

Prof. Władysława Anna Daniel

Head of the Department of Pharmacokinetics and Drug Metabolism, Institute of Pharmacology, Polish Academy of Sciences, Kraków, Poland

Prof. W.A. Daniel graduated from the Pharmaceutical Faculty of the Medical Academy in Kraków (Master's degree). Afterwards, she joined the doctoral studies at the Institute of Pharmacology of the Polish Academy of Sciences in Kraków (PhD) and then she completed the 'habilitation thesis' (Post-doctoral degree). She gained her post-doctoral research training at the Department of Pharmacology and Toxicology, School of Medicine, Philipp's University in Marburg, Germany (2 years) and at the Institute of Pharmacology, University of Berne, Switzerland (1 year). In 2003 she obtained the academic title of professor (Titular Professor) at the Pharmaceutical Faculty, Collegium Medicum, Jagiellonian University in Kraków and a position of professor at the Institute of Pharmacology of the Polish Academy of Sciences, Kraków. Prof. Daniel has been a research adviser of 6 doctor's dissertations and 1 'habilitation' thesis. She published more than 100 original scientific articles, as well as review articles and book chapters.

Main Research Areas

The main research areas of Prof. Daniel are:

- the role of the central nervous system in the regulation of cytochrome P₄₅₀ expression;
- contribution of brain cytochromes P₄₅₀ to the local metabolism of monoaminergic neurotransmitters and psychoactive drugs;
- impact of psychotropic drugs on cytochrome P₄₅₀ isoenzymes in the brain and liver;
- identification and quantitative contribution of liver cytochrome P₄₅₀ isoenzymes to the metabolism of centrally active drugs;
- pharmacokinetic interactions within clinical combinations of psychotropic drugs and their mechanisms;
- pharmacokinetics and metabolism of psychotropic drugs after acute and chronic treatment;
- relationships between drug concentration in blood plasma and the brain: mechanisms of drug distribution.

Methods

The following pharmacokinetic and biochemical methods are used in the Department of Pharmacokinetics and Drug Metabolism, headed by Prof. Daniel:

- drug administration *via* different routes;
- stereotaxic implantation of cannula in the brain (intracerebral injections), brain microdialysis, brain surgery, brain section;
- determination of tissue and extracellular concentrations of monoaminergic neurotransmitters and their metabolites in the brain using HPLC (electrochemical detection);
- determination of the concentrations of psychotropic drugs and their metabolites in blood plasma and brain using HPLC (UV and fluorescence detection);
- drug metabolism *in vitro*: preparation of brain and liver microsomes, measurement of the rate of drug metabolism in liver and brain microsomes;
- estimation of cytochrome P₄₅₀ activity in brain and liver microsomes by isoenzyme-specific reactions (metabolism of testosterone, caffeine, ethylmorphine, bufuralol, warfarin), using HPLC and LC/ESI-MS/MS;
- determination of cytochrome P₄₅₀ isoenzyme protein levels in brain and liver microsomes by electrophoresis and Western blot, followed by immunodetection and chemiluminescence measurement;
- evaluation of cytochrome P₄₅₀ gene expression: mRNA measurement (qRT-PCR);
- determination of serum and brain hormone and cytokine levels (ELISA).

