

## Summary

Malignant tumours are the second most common cause of death worldwide right behind the cardiovascular diseases. This tendency is by the opinion of the World Health Organisation increasing especially in well developed countries. (Ferlay 2012) Because cancer has become in 20th century serious social and economic problem, research on it is for WHO and IARC (International Agency for Research on Cancer) the top priority. (Mendis 2014) Relative and absolute incidence is also rising. The reason, besides others, is aging of population. Because age is one of the main prognostic factors for cancer, people are more likely to „survive“ till the onset of it.

However, diagnostic options are improved and many tumours are detected in early stage which in turn boosts the ability and effectiveness of treatment. Screening programmes are introduced into routine medical practice (e.g. mammography, prostate-specific antigene, occult blood testing or colonoscopy) inducing awareness in the general population. (Dušek *et al.* 2005; Mendis 2014) Last but not least, the treatment itself has developed considerably over the last 15 to 20 years, with the focus on patient "tailor-made" therapy. It includes new mini-invasive or robot-assisted surgical techniques, new radiation techniques (IG-IMRT – Image-Guided Intensity-Modulated Radio-Therapy), use of targeted (sometimes also called biological) treatment, administration of new cytostatic drugs, improvement of supportive therapy and prevention of side effects of the treatment.(Sudhakar 2009) All these advances are also possible due to basic molecular biology research.

Use of tumour cell lines as a model system represents one of these options. Its similarity to the original tumour allows us to investigate biological nature, behaviour and possible response to the chosen treatment. (Langdon 2004)

In the present work we focus on the cytostatic effect of irinotecan on selected colorectal cancer cell lines *in vitro*, particularly on the characterization of cell growth and death. The results obtained by these experiments may contribute to a better understanding of cellular response to induced injury and, in a broader context, to increase efficiency of this cytostatic therapy.