**Supplementary Table 1. State variables in the model of tumor cell metabolism.**

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| --- | --- | --- | --- |
| **Variable** | **Description** | **Unit** | **Remarks** |
|  Metabolic model |
| glucose | glucose concentration | µmol/liter | distributed in cytosol and extracellular compartment, amount per liter H2O |
| lac | lactate concentration | µmol/liter | cytosol and extracellular |
| pyr | pyruvate concentration | µmol/liter | cytosol and extracellular |
| ATP | adenosine triphosphate concentration | µmol/liter | cytosol |
| ADP | adenosine diphosphate concentration | µmol/liter | cytosol |
| FBP | fructose 1,6-bisphosphate concentration | µmol/liter | cytosol |
| Factive | active fraction of the head section of glycolysis | fraction | cytosol |
| NAD | nicotinamide adenine dinucleotide (oxidized) | µmol/liter | cytosol |
| NADH | nicotinamide adenine dinucleotide (reduced) | µmol/liter | cytosol |
| O2 | oxygen | µmol/liter | cytosol and extracellular |
| PGI | phosphorylated glycolytic intermediates | µmol/liter | cytosol, PGI=RPGI/FBP∙FBP |
|  Tissue O2 transport model |
| O2,perivascular | oxygen concentration near blood vessel | µmol/liter |  |
| ca,O2 | arterial oxygen concentration | µmol/liter | free oxygen, excluding oxygen bound to hemoglobin |
| cv,O2 | venous oxygen concentration | µmol/liter | free oxygen |
| Mperivascular | concentration metabolite M near blood vessel | µmol/liter | M = glucose, lactate or pyruvate |
| cM,a | arterial concentration of metabolite | µmol/liter | M = glucose, lactate or pyruvate |
| cM,v | venous concentration of metabolite M | µmol/liter | M = glucose, lactate or pyruvate |
| M | concentration of metabolite M in tissue | µmol/liter | M = glucose, lactate or pyruvate |