

Lesson 4 Activity: "Angiogenesis and Metastasis" Teacher Handout

You will need:

Two different kinds of balls (tennis balls, ping pong balls, etc)
Long Tube (cardboard tube inside wrapping paper works nicely)

The objective of this activity is to have the students acting as tumor cells and endothelial cells, and the tennis balls and ping pong balls acting as pro-angiogenic factors and nutrients, respectively.

1. Pick one student to act as the initial tumor cell. Have the student stand up in the front of class and tell them that they student represents a tumor cell. A single tumor cell or a small tumor can easily get nutrients and oxygen from its host. (Toss the tennis balls at the student and tell them the tennis balls represent nutrients and oxygen). The tumor will then start to divide and grow.

2. To represent the tumor growing, bring more students up and have them surround the initial student. Now throw them the tennis balls and demonstrate that when a tumor gets very large, it is hard for the inside of a tumor (the initial student) to get nutrients and oxygen. Only the tumor cells on the periphery of the tumor (students on the outside) are able to easily get nutrients. The lack of nutrients in the inside of the tumor cell cause's the cells to release pro-angiogenic factors (ping pong balls) to attract endothelial cells. The initial student should throw ping pong balls to the students that are acting as the endothelial cells. This causes the endothelial cells to divide and form a new network (a new blood vessel that can infiltrate the tumor).