PamChip® microarrays and PamStation® instruments; A novel platform to support kinase and kinase inhibitor research

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Description
PamGene microarray technology was first presented in 2001 for nucleic acid applications. Today, the platform is among others used for kinase and kinase inhibitor drug research. The platform is composed of:
1. Peptide microarrays (PamChip® arrays)
2. Workstation (PamStation® hardware)
3. Data analysis & interpretation package (Bionavigator)

The technology is based on measurement of peptide phosphorylation by protein kinases. The peptides are immobilized on a dedicated microarray and detection uses fluorescently labelled anti-phospho-antibodies (fig A). These microarrays consists of a highly porous ceramic membrane (fig B). 144 or 256 of these peptide substrates are immobilised per microarray (fig C). Four or 96 arrays are combined into a PamChip®4 or PamChip®96 (fig D). The assay as outlined in figure A detects kinase activity from the kinome present in cells or tissue lysates kinetically over the course of about 1 hour (fig F). This is accomplished by an up and down movement of the sample solution through the array, giving the kinases, maximal opportunity to phosphorylate the peptides on each array (fig E). When the solution is underneath the array the CCD camera in the workstations will take an image of each array. The incubation, washing, dispensing of reagents and imaging of the PamChip® arrays is done in fully automated workstations called PamStation® (fig G). These workstations take typically 15 images during the incubation of one hour. The data workflow consisting of image quantification, quality control, statistical analysis, visualization and interpretation is performed using the Bionavigator software.

The technology is used to find peptides for translational research and patient prognosis, diagnosis and treatment response prediction. The discovery/verification is done using PamGene’s 96-array platform whereas clinical validation will be done using the 12-array system. Both systems, have received CE marking in Europe.

References:

Conclusion
PamGene’s kinase activity profiling platform using peptide PamChip® microarrays and PamStation® instrument are a novel tool to support cell signaling research.