NMR Spectroscopy Applied in the Identification of Organic Substances and Medicinal Drugs

Danilov Dorina

Academic adviser: Tihon Iurie, M.D., Ph.D., Associate Professor
State Medical and Pharmaceutical University "Nicolae Testemitanu", Chisinau, Republic of Moldova

NMR spectroscopy is one of the most powerful available for studying the structure of molecules and identification of drugs. NMR involves the absorption of radiowaves by the nuclei of some combined atoms in a molecule that is located in the magnetic field. An NMR spectrum is acquired by varying or sweeping the magnetic field over a small range while observing the resonance signal from the sample. Due to NMR spectra we can confir the structure of compounds . Aims : The purpose of our investigation was to elaborate the method of interpreting 1H proton and 13C carbonic spectra. Materials and methods: In the analysis were used the drugs like aspirin ,Benzituron , Isohydrofural , Metiferon. The NMR spectra was registered at Fourier Transformation NMR spectrometer. The substances were dried for 2 hours at 1050 C, after that the samples is necessary to be dissolved in the deuterised water and be filtered through Millipore filter 0.2 μm under vacuum. The obtained solutions were transferred in glass tubes about 15 cm in long and 5 mm in diameter .As a reference standard is used TMS with the absorbance set at 0,0 ppm ,which is introduced in the tube with solution. Results: The NMR spectra of these substances give important and detailed information about molecules. Every spectrum is characterized by the chemical shift of peaks and spin-spin splitting of peaks . For example the chemical shift indicates the functional groups that are present, such as aromatics, ketones, amines, alcohols, aldehyde and so on. .The multiplicity of the resonances identifies the type of protons. The 1H protonic spectrum of Benzituron contain resonance signals of a high intensity which demonstrate the presence of hydrogen proton in the molecule. The signal at 3.4 ppm belong to metylen group (-CH_2-) it is a diplet. The zone of resonance at 4.56 ppm correspond to amines group (NH_2) and imines (NH),its represented as a common signal, due to superposition of peaks. The signal at 7.21,7.22;7.24; ppm included in multiplet are assigned to aromatic ring. Conclusions: There were examined the 1H -protonic and 13C- carbonic spectra of different substances in order to elaborate the rules for interpreting spectra. These spectra permits to confirm the structure of compounds, to identify the drugs.

Strategy and Competence in the Pharmaceutical Industry

Erhan Tatiana

Academic adviser: Dr. Vladimir Safta
State Medical and Pharmaceutical University "Nicolae Testemitanu", Chisinau, Republic of Moldova

How will the drug industry look like in 20 years? Can we get there? How? Of course, it's hard times in every industry these days, but none has anywhere near the inherent contradictions and high risks, regulations, technologies, and costs pressing down on every aspect of its business. True innovation in this maze is a near miracle. Valued at US$199mln in 2008, Moldova's pharmaceutical market is forecast to increase at a steady CAGR of 9.70% in local currency terms. By 2014, the market is expected to top US$387 mln at consumer prices. In 10-year forecast period through to 2019, market development is likely to accelerate, growing at a CAGR of 10.49% in local currency terms, stimulated by economic recovery, healthcare modernization and the expansion of healthcare insurance coverage. Generics' CAGR will be similar to that of the overall market, with patented medicines expected to benefit from regulatory improvements and Moldova's progress towards European Union (EU) membership, which will translate into a 2009-2014 CAGR of 18.86% in local

currency terms. The pharmaceutical industry is a very unique and spectacular industry, with an impressive evolution along the 20th and the beginning of the 21st centuries, as well as facing a challenging future. The situation in the industry has spectacularly changed in the past two decades, leading to new strategies and new portfolios, especially for the major pharmaceutical companies worldwide. We are now confronted with a mature, stable industry, constantly affected by mergers and acquisitions, as well as by new scientific discoveries. Therefore, trying to foresee the future of such an industry becomes very interesting and challenging at the same time.