THE INVESTIGATION OF POLYMORPH TRANSITIONS OF ERLOTINIB SALTS

***Wioleta MARUSZAK[1], Marta ŁASZCZ[1], Kinga TRZCIŃSKA[1], Wojciech ŁUNIEWSKI[2], Krzysztof BAŃKOWSKI[2], Kamil JATCZAK[2]**

[1]Pharmaceutical Research Institute, R&D Analytical Chemistry Department, Rydygiera 8, 01-793 Warsaw
[2]Pharmaceutical Research Institute, Chemistry Department, Rydygiera 8, 01-793 Warsaw

** w.maruszak@ifarm.eu*

Erlotinib is a reversible tyrosine kinase inhibitor, which acts on the epidermal growth factor receptor (EGFR) and is used to treat non-small cell lung cancer (NSCLC), pancreatic cancer and several other types of cancer [1]. It is known that erlotinib forms different salts which can exist in multiple crystalline solid forms. This important property known as a polymorphism may have an impact on physical and chemical stability of the drug substance (API), processability during manufacturing in the final drug product and bioavailability of the drug to the patient. Changes in the crystal structure of API can lead to the undesired changes in properties. Hence, the control of the polymorphic form is essential during the drug substance manufacture and requires a thorough understanding of solid-state changes that may occur in pharmaceutical materials. To achieve a comprehensive understanding of solid-state transformations different analytical techniques are applied.

In our studies the variable–temperature powder X-ray diffraction (VT–PXRD), differential scanning calorimetry (DSC), thermogravimetry (TGA), Fourier transformed infrared (FTIR), attenuated total reflectance (ATR) and Raman spectroscopy were used to investigate the correlation between the thermal behavior and structural transformations of polymorphic forms of erlotinib salts. VT-PXRD method has detected the temperature range of the existence of polymorphic transitions, spectroscopy methods have characterized intramolecular vibrations and thermal methods have provided information on the transition and melting temperature and relationships between polymorphic forms.

Acknowledgments
This research project has been supported by the European Union within European Regional Development Fund through grant program INNOMED/I/15/NCBR/2014 "Modern API technology and pharmaceutical composition of kinase inhibitor generic drug for cancer therapy"
X-ray measurements were accomplished at the Structural Research Lab. of the Chemistry Department, Warsaw University, Poland, established with the financial support from the European Regional Development Found in the Sectoral Operational Programme "Improvement of the Competitiveness of Enterprises, years 2004–2006" project no: WKP_1/1.4.3./1/2004/72/72/165/2005/U.

References:
[1] Assessment Report for Tarceva EMA/CHMP/298837/2010

The form of presentation proposed by the Author (delete inappropriate):
oral (15 min)