

The Top ten scientific developments in Latvia in 2008

In scientific research:

- A novel cell mechanism that is responsible for the capability of malignant tumors to regenerate after anti-cancer therapy was discovered (*Dr.habil.med.* Jekaterina Erenpreisa, the Latvian Biomedical Research and Study Centre in cooperation with the University of Southampton, the University of Heidelberg and the Bundeswehr Institute of Radiobiology).
- Approaches for the synthesis and isolation of pure optical isomers of biologically active compounds were developed and their properties studied; these findings contribute to developing more effective medications (The Latvian Institute of Organic Synthesis - Professor Ivars Kalvins, *Dr.habil.chem.*, *Dr.habil.chem.* Edmunds Lukevics, *Dr.pharm.* Maija Dambrova, *Dr.chem.* Aivars Krauze, *Dr.habil.chem.* Grigory Veinberg).
- A novel integrated study of methods, strategy and tactics of sustained nonviolent resistance in Latvia in regaining independence and international recognition in a democratic way completed and published in the monograph *Nonviolent Resistance: Road to Regaining Independence of Latvia, 1945-1991* authored by Valdis Blūzma, Tālav Jundzis, Jānis Riekstiņš, Heinrichs Strods, Gene Sharp. The study was carried out within the framework of National Research Programme *Letonika: research on history, language and culture*.
- A hitherto unknown syndrome of gait disturbance (resembles Parkinsons's disease) in intravenous drug Methcathinone (ephedrone) users was discovered and the syndrom's cause established – excessive accumulation of manganese compounds in these individuals (Professor Viesturs Liguts, *Dr.med.*, Dr. Ainārs Stepens, Riga Stradins University in cooperation with the University of Oxford).
- For the first time, quantum interference in carbon nanotube current source was modelled. This provides significant stepping-stone towards the design of quantum information-processing devices (*Dr.phys.* Vyacheslavs Kascheyevs, the Institute of Solid State Physics of the University of Latvia in cooperation with the University of Cambridge and the University of Washington).

In practical applications:

- A simultaneous pancreas-kidney transplantation was first performed in Latvia (under the leadership of Professor Rafail Rosental, *Dr.habil.med.*, P.Stradiņš Clinical University Hospital).
- Solar energy testing equipment was developed and installed (under the leadership of Professor Peteris Shipkovs, *Dr.habil.sc.ing.*, the Institute of Physical Energetics).
- A new information technology for providing sustainability of the electrical transmission network and generation was elaborated and introduced (under the leadership of Professor Yuri Merkurjev, *Dr.habil.sc.ing.*, Riga Technical University and the Institute of Physical Energetics).
- Novel methods for isolating antioxidants from biomass and for using them as biodiesel stabilizers were developed (under the leadership of Professor Valdis Kampars, *Dr.habil.chem.*, the Faculty of Materials Science and Applied Chemistry of Riga Technical University, the Latvian State Institute of Wood Chemistry).
- A comprehensive glossary in linguistics published for the first time in Latvia. *Glossary of Basic Linguistic Terms* contains 2000 terms, their explanations in Latvian and equivalents in English, German and Russian. The glossary is intended for establishing a unified linguistic terminology. Compiled under the direction of Professor Valentīna Skujiņa, *Dr.habil. philol.*