Plant growth and development is conditioned by external environmental factors that determine their course. Light is one of the most important factors. The intensity of light affects the regulation of photosynthetic processes. The photoperiod is associated with the reaction and functioning of the plant in conditions of bright day and dark night. The quality of light, and therefore its spectrum, consisting of different wavelengths, is responsible for photomorphogenetic processes. Plants have evolved a number of adaptations and mechanisms for receiving and processing light signals reaching the surface of their tissues. Photoreceptors such as phytochromes, phototropins or cryptochromes absorb light and induce specific physiological reactions in the organism that translate into morphogenetic effects. The regulation of these processes is governed by endogenous growth regulators known as phytohormones. They are active at low concentrations, which exclude their trophic effects, and its mechanism of action has low specificity, which may cause different hormones to have similar effects. Therefore, the links between their synthesis and metabolic pathways, depending on different light quality, remain largely unexplained. The aim of the research is to detect these relationships by observing and analyzing morphological, anatomical, biochemical and physiological changes that the research object will provide. *Gerbera jamesonii*, propagated in in vitro cultures, will be subjected to different light spectral quality – monochromatic red, blue and a combination of these two wavelengths. Their separate impact and joint action will be examined. Quantitative analyzes of the content of endogenous phytohormones from auxin, gibberellin and cytokinin (and other acids) groups will be carried out as well as the dynamics of changes during the culture. The analyses will be performed using a precision device and ultra-high performance liquid chromatography. This will allow revealing metabolic pathways of their synthesis and correlating the results with plant morphogenetic response. We expect answers regarding their stimulating or inhibitory action on specific developmental effects. In addition, non-invasive photosystem efficiency measurements will be performed using the chlorophyll fluorescence method, which will provide knowledge about the condition of plants and the functioning of photosynthesis, in spite of strongly limiting in vitro culture conditions. Analysis of leaf blade cross-sections and epidermal imprintts of the abaxial side of the leaf blade will provide information on the anatomical structure as well as density and size of stomata. The research results will be supplemented with observations of morphological parameters using the traditional biometric method. All collected results will be used to understand how the plant’s morphogenetic response functions under different light qualities, with particular emphasis on metabolic pathways and mechanism of action of endogenous phytohormones that regulate these changes.