

## BTL Properties Guide

Instructions for the parameters of the BTL property files in the 'properties' directory of BTL:

Property	Example value(s)	Description
configurationName	Exp-2_.txt	Name used for the log and data files. BTL automatically adds a sequential 3-digit number to the name, so that the experiment can be run many times without having to remember to change the name in the property file.
chemistryUsed	MWL7-Chem	If multiple artificial chemistries (ACs) are used, one can specify which one to use. The version of BTL posted only supports a single AC. Still useful to have it, so that the log clearly states the AC – avoids confusion when other ACs are later tried.
seedOrganisms	ef, eaf	Seed organisms separated by commas. Only supports linear molecules. All the atoms in the seed organisms are set to state 7 (which kicks-off the enzyme creation phase).
numberOfCellsX	120	Total number of columns in the grid, including the boundary.
numberOfCellsY	120	Total number of rows in the grid, including the boundary.
numberOfFreeAtoms	800	Number of food atoms (free atoms in state 0) initially placed in the grid. Half this number will also be added after each half-flood.
dirtSizeInDirtWalls	2,2,2,2,2,2	Each integer refers to a separate "dirt" wall. The value of the integer represents the vertical size of each dirt block (in units of atoms). Different walls can have different dirt sizes.
spaceBetweenDirtWalls	6,6,6,6,6,6	Each integer refers to a separate "dirt" wall – the number of integers must match with dirtSizeInDirtWalls. The value of the integer represents the vertical space between the dirt blocks (in units of atoms).
flowFloodInterval	20000 -1	Number of time-steps between flow-floods. To disable flow-floods, set it to: -1
halfFloodInterval	700000 -1	Number of time-steps between half-floods. To disable half-floods, set it to: -1. If both floods are on, then "halfFloodInterval" needs to be a multiple of "flowFloodInterval". e.g. if flowFloodInterval=400, then halfFloodInterval=1200 is OK, but halfFloodInterval=1000 is not. When half-flood occurs at the same time as flow-flood, then a half-flood will occur.
flowFloodSeverity	800	The number of steps to the (mostly) right during a flow-flood. The exact number does not matter too much, as long as it's significantly larger than numberOfCellsX.
probabilityInsertionMutation	0.0002	Probability of an atom being inserted at the 'f' end of the molecule per possible occurrence.
probabilityDeletionMutation	0.0002	Probability of an atom being removed from the 'e' end of the molecule per possible occurrence.
probabilityPointMutation	0.0005	Probability of a wrong base being used in the molecule copy per possible occurrence.
enzymeToReactionMappingOffset	15149	This offset allows one to modify the arbitrary mapping between the enzyme state number and the reaction specified by that enzyme. This can be convenient to do when conducting experiments. See the paper for details.
probabilityOfR3withE	1 0 0.003	The means by which to turn off one of the essential reactions in the AC. Specifically, R3 for atoms of type 'e'. Can set it to 1, to enable replication without the need for any special enzyme. Setting it to 0 makes replication without the right enzyme impossible. Intermediate values allow some replication while offering an incentive for the enzyme to evolve.
enzymeToTrack	238	Statistics for the enzyme with this state number will appear in the 'TimestepVsReplicationsCountForTop5Species' stats file.