Genomic research has stimulated a rapid expansion of knowledge regarding inherited disease patterns and the genetic implications of therapy. This gives anaesthetists the opportunity to improve their understanding of the varying efficacy of drugs and the risks for adverse events. A three-part session held today will look in depth at pharmacogenetics.

“The session provides urgently needed basic information on genetics and pharmacogenetics to the audience and will demonstrate several examples of the influence of genetic diversity on efficacy and safety of the various classes of drugs used during perioperative medicine,” says session chair Michel Struys, Professor and Chair at the Department of Anaesthesiology, UMC Groningen, The Netherlands. He adds that “Pharmacogenetics is as much a reality in anaesthesia as it is in any other medical specialty involving drug administration.” The topics covered will be’ Pharmacogenetics: Does it really matter?’ (Gerd Mikus, University Hospital Heidelberg, Germany); ‘Pharmacogenetics for anaesthesia and analgesia’ (Ulrike Stamer, University Hospital Bern, Switzerland) and ‘Preoperative genetic testing: from fantasy to facts’ (Thierry Girard, University Hospital Basel, Switzerland).

In the first talk, Mikus covers basic understanding of genetics and the principles of pharmacogenetics, drug metaboliser status and its consequences for drug dosing and drug-drug interaction. Stamer than moves on to recent studies on genetic variables influencing anaesthesia and analgesia, pain and their related pharmacotherapy. Promising candidate genes have been intensively studied during recent years and relevant data having a major impact on clinical practice and outcome will be presented. This will include CYP2D6 dependent metabolism of drugs (codeine, tramadol, antiemetics including serotonin receptor antagonists, and beta-blockers). The impact of genetic variants on the efficacy and side effects of these drugs will be addressed.

Girard will discuss, using a number of examples, how pharmacogenetic testing is already occurring in anaesthesia. In selected cases genetic testing for malignant hyperthermia is routinely performed, which prevents this condition being triggered in these individuals. Other examples covered by Girard will include butyrylcholinesterase deficiency, which slows metabolism of the neuromuscular blocking agent succinylcholine, and polymorphisms in the mu-opioid receptor.

Girard believes, however, that the concept of truly personalised therapy will remain a fantasy for several reasons. “There are many more things which determine the effects of pharmacotherapy. With the human genome project we have a map of the code but we don't
understand too much of that,” he says. “Then there is the whole era of epigenetics, which we
are only beginning to understand.”

Both the pharmacokinetics and pharmacodynamics of drugs are determined by genetics. But
Girard points out there are also the effects of lifestyle (physical activity, smoking, alcohol
consumption) and the environment (pollution, food) to consider. “With the exception of pure,
classical pharmacogenetic diseases, there will never be 100% personalised medicine,”
concludes Girard. “I prefer to talk about ‘better-fitted’ medicine. Think of it like shopping for a
shirt. You don't have it tailored for you personally, but you can choose the best fit from small,
medium, or large. One size does not fit all.”