

Read the article “***Brazilian wasp venom kills cancer cells by opening them up***” from the journal Chemistry/Biochemistry (9/1/2015) and answer the questions below.

1. How does the venom *Polybia*-MP1 kill cancer cells?

Skip down to the next-to-last paragraph. What molecules that normally cannot leave the cell are able to escape from cells disrupted by MP1?

2. *Polybia*-MP1 does not kill normal cells. How is it able to discriminate between normal cells and cancer cells?
3. Where was this study conducted? Name both universities.
4. Draw a picture of the inner and outer membrane leaflets of a healthy cell membrane below. Label 6 of your phospholipids as phosphatidylserine (PS) and phosphatidylethanolamine (PE) in their appropriate location. You can draw your phospholipids like this:



*Normal cell membrane:*

5. Draw a picture of the inner and outer membrane leaflets of a cancer cell membrane. Label 6 of your phospholipids as phosphatidylserine (PS) and phosphatidylethanolamine (PE) in their appropriate location.

*Cancer cell membrane:*

6. For this study, the researchers produced model membranes that could be characterized and studied. These were not actual membranes, but constructs. Draw a picture of these membranes below, label the type/distribution of PE/PS, and show the resulting disruptions (holes or gaps) that occurred in the membrane. Be sure to show a proportionate difference between the presence of PS and the presence of PE.

*a. Membrane with an increased PS content in the outer leaflet of the membrane.*

*b. Membrane with an increased PE content in the outer leaflet of the membrane*

7. The venom MP1 is described as a peptide. What does that mean? Describe the building blocks and bonds you would find in this molecule.