ABSTRACT

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Precision-cut tissue slices are a unique *in vitro* model. Maintaining the tissue architecture gives them an advantage that can not be achieved in cell suspensions. They are also less demanding for number of required laboratory animals than perfused organs. The tissue slices are used mainly in biochemical, toxicological, physiological and pharmacological studies. The aim of this project was to establish optimal conditions for preparation and incubation of precision-cut tissue slices. The liver and small intestine of laboratory rats (*Rattus norvegicus*, *Wistar* strain) were used for tissue slices preparation. Three methods of monitoring of tissue slices viability were tested - MTT assay, NR-assay and the activity of lactate dehydrogenase (LDH). Monitoring of LDH leakage into the medium provided the most accurate values and this method was used in all subsequent experiments. Viability of slices after 24 h was very low. Specific activity of glutathione S-transferase detected in the intestinal slices was low and there was a significant decline after 24 h. UDP-glucuronosyl transferase activity was successfully detected only in liver slices and intestinal punches. None of cytochrome P450 isoforms (1A1, 1A2, 3A, 2B) was detected. From our results, one liver slice (210 micron thick and 8 mm diameter) per one well in 24-well plates (each well contains 0.5 ml of incubation medium) was the best incubation system for liver tissues. Appropriate incubation system for intestinal slices (350 micron or 400 micron thick) is a 24-well plate, each well contains three intestinal slices and 0.5 ml of the medium.