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Mass depending maze exploration strategy for true slime mold

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True slime mold *Physarum polycephalum* is a large uni-cellular amoeba-like organism and it can sense environmental information and change its behaviours. Large true slime mold extends its frontal parts for foraging. To study its exploration strategy, we observed how *physarum* spreads in a *binary-tree-shaped* maze. We found that slime mold changes its searching strategies when its total mass changes. To explain this result, we made a new mathematical model which consists of cylinders filled with liquid, periodic contracting active springs, tubes connecting between cylinders and the elastic sheet. In our model, the pressure has an important role to transmit information among frontal parts. Our model reproduces fundamental characteristics of the front expanding and the searching behaviours of slime mold.

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