

# Bean Branch Initiation

## The model:

One aspect of growth is the production of new parts. One type of growth is the production of branches along a stem. Our model for testing is that the apical bud produces auxins which are transported basipetally to prevent the lateral buds from forming branches; this process is called apical dominance. This is thought to be counteracted by cytokinins produced by roots and transported acropetally.

## The model organism:

For the model organism you will use common kidney beans (*Phaseolus vulgaris*) which demonstrate fairly strong apical dominance. You or your partner planted bean seeds about two weeks ago. Those have sprouted, and now may have senescing/abscising cotyledons, expanding/expanded simple, opposite, primary leaves, and a young expanding trifoliate leaf. Examine your plant carefully to notice its form and locate all lateral buds present.

## The manipulations:

Available to you in the laboratory today are auxin (IBA) and cytokinins (K and BA) in a range of concentrations (5000, 500, 50, 0 ppm) in lanolin paste. Also present are some razor blades for those thinking of a career in surgery. **Before** doing **any** treatments, be sure to clear the project concept and points of application with the instructor!

Think of treatments that might test the two parts of the model. Think of some treatments that might induce branching. Which treatments would be real practical? Try some tedious ones and some that are easier. Be sure you treat all individuals in a pot with the same treatment and mark all pots clearly with your name and treatment. Have you included all the controls you need? Double check with the instructor if needed!

## The analysis:

In a week you will examine the results by counting and measuring. You should gather branch (NOT LEAF OR INTERNODE) lengths and enter them in an organized chart. Perhaps something like this for each treatment:

Primary Leaf Node		Cotyledonary Node	
Longer branch	Shorter branch	Longer branch	Shorter branch

Calculate averages for the treatments, calculate averages for particular nodes, and whatever else seems appropriate to compare the results statistically. A sketch of a bean plant showing the treatment (s) and locations of average branch lengths might be a useful supporting graphic--a pictogram. Maybe you can think of something convincing as well as creative.

## The output:

Write an amplified abstract to report your findings to the instructor.