Parasite infection in a cell population with deaths

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Abstract: We introduce a general class of branching Markov processes for the modelling of a parasite infection in a cell population. Each cell contains a quantity of parasites which evolves as a diffusion with positive jumps. The drift, diffusive function and positive jump rate of this quantity of parasites depend on its current value. The division rate of the cells also depends on the quantity of parasites they contain. At division, a cell gives birth to two daughter cells and shares its parasites between them. Cells may also die, at a rate which may depend on the quantity of parasites they contain. We study the long time behaviour of the parasite infection.

References

[1] A. Marguet and C. Smadi (2020). Parasite infection in a cell population with deaths, arXiv:2010.16070