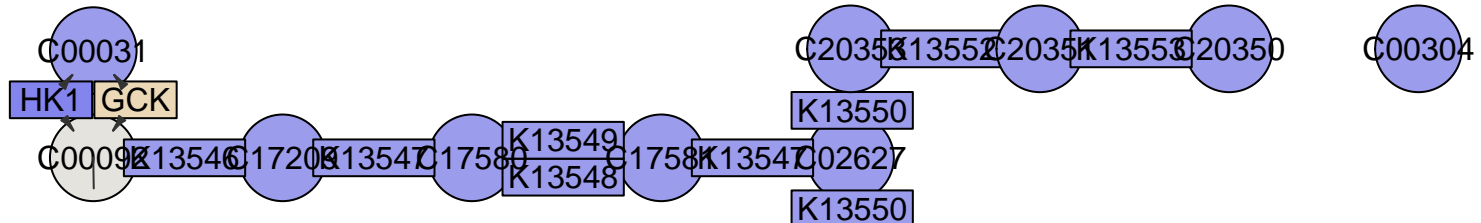
C17586

C17585

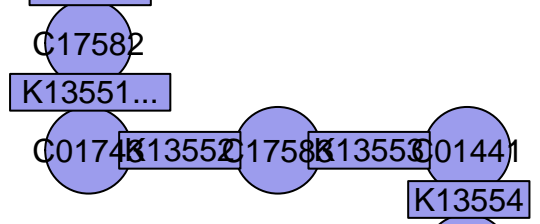
C00043

Amino sugar and  
nucleotide sugar metabolism

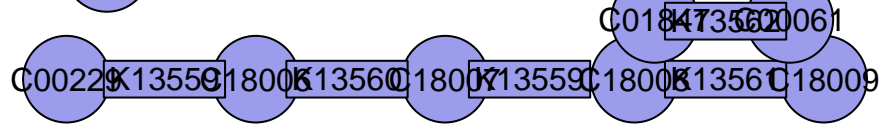
Butirosin and  
neomycin biosynthesis  
MPI-170



Streptomycin biosynthesis



C00025



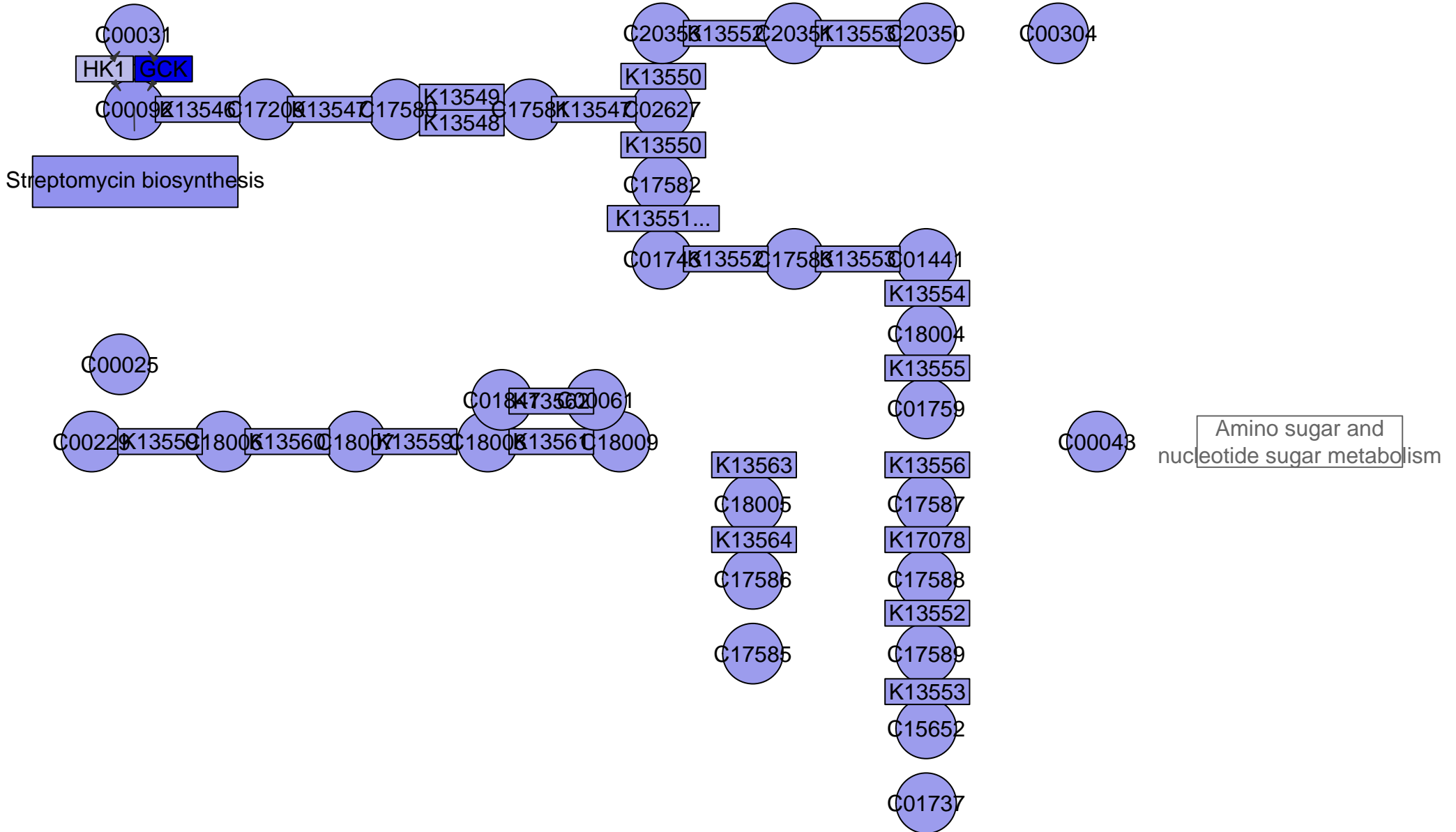
K13563  
C18005  
K13564  
C17586  
C17585

K13554  
C18004  
K13555  
C01759  
K13556  
C17587  
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C17588  
K13552  
C17589  
K13553  
C15652  
C01737

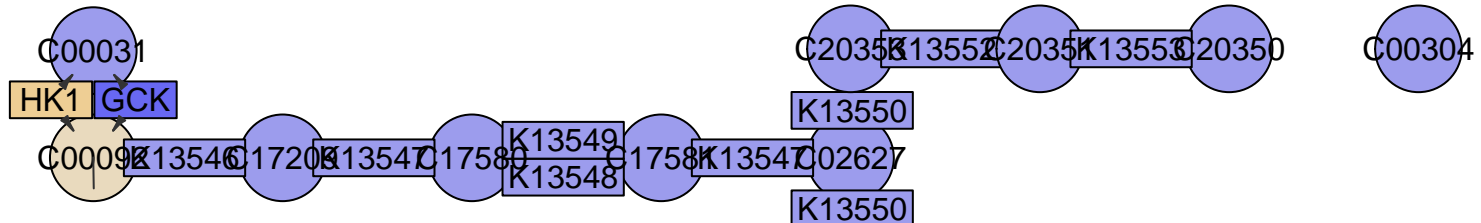
C00043

Amino sugar and  
nucleotide sugar metabolism

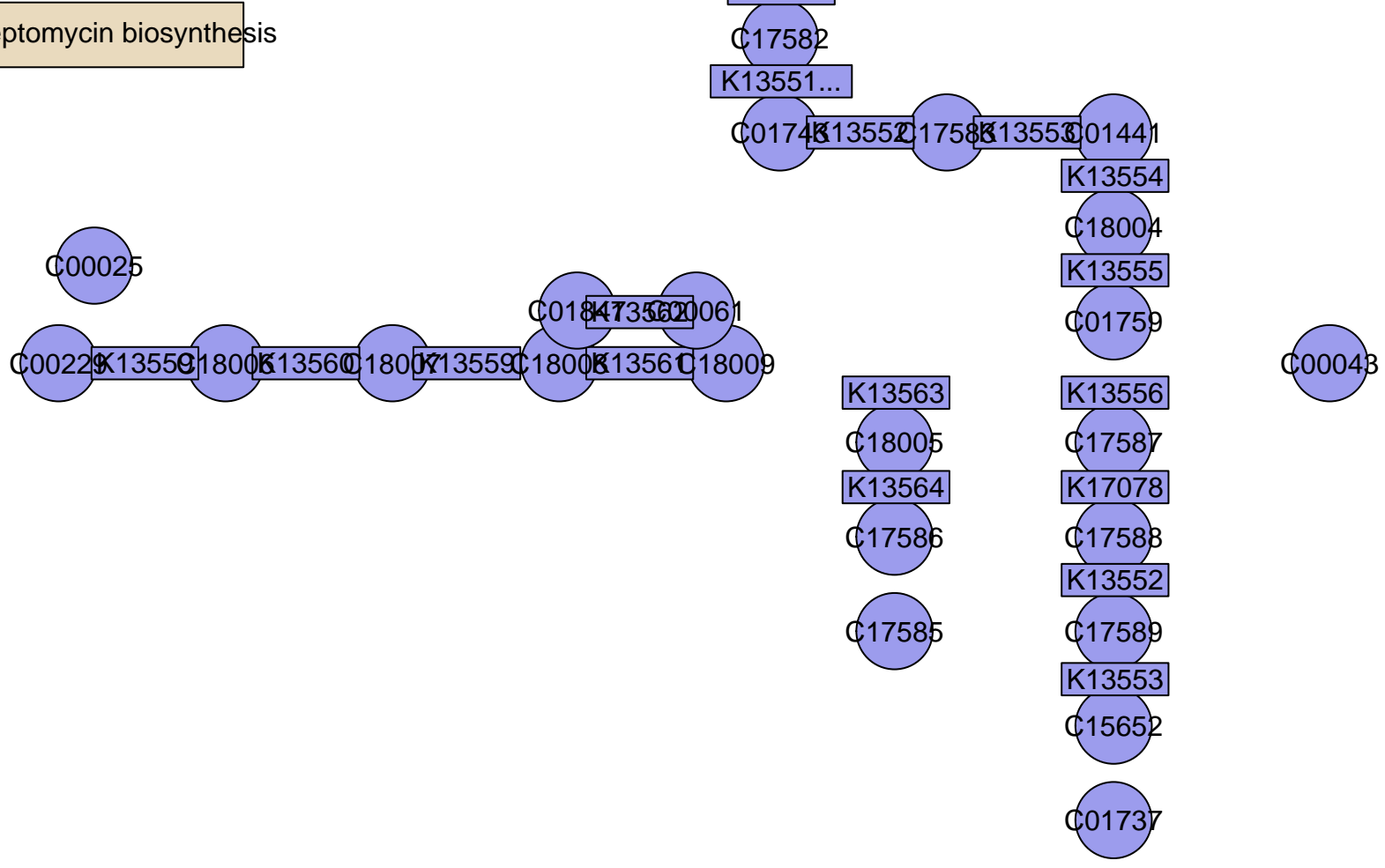
Butirosin and  
neomycin biosynthesis  
MPI-173



Butirosin and  
neomycin biosynthesis  
MPI-174

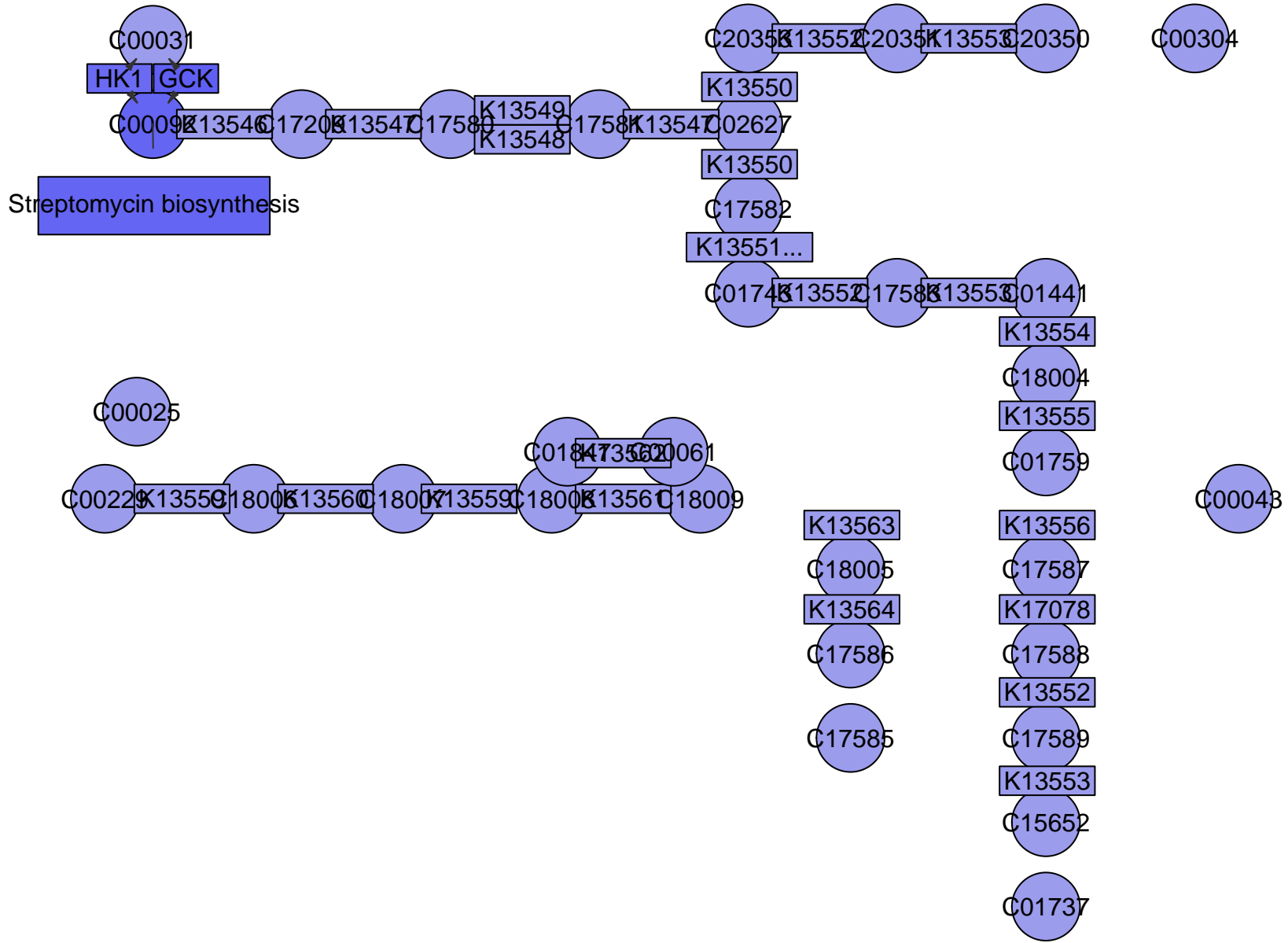


Streptomycin biosynthesis



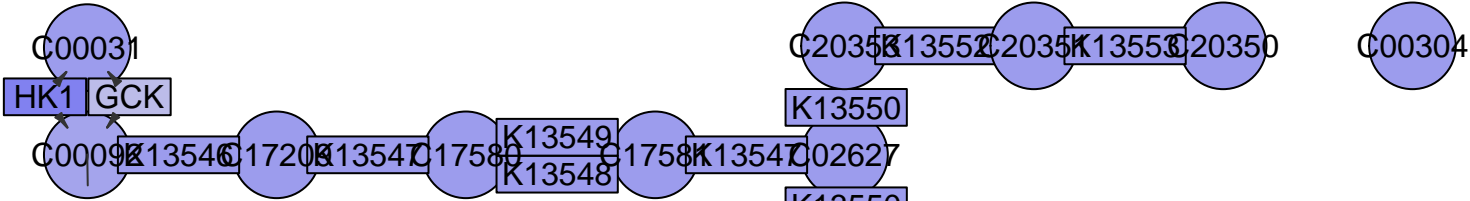
Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-176

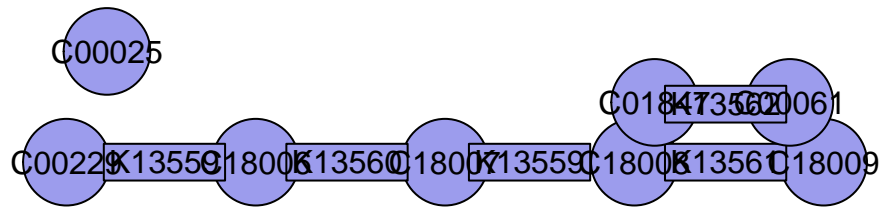
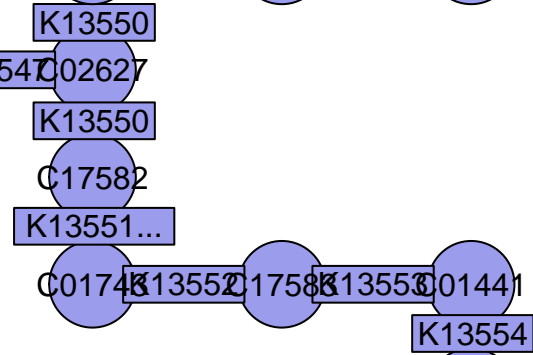


Amino sugar and  
nucleotide sugar metabolism

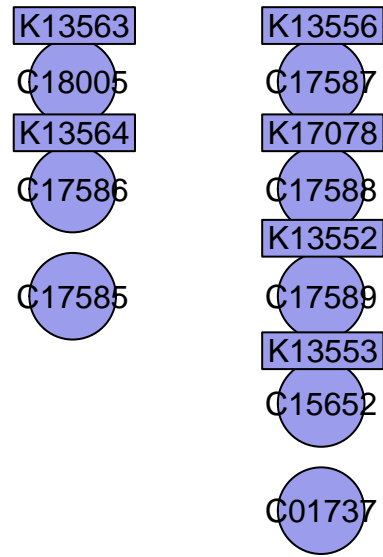
Butirosin and  
neomycin biosynthesis  
MPI-177



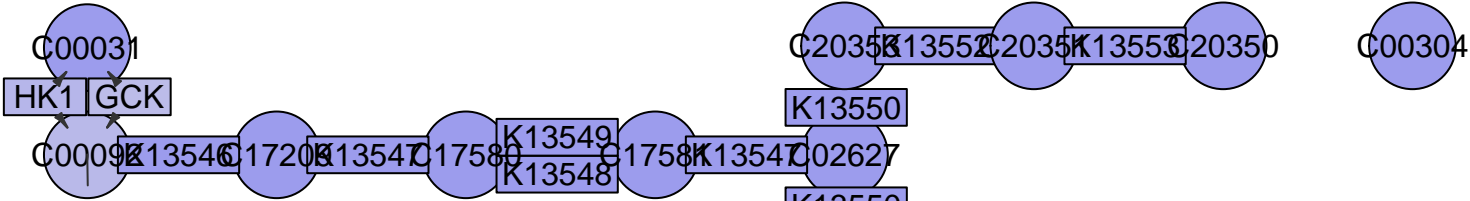
Streptomycin biosynthesis



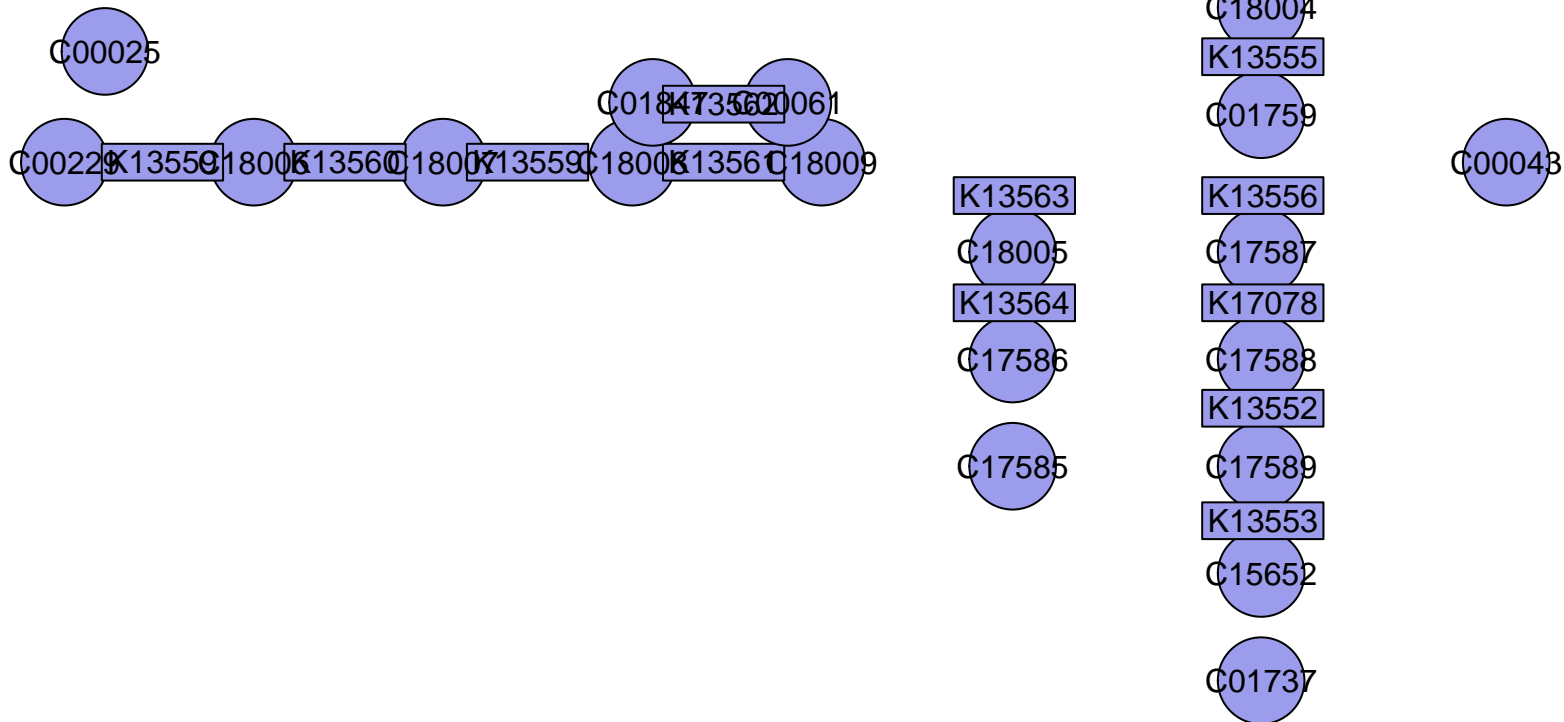
Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-178



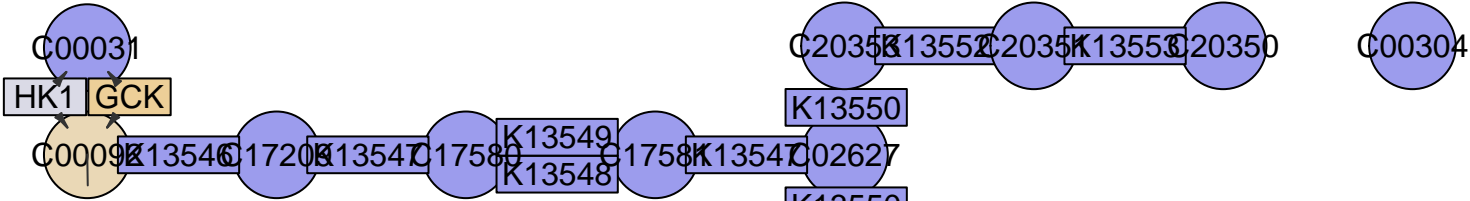
Streptomycin biosynthesis



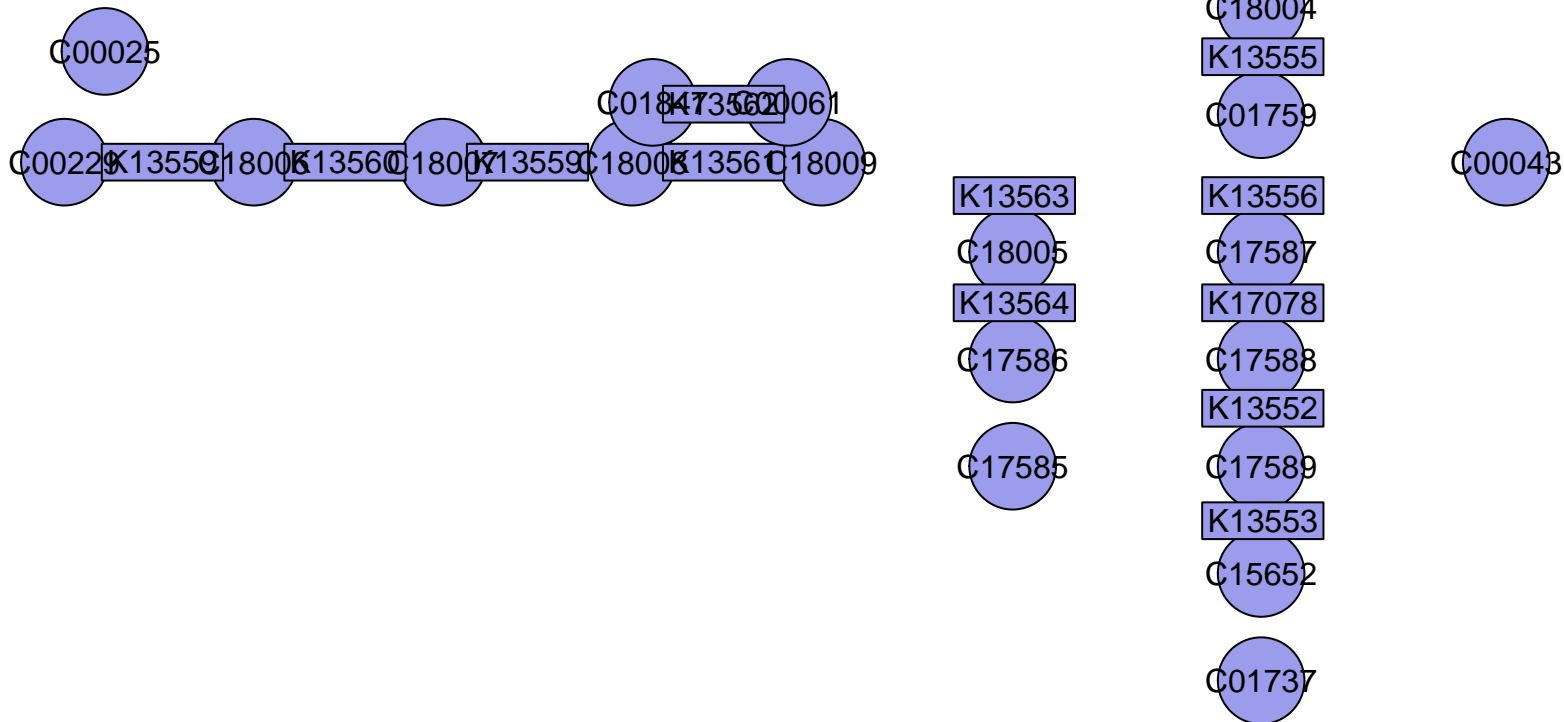
Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-179



Streptomycin biosynthesis

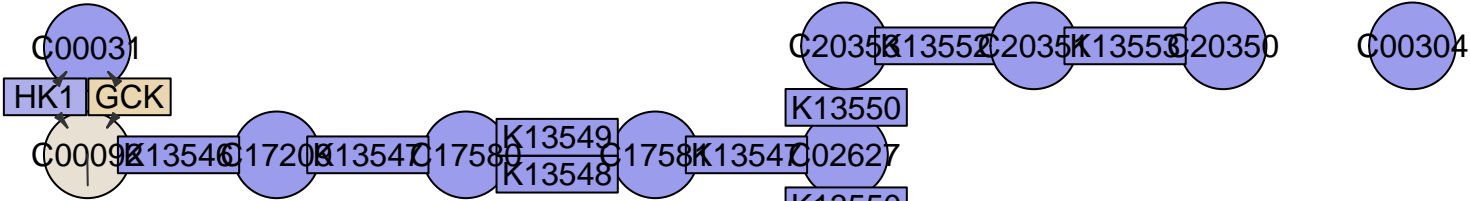


Amino sugar and  
nucleotide sugar metabolism

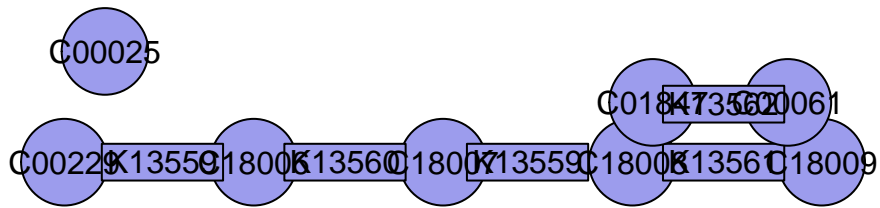




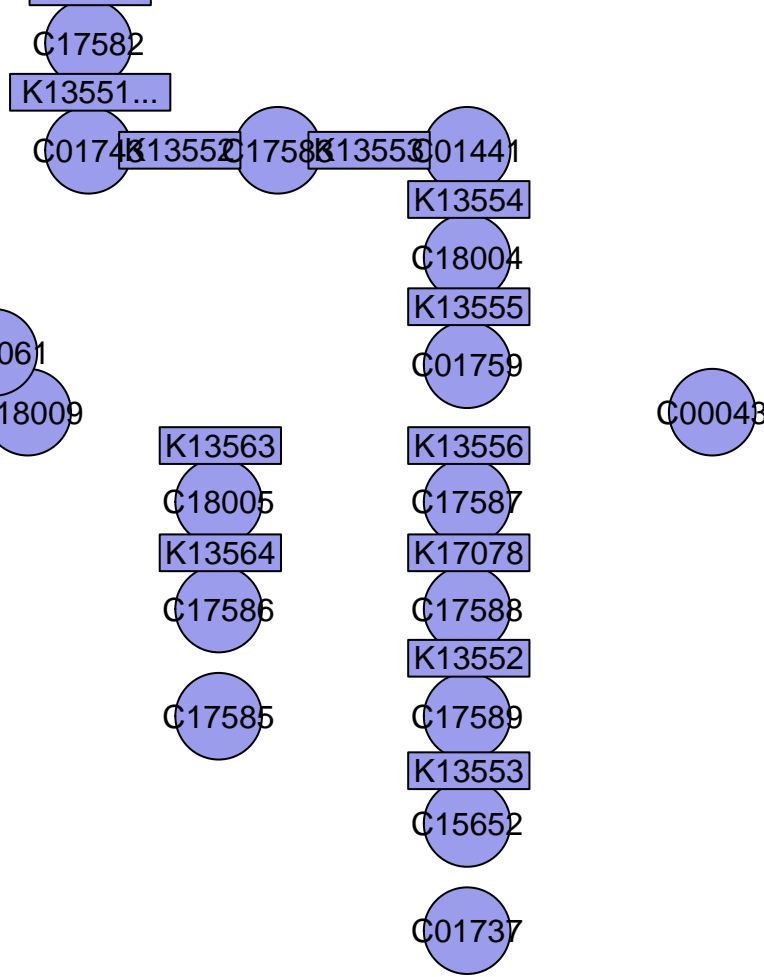
Butirosin and  
neomycin biosynthesis  
MPI-183



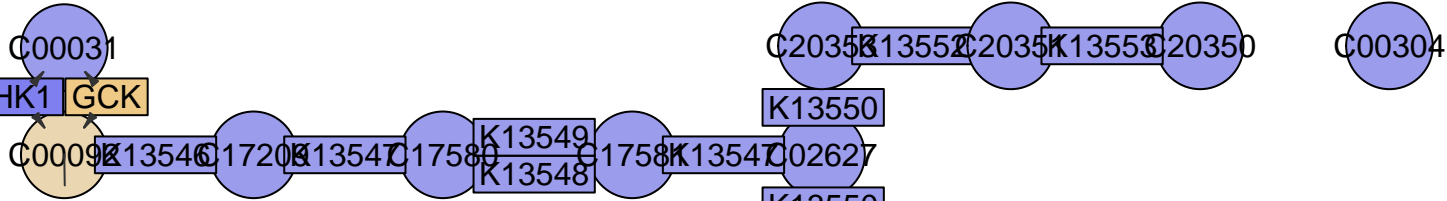
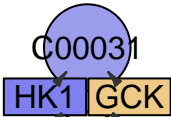
Streptomycin biosynthesis



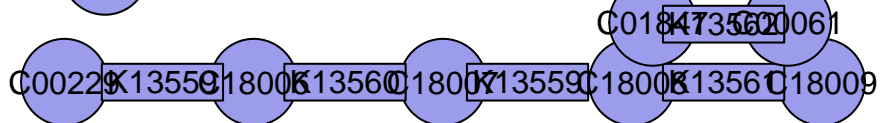
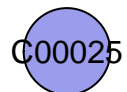
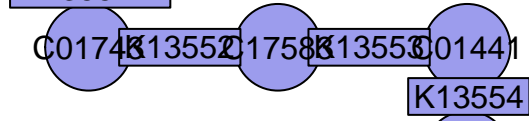
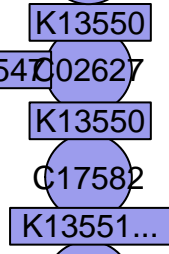
Amino sugar and  
nucleotide sugar metabolism



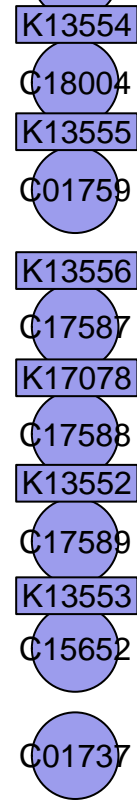
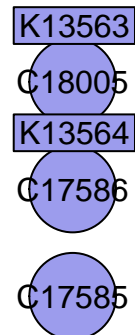
Butirosin and  
neomycin biosynthesis  
MPI-184



Streptomycin biosynthesis



C01804 K13562 C01806

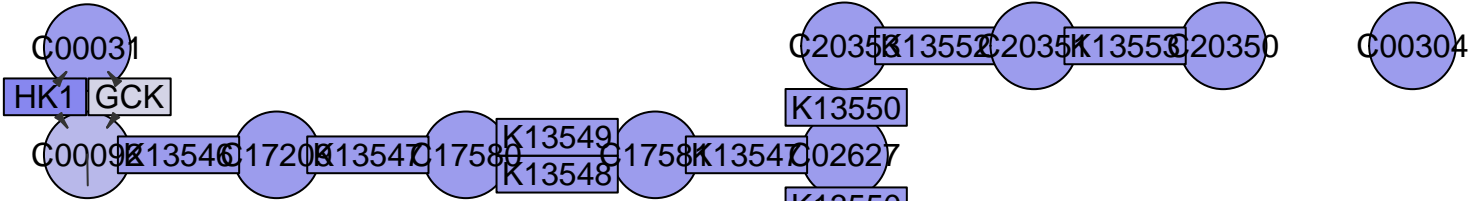


Amino sugar and  
nucleotide sugar metabolism

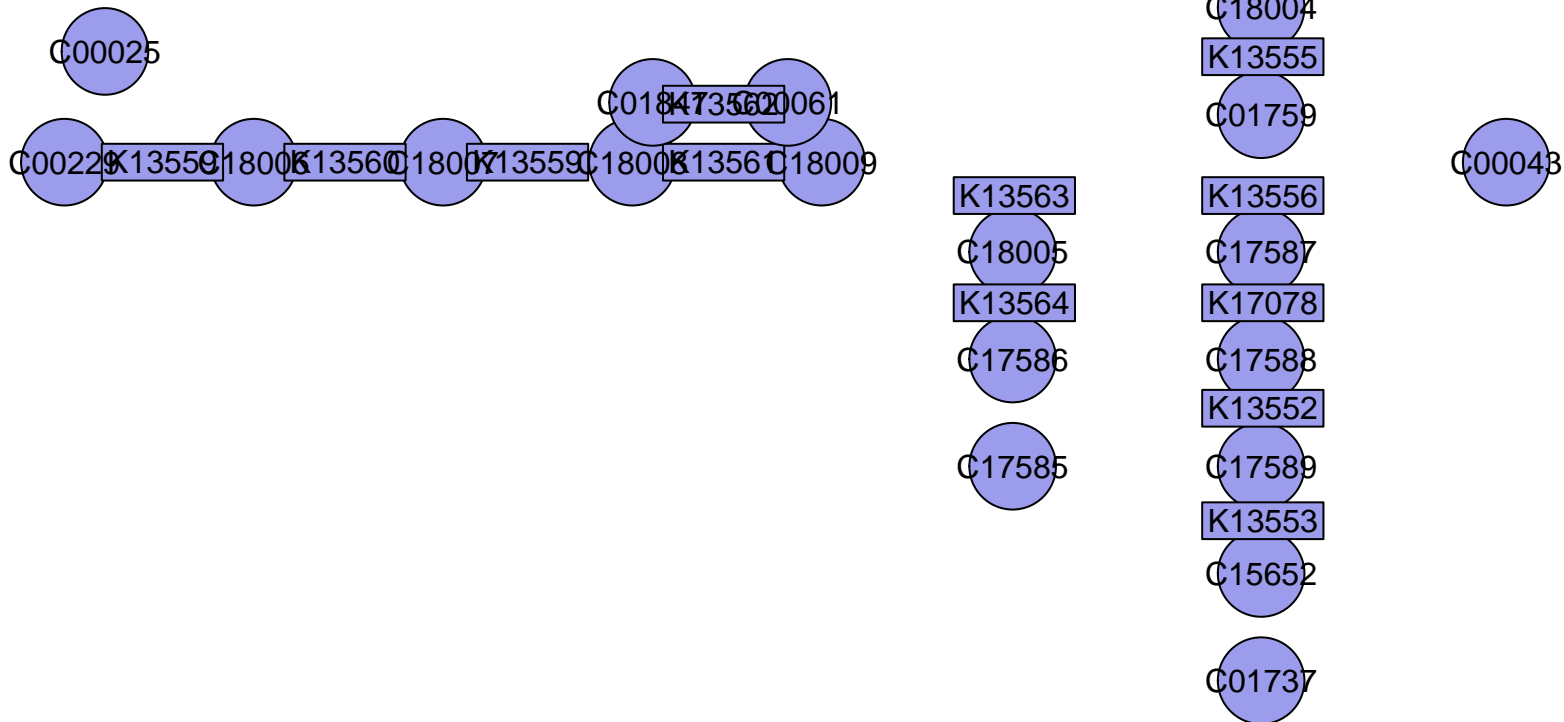




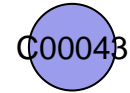
Butirosin and  
neomycin biosynthesis  
MPI-188



Streptomycin biosynthesis

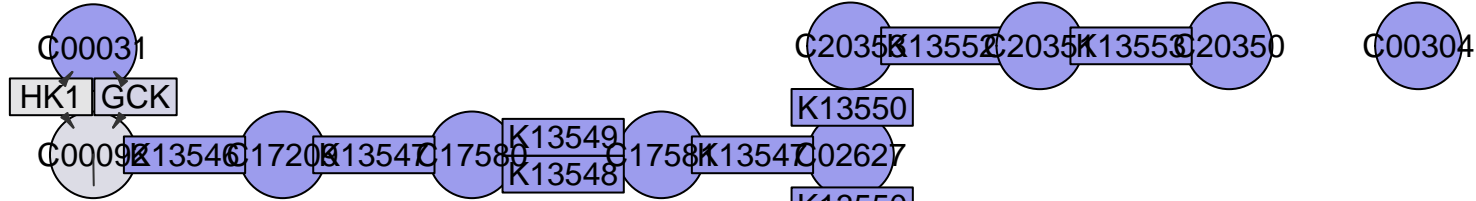


Amino sugar and  
nucleotide sugar metabolism

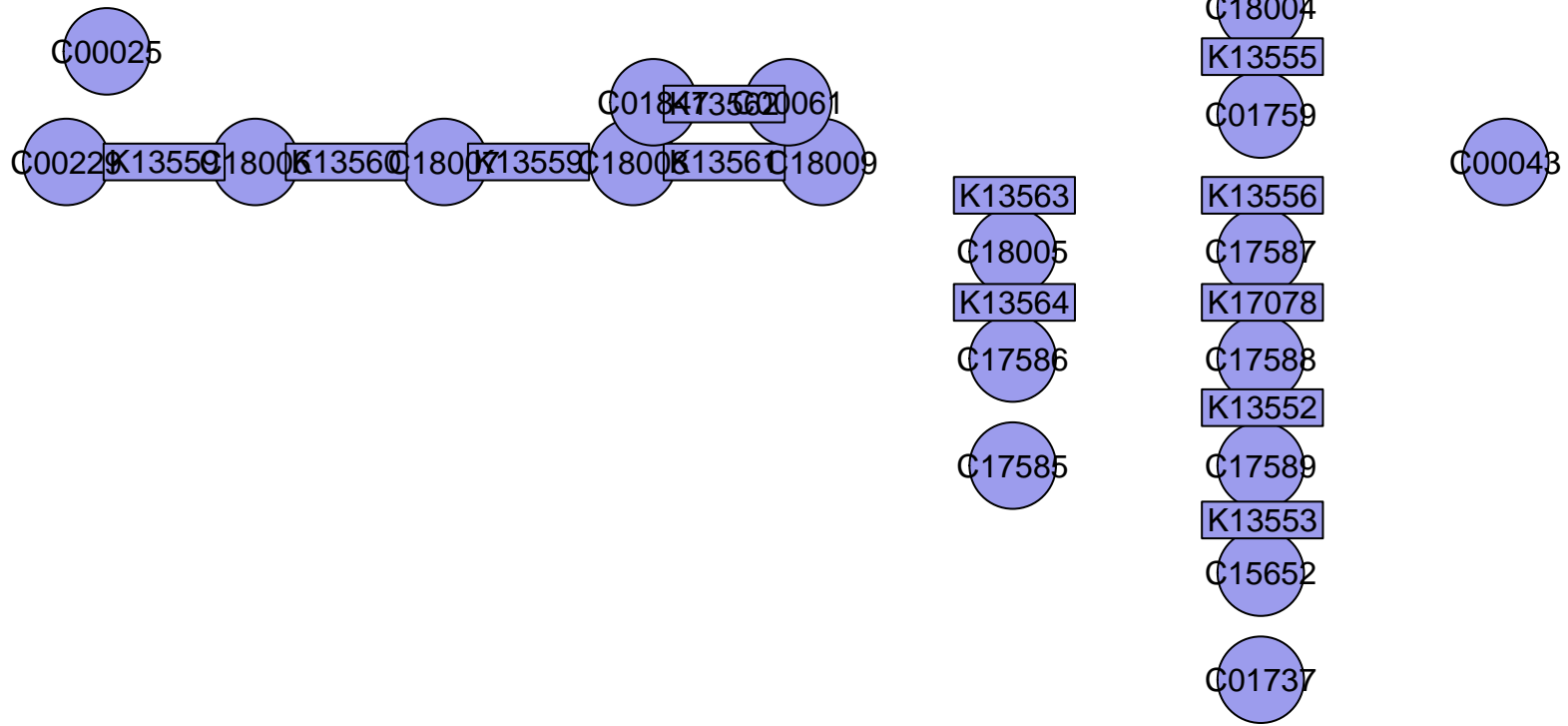




Butirosin and  
neomycin biosynthesis  
MPI-189



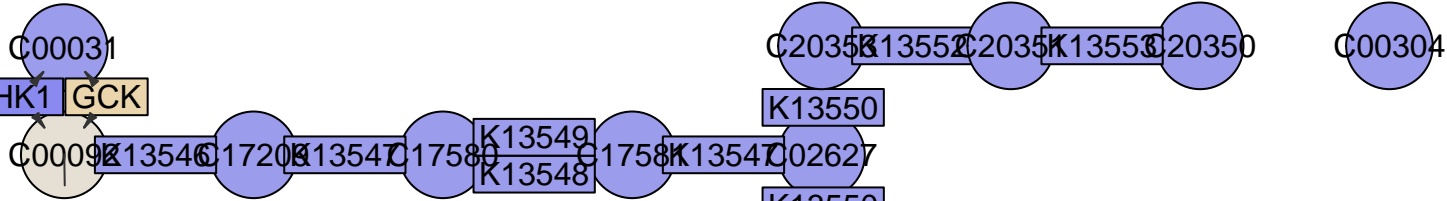
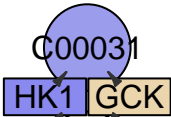
Streptomycin biosynthesis



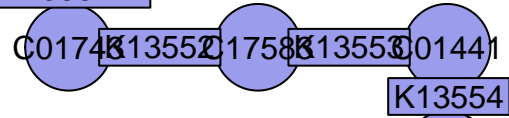
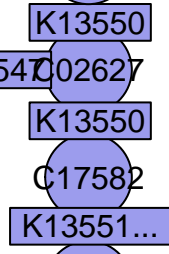
Amino sugar and  
nucleotide sugar metabolism



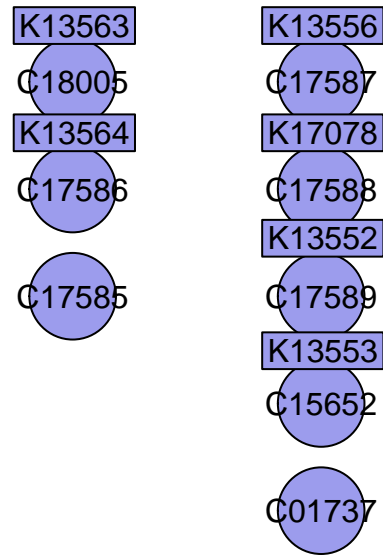
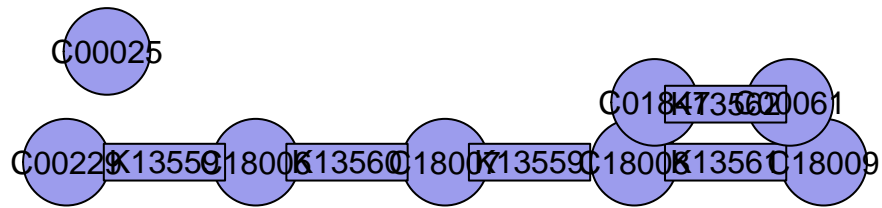
Butirosin and  
neomycin biosynthesis  
MPI-190



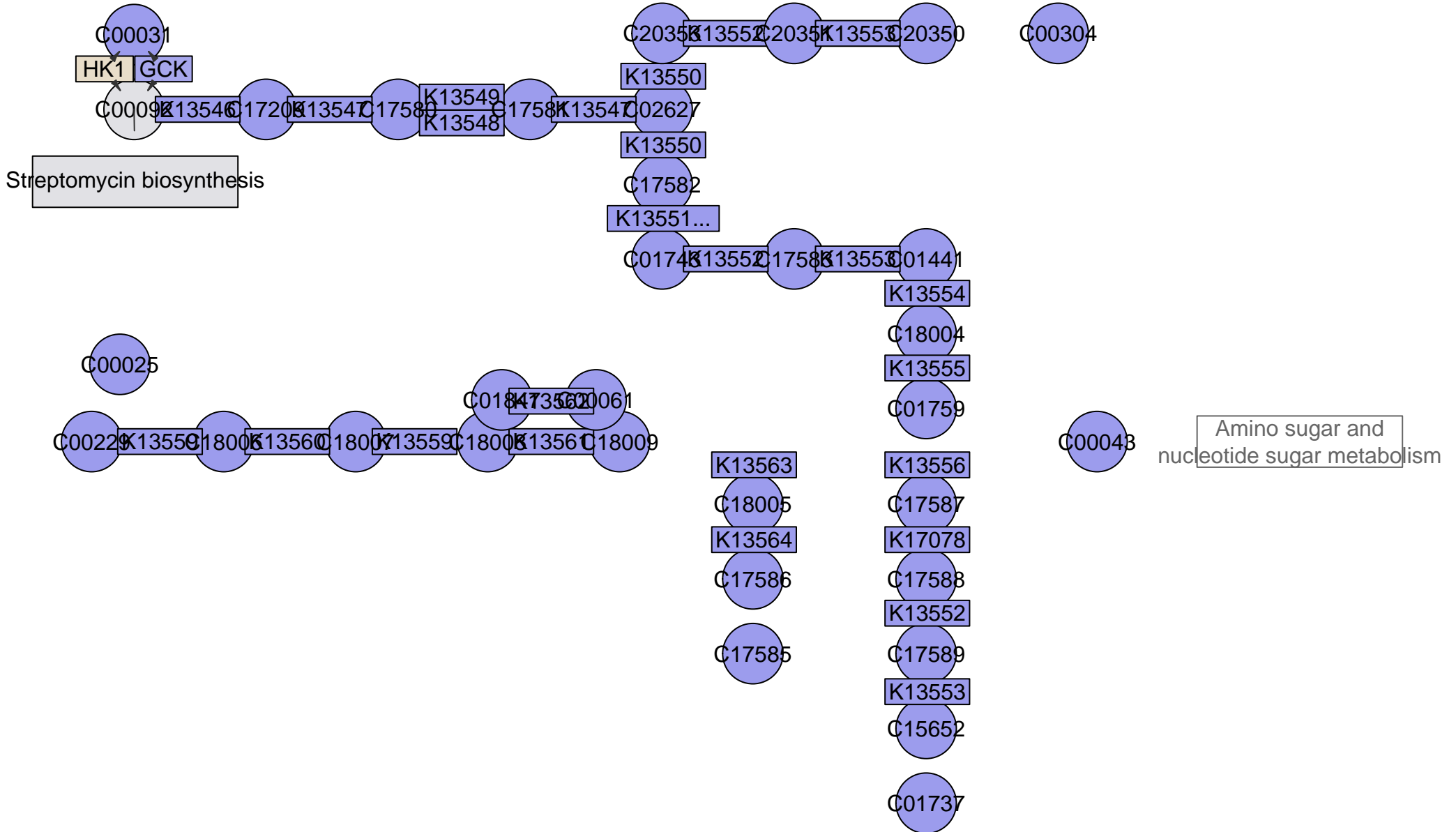
Streptomycin biosynthesis



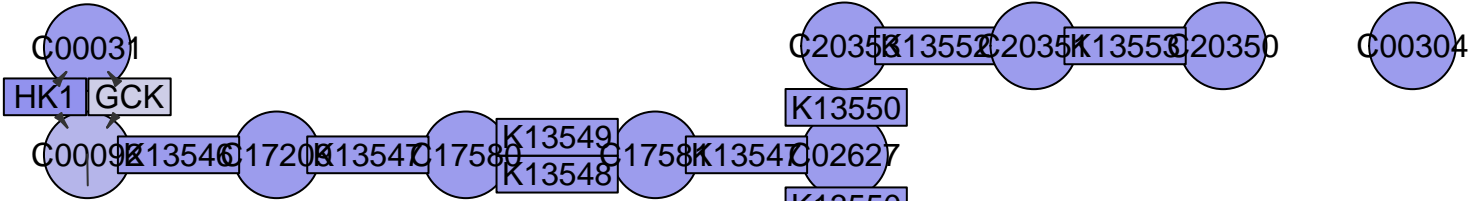
Amino sugar and  
nucleotide sugar metabolism



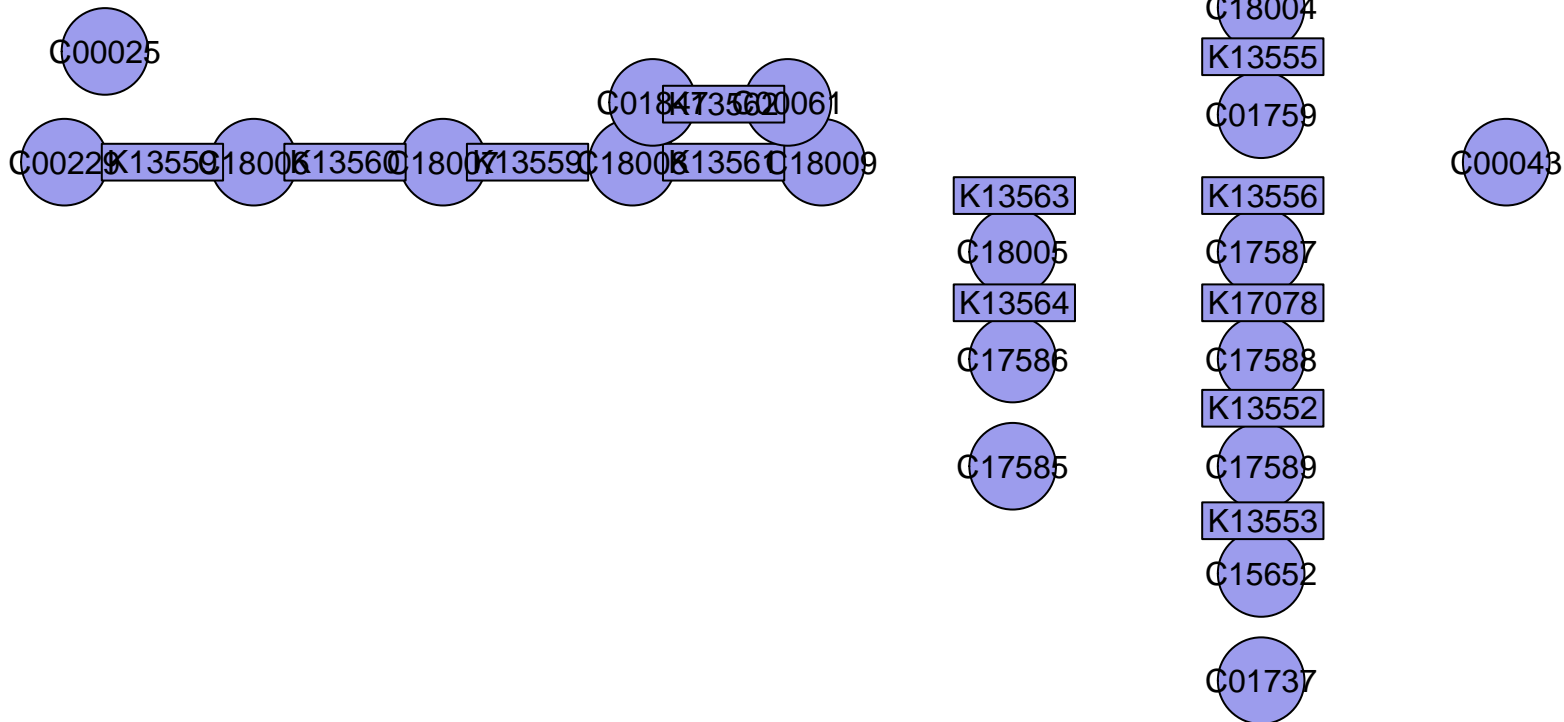
Butirosin and  
neomycin biosynthesis  
MPI-191



Butirosin and  
neomycin biosynthesis  
MPI-192

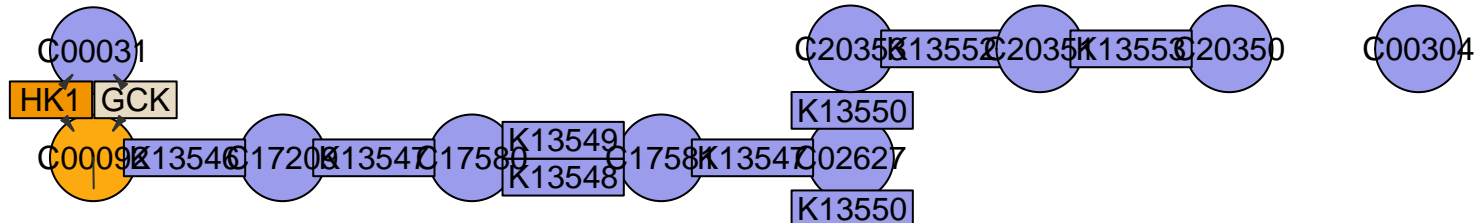


Streptomycin biosynthesis

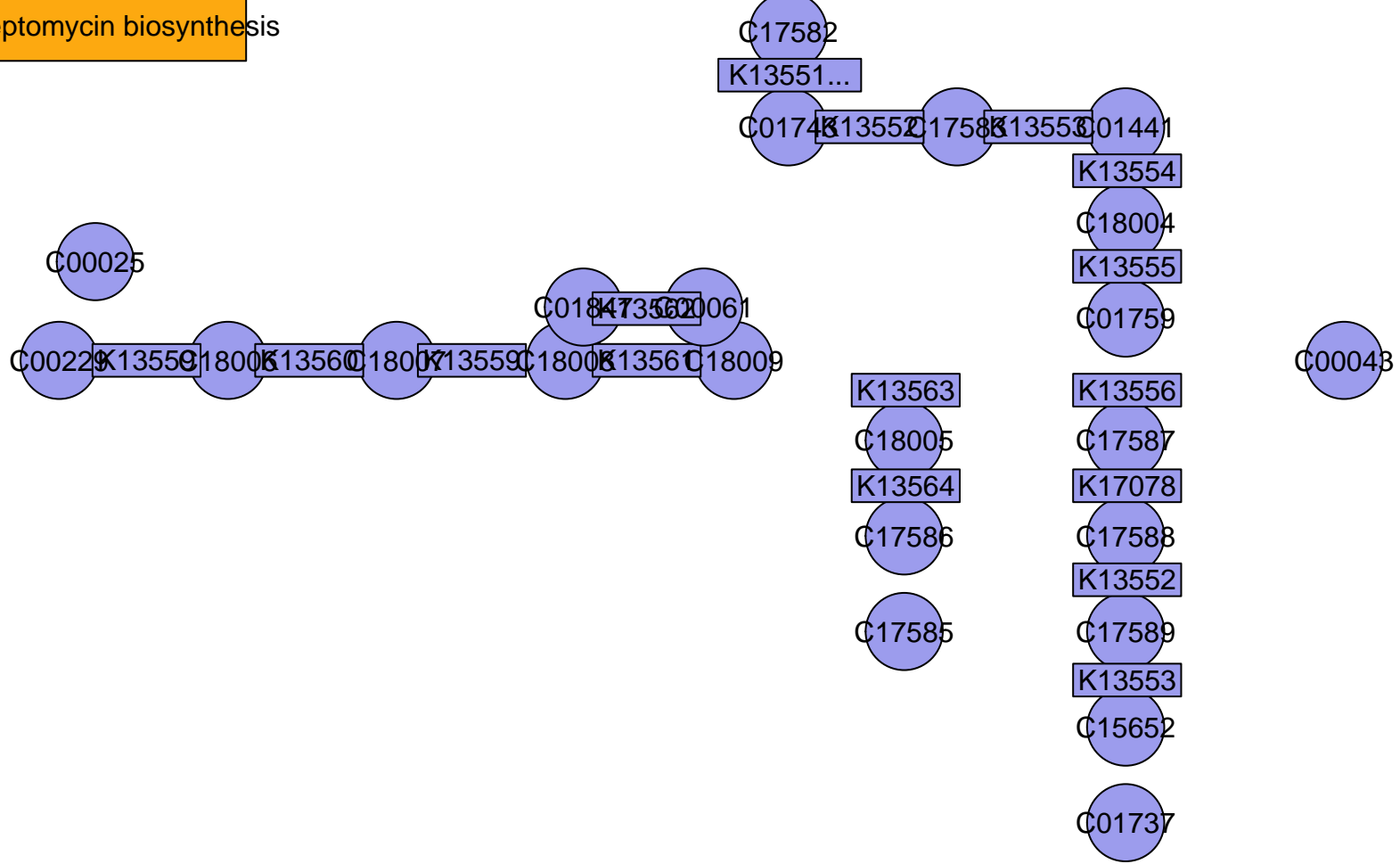


Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-194

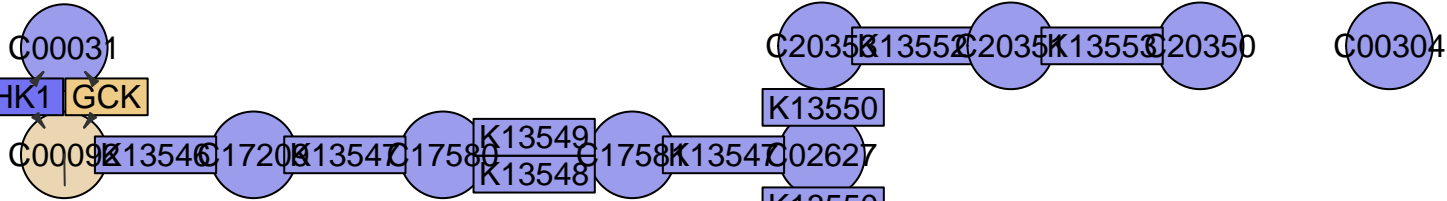
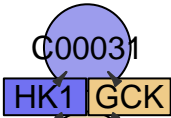


Streptomycin biosynthesis

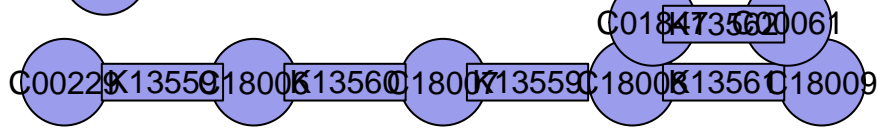
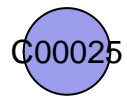
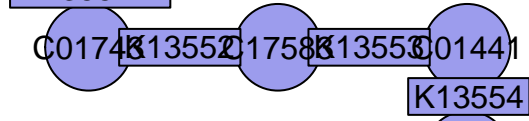
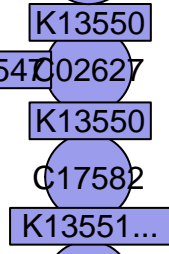


Amino sugar and  
nucleotide sugar metabolism

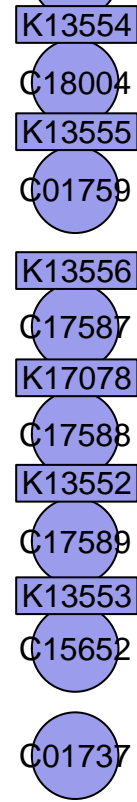
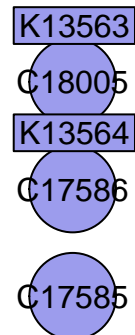
Butirosin and  
neomycin biosynthesis  
MPI-195



Streptomycin biosynthesis

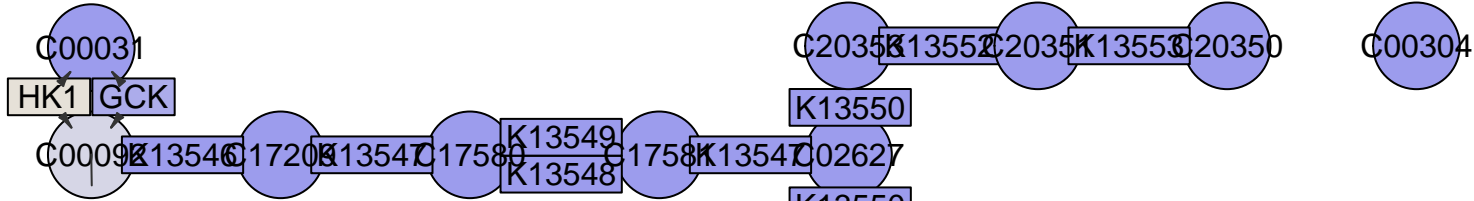


C01804 K13562 C18006

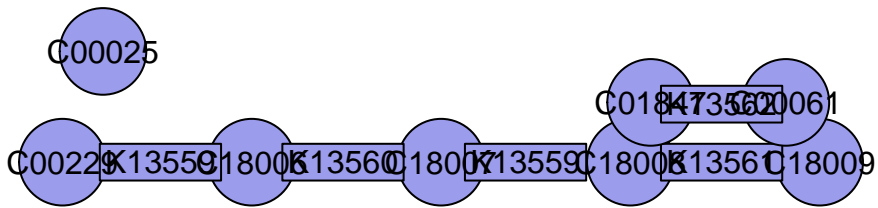
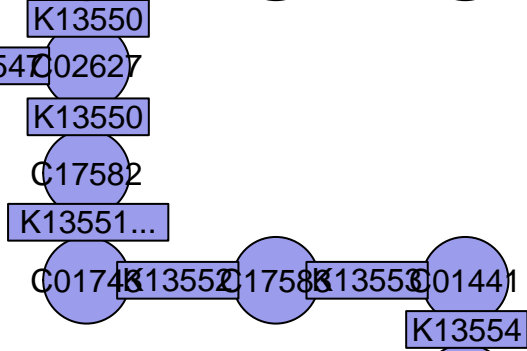


Amino sugar and  
nucleotide sugar metabolism

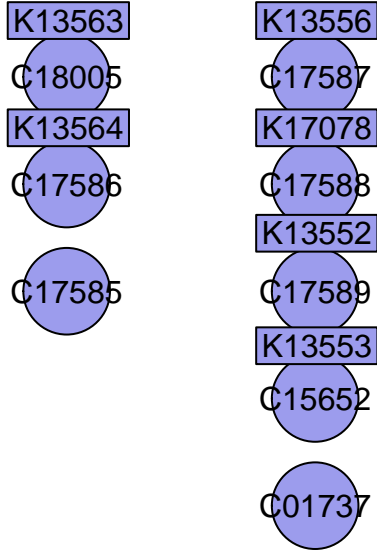
Butirosin and  
neomycin biosynthesis  
MPI-196



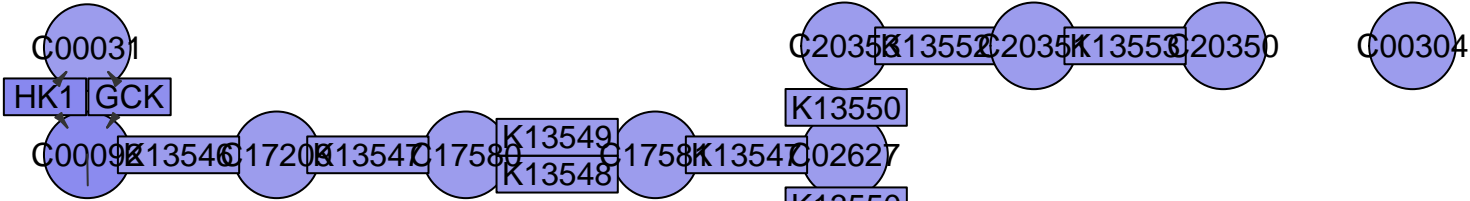
Streptomycin biosynthesis



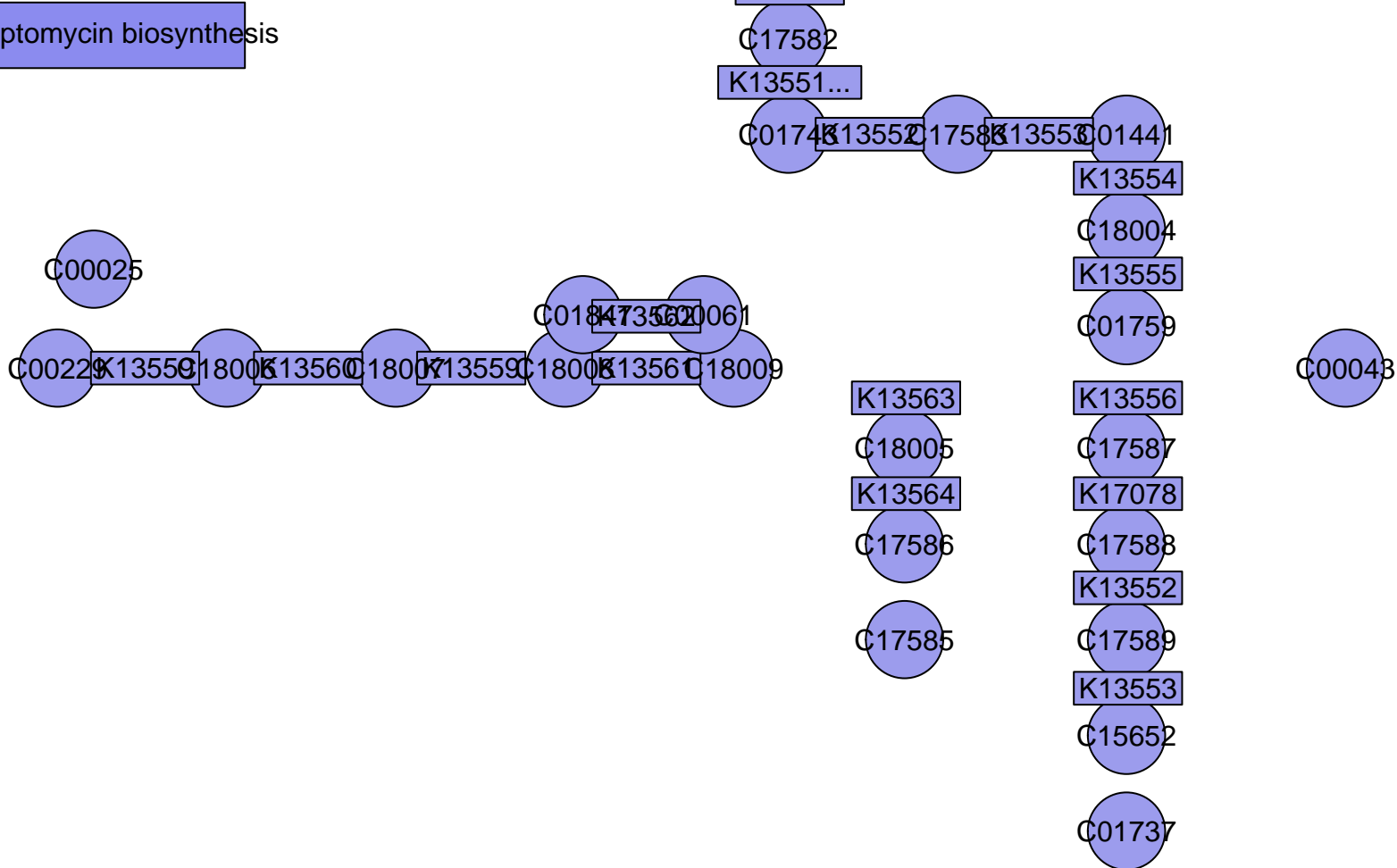
Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-198



Streptomycin biosynthesis



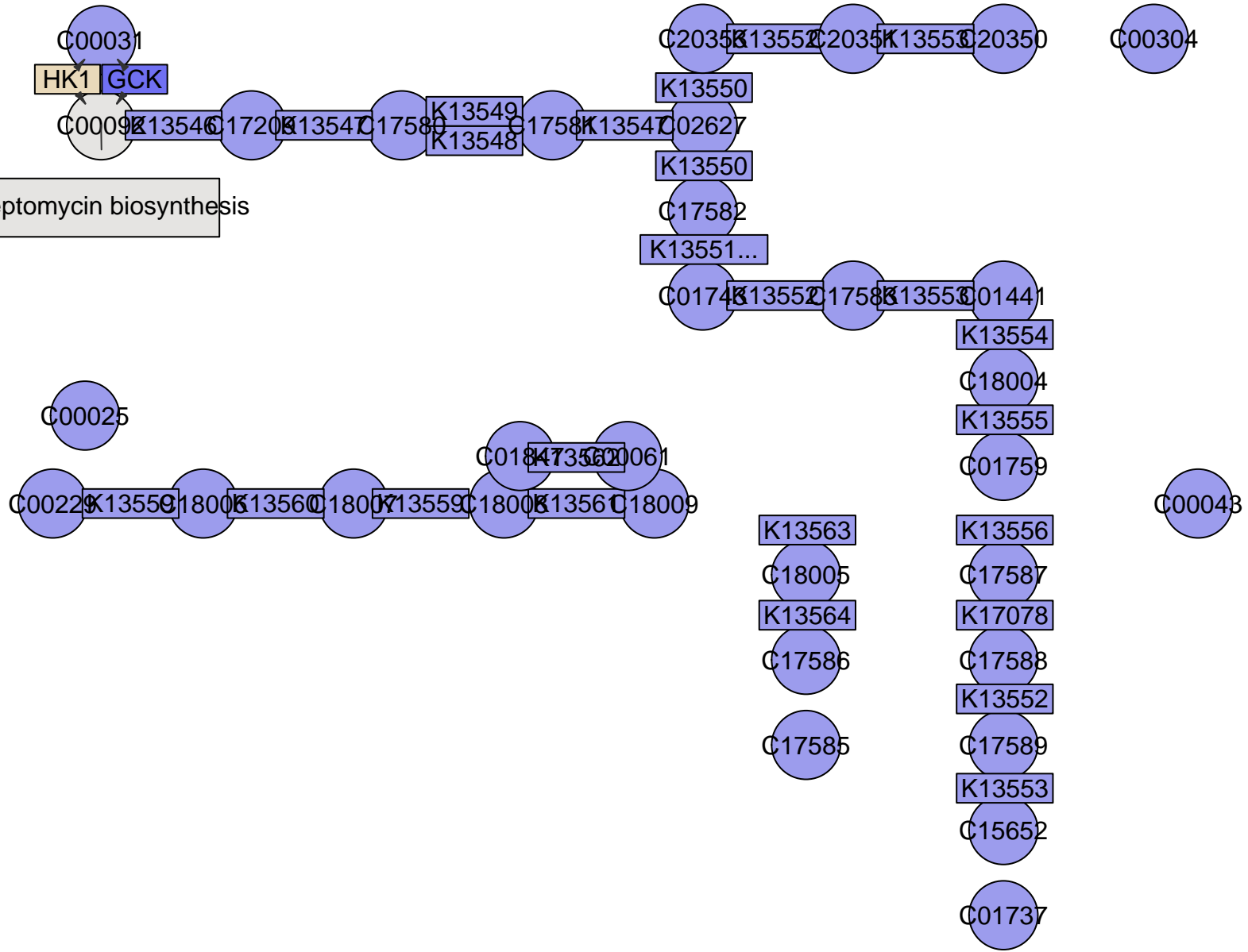
Amino sugar and  
nucleotide sugar metabolism



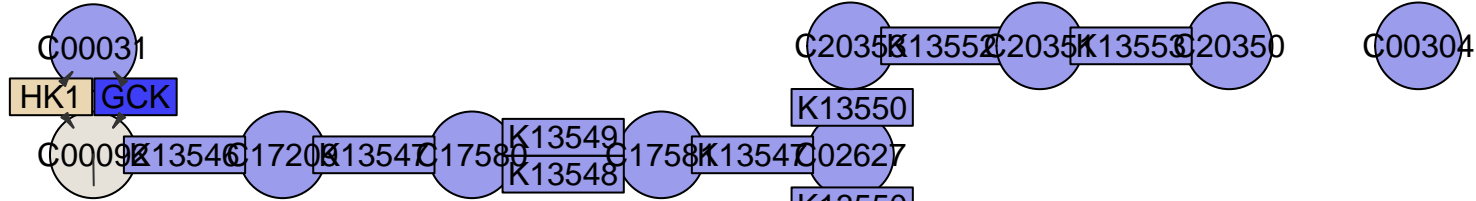
Butirosin and  
neomycin biosynthesis  
MPI-199

Streptomycin biosynthesis

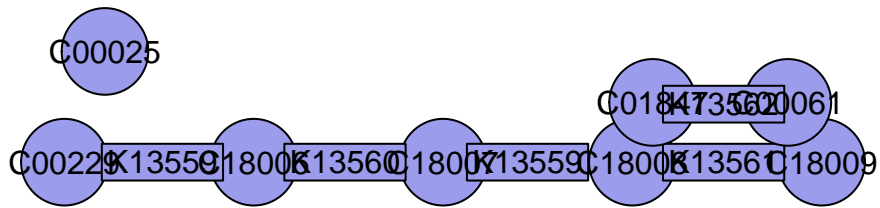
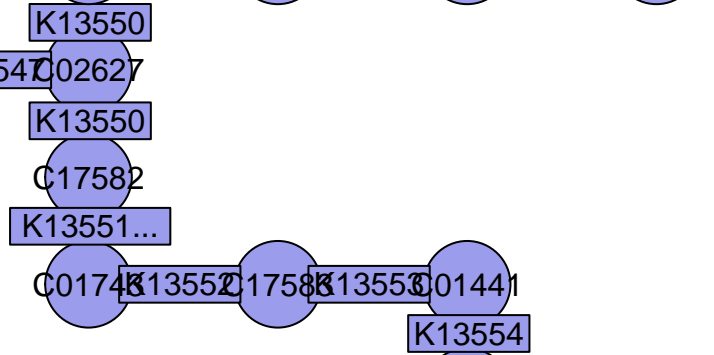
Amino sugar and  
nucleotide sugar metabolism



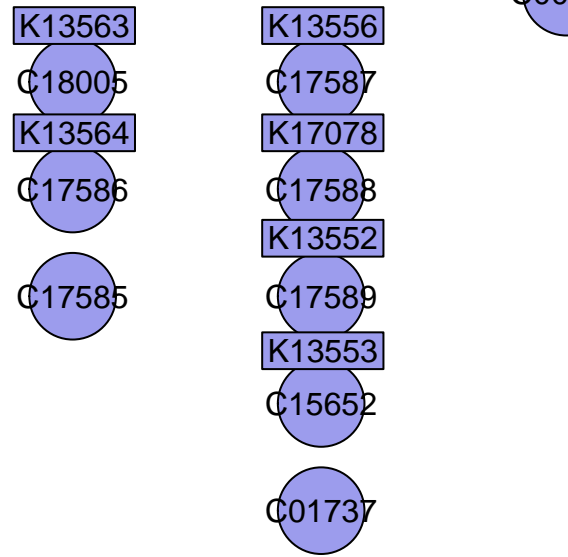
Butirosin and  
neomycin biosynthesis  
MPI-200



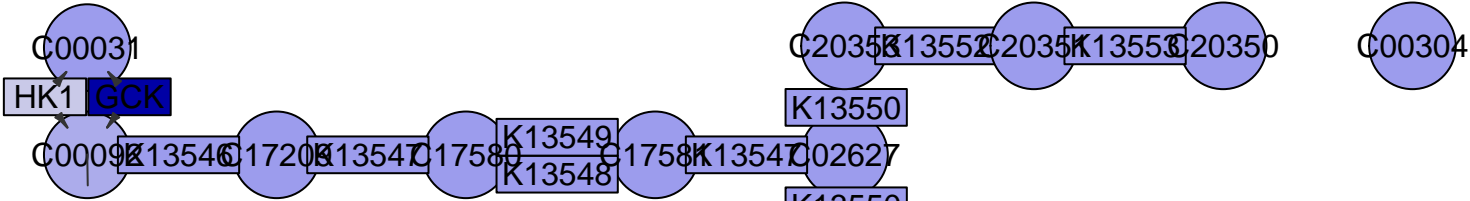
Streptomycin biosynthesis



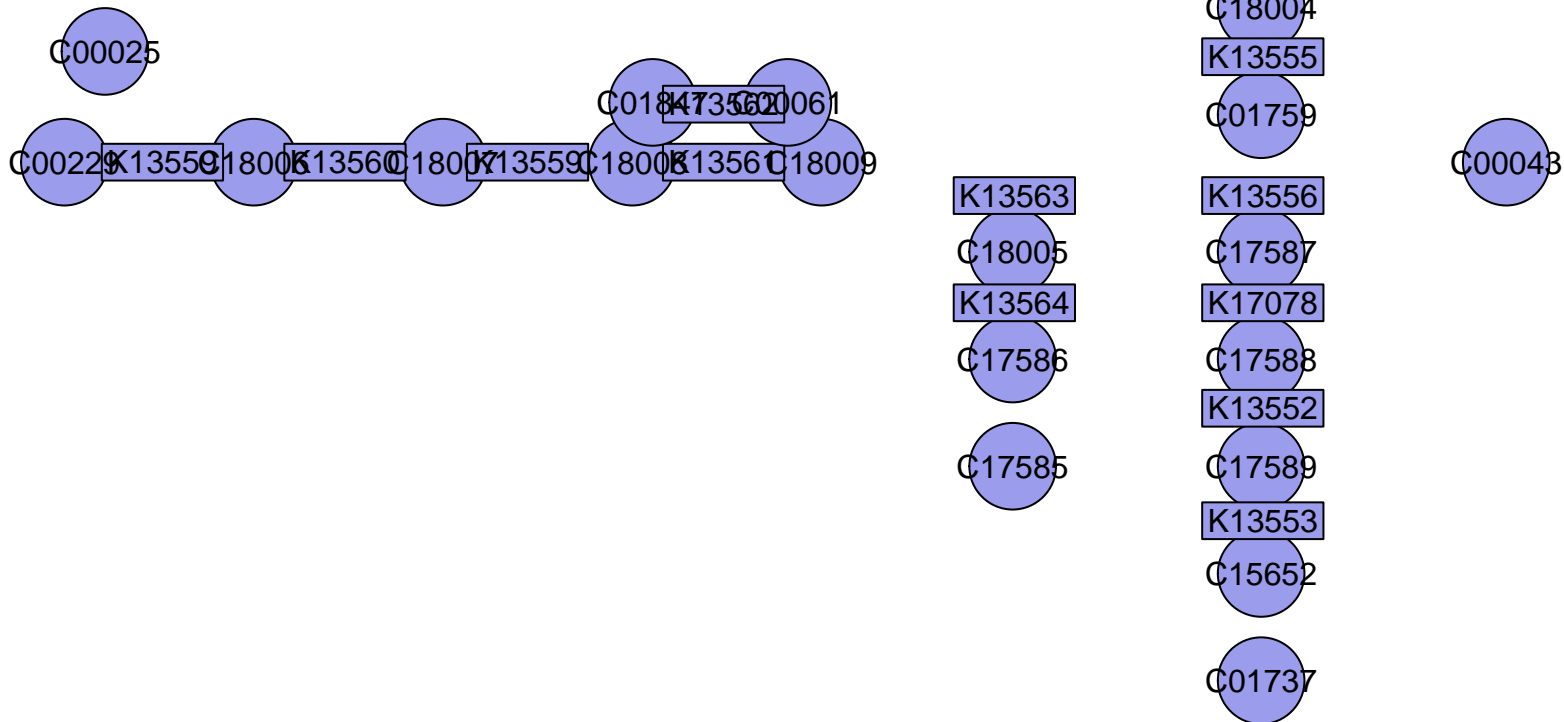
Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-201



Streptomycin biosynthesis



Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-202

C00031

HK1 GCK

C00099

K13546

C17208

K13547

C17580

K13549  
K13548

C17581

K13547

C02627

K13550

C17582

K13551...

C01748

K13552

C17583

K13553

C01441

K13554

C18004

K13555

C01759

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

C01737

C00304

Streptomycin biosynthesis

C00025

C00229

K13559

C18006

K13560

C18007

K13559

C18008

K13561

K13563

C18005

K13564

C17586

C17585

C01847

K13562

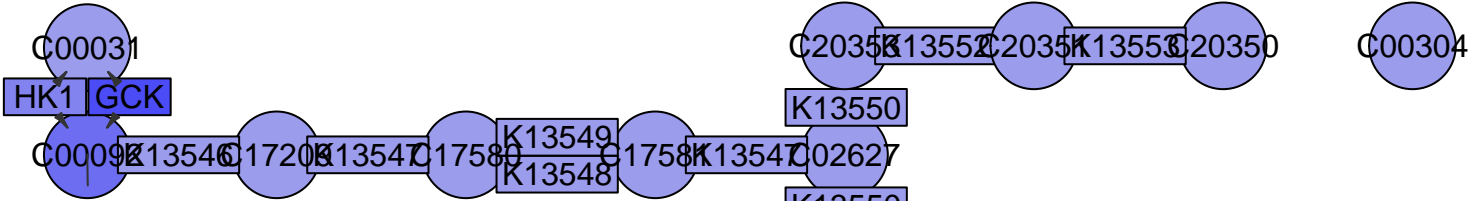
C01061

C00043

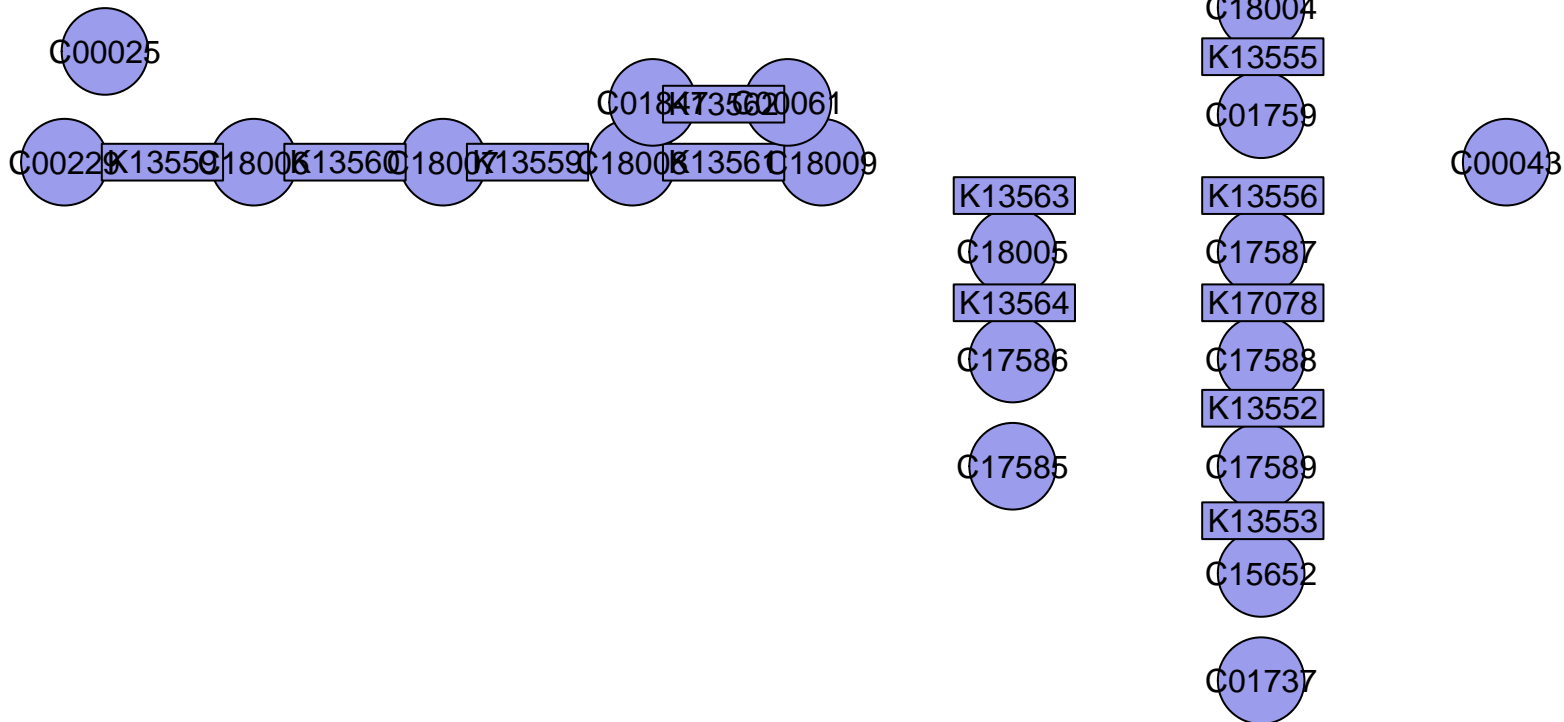
Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-204



Streptomycin biosynthesis



Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-205

C00031

HK1 GCK

C00099

C17209

C17580

K13549  
K13548

C17580

K13550

K13550

C17582

K13551...

C01748

C17580

C01441

K13554

C18004

K13555

C01759

C00304

Streptomycin biosynthesis

C00025

C00229

C18004

C18005

C01804

C01061

C18005

C18009

K13560

K13559

K13560

K13561

K13562

K13563

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C17586

C17585

K13556

C17587

K17078

C17588

K13552

C17589

K13553

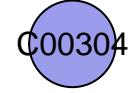
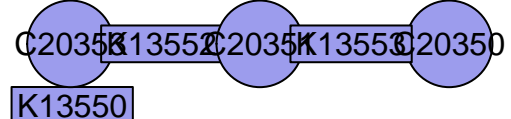
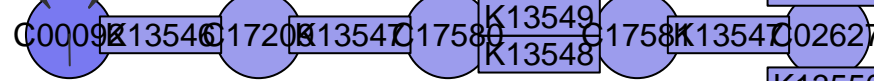
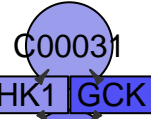
C15652

C01737

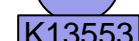
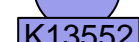
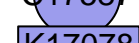
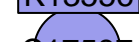
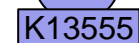
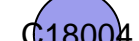
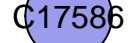
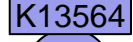
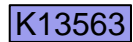
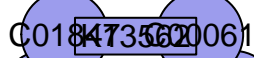
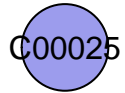
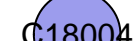
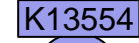
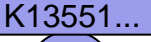
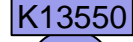
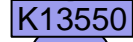
C00043

Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-206



Streptomycin biosynthesis

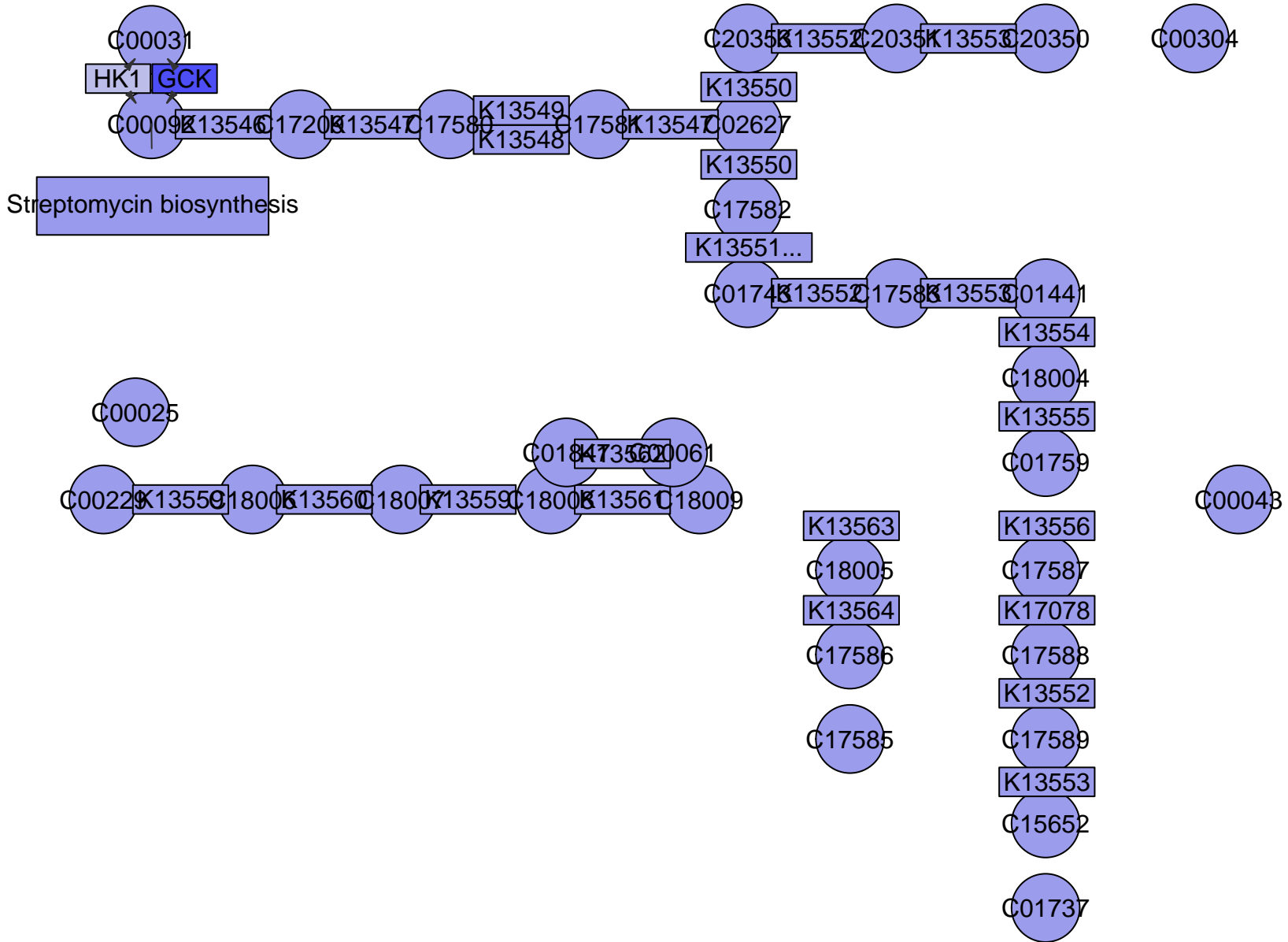


Amino sugar and  
nucleotide sugar metabolism

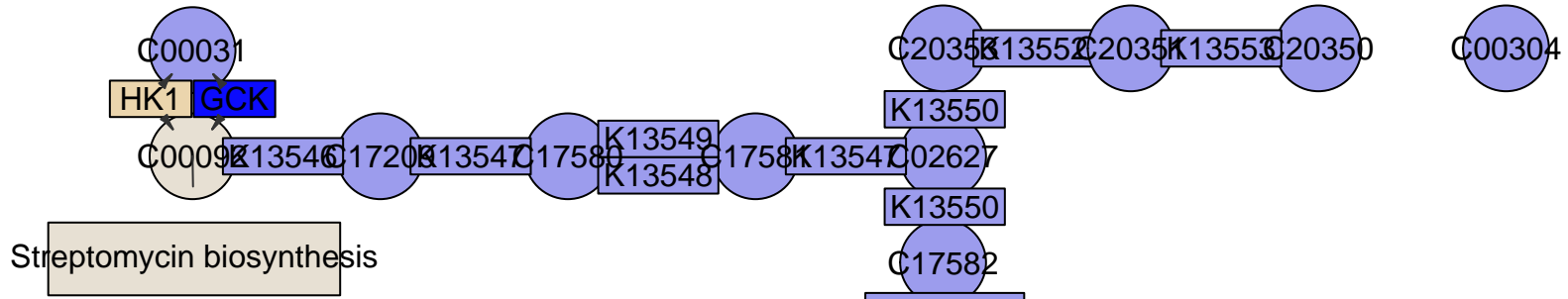




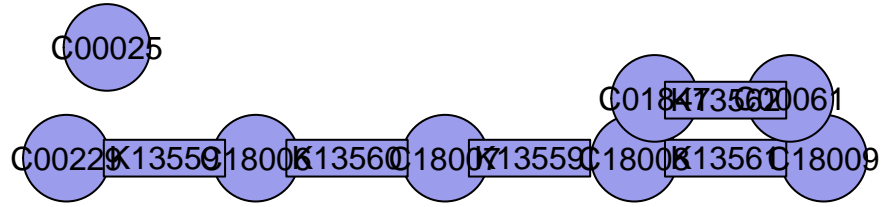
Butirosin and  
neomycin biosynthesis  
MPI-207



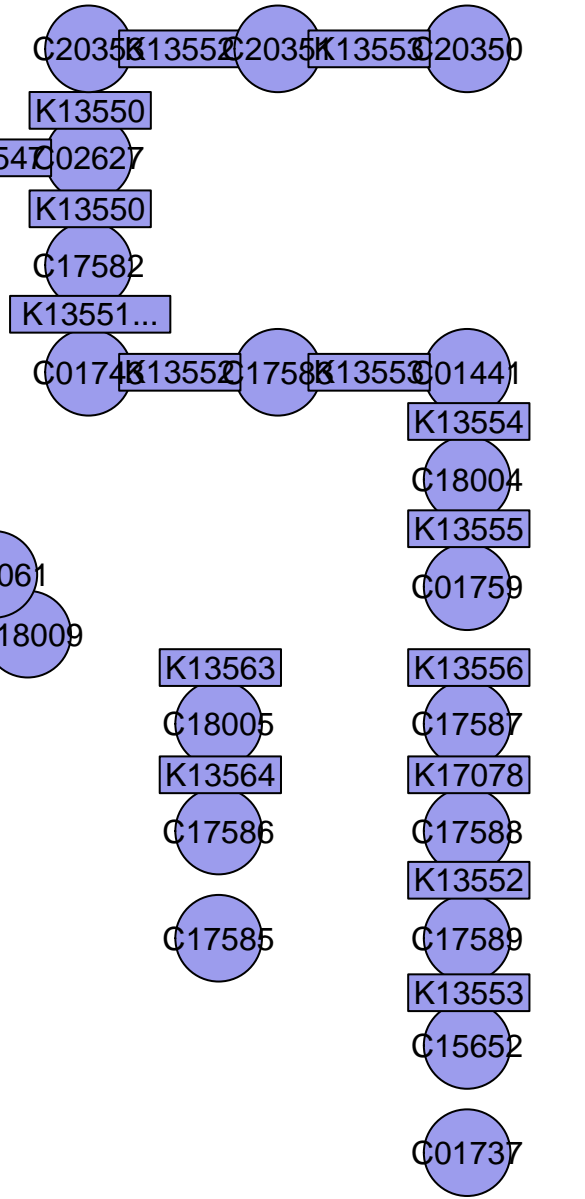
Butirosin and neomycin biosynthesis  
MPI-208



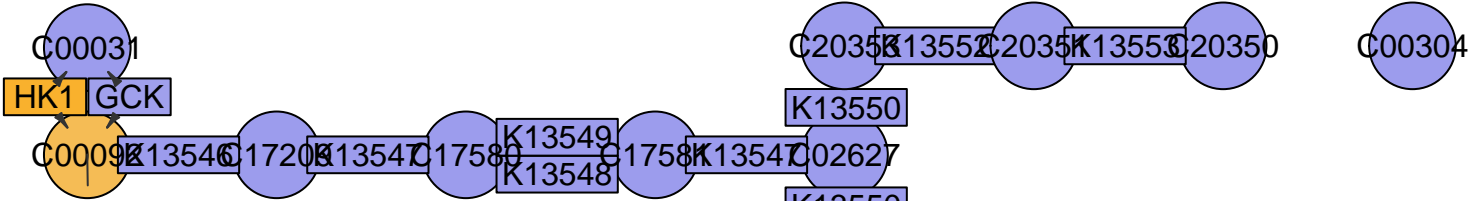
Streptomycin biosynthesis



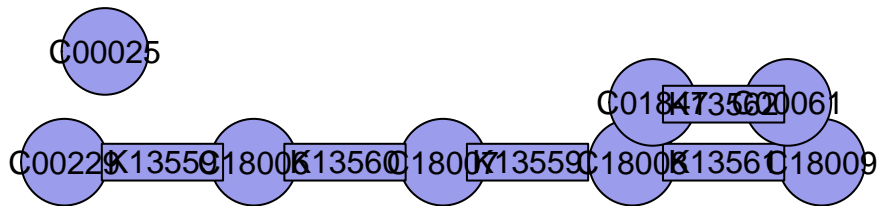
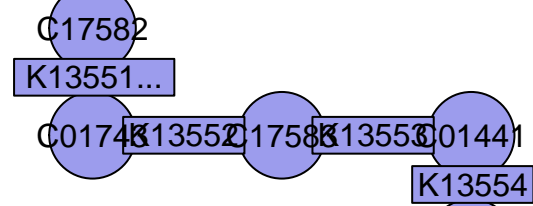
Amino sugar and nucleotide sugar metabolism



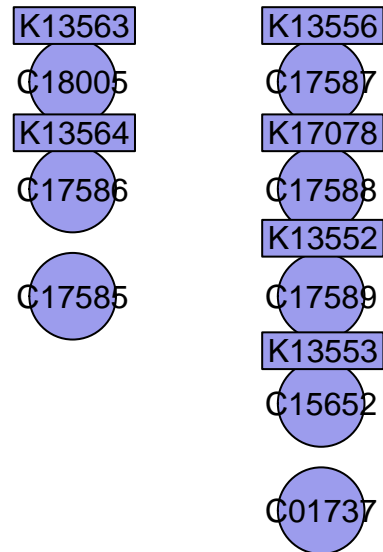
Butirosin and  
neomycin biosynthesis  
MPI-209



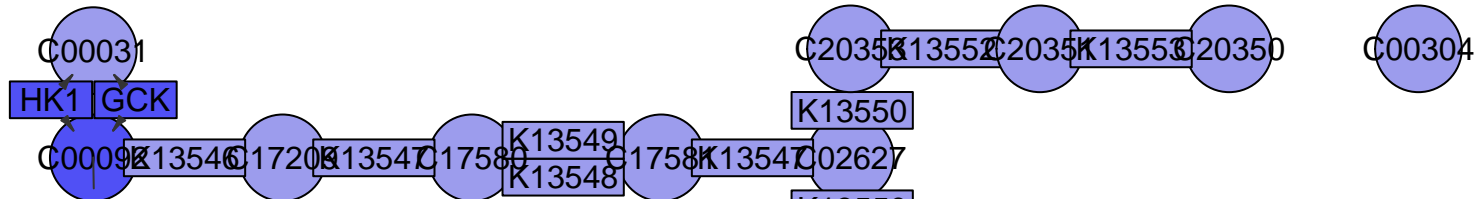
Streptomycin biosynthesis



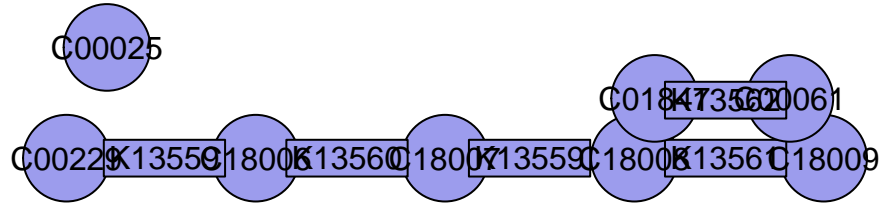
Amino sugar and  
nucleotide sugar metabolism



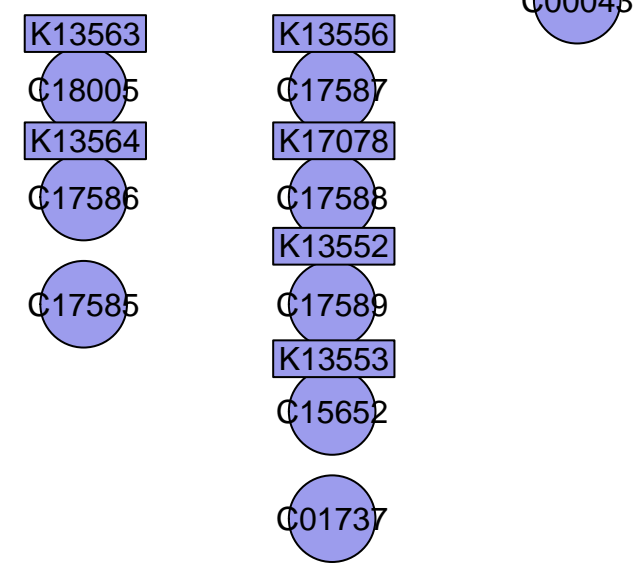
Butirosin and  
neomycin biosynthesis  
MPI-210



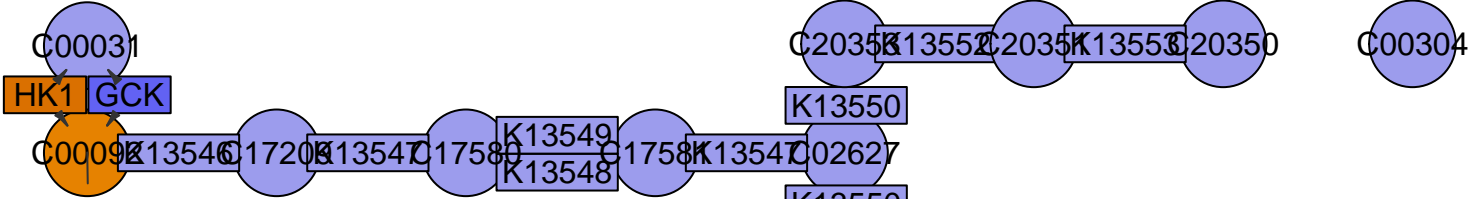
Streptomycin biosynthesis



Amino sugar and  
nucleotide sugar metabolism



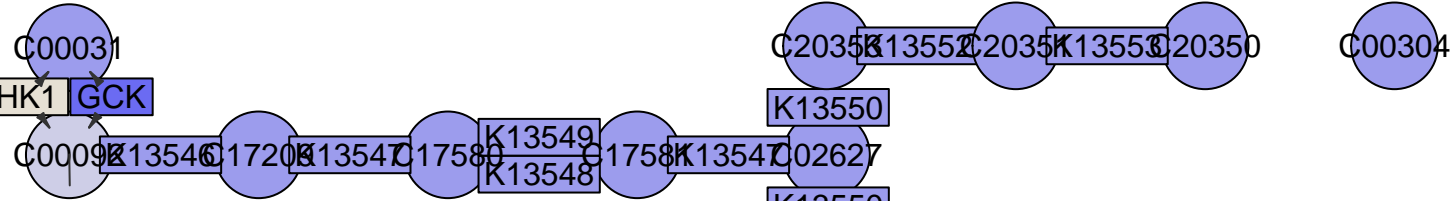
Butirosin and  
neomycin biosynthesis  
MPI-212



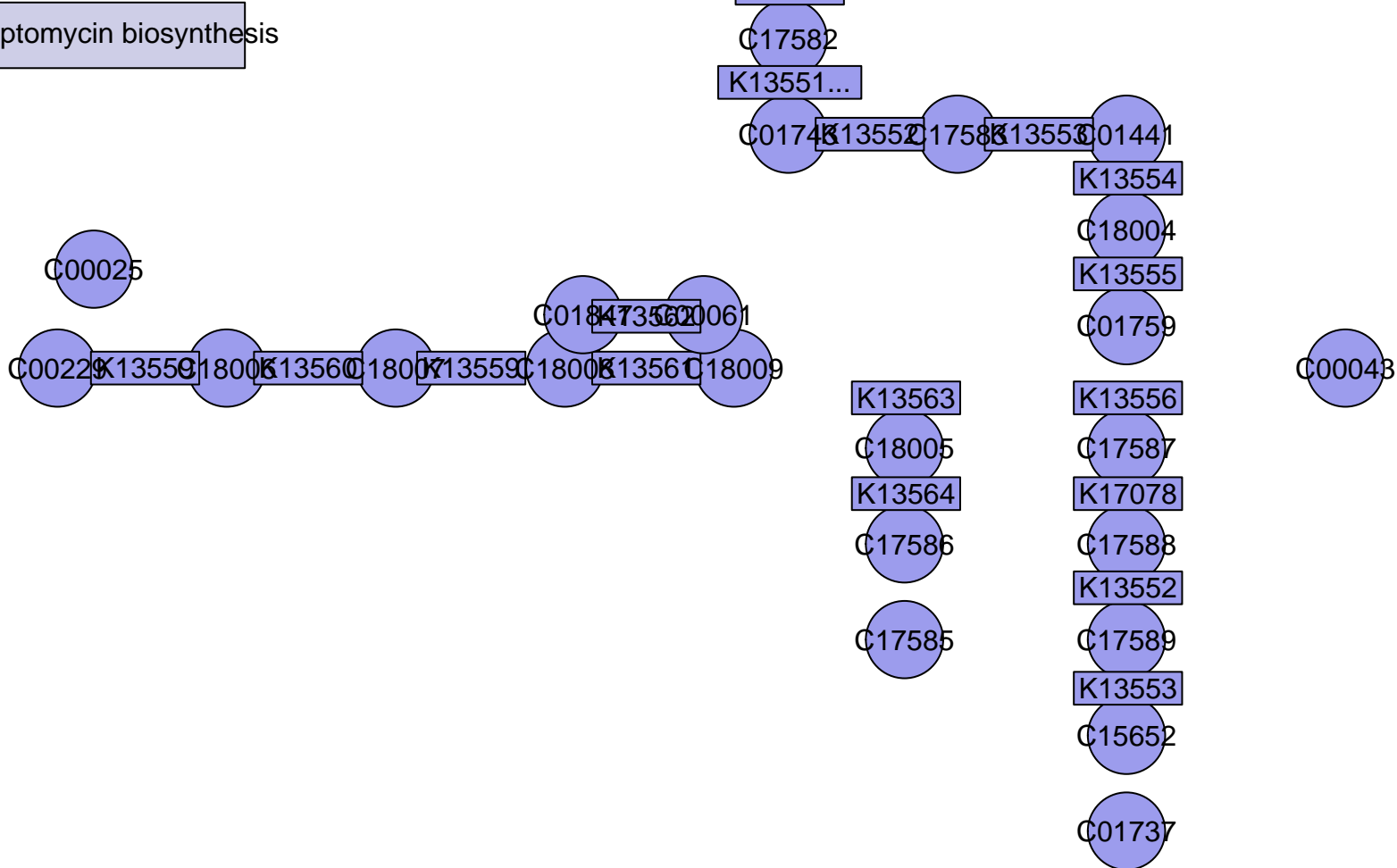
Streptomycin biosynthesis

Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-213

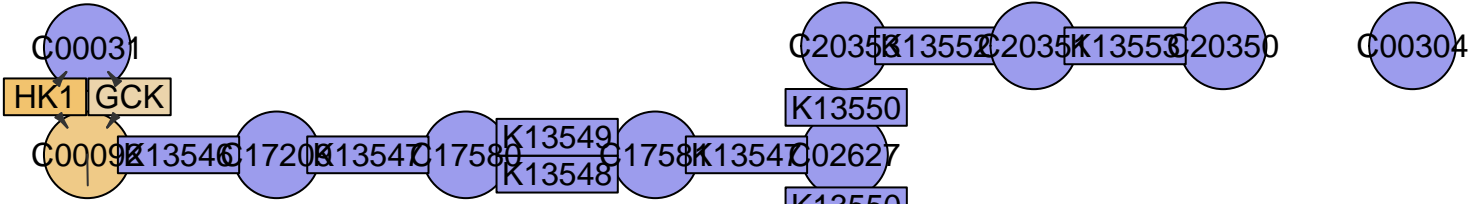


Streptomycin biosynthesis

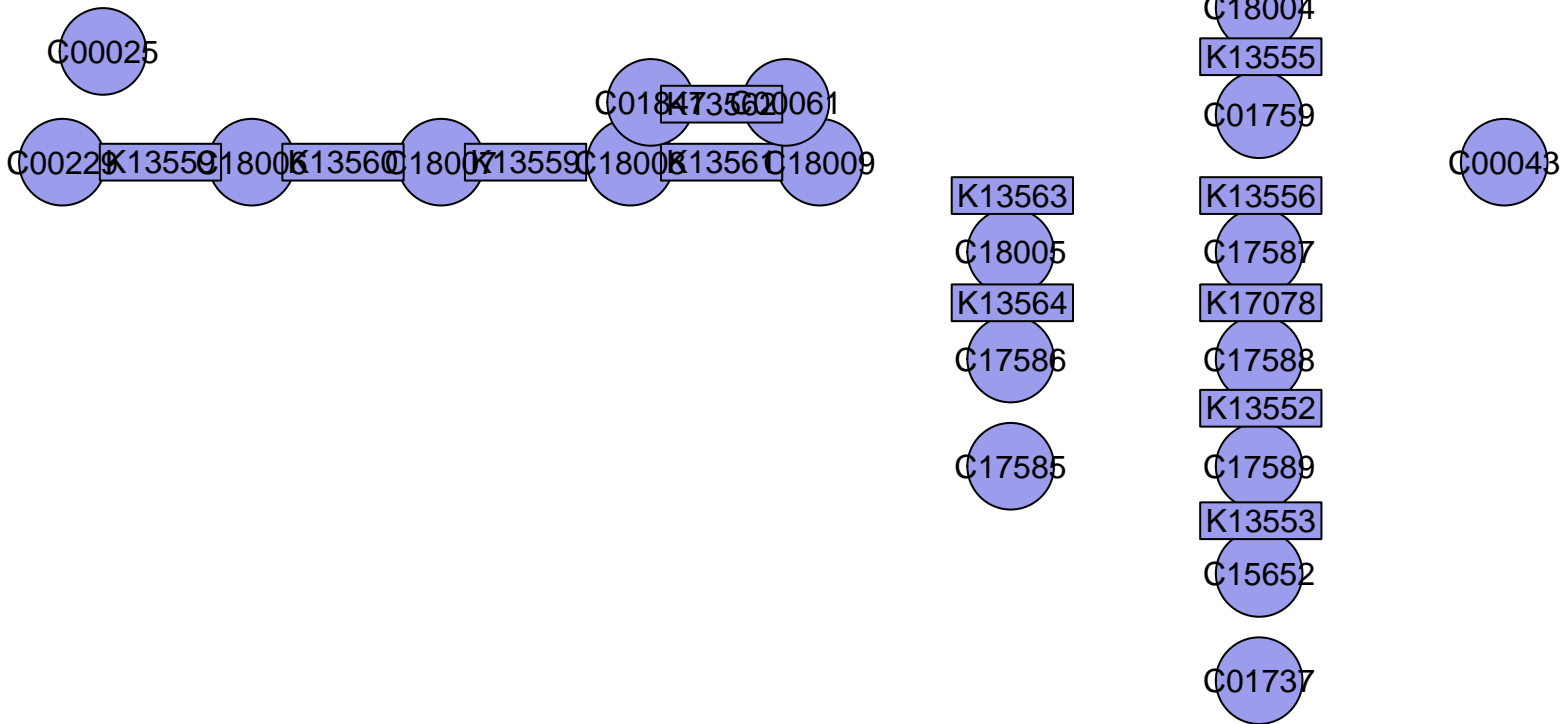


Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-215



Streptomycin biosynthesis

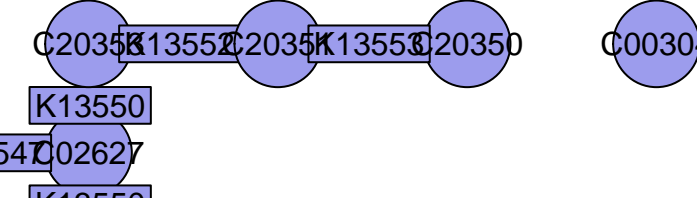
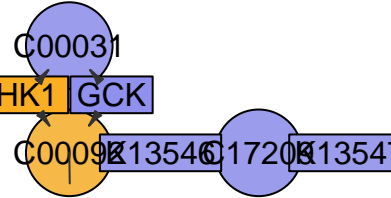


Amino sugar and  
nucleotide sugar metabolism

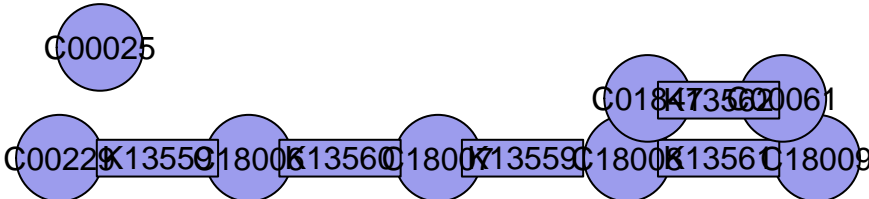




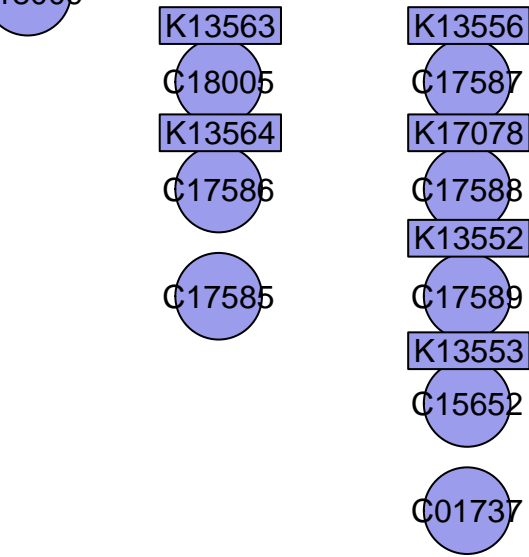
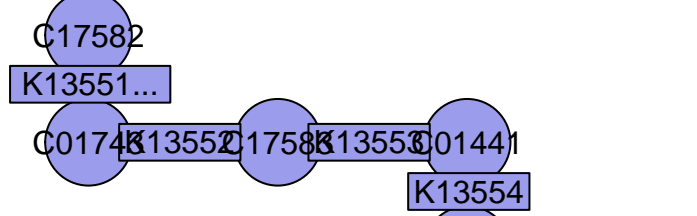
Butirosin and  
neomycin biosynthesis  
MPI-221



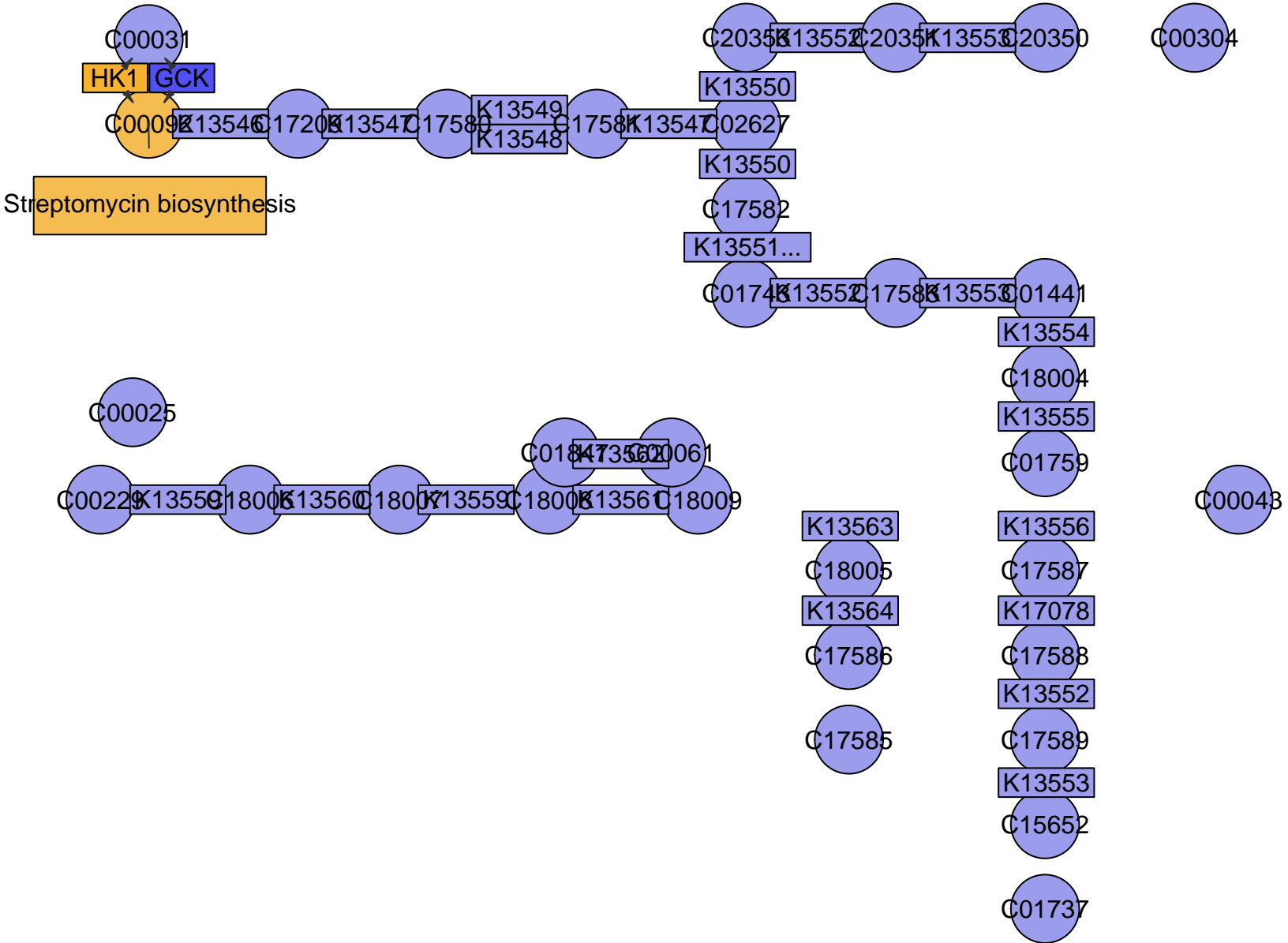
Streptomycin biosynthesis



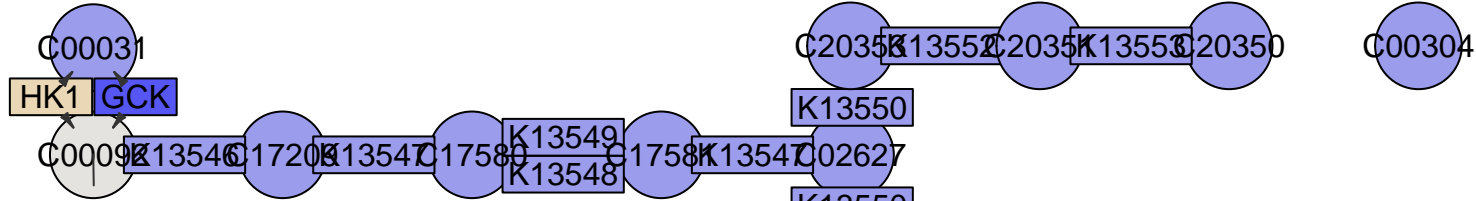
Amino sugar and  
nucleotide sugar metabolism



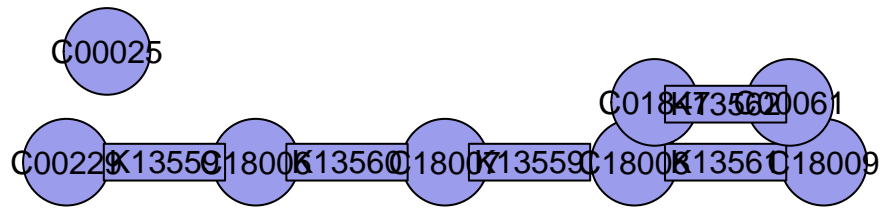
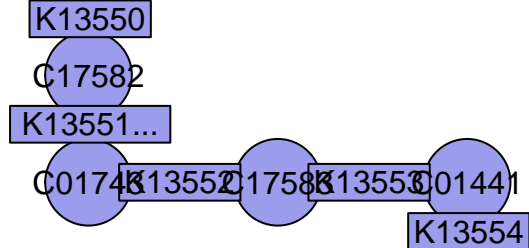
Butirosin and  
neomycin biosynthesis  
MPI-223a



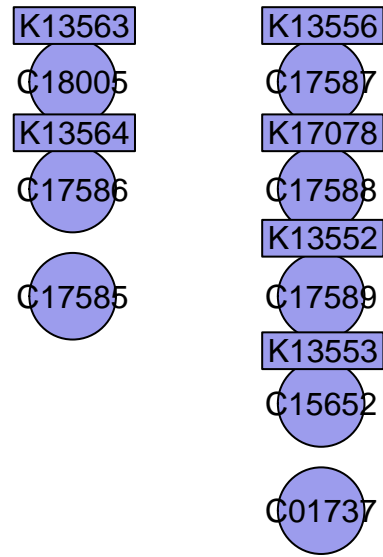
Butirosin and  
neomycin biosynthesis  
MPI-224



Streptomycin biosynthesis



Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-226

C00031

HK1 GCK

C00099

K13546

C17208

K13547

C17580

K13549

K13548

C17581

K13547

C02627

K13550

K13550

C17582

K13551...

C01748

K13552

C17583

K13553

C01441

K13554

C18004

K13555

C01759

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

C01737

C00304

Streptomycin biosynthesis

C00025

C00229

K13559

C18006

K13560

C18007

K13559

C18008

K13561

C18009

C01847

K13562

C01061

K13563

C18005

K13564

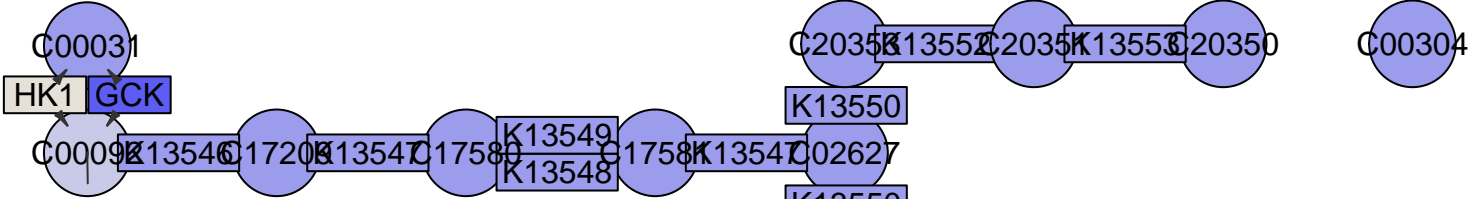
C17586

C17585

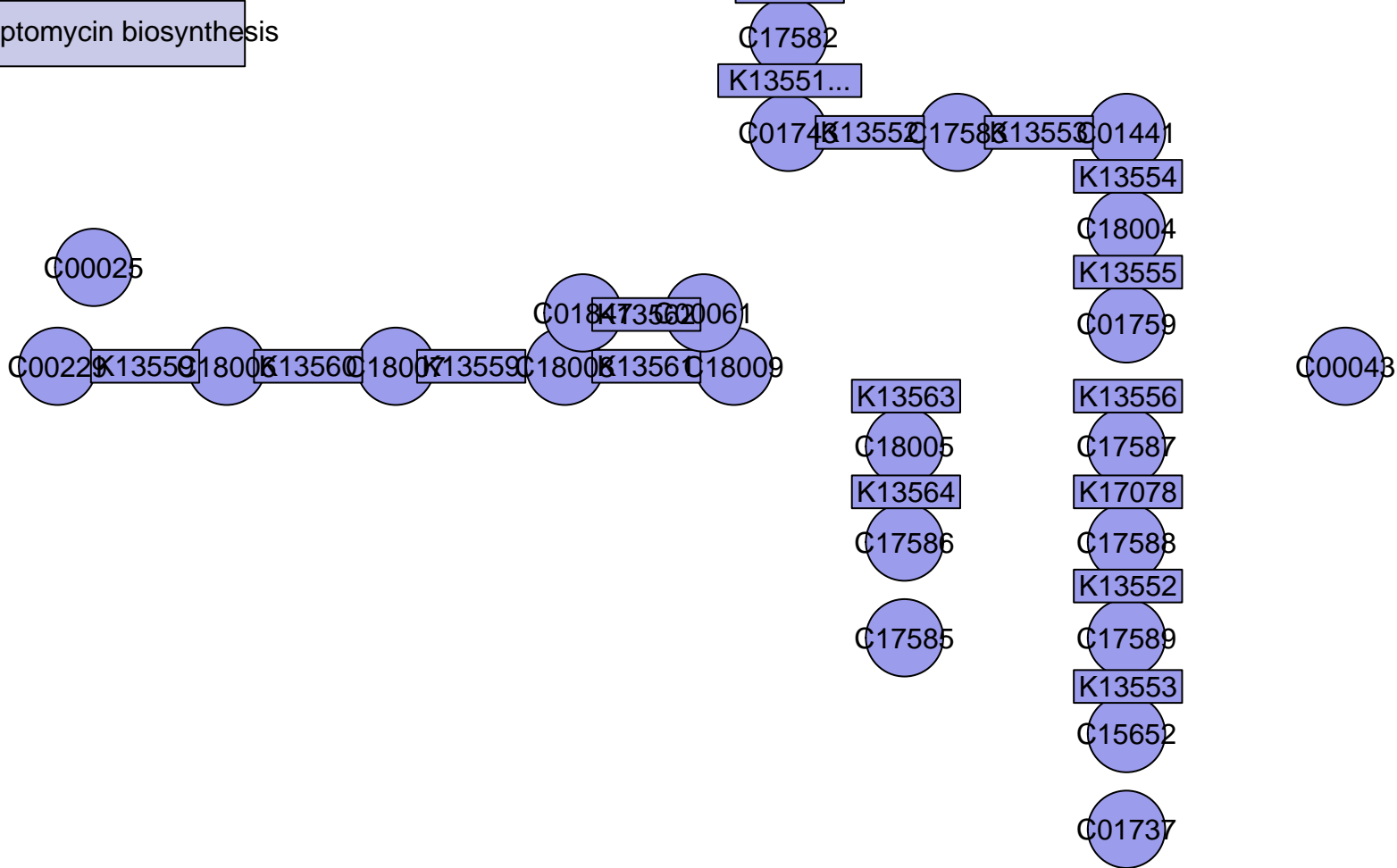
C00043

Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-227



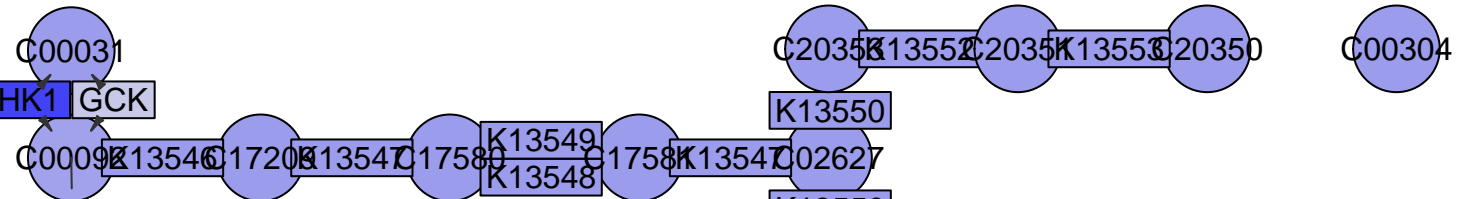
Streptomycin biosynthesis



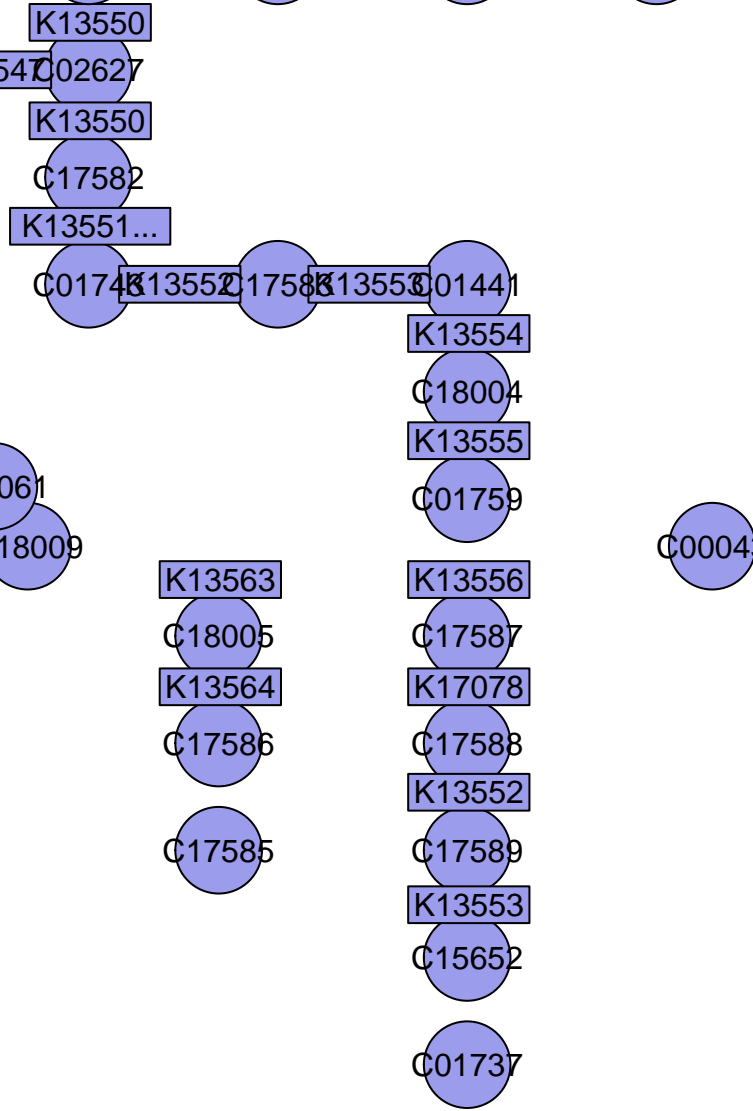
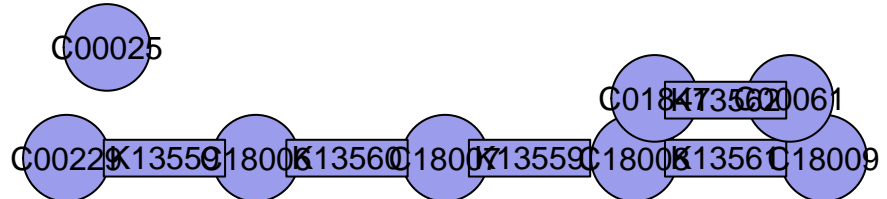
Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-228



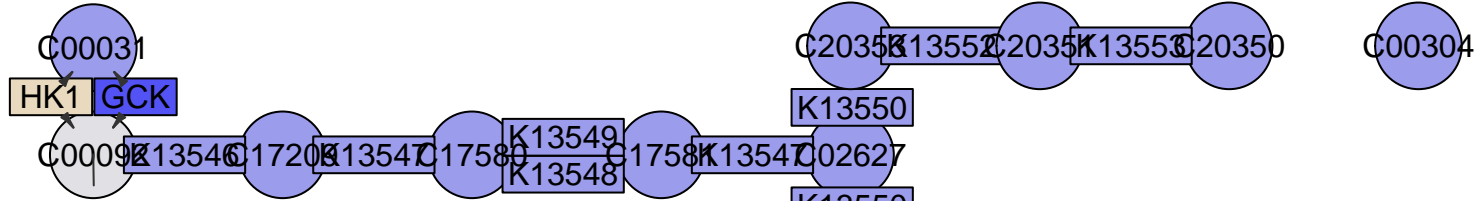
Streptomycin biosynthesis



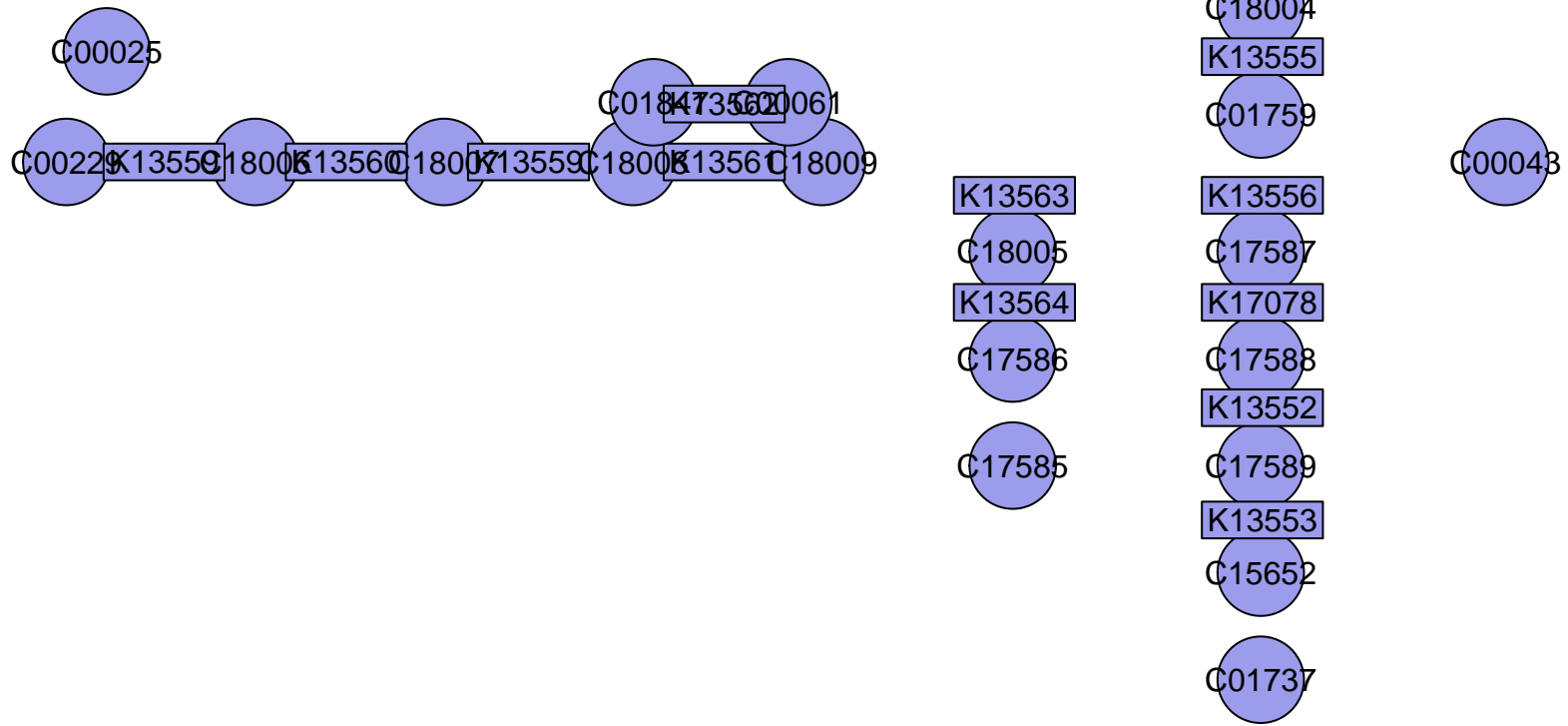
Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-230



Streptomycin biosynthesis

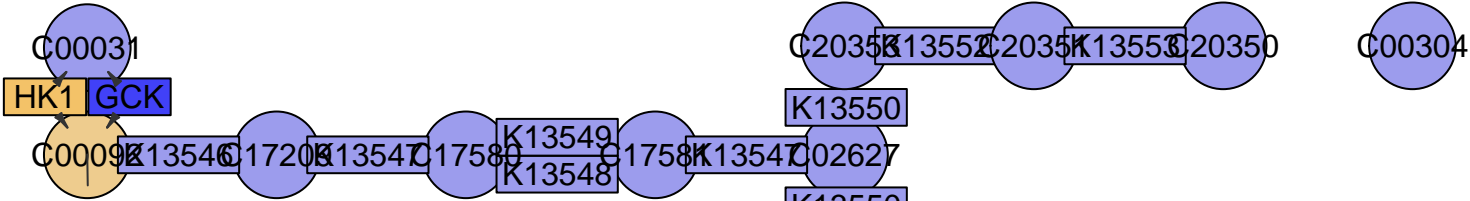


Amino sugar and  
nucleotide sugar metabolism

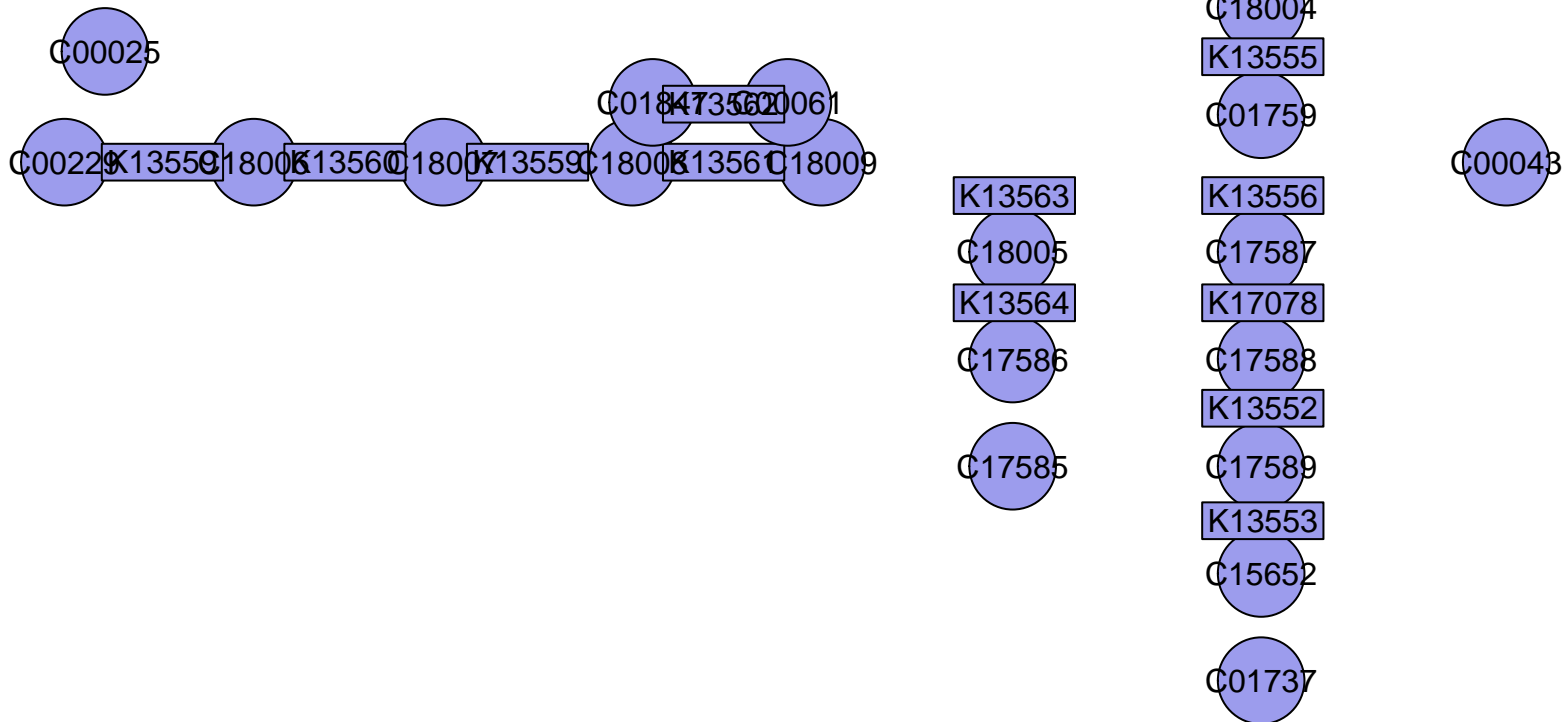




Butirosin and  
neomycin biosynthesis  
MPI-232



Streptomycin biosynthesis



Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-233

C00031

HK1 GCK

C00099

K13546

C17208

K13547

C17589

K13549  
K13548

C17588

K13547

C02627

C20358

K13552

C20358

K13553

C20350

C00304

Streptomycin biosynthesis

K13550

K13550

C17582

K13551...

C01748

K13552

C17588

K13553

C01441

K13554

C00025

C01847

K13562

C01061

C00229

K13559

C18006

K13560

C18007

K13559

C18008  
K13561

C18004

K13555

C01759

C00043

Amino sugar and  
nucleotide sugar metabolism

K13563

C18005

K13564

C17586

C17585

K13556

C17587

K17078

C17588

K13552

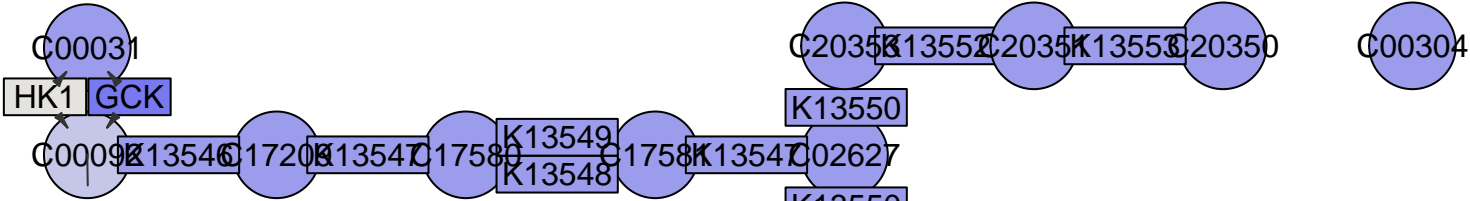
C17589

K13553

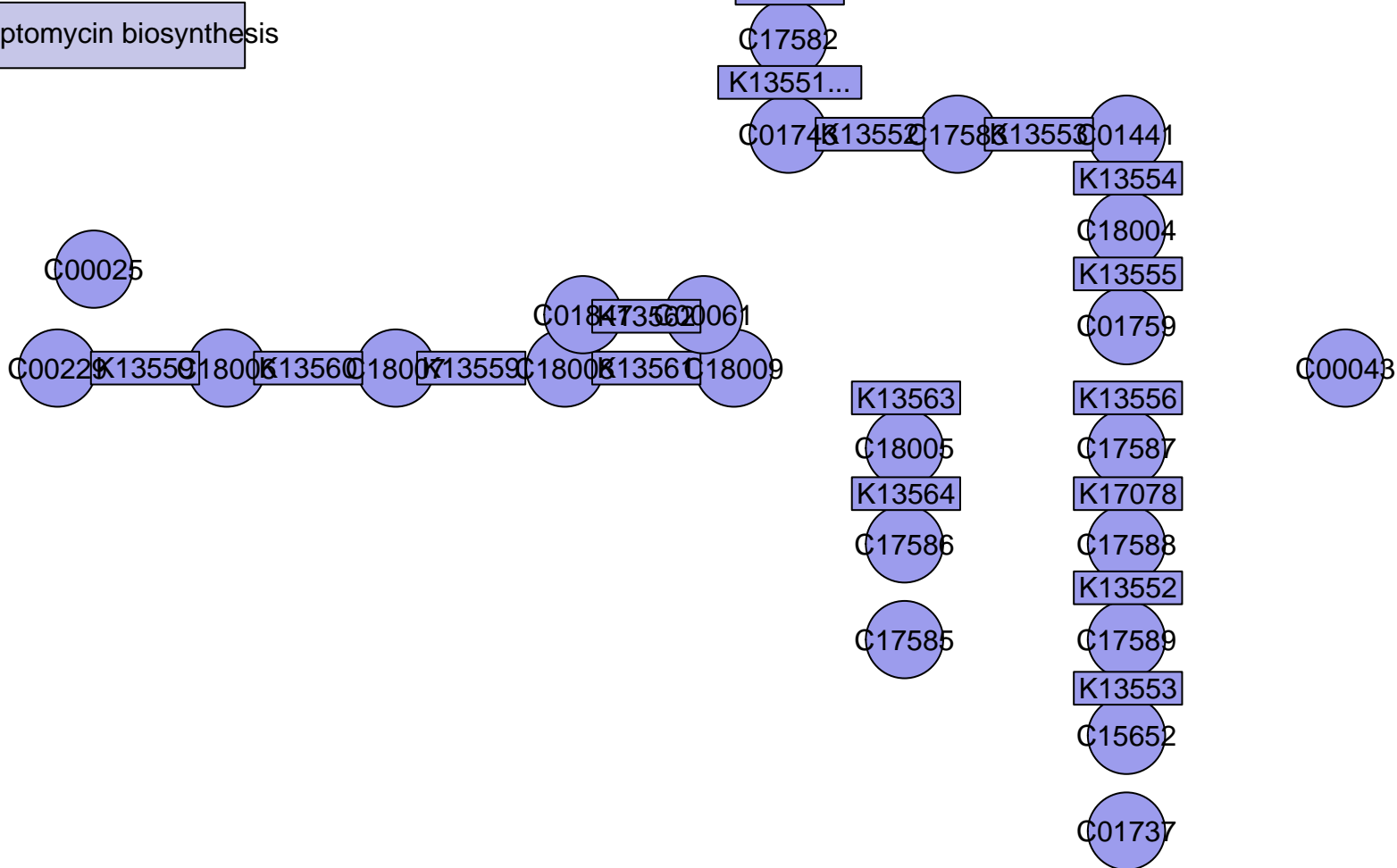
C15652

C01737

Butirosin and  
neomycin biosynthesis  
MPI-234

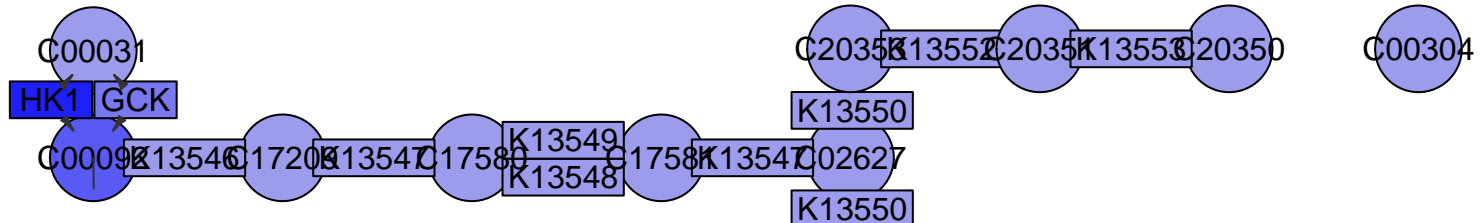


Streptomycin biosynthesis

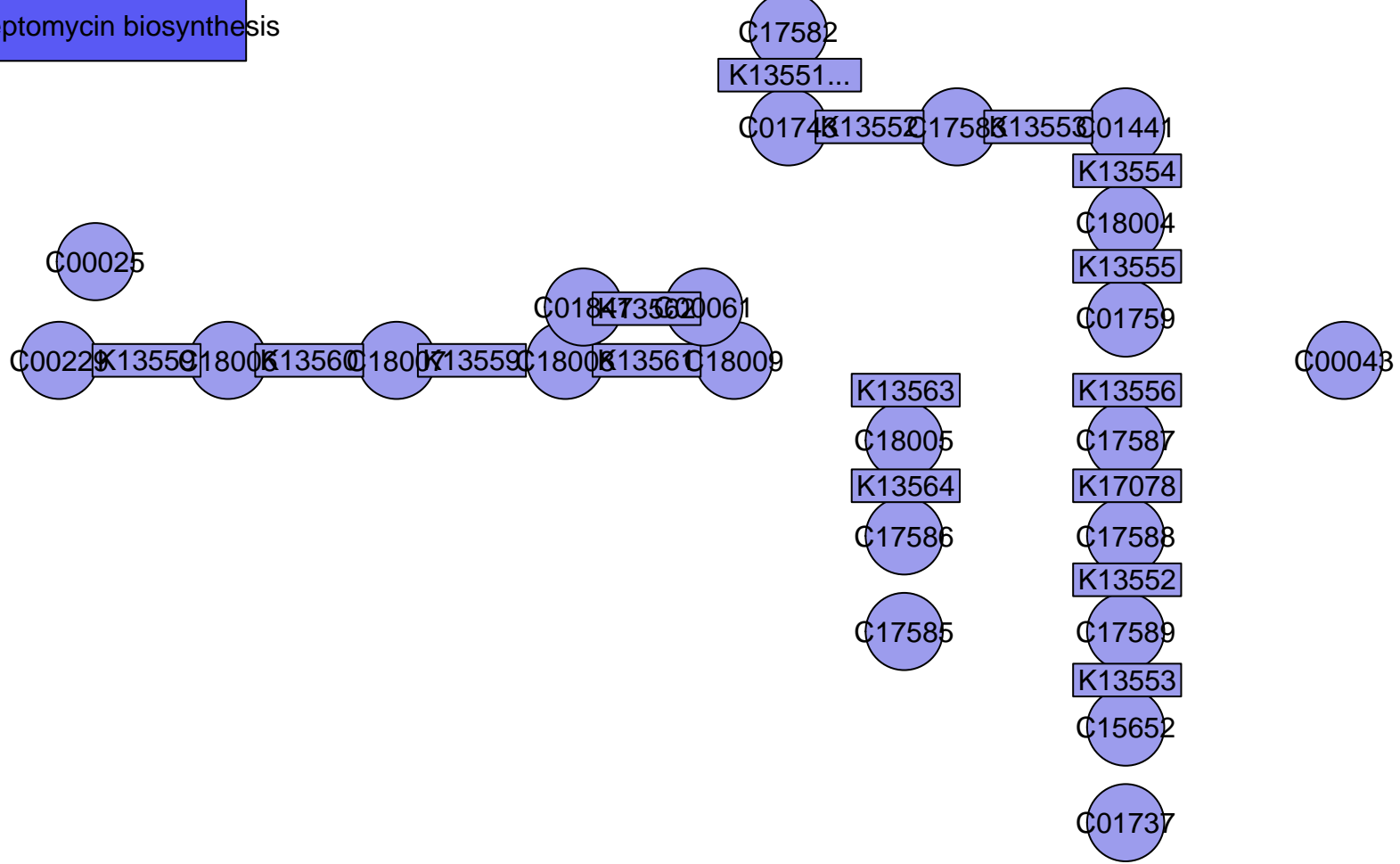


Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-235



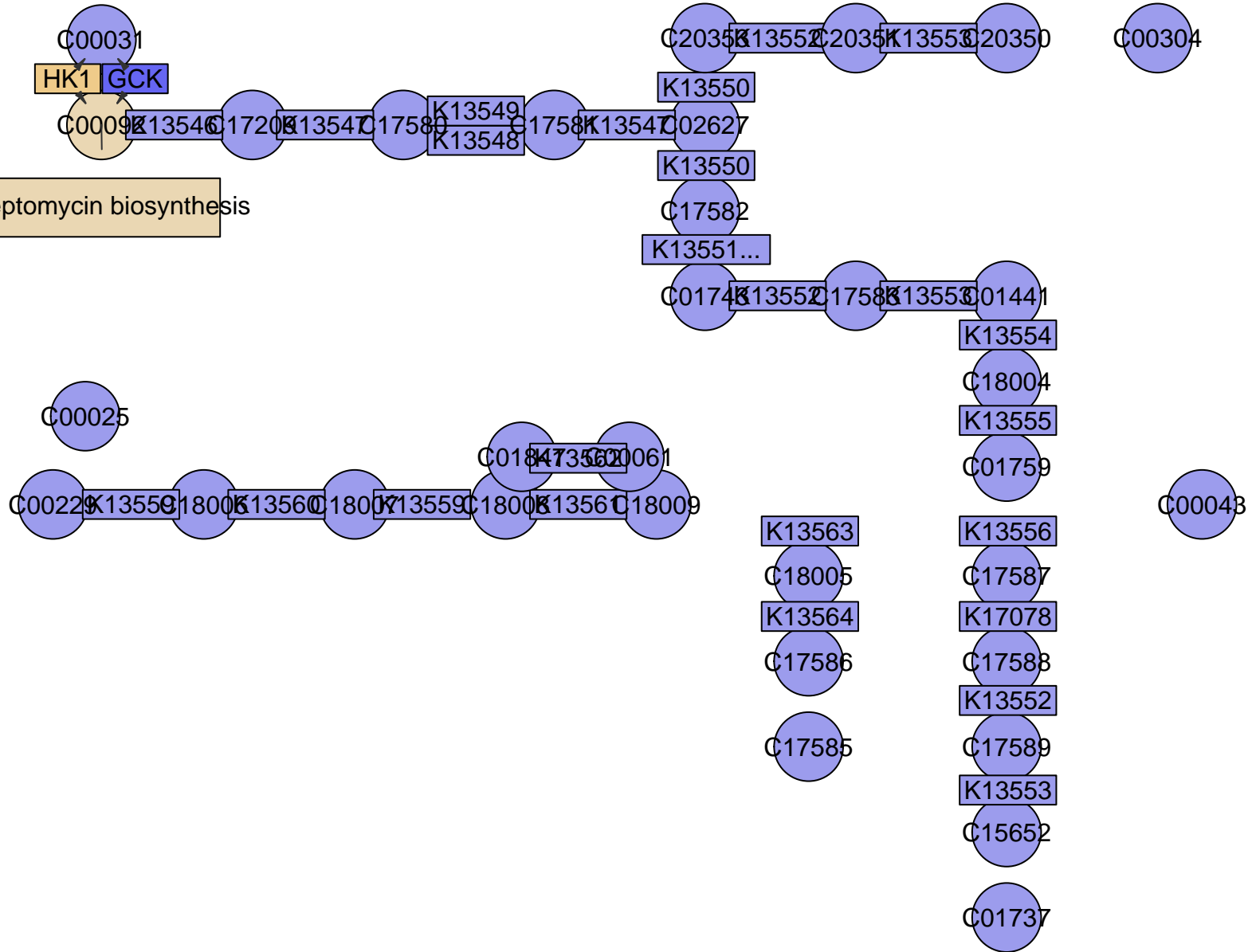
Streptomycin biosynthesis



Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-236

Streptomycin biosynthesis



Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-239

C00031

HK1 GCK

C00099

K13546

C17208

K13547

C17580

K13549

K13548

C17581

K13547

C02627

C20358

K13550

C17582

K13550

C17582

K13551...

C01748

K13552

C17583

K13553

C01441

Streptomycin biosynthesis

C00025

C00229

K13559

C18006

K13560

C18007

K13559

C18008

K13561

C18009

C01847

K13562

C01061

K13563

C18005

K13564

C17586

C17585

K13563

C18005

K13564

C17586

C17585

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

C01737

K13554

C18004

K13555

C01759

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

C01737

C00304

C00043

Amino sugar and  
nucleotide sugar metabolism



Butirosin and  
neomycin biosynthesis  
MPI-241

C00031

HK1 GCK

C00091

K13546

C17208

K13547

C17589

K13549  
K13548

C17588

K13547

C02627

K13550

K13550

C17582

K13551...

C01748

K13552

C17588

K13553

C01441

K13554

C18004

K13555

C01759

K13556

C17587

K17078

C17588

K13552

C17589

K13553

C15652

C01737

C20358

K13552

C20358

K13553

C20350

C00304

Streptomycin biosynthesis

C00025

C00229

K13559

C18006

K13560

C18007

K13559

C18008

K13561

K13563

C18005

K13564

C17586

C17585

C01847

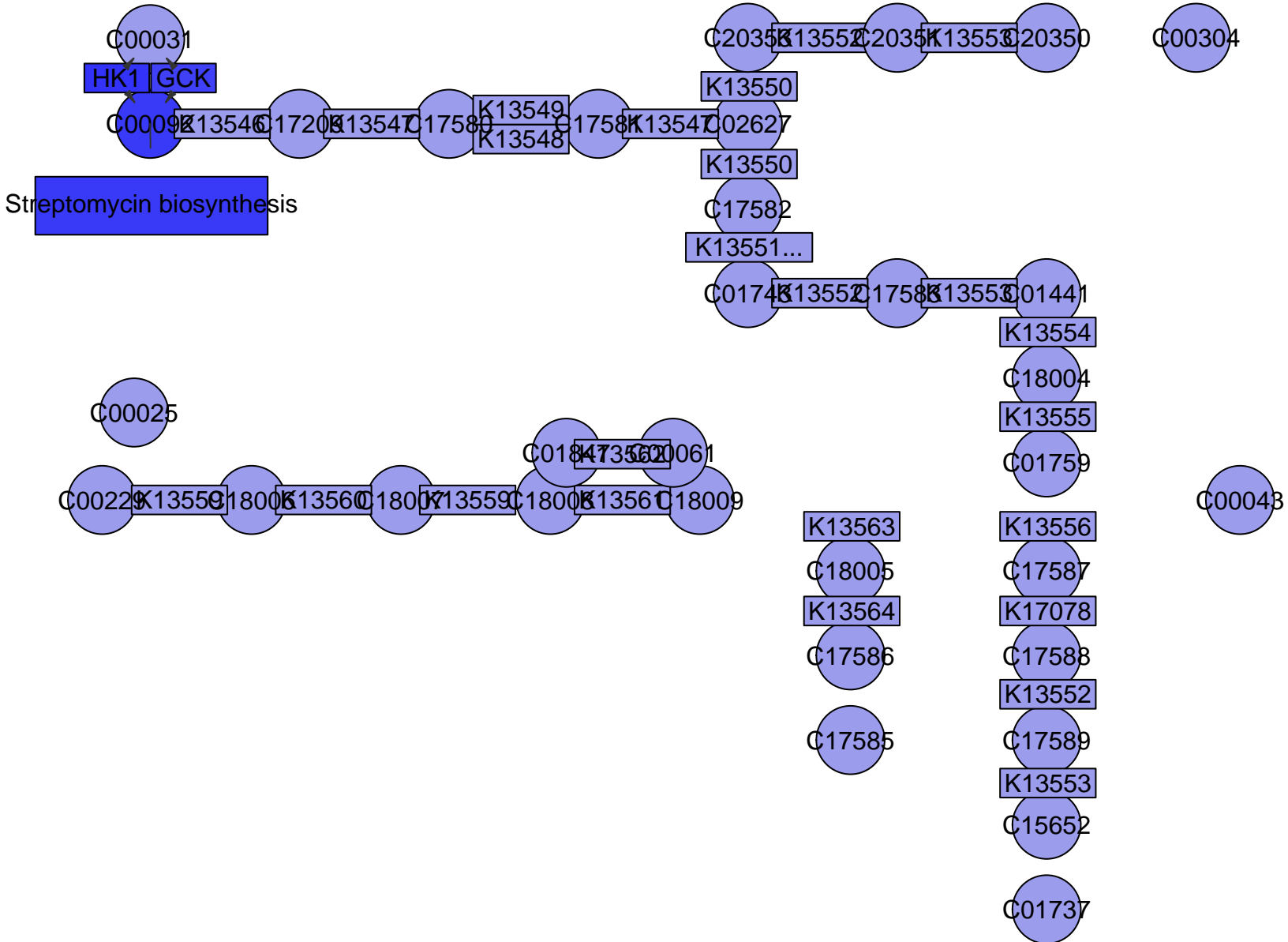
K13562

C01061

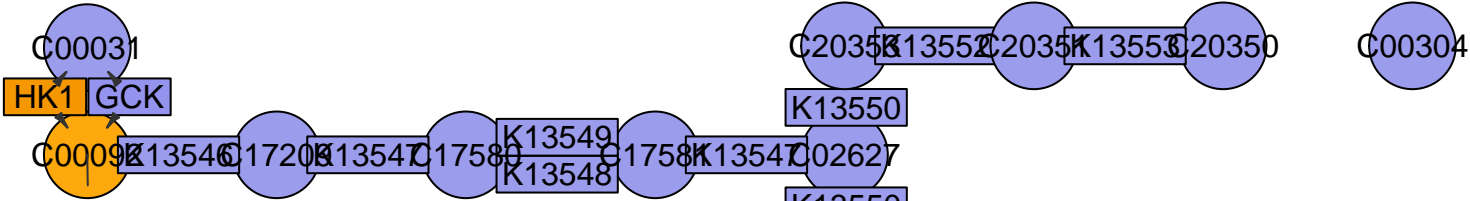
C00043

Amino sugar and  
nucleotide sugar metabolism

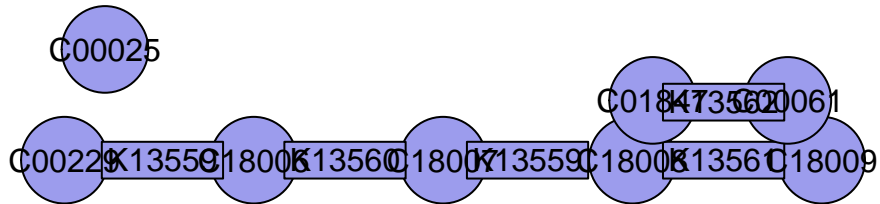
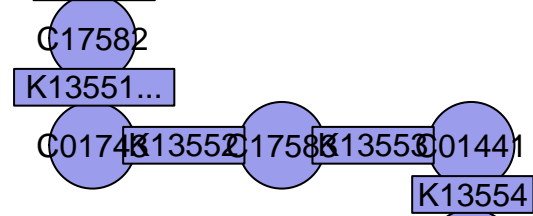
Butirosin and  
neomycin biosynthesis  
MPI-243



Butirosin and  
neomycin biosynthesis  
MPI-244

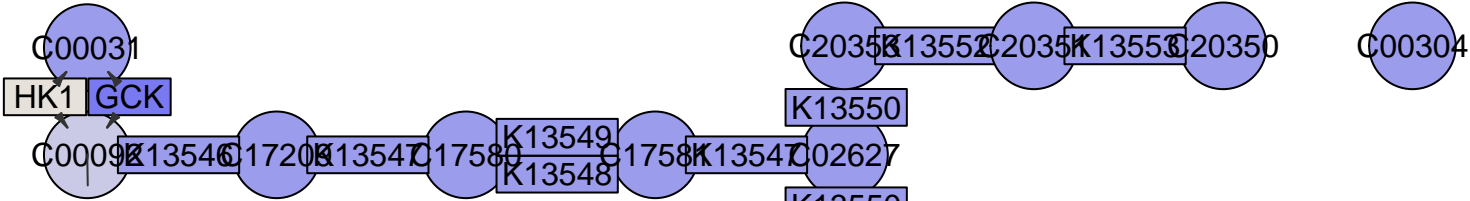


Streptomycin biosynthesis

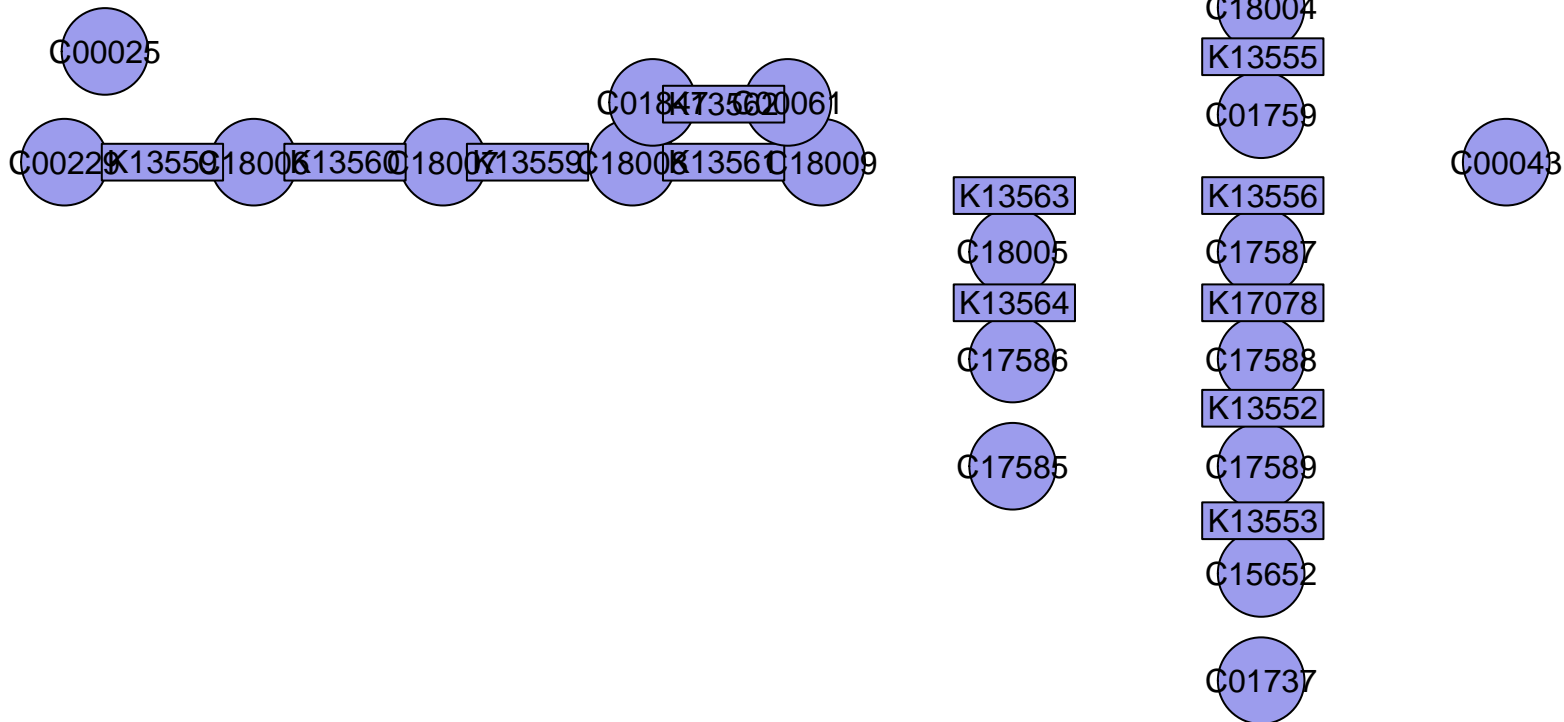


Amino sugar and  
nucleotide sugar metabolism

Butirosin and  
neomycin biosynthesis  
MPI-246



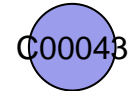
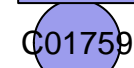
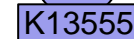
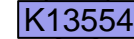
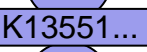
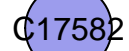
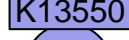
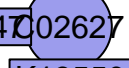
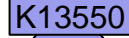
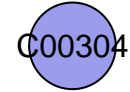
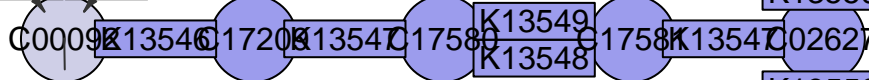
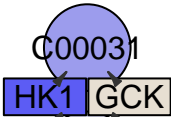
Streptomycin biosynthesis



Amino sugar and  
nucleotide sugar metabolism

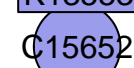
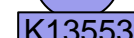
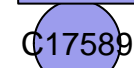
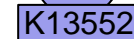
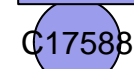
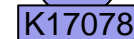
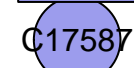
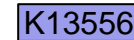
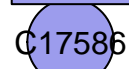
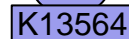
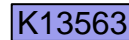
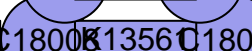
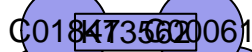
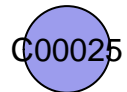


Butirosin and  
neomycin biosynthesis  
MPI-247

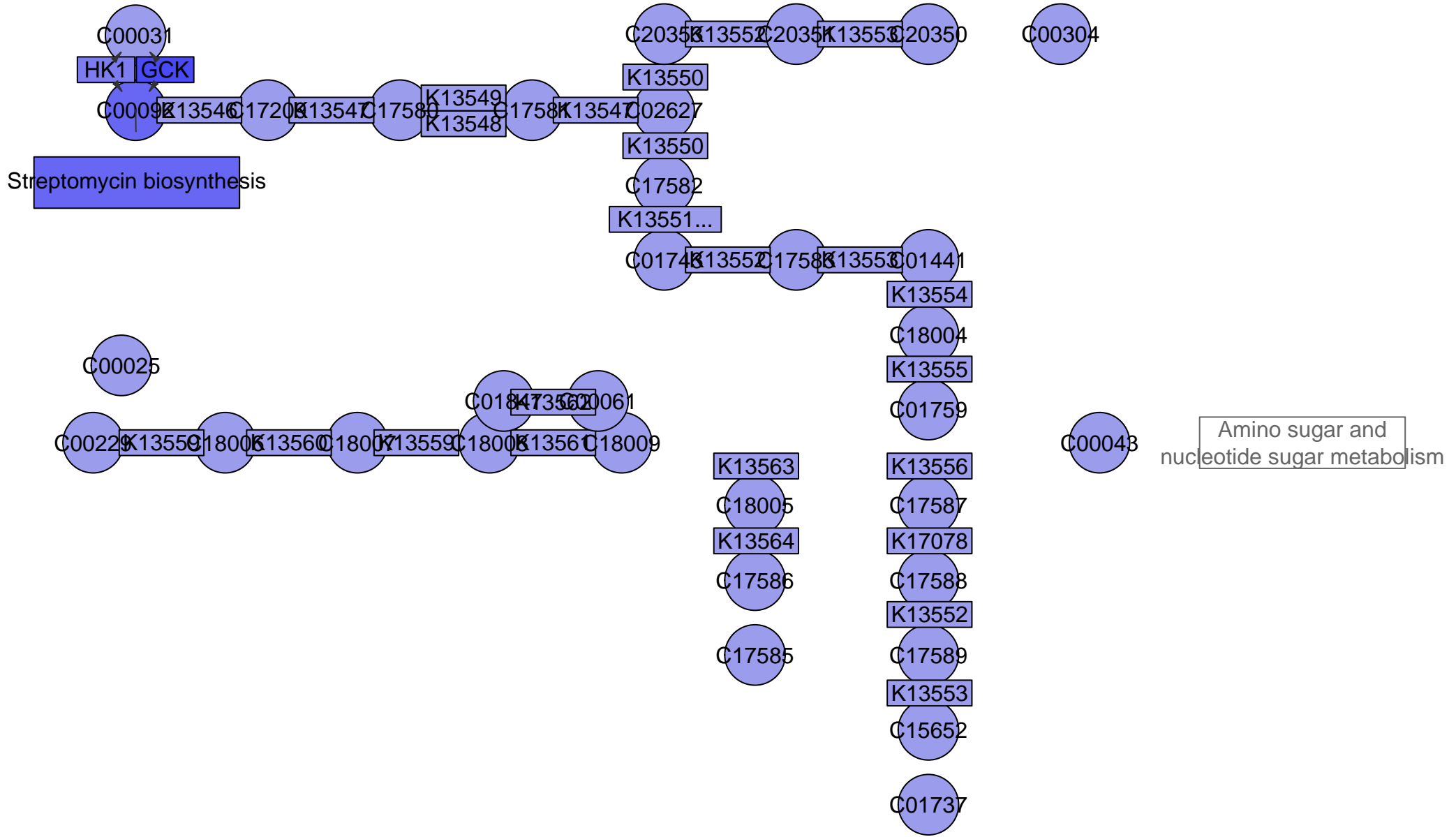


Amino sugar and  
nucleotide sugar metabolism

Streptomycin biosynthesis



Butirosin and  
neomycin biosynthesis  
MPI-251



Butirosin and  
neomycin biosynthesis  
MPI-255

C00031

HK1 GCK

C00091

K13546

C17208

K13547

C17580

K13549  
K13548

C17581

K13547

C02627

C20358

K13552

C20359

K13553

C20350

C00304

Streptomycin biosynthesis

K13550

K13550

C17582

K13551...

C01748

K13552

C17583

K13553

C01441

C00025

C01847  
K13562

C01848

C01849

C00229

K13559

C18006

K13560

C18007

K13559

C18008  
K13561

K13554

C18004

K13555

C01759

C00043

Amino sugar and  
nucleotide sugar metabolism

K13563

C18005

K13564

C17586

C17585

K13556

C17587

K17078

C17588

K13552

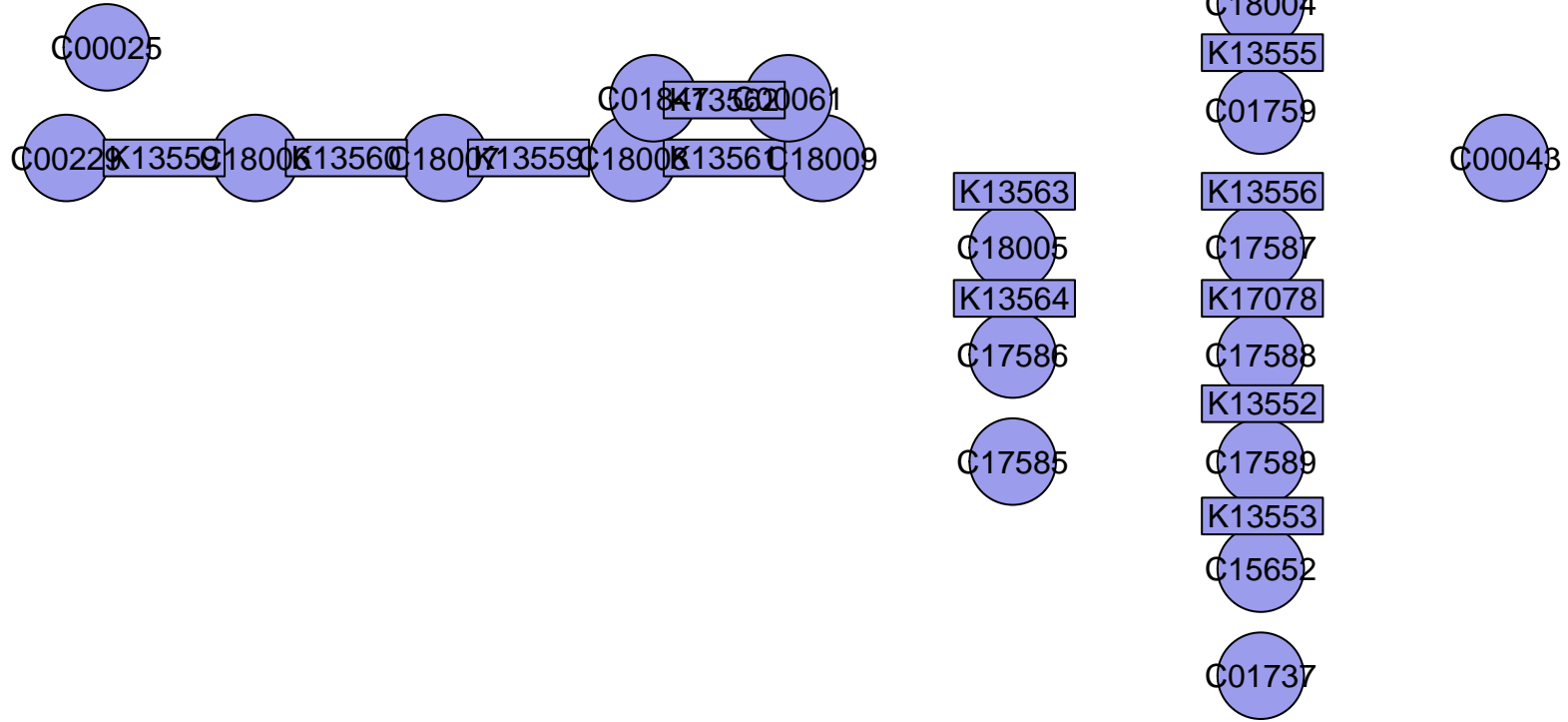
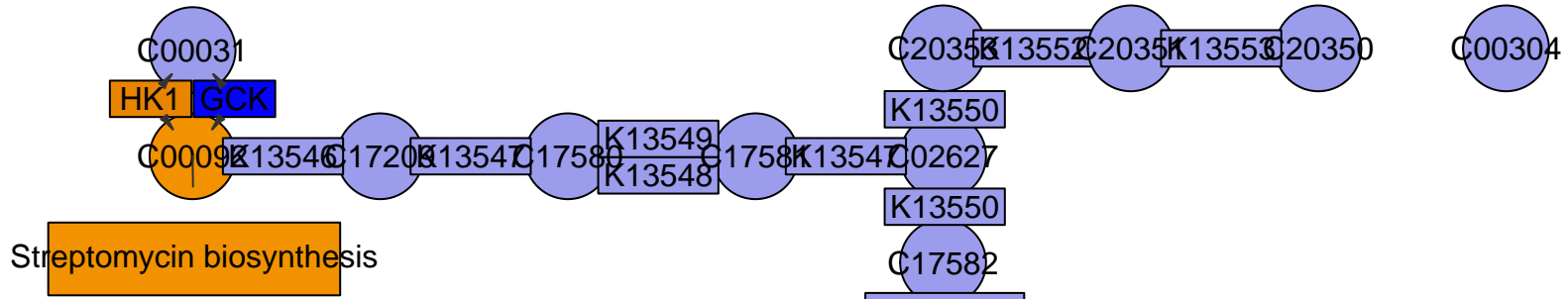
C17589

K13553

C15652

C01737

Butirosin and  
neomycin biosynthesis  
MPI-223b



Amino sugar and  
nucleotide sugar metabolism