

Therapeutics

DKFZ-No. P-1382

Combined prophylactic and therapeutic Vaccines of HPV

Inventors: Müller, Zhao, Ottonello

Cervical cancer is women's second most frequent cancer worldwide. Clinical and molecular studies have shown that certain types of HPV, referred to as high-risk types, are the etiological agents of this disease. Two anti-HPV vaccines for the prophylaxis of cervical cancer have been licensed recently by Merck (GardasilTM) and GlaxoSmithKline (CervarixTM). Both vaccines rely on the major capsid protein L1 in the form of virus-like particles (VLPs) as antigen; they protect against the HPV types from which the L1-VLPs were derived, yet are largely ineffective against all but the most closely related HPV types.

WE developed a vaccine which is composed of an immunogenic polypeptide comprising (i) a B-cell epitope of HPV, (ii) a T-cell epitope of HPV, and (iii) the scaffold polypeptide thioredoxine. The vaccine can be used in prophylactic and therapeutic approaches against infections with human papillomaviruses.

http://www.dkfz.de/TechTrans/patentsearch_pdf//207673_DKFZ_P-1382.pdf

Therapeutics

DKFZ-No. P-1372

Therapeutic microRNAs to prevent tumour invasion and metastases formation in cancer.

Inventors: Eichmüller, König, Ast, Oswald, Berndt, Kordaß, Osen, Eisel

This invention provides a novel therapeutic strategy to prevent and treat different types of cancer. The microRNAs can target cancer associated fibroblasts in the vicinity of the tumour, which regulate expression of extracellular matrix proteins involved in tumorigenesis. Targeting these fibroblast cells instead of direct tumor cell should circumvent the occurrence of tumor escape events, specifically reducing tumor cell invasion and metastases formation.

We are looking for collaborators to help us obtain pre-clinical data and take this to the clinical trials.

http://www.dkfz.de/TechTrans/patentsearch_pdf//216146_DKFZ_P-1372.pdf

DKFZ-No. P-1361

Iron Chelators in Tumor Therapy

Inventors: Hoppe-Seyler, Braun, Hoppe-Seyler

We invented a pharmaceutically compatible iron chelator or a pro-drug thereof for use in treating and/or preventing cancer in a patient suspected or known to comprise hypoxic cancer cells, and use in treatment and/or prevention of a human papillomavirus (HPV) related lesion. The technology further allows the use of an iron chelator or prodrug thereof for inducing senescence in a cancer cell, preferably a hypoxic cancer cell; and to a method for inducing an irreversible proliferation arrest in cancer cells comprising a) contacting said cancer cells with an iron chelator or prodrug thereof and, thereby, b) inducing an irreversible proliferation arrest in said cancer cells.

http://www.dkfz.de/TechTrans/patentsearch_pdf//207663_DKFZ_P-1361.pdf

Therapeutics

DKFZ-No. P-1358

Cutaneous human Papilloma Virus Vaccine

Inventors: Müller, Ottonello, Bolchi, Mariz, Balz, Zhao

Infections with human papillomavirus (HPV) are a worldwide health challenge, particularly in resource-limited regions. HPV-related diseases are pre-malignancies or overt malignancies of the skin and mucosal surfaces and are an important personal and public health problem causing physical, mental, sexual and financial detriments. The World Health Organization estimates that there are approximately 14 million new HPV infections each year. We have developed an immunogenic polypeptide comprising a multitude of papilloma-virus (PV) L2 N-terminal peptides to protect against most cutaneous HPV types.

http://www.dkfz.de/TechTrans/patentsearch_pdf//207674_DKFZ_P-1358.pdf

DKFZ-No. P-1351

Non-Viral, Non-Integrating DNA Vectors for the Safe and Efficient Engineering of Primary Human Cells

Inventors: Harbottle, Bozza

This technology utilizes a novel DNA vector platform for the safe and efficient generation of genetically engineered cells. This DNA vector system contains no viral components and comprises only clinically approved sequences, which makes it ideal for applications for human therapy such as immuno- and stem-cell therapy.

http://www.dkfz.de/TechTrans/patentsearch_pdf//210486_P-1351.pdf

DKFZ-No. P-1306

Treatment of chemotherapy-resistant Small Cell Lung Cancer

Inventors: Amtmann, Gunkel, Miller, Morgen

Lung cancer is the leading cause of death among men and women in North America and attracts substantial pharmaceutical investment. However, in contrast to non-small cell lung cancer (NSCLC) therapies, where significant progress has been made with targeted agents and immunotherapies, the small cell lung cancer (SCLC) landscape has remained static for more than 30 years. However, we have shown that cyclodextrin stimulates the anti-tumor effect of combinations of disulfiram with various heavy metal salts. Surprisingly, the tested T-cell lymphoma/leukemia, carcinoma, non-T-cell leukemia and SCLC cells are hypersensitive to the combination treatment in cyclodextrin formulation.

http://www.dkfz.de/TechTrans/patentsearch_pdf//207672_DKFZ_P-1306.pdf

DKFZ-No. P-1305

Treatments of Non-Alcoholic Steatohepatitis (NASH) and HCC

Inventors: Heikenwälder, Zender, Weber

Non-alcoholic fatty liver disease (NAFLD), comprising several liver diseases including NAFL and NASH, which is the most frequent liver disease world-wide, is a clinical manifestation of overweight and metabolic syndrome. The prevalence of NAFL is increasing globally. We have identified compounds that are effective for treating non-alcoholic steatohepatitis (NASH), an advanced stage of NAFL (non-alcoholic fatty liver), in order to avoid the development of liver cirrhosis and hepatocellular carcinoma (HCC).

http://www.dkfz.de/TechTrans/patentsearch_pdf//207675_DKFZ_P-1305.pdf

DKFZ-No. P-1193

New Antibody against SUMO1 protein

Inventors: Melchior

The antibody of this invention is a mouse monoclonal antibody directed against SUMO176-86 recognizing SUMO1 of human, mouse, chicken and X. laevis. It is suitable for western blot and immune precipitation as well as for large-scale enrichment of SUMOylated species by IP / peptide elution.

http://www.dkfz.de/TechTrans/patentsearch_pdf//156092_DKFZ_P-1193.pdf

DKFZ-No. P-1000

Oligomerization improves endostatin as antiangiogenic and anticancer drug

Inventors: Abdollahi, Lee, Javaherian

Endostatin is an antiangiogenic protein first discovered in Folkman's laboratory at Childrens Hospital, Harvard Medical School, and Boston. The antitumor properties of this protein are well established. However, the amount of protein required for injection in patients was beyond production feasibility due to the poor pharmacokinetics of endostatin monomer. We have shown that the problem of poor pharmacokinetics can be solved by using the Fc domain of IgG being conjugated to endostatin, a component of all monoclonal antibodies approved for patients with a number of diseases including cancer. As a result of employing Fc-endostatin, the half-life in mice was increased to 2 weeks instead of 2 hours for endostatin alone, consistent with pharmacokinetics of monoclonal antibodies.

http://www.dkfz.de/TechTrans/patentsearch_pdf//192726_DKFZ_P-1000.pdf

DKFZ-No. P-987

Method for immunodiagnostic und immunotherapy of astrozytomes having IDH1R132H-mutation

Inventors: Platten, Bunse geb. Schumacher, Wick

The invention relates to a peptide identical to human isocitrate dehydrogenase type 1 (IDH1) which can be used for diagnosis, vaccination and subsequent immunomonitoring of patients with various types of cancer containing an IDH1 R123H mutation.

http://www.dkfz.de/TechTrans/patentsearch_pdf//173703_DKFZ_P-987.pdf

Therapeutics

DKFZ-No. P-975

Evi/Gpr177 as target and marker in tumors

Inventors: Boutros, Augustin

DKFZ inventors identified the Wnt secretion protein Evi/Gpr177 as new target, which is strikingly upregulated during glioma tumorigenesis in a stage-independent way and which correlated with poor prognosis. Silencing of the Evi/Gpr177 protein significantly inhibited glioma cell proliferation and migration. Additionally an inhibitory antibody against Evi/Gpr177 was invented that significantly reduced Wnt Evi/Gpr177 gene response.

http://www.dkfz.de/TechTrans/patentsearch_pdf//155914_DKFZ_P-975.pdf

DKFZ-No. P-916

New Wnt Targeting and Apoptosis Inducing Lead-Compound for Cancer Treatment

Inventors: Boutros, Maskey, Koch, Fuchs, Steinbrink, Gilbert

The Wnt signaling pathway plays an important role in the regulation of cell proliferation and differentiation. Aberrant activation of the Wnt signaling pathway is known to promote uncontrolled cell growth and survival. Compound library screening and med-chem based structure activity improvement revealed potent Wnt signaling inhibitors that selectively affected carcinoma cell lines. In addition, further experiments proved these compounds to induce apoptosis.

http://www.dkfz.de/TechTrans/patentsearch_pdf//143778_DKFZ_P-916.pdf

Diagnostics

DKFZ-No. P-1371

Reliable noninvasive biomarkers for early detection of colorectal cancer

Inventors: Brenner, Chen

The invention offers a mixed protein and autoantibody set that can be used as a diagnostic tool for diagnosis, stratification and therapy monitoring of colorectal cancer patients.

http://www.dkfz.de/TechTrans/patentsearch_pdf//194276_DKFZ_P-1371.pdf

Diagnostics

DKFZ-No. P-1348

Prognostic methylation-based classifier for colorectal cancer (ProMCol)

Inventors: Burwinkel, Brenner, Gündert, Edelmann

Colorectal cancer (CRC) is the third most common cancer worldwide accounting for 1.36 million new cases annually. Harmful overtreatment of patients with colorectal cancer (CRC) due to imprecise prognosis prediction based on the traditional tumor, node, metastasis system highlights the need of additional prognostic markers. Our classifier (ProMCol) allows predicting disease specific survival of colorectal cancer patients. This can guide treatment decisions and therefore avoid unnecessary side effects associated with chemotherapy, if the survivability prediction is positive.

http://www.dkfz.de/TechTrans/patentsearch_pdf//204469_DKFZ_P-1348.pdf

DKFZ-No. P-1333

Mortality prediction through DNA methylation biomarkers

Inventors: Brenner, Zhang

Getting to know your chances of dying can be daunting but also can be rather useful and fascinating. The kit predicts all-cause mortality independent of underlying diseases or the 'epigenetic clock'. It has been validated through a 14 year long patient study.

http://www.dkfz.de/TechTrans/patentsearch_pdf//194633_DKFZ_P-1333.pdf

DKFZ-No. P-1214

Biomarker panel for diagnosing colorectal cancer

Inventors: Brenner, Chen

The invention offers a plasma protein biomarker set that can be used as a diagnostic tool for diagnosis and stratification of colorectal cancer.

http://www.dkfz.de/TechTrans/patentsearch_pdf//183491_179641_DKFZ_P-1214.pdf

DKFZ-No. P-1157

Plasma S100P and hyaluronic acid level as prognostic and treatment monitoring markers for metastatic breast cancer

Inventors: Burwinkel, Yang, Peng, Cike, Schneeweiss

The present invention comprises the use of two serum/plasma markers for stage discrimination and prediction of survival as well as treatment response in breast cancer patients. Test statistics show that these markers outperform established ones like the number of circulating tumor cells (CTCs).

http://www.dkfz.de/TechTrans/patentsearch_pdf//160487_DKFZ_P-1157.pdf

DKFZ-No. P-1137

MicroRNAs Modulating the Effect of Glucocorticoid Signaling

Inventors: Herzig, Berriel Diaz, de Guia

The invention describes a miRNA which interferes with glucocorticoid signalling and can therefore be used as a therapeutic target for e.g. diabetes-related metabolic disorders.

http://www.dkfz.de/TechTrans/patentsearch_pdf//156084_DKFZ_P-1137.pdf

DKFZ-No. P-1124

A double-labeled probe for molecular imaging

Inventors: Eder, Kopka, Schäfer, Bauder-Wuest, Haberkorn

The technology allows for direct and indirect detection of cancer tissue. It deals with a pharmaceutical compound consisting of three subdomains: (A) for specific cell surface binding to neoplastic cells, (B) for binding radiometals via a chelator domain for e.g. PET, and (C) harboring a fluorescent dye moiety for optical detection. The combination of PET tracer and optical moiety enables the surgeon to localize the tumor preoperatively via PET/CT and intraoperatively through optical detection.

http://www.dkfz.de/TechTrans/patentsearch_pdf//156398_DKFZ_P-1124.pdf

Diagnosics

DKFZ-No. P-1105

450K methylation arrays for classification of brain tumor types

Inventors: Pfister, Jones, Capper, von Deimling, Sill, Hovestadt, Schick, Bewerunge-Hudler

The method allows very consistent classification of tumor entities (especially brain tumor sub-types) by analyzing the methylation pattern of genome wide CpG positions.

http://www.dkfz.de/TechTrans/patentsearch_pdf//133833_DKFZ_P-1105.pdf

DKFZ-No. P-1012

Histone mutations as marker for Glioblastoma

Inventors: Lichter, Pfister, Witt, Jones, Sturm, Plass, Korshunov, Pfaff, Jabado

This technology was achieved by a cooperation between McGill University and DKFZ. Brain tumours, such as the highly aggressive glioblastoma multiforme (GBM), are currently the leading cause of cancer-related mortality and morbidity in children. Current diagnosis of brain cancers involve MRI, PET and CT scans, angiographies, followed by biopsies performed either during the resection of the tumor or as a separate procedure via a burr hole. A blood-based test would provide a more economical, i.e. accessible and less invasive diagnostic tool. The GBM specific biomarker has been patented and is available for licensing i.e. for companion diagnostics.

http://www.dkfz.de/TechTrans/patentsearch_pdf//155919_DKFZ_P-1012.pdf

DKFZ-No. P-977

Diagnosis of glioblastoma and acute myeloid leukaemia by (D)-2-hydroxyglutarate test

Inventors: von Deimling, Buckel, Balss, Pusch

Diagnosis and monitoring of IDH1/IDH2/IDH3 dependent diseases such as: Glioblastomas, astrocytoma, oligodendrogliomas, oligoastrocytoma, acute myeloid leukaemia (AML), chondrosarcoma, intrahepatic cholangiocarcinoma, angioimmunoblastic T cell lymphoma. The technology describes a patented test, which is a simple and robust enzymatic assay with a readout in 3 hours. The test is suitable for 96-/384-well format, less expensive/time-consuming and high-throughput possible in opposite to established GC-MS test.

http://www.dkfz.de/TechTrans/patentsearch_pdf//198530_DKFZ_P-977.pdf

DKFZ-No. P-938

High-throughput method for determining the presence of papillomavirus-neutralizing antibodies in a sample

Inventors: Müller, Pawlita, Rubio, Sehr

The invention is based on papillomavirus pseudovirions consisting of L1 and L2 proteins encapsulating Gaussia luciferase as a reporter system. Using HeLaT K4 cells as target cells the screen can be performed in a high-throughput format without the need of time consuming manual pipetting steps. The method is validated and can be used for clinical studies generating approval-relevant data. Technology opportunities are non-exclusive licensing or service.

http://www.dkfz.de/TechTrans/patentsearch_pdf//113522_DKFZ_P-938.pdf

DKFZ-No. P-897

Monoclonal Antibody against Neurofibromin: Diagnostic and Prognostic Marker for Glioma Treatment (N terminal antibody: mAb NF1-5.16)

Inventors: Moldenhauer, Scheffzek, Parret

Monoclonal Antibody against Neurofibromin as a diagnostic and prognostic Marker for Glioma Treatment. The proof of concept is established with Biopsy Material. The antibody is fast, reliable & ready to use.

http://www.dkfz.de/TechTrans/patentsearch_pdf//156427_DKFZ_P-897.pdf

DKFZ-No. P-760

An oligonucleotide mixture for improved detection of human papillomavirus genotypes

Inventors: Pawlita, Schmitt, Waterboer

“Ready to use kit” for simultaneous quantitative detection of up to 51 HPV genotypes. Kit contains internal quality and performance controls and allows identification of cervical abnormalities by predefined high viral load cutoffs.

http://www.dkfz.de/TechTrans/patentsearch_pdf//185314_DKFZ_P-760.pdf

DKFZ-No. P-1351

Non-Viral, Non-Integrating DNA Vectors for the Safe and Efficient Engineering of Primary Human Cells

Inventors: Harbottle, Bozza

This technology utilizes a novel DNA vector platform for the safe and efficient generation of genetically engineered cells. This DNA vector system contains no viral components and comprises only clinically approved sequences, which makes it ideal for applications for human therapy such as immuno- and stem-cell therapy.

http://www.dkfz.de/TechTrans/patentsearch_pdf//210486_P-1351.pdf

DKFZ-No. P-1295

Pipette device for delicate transfer of tissue in immunohistochemistry staining procedures

Inventors: Watanabe, Monyer

Staining of tissue is a standard method in biological laboratories, but also in clinical environment for diagnostics such as immunohistochemistry (IHC). After a certain incubation period the protocol often requires the transfer of the tissue into another staining chamber. This transfer is a critical step since the thickness of the paraffin embedded slices is smaller than 10 micrometers. As a technical solution a disposable pipette is engineered to have a hole at a specified spot for pressure regulation. This ensures that no under pressure occurs, which might be able to damage the tissue mechanically and/or inhibits the tissue from being sucked into the pipette.

http://www.dkfz.de/TechTrans/patentsearch_pdf//183492_182837_DKFZ_P-1295.pdf

DKFZ-No. P-1245

A unique inducible mouse model of hepatocellular carcinoma (HCC)

Inventors: Arnold

The mouse model faithfully mimics clinical conditions in HCC and allows evaluation of novel therapeutic strategies like immunotherapy or antiangiogenic therapy or vaccination. The tumor induction is tightly controlled by cre/loxP-system in a dose-dependent manner.

http://www.dkfz.de/TechTrans/patentsearch_pdf//131798_DKFZ_P-1245.pdf

Research Tools

DKFZ-No. P-1193

New Antibody against SUMO1 protein

Inventors: Melchior

The antibody of this invention is a mouse monoclonal antibody directed against SUMO176-86 recognizing SUMO1 of human, mouse, chicken and X. laevis. It is suitable for western blot and immune precipitation as well as for large-scale enrichment of SUMOylated species by IP / peptide elution.

http://www.dkfz.de/TechTrans/patentsearch_pdf//156092_DKFZ_P-1193.pdf

DKFZ-No. P-1168

Know-How: A natural rodent model system for papilloma-virus (PV) - induced cancer

Inventors: Rösl

The Mastomys mouse model is the only existing natural laboratory model to investigate PV pathogenesis and tumor development in the skin, ear, eye and tongue and could help to develop prophylactic or therapeutic approaches to prevent those lesions.

http://www.dkfz.de/TechTrans/patentsearch_pdf//106779_DKFZ_P-1168.pdf

DKFZ-No. P-1157

Plasma S100P and hyaluronic acid level as prognostic and treatment monitoring markers for metastatic breast cancer

Inventors: Burwinkel, Yang, Peng, Cike, Schneeweiss

The present invention comprises the use of two serum/plasma markers for stage discrimination and prediction of survival as well as treatment response in breast cancer patients. Test statistics show that these markers outperform established ones like the number of circulating tumor cells (CTCs).

http://www.dkfz.de/TechTrans/patentsearch_pdf//160487_DKFZ_P-1157.pdf

DKFZ-No. P-1148

A Fast and Cost-Efficient In Vivo Model to Investigate Tumor Metastasis

Inventors: Allgayer, Leupold

The invention discloses an improved version of the chorionallantic membrane, for accurate quantification of metastatic cells in different organs of the chicken embryo at a high sensitivity.

http://www.dkfz.de/TechTrans/patentsearch_pdf//156087_DKFZ_P-1148.pdf

DKFZ-No. P-1045

Cell line for screening demethylating agents using an endogenous epigenetically silenced reporter

Inventors: Schmidt, Oakes, Plass

The invention provides a cell based high-throughput screening system for agents that influence DNA methylation by determining the methylation status of an internal promoter.

http://www.dkfz.de/TechTrans/patentsearch_pdf//169655_DKFZ_P-1045.pdf

DKFZ-No. P-1007

Multiple orthogonal labelling of oligonucleotides

Inventors: Becker geb. Schoch, Jäschke, Samanta, Wießler

Labeled oligonucleotides are used in research and for diagnostic, therapeutic and industrial applications. Researchers from the DKFZ and the Heidelberg University developed a fast method for post-synthetic multiple orthogonal labeling of oligonucleotides by combining the inverse Diels-Alder reaction with the well-known copper-catalyzed azide-alkyne cycloaddition.

http://www.dkfz.de/TechTrans/patentsearch_pdf//155921_DKFZ_P-1007.pdf

Research Tools

DKFZ-No. P-938

High-throughput method for determining the presence of papillomavirus-neutralizing antibodies in a sample

Inventors: Müller, Pawlita, Rubio, Sehr

The invention is based on papillomavirus pseudovirions consisting of L1 and L2 proteins encapsulating Gaussia luciferase as a reporter system. Using HeLaT K4 cells as target cells the screen can be performed in a high-throughput format without the need of time consuming manual pipetting steps. The method is validated and can be used for clinical studies generating approval-relevant data. Technology opportunities are non-exclusive licensing or service.

http://www.dkfz.de/TechTrans/patentsearch_pdf//113522_DKFZ_P-938.pdf

DKFZ-No. P-876

Scaffold-based organotypic culture for the long-term cultivation of human epidermal stem cells

Inventors: Boukamp, Stark, Böhnke, Fusenig

The invention provides a long time culture model which can be used for the production of skin equivalents with a life span of at least 10 weeks.

http://www.dkfz.de/TechTrans/patentsearch_pdf//156076_DKFZ_P-876.pdf

DKFZ-No. P-870

Post-synthetic modification of nucleic acids by inverse Diels-Alder reaction

Inventors: Kliem, Wießler, Lorenz, Fleischhacker, Jäschke, Becker geb. Schoch

This invention provides a method for an easy, economical and reliable post-synthetic modification of nucleic acids. The key facts are:

- Variety of application: labelling, drug discovery, material studies, biomolecule research
- Attractive for conjugation of expensive and sensitive compounds
- Suitable for simple and complex molecules
- High yielding, easy to monitor, non-toxic reactions

http://www.dkfz.de/TechTrans/patentsearch_pdf//185597_DKFZ_P-870.pdf

Research Tools

DKFZ-No. P-687

Versatile method to link diagnostics and/or therapeutics to biomolecules

Inventors: Wießler, Müller, Kliem, Lorenz, Fleischhacker

The site-directed modification of e.g. biomolecules is often time consuming and laborious. This invention provides a high yielding and highly specific method to link nearly any molecule to nearly any other molecule. The "Click reaction" used is the well known Diels-Alder reaction with inverse electron demand. In this fast reaction an appropriate, easily functionalized dien (e.g. Tetrazin) is reacted with an appropriate functionalized dienophil (e.g. Olefin) to yield the conjugate. The release of nitrogen makes the reaction irreversible. No side reactions occur. Further the Intellectual Property covers specific information regarding the ligation of a diagnostic marker AND a therapeutic agent AND a biomolecule. Convincing synthetic data are available for the ligation of peptide with peptide, peptide with marker molecule, peptide with therapeutic agent, peptide with oligo nucleotide, dendritic structure and specific surface modification by means of this technology.

http://www.dkfz.de/TechTrans/patentsearch_pdf//155922_DKFZ_P-687.pdf

Vaccines

DKFZ-No. P-1382

Combined prophylactic and therapeutic Vaccines of HPV

Inventors: Müller, Zhao, Ottonello

Cervical cancer is women's second most frequent cancer worldwide. Clinical and molecular studies have shown that certain types of HPV, referred to as high-risk types, are the etiological agents of this disease. Two anti-HPV vaccines for the prophylaxis of cervical cancer have been licensed recently by Merck (GardasilTM) and GlaxoSmithKline (CervarixTM). Both vaccines rely on the major capsid protein L1 in the form of virus-like particles (VLPs) as antigen; they protect against the HPV types from which the L1-VLPs were derived, yet are largely ineffective against all but the most closely related HPV types.

WE developed a vaccine which is composed of an immunogenic polypeptide comprising (i) a B-cell epitope of HPV, (ii) a T-cell epitope of HPV, and (iii) the scaffold polypeptide thioredoxine. The vaccine can be used in prophylactic and therapeutic ap-proaches against infections with human papillomaviruses.

http://www.dkfz.de/TechTrans/patentsearch_pdf//207673_DKFZ_P-1382.pdf

Vaccines

DKFZ-No. P-1358

Cutaneous human Papilloma Virus Vaccine

Inventors: Müller, Ottonello, Bolchi, Mariz, Balz, Zhao

Infections with human papillomavirus (HPV) are a worldwide health challenge, particularly in resource-limited regions. HPV-related diseases are pre-malignancies or overt malignancies of the skin and mucosal surfaces and are an important personal and public health problem causing physical, mental, sexual and financial detriments. The World Health Organization estimates that there are approximately 14 million new HPV infections each year. We have developed an immunogenic polypeptide comprising a multitude of papilloma-virus (PV) L2 N-terminal peptides to protect against most cutaneous HPV types.

http://www.dkfz.de/TechTrans/patentsearch_pdf//207674_DKFZ_P-1358.pdf

DKFZ-No. P-1309

Improved EBV Vaccine: BNRF1 inducing chromosomal instability

Inventors: Delecluse, Tsai, Shumilov

This invention provides a safe Epstein-Barr Virus vaccine, which does not introduce chromosomal instabilities associated with cancer development.

http://www.dkfz.de/TechTrans/patentsearch_pdf//221823_DKFZ_P-1309.pdf

DKFZ-No. P-989

Promising effective and safe Epstein-Barr virus (EBV) vaccine based on VLPs

Inventors: Delecluse, Feederle, Hundt geb. Pavlova

Virus-like particles (VLPs) of EBV, completely devoid of viral DNA, for the prevention of infectious mononucleosis (IM) and EBV-associated diseases like lymphomas often developed in patients with immunosuppression.

http://www.dkfz.de/TechTrans/patentsearch_pdf//221825_DKFZ_P-989_Delecluse.pdf

Vaccines

DKFZ-No. P-938

High-throughput method for determining the presence of papillomavirus-neutralizing antibodies in a sample

Inventors: Müller, Pawlita, Rubio, Sehr

The invention is based on papillomavirus pseudovirions consisting of L1 and L2 proteins encapsulating Gaussia luciferase as a reporter system. Using HeLaT K4 cells as target cells the screen can be performed in a high-throughput format without the need of time consuming manual pipetting steps. The method is validated and can be used for clinical studies generating approval-relevant data. Technology opportunities are non-exclusive licensing or service.

http://www.dkfz.de/TechTrans/patentsearch_pdf//113522_DKFZ_P-938.pdf

DKFZ-No. P-824

Presentation of HPV L2 Epitopes by using thioredoxin scaffold

Inventors: Rubio, Müller, Tommasino, Ottonello, Bolchi

The current invention provides a prophylactic HPV vaccine. Immunization against peptides from the HPV L2 protein gives a robust immune reaction that provides cross-protection against a variety of other high-risk HPV strains. The vaccine is based on a thioredoxin-L2 construct and can be produced in standard E. coli bacteria, which makes a cost-effective production feasible.

http://www.dkfz.de/TechTrans/patentsearch_pdf//104832_DKFZ_P-824.pdf

DKFZ-No. P-1375

Deep Scatter Estimation in Positron Emission Tomography and other modalities

Inventors: Kachelrieß, Berker

This invention is based on the assumption that large-angle, low-energy scatter (which is usually discarded) contains useful information about low-angle, high-energy scatter (which shall be estimated) that can be leveraged by machine learning. The invention therefore uses energy measurements to discern measured photons by energy bin. Multiple raw-data images can be formed from raw data acquired in multiple energy bins, and used for machine-learning approaches such as convolutional neural networks.

http://www.dkfz.de/TechTrans/patentsearch_pdf//218665_DKFZ_P-1375.pdf

DKFZ-No. P-1295

Pipette device for delicate transfer of tissue in immunohistochemistry staining procedures

Inventors: Watanabe, Monyer

Staining of tissue is a standard method in biological laboratories, but also in clinical environment for diagnostics such as immunohistochemistry (IHC). After a certain incubation period the protocol often requires the transfer of the tissue into another staining chamber. This transfer is a critical step since the thickness of the paraffin embedded slices is smaller than 10 micrometers. As a technical solution a disposable pipette is engineered to have a hole at a specified spot for pressure regulation. This ensures that no under pressure occurs, which might be able to damage the tissue mechanically and/or inhibits the tissue from being sucked into the pipette.

http://www.dkfz.de/TechTrans/patentsearch_pdf//183492_182837_DKFZ_P-1295.pdf

DKFZ-No. P-1284

Machine learning-based quantitative photoacoustic tomography

Inventors: Maier-Hein, Kirchner, Gröhl

The proprietary technology includes a method, a computer program and an apparatus for estimating an optical property of a tissue from a photoacoustic image in a fast, simple and accurate manner allowing real-time, in vivo application. Specifying the optical properties of a tissue is vital for interpreting diagnostic measurements, designing devices and planning therapeutic protocols (e.g. photodynamic therapy).

http://www.dkfz.de/TechTrans/patentsearch_pdf//217810_DKFZ_P-1284.pdf

DKFZ-No. P-1254

System for fluorescence-guided surgery

Inventors: Maier-Hein, Stenau geb. Wild, Teber

The technology enables the surgeon to place and navigate e.g. a laparoscope, within an organ in an extremely precise, safe, and reliable manner.

http://www.dkfz.de/TechTrans/patentsearch_pdf//162233_DKFZ_P-1254.pdf

DKFZ-No. P-1216

Actively switched beam splitter

Inventors: Engelhardt

DKFZ researchers developed an actively switched beam splitter based on polarizing beam splitters in combination with a Pockels cell which can be used for all fluorescent microscopes using pulsed excitation light.

http://www.dkfz.de/TechTrans/patentsearch_pdf//179640_DKFZ_P-1216.pdf

Devices

DKFZ-No. P-1170

Device for sample purification by paramagnetic beads

Inventors: Wilkening

The invention discloses a device that enables bead purification and mixing of the sample without the need for moving the reaction plate from one deck position to the other and hence saving time and deck space.

http://www.dkfz.de/TechTrans/patentsearch_pdf//160483_DKFZ_P-1170.pdf

DKFZ-No. P-1044

New MLC generation for radiotherapy: drive concept leaves by using linear servo motor

Inventors: Seeber, Schewiola

The aim of radiation therapy is to eradicate a tumor without causing significant damage to contiguous normal tissue. For precise field shaping of the radiation beam multileaf collimators (MLC) have been broadly established. The linear servo MLC presented here provides various advantages over conventionally employed MLCs like reduced size and weight, dynamic leaf movements up to 4 m/s, direct fixation of the linear servo rod to the associated leaf and position sensors are implemented in the linear drives.

http://www.dkfz.de/TechTrans/patentsearch_pdf//217851_DKFZ_P-1044.pdf

DKFZ-No. P-1010

4Pi STED Fluorescence Light Microscope with high three-Dimensional Spatial Resolution

Inventors: Engelhardt

The here presented technology provides an apparatus for 4Pi STED which allows to generate a three-dimensional light intensity distribution comprising a very steep light intensity gradient between the areas of minimum and maximum light intensity.

http://www.dkfz.de/TechTrans/patentsearch_pdf//213294_DKFZ_P-1010.pdf

DKFZ-No. P-996

Control of radiation therapy devices via PLC technology

Inventors: Schewiola, Seeber

Synchronization and control of linear accelerator, multi-leaf collimator, gantry system, patient support system and x-ray beam generation system at the same time is difficult to establish, particularly with hard real-time requirements. The presented technology comprises a control unit consisting of standardized programmable logic controllers for real-time operation of all subsystems of a radiation therapy device. Thus, the technology allows precise and dynamic patient treatment with high time resolution.

http://www.dkfz.de/TechTrans/patentsearch_pdf//155926_DKFZ_P-996.pdf

DKFZ-No. P-991

Measurement of protein mobility and interactions in living cells by 3PEA

Inventors: Erdel, Rippe

Several limitations restrict conventional Fluorescence recovery after photobleaching (FRAP) application. Examples are: 1) Low temporal resolution, which prohibits measurements of faster processes 2) FRAP evaluation schemes cannot include spatial constraints imposed by the cellular environment on protein mobility 3) FRAP ignores the sequential nature of the bleaching and image acquisition process. In order to overcome these limitations of conventional FRAP DKFZ researchers developed a novel FRAP based method called 3PEA (Pixel-wise Photobleaching Profile Evolution Analysis). The advantages of 3PEA are e.g.: accurate mobility measurements of fast, slow, and immobile proteins and fast determination of effective diffusion coefficients. The presented technology is thought to be suitable for use in all confocal laser scanning microscopes (no additional hardware is needed) and would allow automated high throughput FRAP experiments.

http://www.dkfz.de/TechTrans/patentsearch_pdf//155927_DKFZ_P-991.pdf

DKFZ-No. P-973

Piezo elements as driving units for leafs of multi-leaf collimators (MLC)

Inventors: Echner, Seeber, Schewiola

Currently, multi leaf collimators (MLC) are established and state of the art in numerous devices for radiotherapy used for cancer treatment. However, the established MLC comprising 80 and more leafs require an enormous space at the level of the leaves for corresponding drive and controlling elements if realized with normal electric motors. Since space is very limited within the head of linear accelerators the invention proposes a new small and convenient driving/controlling device based on piezoelectricity, which is directly coupled to the leaves and their driving rods.

http://www.dkfz.de/TechTrans/patentsearch_pdf//155928_DKFZ_P-973.pdf

DKFZ-No. P-952

Mobile On-patient visualization device of medical images

Inventors: Maier-Hein, Meinzer, Fangerau, Seitel

We developed a new concept for on-patient visualization of anatomical data acquired with an arbitrary modality (typically CT or MRI). The method is based on a mobile device consisting of a flat display and a Time-of-Flight (ToF) camera which can be moved along the patient to provide a view on internal anatomical structures via augmented reality. For this purpose, the pose of the mobile device, which represents the viewing direction of the user, is continuously estimated by registering (i.e., aligning) the ToF data acquired during the visualization process with the patient surface extracted from the 3D medical data set. During camera pose estimation, a custom-designed algorithm accounts for the camera specific localization errors.

http://www.dkfz.de/TechTrans/patentsearch_pdf//179631_DKFZ_P-952.pdf

DKFZ-No. P-901

Compact Multileaf-Collimator with small diameter

Inventors: Echner

Currently, Multileaf Collimators (MLC) are established and state of the art in numerous devices for radiotherapy used for cancer treatment. However, the established MLC comprising 80 and more leafs require an enormous space at the level of the leaves together with corresponding drive elements and position measuring/ acquisition. Since space is very limited within the head of linear accelerators DKFZ developed a smaller sized Compact MLC, which prototype was tested successfully.

http://www.dkfz.de/TechTrans/patentsearch_pdf//155931_DKFZ_P-901.pdf

DKFZ-No. P-899

Localization Light Emitting Molecules of Unknown Orientation

Inventors: Engelhardt, Hell, Keller

Many light emitting entities routinely used, in cell biological settings show a dipole orientation. If the exact z position of the light emitting entity is unknown, using simple two-dimensional Gaussian fit algorithms to the light intensity distribution of a range of emitted light, may lead to calculation errors of the x- and y-position of several 10nm. The invention discloses a method for calculation of the exact spatial position and orientation of a light emitting in a sample.

http://www.dkfz.de/TechTrans/patentsearch_pdf//155932_DKFZ_P-899.pdf

DKFZ-No. P-876

Scaffold-based organotypic culture for the long-term cultivation of human epidermal stem cells

Inventors: Boukamp, Stark, Böhnke, Fusenig

The invention provides a long time culture model which can be used for the production of skin equivalents with a life span of at least 10 weeks.

http://www.dkfz.de/TechTrans/patentsearch_pdf//156076_DKFZ_P-876.pdf

Devices

DKFZ-No. P-806

Manufacturing patient mask for positioning patients in radiotherapy by rapid prototyping

Inventors: Giesel, Zechmann, von Tengg-Kobligk, Münter, Neumann, Debus

Radiotherapy is a well-established method to treat certain tumor types in particular brain tumors. For fixation of the patient's head a "mask" is used, with is connected to the plate where the patient is located on. The novel technology describes a non-invasive procedure, where the patient mask is produced by rapid prototyping based on CT/MR data.

http://www.dkfz.de/TechTrans/patentsearch_pdf//155941_DKFZ_P-806.pdf

DKFZ-No. P-750

Quadscanner for High Resolution Microscopy

Inventors: Engelhardt

Quadscanner for High Resolution Scanning Microscopes and Array Readers. The key facts are: (1) Fast, adaptive optical scanning device; (2) Completely free positioning of the scanning mirrors regarding the conjugated back focal plane; (3) Calibration with 4 galvanometers; (4) Application in high resolution microscopes (fluorescence, Raman, STED, localization), but also in Array Readers.

http://www.dkfz.de/TechTrans/patentsearch_pdf//179601_DKFZ_P-750.pdf

DKFZ-No. P-743

Stabilisation of images in microscopy

Inventors: Engelhardt

The technology specifies a novel device which allows to stabilize images of optical microscopes with high resolutions against externally induced oscillations and drift effects. In particular for optical microscopes, which achieve a higher resolution, it is important to ensure a high mechanical stability of the structure of microscope for a good image quality. It improves the performance of instruments such as laser scanners, fluorescence microscopes, Raman systems, STED- or localization-microscopes.

http://www.dkfz.de/TechTrans/patentsearch_pdf//179598_DKFZ_P-743.pdf

DKFZ-No. P-734

Optical Tomography (OT) and MR combination for dual-modality imaging

Inventors: Peter, Bock, Umatham

Optical techniques, such as bioluminescence and fluorescence, are emerging as powerful new modalities for molecular imaging in disease and therapy. Combining innovative molecular biology and chemistry, researchers have developed optical methods for imaging a variety of cellular and molecular processes in vivo, including protein interactions, protein degradation, and protease activity. DKFZ developed an optical imaging detector regarding fluorescence and bioluminescence for small animal imaging, which is compatible for magnetic resonance imaging (MRI). This technology provides the possibility to study simultaneously tracer/marker kinetics of optical (OT) as well as NMR induced signals.

http://www.dkfz.de/TechTrans/patentsearch_pdf//179597_DKFZ_P-734.pdf

DKFZ-No. P-706

Optical Tomography (OT) for multi-modality imaging

Inventors: Schulz, Peter, Unholtz

DKFZ developed an optical imaging detector (25 mm x 100 mm photon sensor) for fluorescence and bioluminescence in small animal imaging, which is compatible for magnetic resonance imaging (MRI), computer tomography (CT), positron electron tomography (PET) and Single-photon emission computed tomography (SPECT). The instrument has been evaluated regarding its optical performance including radiation durability using various phantoms and measurement setups and was successfully used in a number of preclinical studies such as simultaneous positron (¹⁸F-FDG, ⁶⁸Ga-RGD) - bioluminescence (PC-3-hVEGF-Luc) imaging of reporter gene expression and receptor targeting in mice or simultaneous imaging of fluorescent XenoLight-RediJect-2-DG-750 and radiolabeled FDG probes.

http://www.dkfz.de/TechTrans/patentsearch_pdf//179595_DKFZ_P-706.pdf

Devices

DKFZ-No. P-655

Optical Tomography (OT) and PET combination for dual-modality imaging

Inventors: Peter, Schulz

DKFZ developed an optical imaging detector for fluorescence and bioluminescence in small animal imaging, which is compatible for positron electron tomography (PET). Compatibility of light detection with PET has been accomplished by developing an optical detector that consists of a 25 mm x 100 mm photon sensor (liquid cooled) for light detection, a microlens array for field-of-view definition, a septum masks for cross-talk suppression, and a transferable filter for wavelength selection.

http://www.dkfz.de/TechTrans/patentsearch_pdf//179331_DKFZ_P-655.pdf

Software

DKFZ-No. P-1375

Deep Scatter Estimation in Positron Emission Tomography and other modalities

Inventors: Kachelrieß, Berker

This invention is based on the assumption that large-angle, low-energy scatter (which is usually discarded) contains useful information about low-angle, high-energy scatter (which shall be estimated) that can be leveraged by machine learning. The invention therefore uses energy measurements to discern measured photons by energy bin. Multiple raw-data images can be formed from raw data acquired in multiple energy bins, and used for machine-learning approaches such as convolutional neural networks.

http://www.dkfz.de/TechTrans/patentsearch_pdf//218665_DKFZ_P-1375.pdf

DKFZ-No. P-1284

Machine learning-based quantitative photoacoustic tomography

Inventors: Maier-Hein, Kirchner, Gröhl

The proprietary technology includes a method, a computer program and an apparatus for estimating an optical property of a tissue from a photoacoustic image in a fast, simple and accurate manner allowing real-time, in vivo application. Specifying the optical properties of a tissue is vital for interpreting diagnostic measurements, designing devices and planning therapeutic protocols (e.g. photodynamic therapy).

http://www.dkfz.de/TechTrans/patentsearch_pdf//217810_DKFZ_P-1284.pdf

DKFZ-No. P-991

Measurement of protein mobility and interactions in living cells by 3PEA

Inventors: Erdel, Rippe

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DKFZ-No. P-952

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http://www.dkfz.de/TechTrans/patentsearch_pdf//179631_DKFZ_P-952.pdf

DKFZ-No. P-806

Manufacturing patient mask for positioning patients in radiotherapy by rapid prototyping

Inventors: Giesel, Zechmann, von Tengg-Kobligk, Münter, Neumann, Debus

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