Inhibition of excystation and metacystic development of *Entamoeba invadens* by inhibitors of signaling molecules

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Using an axenic excystation system in vitro, we examined the effect on excystation and metacystic development of *Entamoeba invadens* of inhibitors of phosphatidylinositol 3-kinase (PI3K) and protein kinase C (PKC), which are signaling molecules responsible for numerous cellular responses. Excystation, which was assessed by counting the number of metacystic amoebae after the induction of excystation, was inhibited by wortmannin, a potent inhibitor of PI3K, in a concentration-dependent manner. As cyst viability was not affected by this inhibitor, reduced excystation was not due to a direct toxic effect on cysts. Metacystic development, as determined by the number of nuclei in the amoebae, was delayed by wortmannin, because the percentage of single-nucleate amoebae was lower than in controls at day 3 of incubation. The PKC inhibitors staurosporine and chelerythrine chloride also inhibited excystation and metacystic development of *E. invadens* in a concentration-dependent manner. These results indicate that signaling through PI3K and PKC contributes to the excystation and metacystic development of *E. invadens*.