

Initialise the COBRA Toolbox

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Reviewers:

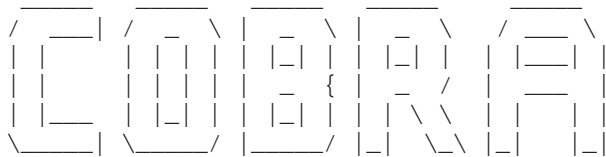
MATERIALS - EQUIPMENT SETUP

Please ensure that all the required dependencies (e.g. , `git` and `curl`) of The COBRA Toolbox have been properly installed by following the installation guide [here](#).

PROCEDURE

At the start of each MATLAB session, The COBRA Toolbox should be initialised. Navigate to the directory where you installed The COBRA Toolbox and initialise, but without updating it.

```
updateToolbox=1;  
initCobraToolbox(updateToolbox) % false, as we don't want to update
```



CONstraint-Based Reconstruction and Analysis
The COBRA Toolbox - 2019

Documentation:
<http://opencobra.github.io/cobratoolbox>

```
> Checking if git is installed ... Done (version: 2.17.2).  
> Checking if the repository is tracked using git ... Done.  
> Checking if curl is installed ... Done.  
> Checking if remote can be reached ... Done.  
> Initializing and updating submodules (this may take a while)... Done.  
> Adding all the files of The COBRA Toolbox ... Done.  
> Define CB map output... set to svg.  
> TranslateSBML is installed and working properly.  
> Configuring solver environment variables ...  
- [----] ILOG_CPLEX_PATH: --> set this path manually after installing the solver ( see instructions )  
- [---*] GUROBI_PATH: /Library/gurobi800/mac64/matlab  
- [----] TOMLAB_PATH: --> set this path manually after installing the solver ( see instructions )  
- [----] MOSEK_PATH: --> set this path manually after installing the solver ( see instructions )  
Done.  
> Checking available solvers and solver interfaces ... Done.  
> Setting default solvers ... Done.  
> Saving the MATLAB path ... Done.  
- The MATLAB path was saved in the default location.  
  
> Summary of available solvers and solver interfaces
```

| | Support | LP | MILP | QP | MIQP | NLP | |
|--------------|---------|----|------|----|------|-----|---|
| gurobi | active | | 1 | 1 | 1 | 1 | - |
| ibm_cplex | active | | 0 | 0 | 0 | 0 | - |
| tomlab_cplex | active | | 0 | 0 | 0 | 0 | - |
| glpk | active | | 1 | 1 | - | - | - |
| mosek | active | | 0 | - | 0 | - | - |
| matlab | active | | 1 | - | - | - | 1 |
| cplex_direct | active | | 0 | 0 | 0 | - | - |
| dqqMinos | active | | 1 | - | - | - | - |

| | | | | | | |
|--------------|---------|---|---|---|---|---|
| pdco | active | 1 | - | 1 | - | - |
| quadMinos | active | 1 | - | - | - | - |
| qpng | passive | - | - | 1 | - | - |
| tomlab_snopt | passive | - | - | - | - | 0 |
| lp_solve | legacy | 1 | - | - | - | - |
| ----- | | | | | | |
| Total | - | 7 | 2 | 3 | 1 | 1 |

+ Legend: - = not applicable, 0 = solver not compatible or not installed, 1 = solver installed.

```
> You can solve LP problems using: 'glpk' - 'pdco'
> You can solve MILP problems using: 'glpk'
> You can solve QP problems using: 'pdco' - 'qpng'
> You can solve MIQP problems using:
> You can solve NLP problems using:
```

```
> Checking for available updates ...
> The COBRA Toolbox is up-to-date.
```

The user who primarily uses the official openCOBRA repository may automatically initialise The COBRA Toolbox. To do so, edit the MATLAB `startup.m` file and add a line with `initCobraToolbox` so that The COBRA Toolbox is initialised each time that MATLAB is started.

```
if usejava('desktop') && 0 % This line of code is to avoid execution in non
gui-environments
    edit startup.m
end
```

ANTICIPATED RESULTS

The initialisation step automatically checks the configuration of all of the required and some of the optional software dependencies. During initialisation, all git submodules are updated. The solver paths are set when available and compatible. A system-dependent table with the solver status is returned, together with solver suggestions. The user is also presented with options to update The COBRA Toolbox when necessary. It is important to check if the solvers installed are satisfactory. A table stating the solver compatibility and availability is printed to the user during initialisation.

CRITICAL STEP

During initialisation, a check for software dependencies is made and reported to the command window. It is not necessary that all possible dependencies are satisfied before beginning to use the toolbox, e.g., satisfaction of a dependency on a multi-scale linear optimisation solver is not necessary for modelling with a mono-scale metabolic model. However, other software dependencies are essential to be satisfied, e.g., dependency on a linear optimisation solver must be satisfied for any method that uses flux balance analysis.

TROUBLESHOOTING

1. Read the output of the initialisation script in the command window. Any warning or error messages, though often brief, will often point toward the source of the problem during initialisation if read literally.

2. Verify that all software versions are supported and have been correctly installed.
3. Ensure that you are using the latest version of The COBRA Toolbox by typing `updateCobraToolbox`
4. Verify and test The COBRA Toolbox, as described in the "Verify and test The COBRA Toolbox" tutorial.
5. Finally, if nothing else works, consult the COBRA Toolbox forum, as described in the "Engaging with The COBRA Toolbox community" tutorial.