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Pointwise persistence in full chemotaxis models with logistic source on bounded heterogeneous environments

In this talk, I will present our work on pointwise persistence in full chemotaxis models with local as well as nonlocal time and space dependent logistic source in bounded domains. We first prove the global existence and boundedness of nonnegative classical solutions under some conditions on the coefficients in the models. Next, under the same conditions on the coefficients, we show that pointwise persistence occurs, that is, any globally defined positive solution is bounded below by a positive constant independent of its initial condition when the time is large enough. It should be pointed out that Tao and Winkler in 2015, established the persistence of mass for globally defined positive solutions, which indicates that any extinction phenomenon, if occurring at all, necessarily must be spatially local in nature, whereas the population as a whole always persists. The pointwise persistence proved in this work implies that not only the population as a whole persists, but also it persists at any location eventually. It also implies the existence of strictly positive entire solutions.