

```
#####  
#       Install cosmosR  
#  
  
if (!requireNamespace("devtools", quietly = TRUE))  
  install.packages("devtools")  
devtools::install_github("saezlab/cosmosR")  
  
#####  
#       Install MOFA+  
#  
if (!requireNamespace("BiocManager", quietly = TRUE))  
  install.packages("BiocManager")  
BiocManager::install("MOFA2")  
  
#####  
## DecoupleR is used to score various regulatory interactions.  
if (!requireNamespace("decoupleR", quietly = TRUE))  
  BiocManager::install("saezlab/decoupleR")  
  
# We are using the LIANA package to process the LR interactions.  
if (!requireNamespace("remotes", quietly = TRUE))  
  install.packages("remotes")  
if (!requireNamespace("liana", quietly = TRUE))  
  remotes::install_github('saezlab/liana')  
  
#####  
#####  
  
library("cosmosR")  
""""  
The list of genes in the differential expression data will also be used as a reference  
to define which genes are expressed or not (all genes in the diff expression data are  
considered expre genes that are no in diff expression data are removed from the network)  
""""  
  
data(toy_network)  
data(toy_signaling_input)  
data(toy_metabolic_input)  
data(toy_RNA)  
""""  
  
OUT:  
  
> toy_metabolic_input  
Metab__HMDB00000190_c Metab__HMDB00000247_c  
2.249355 3.004581  
  
> toy_signaling_input  
MYC USF1 SRF  
12.167479 5.424429 6.709740  
  
> toy_network  
source interaction target  
1 SND1 -1 MGLL  
2 FGFR1 1 LDHA  
3 MAPK14 -1 FGFR1  
4 EPAS1 1 SLC2A1  
5 MYC 1 SLC2A1  
6 HIF1A 1 SLC2A1  
7 EGR1 1 FN1  
8 Metab__HMDB00000122_c 1 Gene1338__AKR1A1  
9 Gene1338__AKR1A1 1 Metab__HMDB00000247_c  
10 Metab__HMDB00000131_c 1 Gene3843__orphanReacNA  
11 Gene3843__orphanReacNA 1 Metab__HMDB00000126_c
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12 Gene9197__MGLL 1 Metab__HMDB00000131_c
13 Gene7338__LDHB_LDHA_reverse 1 Metab__HMDB00000190_c
14 Gene9049__SLC2A1_reverse 1 Metab__HMDB00000122_c
15 MGLL 1 Gene9197__MGLL
16 LDHA 1 Gene7338__LDHB_LDHA_reverse
17 SLC2A1 1 Gene9049__SLC2A1_reverse
18 MAPK14 1 MAPKAPK5
19 MAPKAPK5 1 SND1
20 FN1 -1 MAPK14
21 Metab__HMDB00000122_c 1 Gene1338__AKR1B1
22 Gene1338__AKR1B1 1 Metab__HMDB00000247_c
23 MAPK1 -1 FGFR1
24 Metab__HMDB00000247_c 1 MAPK14
25 MAPK1 1 MAPKAPK5
26 MAPK14 -1 MAPK1
27 Metab__HMDB00000122_c 1 Gene1338__AKR7A2
28 Gene1338__AKR7A2 1 Metab__HMDB00000247_c
29 CDK2 1 MYC
30 APEX1 1 STAT3
31 MAPK14 1 USF1
32 MAPK14 1 ELK1
33 MAPK14 1 STAT3
34 MAPK14 1 JUN
35 MAPK14 1 CSNK2A1
36 MAPK14 1 NR3C1
37 CDK2 1 NR3C1
38 CSNK2A1 1 TFAP2A
39 CSNK2A1 1 SRF
40 CSNK2A1 1 AKT1
41 CDK2 1 SP1
42 CDK2 1 FOXM1
43 AKT1 1 NR3C1
44 AKT1 1 CDK2
45 CSNK2A1 1 APEX1
46 MAPK14 1 ETS1
47 MAPK14 1 MYC
48 TP53BP1 -1 E2F4
49 AKT1 1 SREBF1
50 AKT1 1 MYC
51 MAPK14 1 SP1
52 APEX1 1 EPAS1
53 MAPK14 1 SRF
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57 AKT1 1 HIF1A
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60 MAPK14 1 NFKB1
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63 SP1 1 NFKB1
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68 CDK2 -1 RUNX1
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70 MAPK14 1 MAPK1
71 MAPK1 1 STAT3
72 MAPK1 1 ELK1
73 MAPK1 1 JUN
74 MAPK1 1 SP1
75 MAPK1 1 MYC
76 MAPK1 1 CDK2
77 MAPK1 1 SREBF1
78 MAPK1 1 CSNK2A1

79 MAPK1 1 ETS1
80 MAPK1 1 EGR1
81 MAPK1 1 NFKB1
82 MAPK3 1 HIF1A
83 SMAD2 1 SP1
84 MAPK3 1 STAT3
85 MAPK3 1 ELK1
86 MAPK3 1 SMAD2
87 MAPK3 1 MYC
88 MAPK3 1 ETS1
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90 MAPK3 1 SP1
91 MAPK3 1 SREBF1
92 SMAD2 1 E2F4
93 AKT1 1 MAPK3
94 MAPK3 1 NFKB1
95 MAPK3 1 EGR1
96 AKT1 1 CREB1
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98 CREB1 1 EGR1
99 MAPK14 1 ATF4
100 ATF4 1 EGR1
101 MAPK1 1 SMAD2

> toy_RNA

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