Table A1 - Parameter values

Parameter values used for the model simulations.

Parameter Values				
Parameters	Symbols	Values	Units	Sources
Tissue maximum carrying capacity	C_m	$2.39*10^5$	cells/mm^3	Considered taken into account data of [1]
Initial tumor cell density	C_0	10^4	cells/mm^3	Considered taken into account data of [2]
Initial tumor radius	r_0	1	mm	[1]
Diffusion coefficient of proliferative cells	D_c	0.005 - 0.3	mm^2/day	[1]
Diffusion coefficient of hypoxic cells	D_h	D_c*10	mm^2/day	Considered taken into account [1], [3]
Diffusion coefficient of hypoglycemic cells	D_q	D_c	mm^2/day	Considered taken into account [1], [3]
Proliferation rate constant	ρ	0.0025 - 0.04	1/day	[1]
Initial ECM concentration outside the tumor	f_0	10^{-9}	mol/mm^3	[4]
Initial intratumoral ECM concentration	f_{0tumor}	$f_0/10$	mol/mm^3	Considered taken into account data of [4]
Initial MDEs concentration outside the tumor	m_0	0	mol/mm^3	[5]
Initial intratumoral MDEs concentration	m_{0tumor}	$0.5*C_0$	mol/mm^3	[5]
Initial oxygen concentration outside the tumor	n_0	$0.28*10^{-9}$	mol/mm^3	[6], [7], [8]
Initial intratumoral oxygen concentration	n_{0tumor}	n_0*e^{-dr}	mol/mm^3	Calculated from [6]
Initial glucose concentration outside the tumor	gl_0	$16.5*10^{-9}$	mol/mm^3	[6], [7], [8]
Initial intratumoral glucose concentration	gl_{0tumor}	$gl_0*e^{-d(r)}$	mol/mm^3	Calculated from [6]

Diffusion coefficient of MDEs	D_m	0.00864	mm^2/day	[4]
Diffusion coefficient of oxygen	D_n	157.248	mm^2/day	[6], [9]
Diffusion coefficient of glucose	D_{gl}	9.504	mm^2/day	[6], [10]
Oxygen natural decay rate	α_n	0.0375	1/day	Calculated from [4], [11]
Oxygen production rate	β_n	0.5025	1/day	Calculated from [4], [11]
Glucose natural decay rate	α_{gl}	0.11	1/day	Assumed based on [6], [4], [11]
Glucose production rate	β_{gl}	1.1	1/day	Assumed based on [4], [11]
Oxygen consumption rate by proliferative cells	γ_{cn}	$5.2*10^{-12}$	mol/cell*day	Calculated from [6], [7]
Oxygen consumption rate by hypoxic cells	γ_{hn}	$0.2*\gamma_{cn}$	mol/cell*day	Considered taken into account [3], [4], [6], [7], [12]
Oxygen consumption rate by hypoglycemic cells	γ_{qn}	$0.5*\gamma_{cn}$	mol/cell*day	Considered taken into account [4], [6], [7]
Glucose consumption rate by proliferative cells	γ_{cgl}	$1.446*10^{-12}$	mol/cell*day	Calculated from [6], [7], [13]
Glucose consumption rate by hypoxic cells	γ_{hgl}	$10*\gamma_{cgl}$	mol/cell*day	Considered taken into account [4], [6], [13]
Glucose consumption rate by hypoglycemic cells	γ_{qgl}	$0.5*\gamma_{cgl}$	mol/cell*day	Considered taken into account [4], [6], [14]
ECM degradation rate	δ	0.0022388	$mm^3/mol*day$	Calculated from [4], [11]
MDEs natural decay rate	λ	0.432	1/day	[15]
MDEs production rate by proliferative cells	μ_c	0.006	mol/cell*day	[15]
MDEs production rate by hypoxic cells	μ_h	$2*\mu_c$	mol/cell*day	Considered taken into account [3]
MDEs production rate by hypoglycemic cells	μ_q	μ_c	mol/cell*day	Assumed in this model
Conversion rate of proliferative to hypoxic cells	b_h	$(1- n/n_0)/20$	1/day	Calculated to be proportional to the relative oxygen concentration
Conversion rate of	g_h	0.05	1/day	[1]

hypoxic to proliferative cells				
Conversion rate of hypoxic to necrotic cells due to lack of oxygen	a_h	$b_h/10$	1/day	Considered to be proportional to the proliferative to hypoxic conversion rate
Conversion rate of hypoxic to necrotic cells due lack of glucose	a_{glh}	0.01	1/day	Considered constant in this model
Conversion rate of proliferative to hypoglycemic cells	b_q	$(1- gl/gl_0)/20$	1/day	Calculated to be proportional to the relative glucose concentration
Conversion rate of hypoglycemic to proliferative cells	g_q	0.05	1/day	[1]
Conversion rate of hypoglycemic to necrotic cells due to lack of oxygen	a_q	0.01	1/day	Considered constant in this model
Conversion rate of hypoglycemic to necrotic cells due lack of glucose	a_{glq}	$b_q/10$	1/day	Considered to be proportional to the proliferative to hypoglycemic conversion rate
Conversion rate of proliferative, hypoxic, hypoglycemic to necrotic cells due to contact with necrotic region	a_n	$\log(2)/(50C_m * 10^2)$	1/day	[1]

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