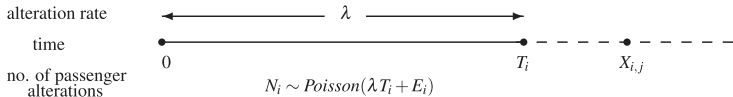
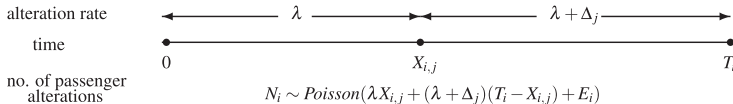


(a) sample i without a mutator alteration



(b) sample i with a mutator alteration in gene j



- λ = basic alteration rate per cell division
 N_i = number of passenger alterations in sample i
 T_i = number of cell divisions in the lineage of the tumor founder cell from the birth to the biopsy
 $X_{i,j}$ = time at the alteration of gene j in units of cell divisions
 Δ_j = increase of the alteration rate per cell division caused by an alteration of gene j
 E_i = increase of total alteration rate by unknown factors