The biology of epithelial cell populations

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Abbreviations

CCPR	The crypt cell production rate, measured in cells produced per crypt per hour.
FCM	Flow cytometry.
FLM	The fraction of labelled mitoses.
G_0	A phase of post-mitotic proliferative quiescence.
G_1	The phase between mitosis and the beginning of DNA synthesis.
G_2	The phase between the completion of DNA synthesis and the beginning of mitosis.
I_L	The continuous [^{3}H]-TdR labelling index; the proportion of cells labelled after prolonged exposure to [^{3}H]-TdR.
I_M	The mitotic index; the proportion of cells in mitosis.
I_{Meta}	The metaphase index; the proportion of cells in metaphase.
I_P	The growth fraction; the ratio of proliferating to non-proliferating cells.
I_S	The flash [^{3}H]-TdR labelling index; the proportion of cells labelled after a brief exposure (usually one hour) of the tissue to [^{3}H]-TdR.
$I_{S\text{expt}}$	The experimental (observed) flash [^{3}H]-TdR labelling index.
$I_{S\text{theor}}$	The theoretical flash [^{3}H]-TdR labelling index, equivalent to $I_{S\text{expt}}$ if all cells in the population are proliferating.
k_B	The birth rate of new cells.
k_G	The overall growth rate of the population (equivalent to the birth rate if no cell loss).
k_L	The rate of cell loss, found by subtraction of k_G from k_B.
M	The phase of mitosis.
P cells	Those cells born into the proliferative compartment.
Φ (phi)	The cell loss factor; the ratio of the cell loss rate to the cell birth rate.
Q cells	Those cells born into the non-proliferative (quiescent) compartment.
r_M	The rate at which cells enter mitosis.
r_S	The rate at which cells enter DNA synthesis.
S	The phase of DNA synthesis.
T_C	The cell cycle time; the time between the completion of mitosis and the next mitosis in one or both of the daughter cells.
$T_{C(a)}$	The apparent cell cycle time; the time taken to replace all the cells in the population (equals T_C when the growth fraction is unity).
t_D	The population doubling time, ideally related to a doubling of cell number, but more usually to a doubling of weight or volume.

t_{G1}	The duration of the G_1 phase.
t_{G2}	The duration of the G_2 phase.
t_M	The duration of the mitotic phase.
t_{PD}	The potential doubling time, the expected time taken for the cell population to double in number based upon the rate of cell production (used in the context of exponentially growing populations). Equals t_D if there is no cell loss.
t_S	The duration of the DNA synthesis phase.
T_T	The transit time, usually within the context of a compartment.
T	The turnover time; the time taken to replace all the cells in the population. Equivalent in duration to t_{PD}, but a more appropriate term in situations where the population size remains constant.
t_2	$t_{G2} + \frac{1}{2} t_M$.