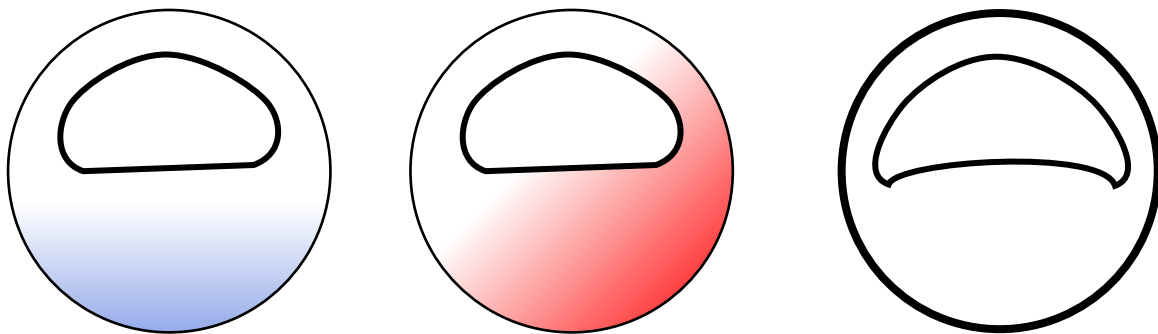


Exercises Gastrulation

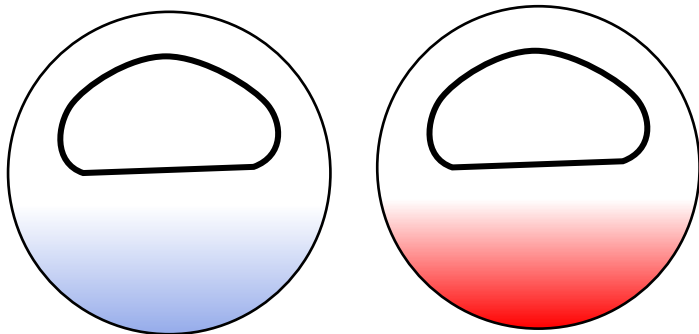
A. Multi-dimensional morphogen gradients

Below are schematic drawing of two morphogen gradients. VegT in blue is a protein that is produced at the vegetal pole. Wnt is a protein produced at the right lower corner. In the third image, indicate

1. all the places with intermediate vegT levels.
2. all the places with intermediate Wnt levels
3. all the places with intermediate vegT and Wnt places
4. How many gradients do you need to specify a position in a two-dimensional space?
5. How many gradients would you need to specify one location in a three-dimensional space?



6. Imagine that the Wnt gradient and the VegT gradient were not tilted to each other:



Where are all the locations with intermediate vegT and Wnt? What changes? What would you expect if in the frog embryo one would change the orientation of the Wnt gradient? (We will discuss this experiment in the next lecture)

B. Cell fate determination

You excise a cell from a Gastrula stage that would normally make blood and you place this region in an area that makes skin. You observe that blood cells form where normally skin cells are. What is your conclusion.

- a. The cell fate was already determined
- b. The cell fate was not determined
- c. The experiment does not allow me to conclude anything
- d. Skin and blood cells are made from the same tissues
- e. Meso- and endoderm are not the same as ectoderm