The purpose of the present work was to analyse the prototypes of information expert systems, their structure, functions and practical application, and to develop a new one for solving practical problems in biotechnology, laboratory practice and environmental protection. The observed prototypes were developed for the use in genetic studies, agricultural production, nature protection from pests and environmental pollutants, for works in medicine, and etc. During the work, following methods were used such as methods of comparative research of the samples of technical devices, imitation and program modeling, which were based on numerical results obtained in experiments with the recording of chemosensitive transmembrane electrical currents in neurons in voltage clamp mode. As a result, an original expert system was developed. It was coupled with a detector group, databases and interface. The developed expert system was able to distinguish automatically the certain types of chemicals at the input, to display their identification data and, if necessary, the reports about their harmfulness. Conclusions were done about the practical value of these data for the elaboration of new electronic expert systems for monitoring the presence of harmful
substances in the environment. It was also discussed the possibility of developed expert system application for new methods of qualitative and quantitative analysis of some organic compounds.

**Key words:** biological and medical expert systems, electronic informational systems, bioinformatics, databases.

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