



**Medical Biotechnology  
and Healthcare Services Ltd.**

The missing link in Biomarker Discovery



## THE MISSING LINK IN BIOMARKER DISCOVERY



KPS develops, validates molecular diagnostic tests and provides molecular pathology services to detect predictive biomarkers in tumor samples

for personalized targeted therapies.

## WHY KPS?

- ✓ In KPS you find special know-how in molecular pathology in combination with state-of-the art R&D infrastructure and internationally trained management.
- ✓ KPS is a fully independent private company, therefore intellectual property and confidentiality is most protected.
- ✓ In Hungary you find EU conform regulatory environment, western-style working moral at low cost, this is why Hungary is already a preferred clinical and translational research site of international pharma companies. In addition, state and EU provided applied research grants are also available.



KPS Diagnostics is your partner in successful and personalized therapy using molecular targeted anticancer medication.

In Hungary, similarly to other countries in the European Union and USA certain special and in many case expensive medications-supported by National Health Insurance Fund reimbursement - requires special molecular diagnostic analyses that are precise and fast. KPS's diagnostic laboratory provides a complex and constantly developing platform, which complies with all the diagnostic challenges and ensures close to 100% specificity and sensitivity in a cost effective way. In our molecular pathology laboratory we use the latest international technology and our in-house developed innovative methods for our molecular pharmacodiagnostic services.

There are several types of biomarkers already available which help the oncologist to make the right choice in the optimal treatment protocol for each patient. Currently the greatest increase in physician demand is to be expected in the case of tests for Epidermal Growth Factor Receptor (EGFR) inhibitors. KPS provides routine molecular analysis of pharmacodiagnostic markers EGFR and KRAS since 2004 for patients suffering from colorectal and

non-small cell lung cancer. Analyses of other diagnostic markers are already under development to be all set for clinical use when they are indicated in the label of any drug or serves as a condition for reimbursement by any payer.

We can analyze practically any type of tissue sample previously taken for diagnosis that contains tumor cells, let it be tissue samples taken during operation, surgical, endoscopic or needle biopsies fixed in formalin and embedded in paraffin blocks, or even cytological smears. A regular test takes 10 workdays from the arrival of the sample. Our laboratory has carried out more than 3500 sequencing reactions from DNA samples isolated from archived tissue samples during the last 5 years.



## BIOMARKER VALIDATION AND ASSAY DEVELOPMENT FOR PHARMACEUTICAL COMPANIES

KPS has performed EGFR and KRAS gene mutation testing in non-small cell lung cancer patients in early-access and post-marketing biomarker clinical trials of erlotinib (Roche) and gefitinib (AstraZeneca). In this study, we were among the first to show that the predictive value of EGFR activating mutations are independent from copy number gain and immunohistochemistry. Further, our result molecular diagnostic test reached the 100% clinical predictive value<sup>1</sup>.

KPS served as a reference laboratory of a KRAS mutation testing validation trial in colon cancer for Amgen, and a similar project is underway in lung cancer to validate EGFR mutation testing for AstraZeneca. KPS has been a continuous partner of Roche Applied Sciences in new assay development and validation. For example, amplification of mRNA<sup>2</sup>.

We validate biomarkers, develop diagnostic assays on clinical tissue samples (fresh tissue, formalin fixed paraffin embedded tissue, cytology smears) and provide central molecular diagnostic services for biomarker trials.

We have already validated assays for Roche Applied Sciences and tested clinical samples for Roche (Pharma), AstraZeneca, Merck and Amgen.

<sup>1</sup> Pinter F et al (2008) J Mol Diagn. 10:160-8.

<sup>2</sup> Jori B et al (2008) Roche Biochemica No. 4.

## BIOMARKER RESEARCH FOR BIOTECH COMPANIES

We help medicinal chemistry drug discovery biotech companies also in the preclinical biomarker R&D for their drug candidates. We also help diagnostic technology companies to validate their assay in clinical settings. Our partners already: Vichem, Solvo, Biostatin, Bioblocks.

KPS and the medicinal chemistry company Vichem Ltd. have several projects to identify novel compounds and companion diagnostics for the treatment of lung cancer, to detect and discover novel targets in cancer stem cells and to develop novel compounds and companion diagnostics against influenza in collaboration with the MaxPlanck Institute<sup>3,4</sup>.

Preclinical biomarker R&D for drug candidates

Validation of diagnostic assays in clinical settings

Investigators of KPS have adopted the functional multidrug resistance technology of SOLVO Inc. to be applicable in solid tumor tissues and rheumatoid arthritis. KPS has also organized the biobanking of blood and urine samples for SOLVO's tumor marker project<sup>5</sup>. KPS was testing the significance of M2PK as potential molecular target of somatostatin analogue developed by Biostatin Ltd<sup>6</sup>.

<sup>3</sup> Breza N et al (2008) J Recept Signal Transduct Res. 28:361-73.

<sup>4</sup> Varkondi E et al (2008) J Recept Signal Transduct Res. 28:295-306.

<sup>5</sup> Schwab R et al (2007) Assay Drug Dev Technol. 5:541-50

<sup>6</sup> Szokolóczy O et al (2005) J Recept Signal Transduct Res. 25:217-35

## TRANSLATIONAL RESEARCH SERVICES FOR ACADEMIC RESEARCH INSTITUTIONS

We help research institutes to translate results of biomarker research into clinically applicable diagnostic tests. Our partners are already the Semmelweis University and several research institutes of the Hungarian Academy of Sciences.

Researchers of KPS in collaboration of Semmelweis University, Budapest have discovered new molecular mechanism of action and predictive biomarkers of the anti-cancer agents TRAIL and proteasome inhibitor, bortezomib<sup>7</sup>.

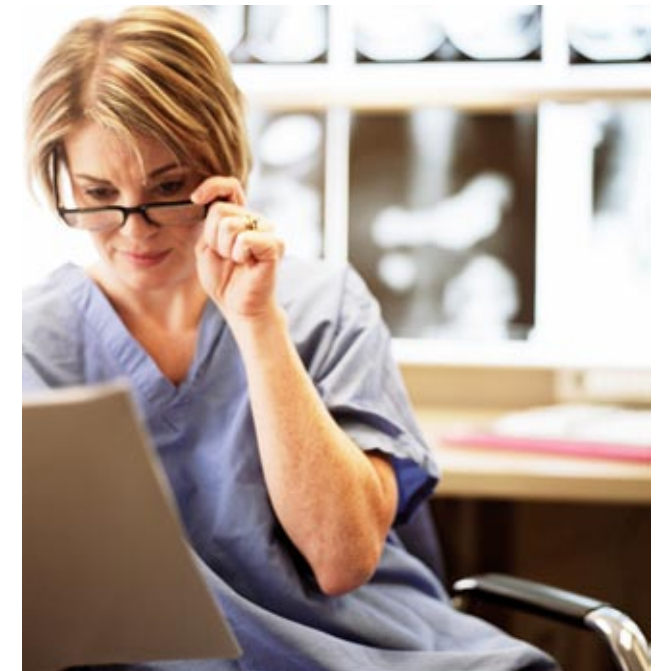
Research into clinically applicable diagnostic test



## PHYSICIAN SERVICES FOR CANCER CENTER

We provide molecular pathology diagnostic services and help clinical investigator initiated biomarker research projects. These hospitals are also our partners in our translational research projects for pharma and biotech companies. We have currently in collaboration agreement with four cancer centers in Hungary.

In collaboration with its clinician partners, scientists at KPS were among the firsts who treated prospectively a lung cancer patient with targeted therapy based on the presence of molecular biomarkers<sup>8</sup>.



<sup>7</sup> Nagy K et al (2006) Pathol Oncol Res. 12:133-42.

<sup>8</sup> Schwab R et al (2005) J Clin Oncol. 23:7736-8

## OUR TECHNOLOGIES

Most advanced technologies like FLX Genome Sequencer, Zeiss Laser capture microscopy and LightCycler480II realtime PCR

Our molecular pathology lab is equipped with the most advanced technologies which includes 454 FLX Genome Sequencer, Zeiss/Palm laser capture microscopy, ABI capillary sequencer, LightCycler 480II real-time PCR instrument. We have proprietary know-how to PCR and sequence DNA extracted from small, formalin fixed samples. For preclinical research we also have a fully equipped tumor cell biology lab with access to animal facility.

## OUR PEOPLE



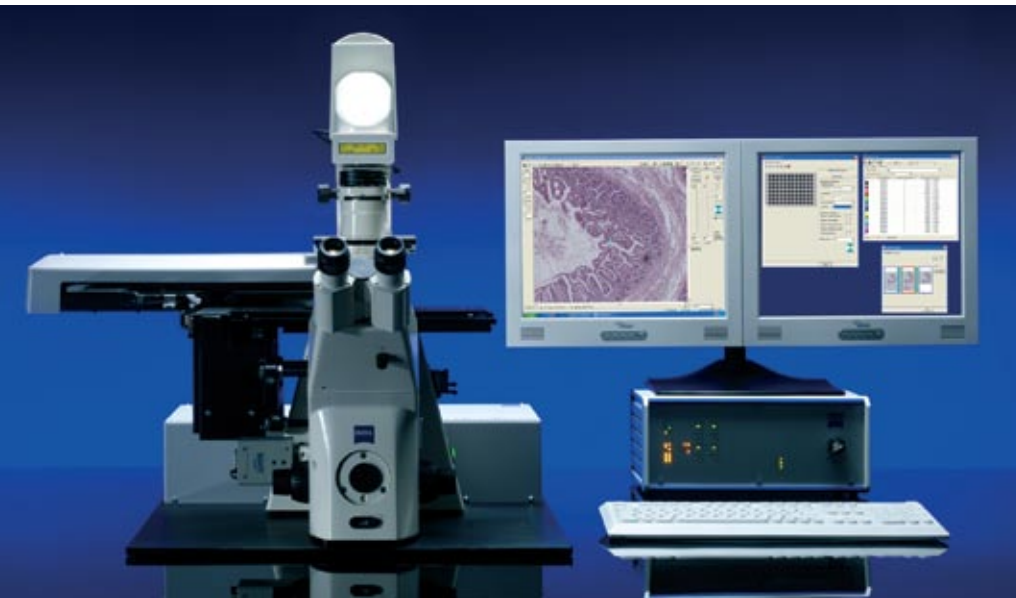
**DR. ISTVAN PETAK, MD, PHD,**  
FOUNDER, CHIEF SCIENTIFIC OFFICER

- senior scientist at the Semmelweis University, Budapest, Hungary and invited lecturer at the University of Perugia, Italy
- scientific director of the Rational Drug Design Laboratories Cooperation Research Center
- opinion leader of predictive molecular diagnostics of targeted anti-cancer therapies in Hungary
- advisory committee of several pharmaceutical companies (Roche, Merck, Amgen, Astra-Zeneca) in Hungary
- the chair of the Scientific and Bioethical Committee of the Hungarian Biotechnology Association
- principal investigator of several biomedical research projects, including biomarker studies
- postdoctoral studies at the Department of Molecular Pharmacology and Experimental Therapeutics of St. Jude Children's Research Hospital in Memphis, Tennessee, USA, Fulbright fellowship
- author of more than 40 peer-reviewed articles and co-investor of 2 patents



**DR. RICHARD SCHWAB, MD, MBA**  
FOUNDER, CHIEF MEDICAL OFFICER

- specialist physician of internal medicine and gastroenterology
- executive MBA degree, scholarship of the Central European University and Perdue University
- strong experience in translational pharmaceutical research
- studies at universities of Basel, Vienna, and London
- development of phase II molecularly targeted drug candidate, TT-232
- CEO of the Rational Drug Design Laboratories Cooperation Research Center
- coordinator of a Hungarian grant for establishing a specialized bio-incubator house for spin-off companies in the field of personalized diagnostics and therapy and regenerative medicine
- author of several peer-reviewed articles and patents



## CONTACT US



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