Plants cannot escape when in danger of attack by other organisms or move when exposed to unfavorable environment, so they must defend passively. Against herbivores, parasites or pathogenic microbes, plants can defend by physical barriers like thorns, thickened bark or cuticle, resins etc. But the smartest weapon, developed throughout millennia of co-evolutions are plant natural chemicals that are making their bodies (or parts of them) poisonous, unpalatable, indigestible, or deterring. Medicinal plants are selected from nature by humans upon observations of their stronger physiological activities. They often produce sophisticated mixtures of substances that act upon various mechanisms in other organisms. In carnation family, these special mixtures contain small molecules called saponins - natural surfactants, and a rare class of toxic proteins - Ribosome Inactivating Proteins (abbreviated as RIPs, able to kill cells of other organisms by destroying their protein production machinery). Saponins, a very versatile group of thousands of different but still related structures are very common among plants and are used as expectorants and other medications. Carnation family is one of the most famous group for saponin content. They can also act in concert with RIPs (as toxic two-component system, TTS) enhancing their toxicity upon ingestion by animals and most probably also on microbes. This a special defensive weapon of carnation relatives that also contributes to pharmacological properties of these plants. However, very little is known about coordination of production of this unique toxic two component system in real plants. We chose two of them that are easy to grow and rich in these substances - *Gypsophila elegans* and *Agrostemma githago*. We will be using plants cultivated in the laboratory under highly controlled conditions and in aseptic regime to minimize influence from other factors from the environment, except those which we want to test. For example, substances from bacteria and fungi (like their cell walls or chitin) or molecules used by cells to alarm the plant on infection (such as for instance salicylic acid or hydrogen peroxide) will be applied to check the hypothesis that it should increase or alter the composition of the toxic two-component system. We will test this influence on cells growing separately in a suspension and also on parts of plants such as roots or shoots. We aim at developing a system in which we will be able to direct the production of certain substances depending on the applied factors. In this way, we will learn what external influences make the plant composing the complex mixture of defense-related products. It will be important for future developments of improved medicinal treatments as well as improve resistance of cultivated plants.