CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY

Name(s)
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Project Number
J1509

Project Title
Designed by Slime: "Intelligent" Transportation Systems

Abstract

Objectives/Goals
The objective of my experiment was to test whether the Physarum polycephalum, a slime mold, is capable of creating dendritic networks between food sources. . I hypothesized that the Physarum polycephalum could be used to help highway engineers design the most efficient transportation routes since the slime mold has the ability to create the shortest path between two points.

Methods/Materials
I prepared ten agar plates and placed twenty oats representing cities within the boundaries of Los Angeles County and Orange County using a printout of a map of the freeway system of the two counties. Once the agar plates were prepared, a piece of the slime mold was placed on the oat flake representing downtown Los Angeles. The movement of the Physarum polycephalum and the connections it made between the oats were observed and then compared to the map, which had been reduced to match the size of the petri dish.

Results
The Physarum polycephalum did create shorter paths between most of the cities. Overall the total distance of the Physarum polycephalum created network was 4.96 centimeters shorter than the total distance of the paths between the cities on the present freeway system.

Conclusions/Discussion
These results support my hypothesis that the Physarum polycephalum is not only capable of creating the shortest path between two food sources, but can also be used as a tool to help guide the design of freeway networks and other transportation systems. This will help civil engineers around the world to design more efficient transportation systems.

Summary Statement
My project was conducted to test the ability of the Physarum polycephalum to create efficient transportation systems.

Help Received
Science teacher allowed use of lab tools to conduct experiment.