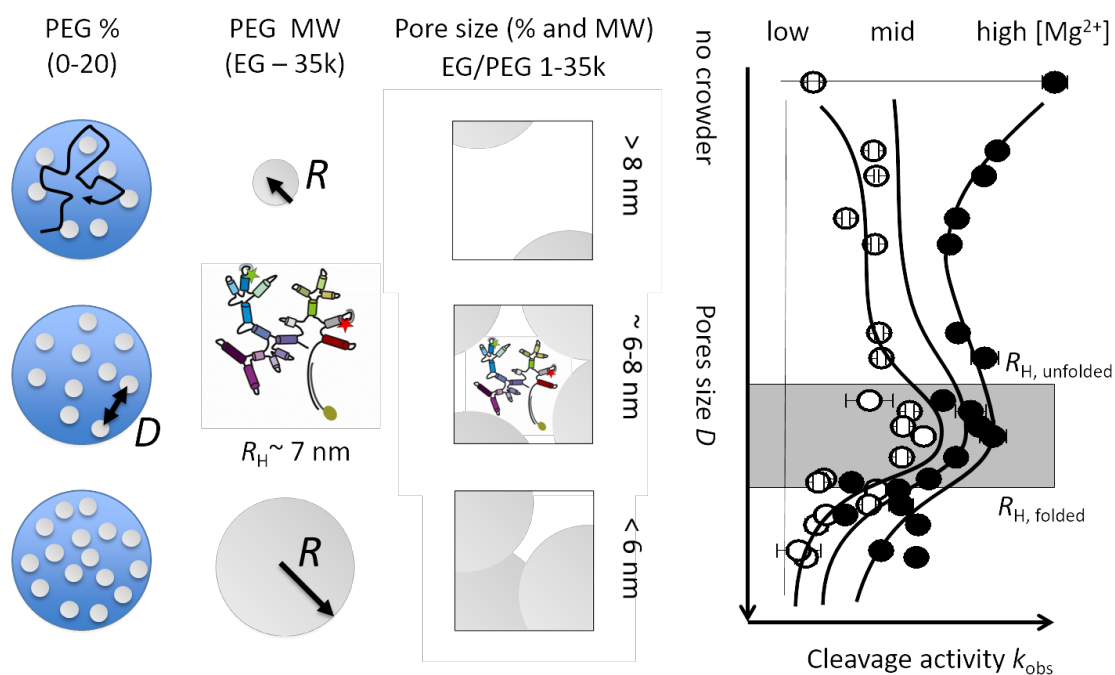


Understanding the crowd: how specific is the influence of crowding particles on the activity of RNAs?

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Ribozymes are catalytic active RNAs requiring a high magnesium(II) concentration to show folding and function *in vitro* [1,2]. In contrast, *in vivo* conditions are characterized by a highly crowded cellular environment and much lower ion concentration. Molecular crowding agents are used to *mimic* the cellular environment. However, particular physical/chemical properties explaining the co-solutes or the macromolecular crowders influence on folding and function of RNAs are poorly understood. In this study, we gain new insights on how polymer properties like dielectric constant, viscosity, diffusion and pore size influence the activity and folding of a large non-coding RNA, the group IIB intron ribozyme of *S. cerevisiae* [3,4]. We combined bulk activity assays, smFRET and NMR diffusion experiments screening the influence of volume fraction (%) and molecular weight (MW) of different crowding particles. We unveiled an optimal pore size of the crowder, i.e. the average distance of the crowding particles in solution, that matches the size of the ribozyme to maintain its catalytic activity even at lower magnesium(II) concentration.



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