

The Mystery of the Toxic Flea Dip

(Adapted from A. Baines et al. (2004). Mystery of the Toxic Flea Dip: An Interactive Approach to Teaching Aerobic Cellular Respiration. *Cell Biol. Educ.* 3, 62-68).



Part 1: The Case

You're working at the medical examiner's office at San Francisco County Hospital. It has been a particularly light day, with only one homicide and a dead chipmunk that you checked over for rabies. The chipmunk didn't have rabies, and you are ready to go home. Just as you're leaving, you get a call from your secretary. "Francesca," he says, "We've got a kid up here that you'll want to look at right away. Might be foul play."

Thinking of your four-year-old daughter waiting for you at home, you grimace. "Ok Jon, I'm heading to the morgue." Performing autopsies on kids is the least favorite part of your job, but you are paid to solve medical mysteries, and it looks like you've got one here.

In the morgue, you find the report from the hospital. Glancing over it, you notice a narrative of the girl's last hours and read it carefully:

At 10 am, mother returns home from the store to find girl vomiting, not feeling well, and sleepy. Mother put girl to bed. Ten minutes later, she noticed that the child's breathing became irregular and slow. She tried to wake her daughter but was not able to do so. The child became comatose. At noon, the girl was admitted to the hospital, with no heartbeat or spontaneous breathing.

A police report states the following:

The parents discovered that the girl had been giving her dog a bath using a flea dip called Fleacide. According to the label on the container, Fleacide is an insecticide made of only plant material and appropriate for external use on animals.