Too high or too low temperatures, not only in animals and humans, but also in plants, are a factor causing stress. Effects of temperature stress (e.g., frost) are particularly dangerous for cultivation plants, as they may decrease the yield or even cause dying out of entire crop. However, thanks to the flexibility of the metabolism, all living organisms are to some extent able to adapt to adverse temperature conditions. Similarly as in humans, steroid hormones play an important role in the regulation of plant metabolism. Plant steroid hormones are called brassinosteroids and help protect cells against the effects of stress. Elucidation of their mechanism of action is the interest of many scientists in the world. Thanks to their research, we gather more and more details concerning the plant's survival in not always favorable environmental conditions. This knowledge can be applied to create new, more resistant to stress crop varieties or produce special preparations designed to protect crops against stress. By implementing the current project, Polish scientists will also contribute to the knowledge of the mechanisms of action of brassinosteroids. The object of our research will be a crop plant – barley, and by carrying out the planned experiments we will answer, among others, the following questions:

- How will the sensitivity of plants change to high and low temperatures if they do not produce sufficient amount of steroid hormones – brassinosteroids?
- Is the appropriate level of steroid hormones responsible for the level of several other hormones important for the life of the plant and its resistance to stress?
- Are brassinosteroids (in conditions of various temperatures) necessary for the proper functioning of the cell membranes (protective barriers surrounding the cells)?
- Are brassinosteroids responsible, and if so then how, for the production of special protective proteins called heat shock proteins, which task is to protect sensitive cellular structures from the damaging effect of too high or too low temperatures?