Name of Beneficiary Organization Title	Name of the Service Provider Organisation Title	Application name	Project Summary
Techinnova S.r.l.	CE Advice Sagl, AnotheReality S.r.l.	MED3D	The world of 3D printing evolves with geometric projections, especially in particular areas such as medicine. The MED3D project intends to strengthen the health sector's confidence in these new technologies to accelerate research, development and adoption of these technologies in order to provide better assistance to patient's need.
BioKryo GmbH	Kairos GmbH	Digitalization of a GMP Biobank Process	BioKryo GmbH is a GMP biobank that stores samples at the following storage temperatures: 4˚C, -20˚C, -80˚C, -150˚C and -196˚C in LIN, until the later use by the owner of the samples in the field of personalized medicine. With its service "HyperPara", BioKryo developed and implemented a biotechnological process to cryopreserve parathyroid glands for a later autologous transplantation. As a young and fast growing biobank, BioKryo is now facing the challenge of managing the quickly increasing amounts of samples and rising numbers of GMP-customers on the one hand, and implementing stringent GMP standards on the other. To cope with the increasing workload and still provide high quality services in accordance to international standards, BioKryo needs to implement an IT-system for biobanking that can be validated. To further convince future customers who produce biopharmaceutical products to store their samples at the BioKryo biobank, it is essential to maintain a service in accordance with the denoted standards, providing high quality storage, shipment, documentation and complete traceability for each sample. To reduce redundant and failure prone data entry (e.g. identical order number on each form of one process), to generate legible and durable documents and to provide a system that supports each work step by digitally managing the workflow, the implied IT-system will help the BioKryo staff by connecting sample/customer data to process data.

MITS GmbH	GMProcess GmbH	Mobile Integrity Test System	The last 10 years has seen a surge in the use of single-use and disposable systems for the production of biopharmaceuticals, initially in early stage products but increasingly in commercial products. Stainless steel production floors get more and more replaced by concepts, where the process liquid is only in contact with a single use bag that gets disposed after use. No cleaning and sterilization is needed any more and CAPEX goes down dramatically. A major concern is the integrity of these single use bags when it comes to transportation and storage application of bulk vaccines, monoclonal antibodies or high value intermediate products in the downstream part of the process. At the Downstream part – the final steps in the manufacturing process – the biopharmaceutical is very concentrated, pure and high valued, e.g. -Dupixent from Sanofi -Ocrevus from Roche -Olumiant from Eli Lilly -And many more But for now, there is no product on the market that is able to fulfill the market driven needs when it comes to leak size, capability to test the fully assembled end-product (single use bag with all assemblies), usability in the cleanroom and cGMP compliant integration into the IT network of the Biopharmaceutical Company. As Life Science SME we are going to close this gap with MITS which is going to result in reducing the loss/failure rate for biopharmaceutical companies and at the same time increasing patient safety!

Cevec Pharmaceuticals GmbH	GoSilico GmbH	VLP purification using modelling approaches	Virus-like particles (VLPs) are formed by recombinant expression of viral proteins. VLP vaccines trigger an effective immune response, mimicking the native virus structure. As VLPs do not contain viral genomes, they are non-infectious, reducing biosafety concerns in production and clinics. VLPs are not only used to fight viruses but also for the development of preventive and therapeutic cancer vaccines, e.g. VLPs presenting tumor-specific proteins and thereby provoking an immune response against the tumor. These personalized cancer vaccines require an fast, efficient, and safe production of VLPs. Suspension cell culture is the method of choice for large scale VLP production. The development of a purification process for VLPs from cell culture supernatant is a very time consuming task. Usually, a gradual optimization of chromatographic steps based on experimental results is carried out. Small changes on the surface of the VLP as needed for personalized drugs lead to a complete re-development of the purification process. Suboptimal process performance can even jeopardize the economic viability. Cevec and GoSilico will pursue a new innovative approach for the purification of VLPs. Based on a limited set of experiments, the chromatographic steps will be modelled in silico. The model will be used to optimize the process regarding time, yield, and purity of the VLP. This modelling approach will speed up the purification process development for upcoming analogous VLP projects.
Norgenotech AS	Robimo GmbH, CoLabGene s.r.o.	Deep learning for rapid and accurate diagnostics of DNA damage in individual cells	In this project biopharma SME NorGenoTech (NGT) teams up with two IT SMEs, Robimo (RB) and CoLabGen (CLG) to develop and implement a novel algorithm addressing an urgent need for fast and efficient classification of DNA damage in cells. Rapid development of personalised medicine requires creating tools for diagnostics, prediction, monitoring and assessment of therapeutic response, which will have a significant impact on clinical decisions and health outcomes. NGT creates a platform for detection of individual levels of DNA damage, oxidation and repair capacity - fundamental health indicators relevant to cancer and other diseases. The platform is based on the achievements from the EC project Comics (LSHB-CT-2006-037575, coordinated by Prof Collins) in making improved high throughput methods for analysis of DNA damage. With increased throughput the technology allows running hundreds of samples a day, however image classification and analysis remains a serious bottle neck: existing software programs are based on the principles developed over 15 years ago and do not cope efficiently with large and complex data generated by the technology. We will provide a novel machine-learning based method for fast and simple analysis of DNA damage in individual cells, thereby increasing the turnover of the existing assay at least 10-fold. The project addresses the challenges within the areas of personalised medical diagnostics and safety assessment of novel chemicals and drugs.

bioMcon GmbH	Inova DE, GmbH	AutoMax User Interface	With the rise of targeted drugs in oncology, pathology institutions are facing novel challenges: targeted drugs require specific aberrations of cancer-cells and new diagnostic methods to identify eligible tumors. Image-based molecular pathology extracts and quantifies specific features from these images, as to define which biomarkers have positive detection and consequently aid the treatment decision. With the wide scope of new targeted drugs, the importance of this work drastically increased over the last decade. Typically it is carried out by viewing on a microscope with manual steps for documenting the obtained quantifications – a tedious and failure-prone process. AutoMax: The software employs newly developed advanced image analysis tools for automating the extraction and quantification part. It runs on standard hardware and needs only regular color photos for valid results. There is no need for special hardware, and can thus fit to every pathology lab configuration. It represents a valuable support tool for the responsible pathologist, as it is tuned to effectively assist with this task. AMUI: AutoMax User Interface aims to integrate AutoMax into the pathologist's workflow. It compiles images for uploading and processing, and helps in inspecting the output and in documenting the medical decision. AMUI + AutoMax make advanced image analysis operable for every pathology lab. This will reduce the workload of pathologists and improve the consistency and precision of results.
RMB-Research GmbH	SCARLETRED Holding GmbH	STATMICOLL - Objective and standardized digital clinical scoring of Diabetic Wound Ulcer by Scarletred® skin image analysis technology	Chronic, non-healing wounds like diabetic foot ulcer, venous ulcer, and pressure ulcer represent a major global medical, social, and economic problem. In developed countries, it has been estimated that 1 to 2% of the population will experience a chronic wound during their lifetime. The associated costs account for up to 4% of total health care expenses and the burden is rapidly growing due to an aging population, a sharp rise in the incidence of diabetes and obesity as well as an increasingly sedentary lifestyle. Despite of the high medical need, there is currently no satisfying therapy available for the treatment of chronic ulcers. On the other side the assessment of wound size and visual inspection for signs of infection, necrosis, and erythema are key features in wound classification, guiding the further evaluation and treatment and also provide the basis for assessing the efficacy of a therapy. However the clinical practice of measuring wounds is not standardized and involves a high level of subjectivity, which impacts negatively on data quality, clinical research time and cost. Our innovative project targets on solving both, the therapeutic problem and the lack in clinically validated technology by integrating the CE medical device skin imaging device SCARLETRED®Vision in RMB's trials. This will allow testing safety and efficacy of STATMICOLL, a first-in-class biopharmaceutical capable of activating endogenous wound healing and bacterial clearance mechanism.

Universal Diagnostics SL	Diseño Web Freelancer	Biostatistical Continuous Integration Tool	Main challenges in the early detection of colorectal cancer (CRC) through metabolomics and the continuous improvement of these techniques are linked to the quality of raw data, protocols applied and above all digitalization processes. This can be improved through Information Technologies (IT). IT solutions not only help standardize data and automatize processes, they also guarantee robust and safe information, which is fundamental for a more accurate diagnosis. In this context, Universal Diagnostics (UDX), a bio-medicine start-up focused on metabolomics for early detection of CRC via blood test, has identified a series of challenges (data standardization, modelling and management) that can be overcome with BiosCIT, an IT solution that will increase UDX's R&I technological performance. Firstly, by implementing a platform based on continuous integration techniques to efficiently automate the analysis flow in the field of metabolomics for early cancer detection. While state-of-the-art solutions are focused on laboratory management or data analysis, BiosCIT will include study/experiment management, interpretation of results and detection of potential deviations. Secondly, by providing a friendly-tool for end users (researchers, physicians, statisticians and technicians) offering standardized, reliable, up-to-date, and accessible information. BiosCIT will address the challenge of tedious maintenance of traceability of data from the past to the future and vice versa.
Arctic Pharma AS	CSBJ Consultancy	Computational Chemical Biology approaches for the development of targeted therapy for triple negative Breast Cancer	Cancer is a major global burden that in 2015 claimed the lives of 8.8 million people as stated by the World Health Organization. In women, breast cancer is the most common cancer type with an estimate of 571,000 deaths per year. An especially aggressive form that is prone to metastasize, reoccur and has limited treatment options is triple negative breast cancer. This phenotype lacks the three most common biomarkers, which are hormone and growth factor receptors, and is therefore not treatable with for example established hormone therapies. This leaves chemotherapy, surgery and radiation as only treatment options. Chemotherapy using cytotoxic drugs is non-specific and affects all dividing cells leading to severe side effects. Together with the Computational Chemical Biology expertise at CSBJ Consultancy, Arctic Pharma would like to directly target key enzymes that are upregulated in cancer cell metabolism with inhibitors that will be designed based on the results of this project utilizing the high-throughput virtual screening tools and molecular modeling predictions. This will enable us to develop new pharmaceuticals to combat cancer that exhibit fewer side effects.

Avergen Pharmaceuticals GmbH	BioSolveIT	Automated Linker Selection for a Protein-Protein Interaction Inhibitor Drug Discovery Platform	For most cancers, there has been no or only small progress in improving survival rates. For example, patients with metastatic pancreas cancer have an abysmal 2% 5-year survival rate! Thus, the medical need for effective therapies is immense. At the same time, it takes 10-20 years until a compound is developed and gets market approval! One of the most promising cancer drug target class are intracellular protein-protein interactions (PPI). There are dozens of PPI cancer targets already known and validated in animal models. But the vast majority of these PPI cancer targets cannot be addressed with classical small molecules as most PPI have flat and large surfaces. We are using a propriety technology to screen fragments for PPI target surfaces to identify effective inhibitors of PPI. The Software of BioSolveIT enables us to identify linkers for our fragments. We want to customize the software for drug screening software of BioSolveIT and thus improve our drug discovery process considerably. In a nutshell, the Permides grant would improve our chances
Biocrates Life Sciences AG	Evaluation Software Development	Metabolic Pathway Analysis	In the field of metabolic phenotyping (metabolomics) Metabolic Pathway Analysis becomes more and more important to assess the metabolic changes in context of biological processes which are altered in complex diseases. It is important for biomarker discovery to identify which and to understand why biomarker metabolite signatures are significantly different between disease and healthy cohorts and to investigate commonalities between the diseases (e.g. the role of insulin resistance in metabolic disorders like diabetes, in cardiovascular diseases like heart failure or in neurological diseases like Alzheimer's disease). The complexity of data generated with metabolomics techniques and the elaborate analysis, interpretation and visualization thereof are so far major hurdles for this discipline. Combining the standardized chemical analysis in kit format with an easy-to-use software solution for data interpretation will overcome these hurdles and then enable scientists to include the uprising and very promising field of metabolomics in their research projects. Therefore the goal of this project is to develop a Metabolic Pathway Analysis tool for the BIOCRATES kit software MetIDQ™. This enables kit users to conduct a Metabolic Pathway Analysis within minutes, revealing deeper insights into the biology and metabolic network of complex diseases.

Icosagen Cell Factory OÜ	Quretec OÜ	Development of antibody humanization platform	Icosagen Cell Factory (ICF) is a biopharma company (service provider) that develops personalized medicine treatments for cancer. To produce antibodies for preclinical experiments, ICF uses proprietary HybriFree (antibody development) and QMCF technologies (antibody production in chicken, mouse, and rabbit cell systems). The company is currently finalizing the development of IcoCell technology for the development of cell lines for production of antibodies for human trials. These 3 technologies significantly reduce the cost of therapeutic antibody development. However, ICF currently does not have an antibody humanization platform, which is the missing link between pre-clinical and clinical stage of development. This gap in the value proposition causes us revenue loss and acts as a barrier to the commercialization of our proprietary technologies. In the proposed project, we involve the expertise of IT company Quretec to develop a proprietary software for humanization of non-human antibodies derived from animal sources such as mouse, rabbit, and chicken. This platform would significantly contribute to the development of antibodies, which take into account the peculiarity of the patient and therefore provide maximum therapeutic effect. The newly developed humanization platform will be added to our service offering immediately after the project conclusion.
Protobios	BioVariance GmbH	Immunoprofiling-based analysis platform for biomarker discovery and identification	Chronic diseases (cancer, cardiovascular and mental diseases) are the leading causes of illness and death. Disease rate from these conditions is accelerating globally across all socioeconomic classes. By 2020 their contribution is expected to rise to 73 % of all deaths (of which nearly half as premature) and 60 % of the global burden of disease. To radically reduce the related healthcare spending and contribute to healthy aging, it is important to diagnose these diseases as early and accurately as possible. Current analytical platforms and computational tools lag far behind the amounts of information/data that need to be analyzed for discovering new biomarkers . As a result, the number of biomarkers approved by the EU and US regulatory bodies is modest: less than 30 in the most recent published compilation. Current routine diagnostic tests measure only against a limited number of biomarkers and thus provide a very limited overview of the patient's health status. Immunoprofiling supported by integrated ICT platform (BioCODEHealth) has the potential to transform the course of medicine – it can be used to develop new clinical diagnostics and

Astro-Pharma	Management Partners business solution gmbh	Simplified documentation and reporting of possible side-effects by patients	The pharmaceutical market is huge and competitive. As patients may become uncomfortable with new drugs, direct reporting of possible side-effects to their physicians is desirable and may increase patients' confidence in new medications. Also reporting of side-effects to authorities is generally low in Austria. In this joint project between a biopharma SME and an IT-SME reporting of possible side-effects will be simplified by a new webbased IT solution to be used on patients' mobiles, tablets and/or computers: The biopharma SME will receive a customized IT solution for documentation and reporting of possible side-effects to the physicians, adapted for the SME's biopharmaceutical product. The patient's report will be then attached to the pre-existing documentation of the physician available in the existing SolutionX software platform (beta version in clinical use) to allow informed and rapid decision-making by the physician. Data safety and regulatory affairs are managed within the SolutionX project. Taken together, this new tool will allow documentation and reporting of possible side-effects for informed and rapid evaluation by physicians thus increasing patients' trust in the safety of new medications. This innovative tool will provide an additional argument for a new medication in the specific competitive situation of the pharmaceutical market.
INOVOTION	AGILAB	In Ovo Test Controller	Inovotion is a biotech company that commercializes a unique new approach to toxicity and efficacy evaluation of anti-cancer drugs, using chick embryos instead of lab mice. Our technology is 2-3 times faster, 5-8 times less expensive, and does not involve animal testing. Based on this revolutionary new technology (already used by Inovotion for Drug Discovery), we are developing an innovative PERSONALIZED MEDICINE test to evaluate the available anticancer therapies for each specific patient in parallel, based on the patient’s tumor biopsy. This was not possible previously, because mouse tests are too slow to be compatible with clinical requirements. The low-level lab processes for implementing the technology are being fully automated: soon, anticancer centers will be able to use our assays to identify the best anticancer treatment quickly and efficiently. This is a ground-breaking new technology for greatly improving patient care and increasing survivability rates. However, this low-level automation will need to be integrated into a higher-level system ensuring: •Test mgt: high-level control depending on on-going results •Data processing: integrate external data, archival, easy retrieval, preparation for the experts’ analysis, report production, large-scale data sharing AgiLab has been selected for implementing the higher-level system, because it has the right competencies and technological / cultural fit for establishing a long-term working relationship with Inovotion.

Misvik biology Oy	DoubleStrand Bioinformatics	SmartTrials –drug resistance and sensitivity screening for personalized cancer therapy	Misvik Biology has over the last few years developed laboratory technologies to run complex high content imaging based drug screens, allowing for single cell resolution of drug response characteristics. As a further development of this system Misvik Biology, in collaboration with oncology clinics and pharmaceutical companies, have developed an advanced analytical system called the Drug Sensitivity and Resistance Test (DSRT). The DSRT system allows for direct testing of hundreds of approved cancer drugs by direct analysis of patient tumor cells freshly isolated from a surgical or biopsy specimen. This rapid large-scale therapy efficacy testing can be directly translated to the patient as a personalized treatment regimen, with multiple clinical success stories so far. The current aim is to expand the DSRT system to a patient stratification system for multi-arm 'basket-style' clinical trials. While there is significant interest from both oncology clinics and the pharmaceutical industry, the expansion is currently hampered by lack of a consistent data management and analysis system. The main objective of this project action is to develop an integrative data storage, analysis, visualization and reporting frame-work, the SmartTrials DSRT system, through collaboration with DoubleStrand Bioinformatics. This system will seamlessly integrate with the laboratory procedures performed by Misvik Biology and serve multiple purposes throughout the DSRT screen process.

Rheumatech AS	PubGene AS	A personalized companion diagnostic for rheumatoid arthritis patients	PERDIRA is a project that aims to develop a companion diagnostic tool that is able to predict patient response to the different classes of therapeutics to treat autoimmune diseases, such as rheumatoid arthritis (RA). The project will employ the use of novel software and database services developed by PubGene AS. The tool will create patient-specific metabolic profiles, correlate these to existing and newly collected clinical data and ultimately offer advice on whether the patient is a good candidate for use of the new drug being developed by Rheumatech AS. A more personalized strategy will offer possibilities to avoid unnecessary, ineffective and costly over-medication for patients that are unlikely to respond to traditional treatment plans. This tool will identify patients that will benefit from Rheumatech's pipeline drugs to treat RA, identify candidates likely to respond to a drug of interest during crucial clinical trials and enhance drug marketability in the extensive RA market. This project will allow PubGene to develop an analysis tool in the metabolome domain, representing an exciting opportunity to enhance its proprietary Coremine platform with metabolic profiling for the precision medicine market. The Coremine platform has served as the foundation for the creation of the cancer-centric analysis tool Coremine Oncology. The success of Coremine Oncology will be utilised in the creation of the PERDIRA tool.

Educational Factory srl	EUROB CREATIVE SLNE	Smart Sensor and Integrate Assistance for Multiple Sclerosis and Chronic Patients	We have developed a multi-domain computer-assisted intelligent device that measure physical abilites using wearable sensors, and the cognitive capacities of patients affected by Multiple Sclerosis (MS), a chronic desease that tends to worsen and where subject respond differently to drugs therapies. We have developed an instrument to support neurologists and physiotherapists administering their therapies, in particular to objectively understand the effects of pharmaceutical therapies. At the scope, we exploit methods result of three years of research effective on sensor data analysis, which have a higher sensitivity on data classification (98,4% accuracy, $p < 0.01$). Thanks to our approach, we can give objective measures of physical and cognitive state of the patients on a daily basis. We can clusterize the population, understand evolution of the illness, give a prognosis of the ilnees evolutions, and objectively assess patient response to drugs therapies. The instrument give the benefits of continuos monitoring and exploist the effects of the economy of scale. The product is a fully tested prototype in TRL4, we want to arrive to a TRL7 , a product to be used in real environments by neurologists and physiotherapists, and MS patients, to asses its use on an adequate number of people. We want to study the effects of our programs, and the response of physicians and patients, the response to drug therapies, and the impact on the quality of life.
Parkinson Smartwatch BV	INZENTIZ	Medical Cloud Connectivity for Parkinson Smartwatch	Parkinson's is a degenerative disease and medication must be adjusted from time to time. The cheapest medication, Levodopa, works good but only during short durations during the day. Currently doctors have no way to see the patients Parkinson symptoms during the day. They see their patient every few weeks. Treatments plan are: How do you feel? The ParkinsonSmartwatch is medical certified device and capable of 'measuring' the patient symptoms throughout the day and give doctors the opportunity to make a treatment plan based on data instead of subjective questionnaires. Our previous results with trials and prototypes show a huge increase in patient wellbeing and a very large saving on healthcare costs. This 'precision medication' does have a huge impact. Our medical device is still being developed and must be connected to a medical certified cloud. Because of this, patients can be monitored remotely and several other remote functionalities do exist in the current design. For this solution Inzentiz will develop a medical cloud and app software development kit to facilitate this solution. This solution has the needed security and integrity measures needed to be able to use it as a medical product. The INZENTIZ® approved API platform realizes the software of any medical App. The API calls meet all FDA – CE demands for medical software. It meets the strictest demands for medical devices and HIPAA, implemented through integrity by design, security by design and privacy by design.

Human Research Institut für Gesundheitstechnologie und Präventionsforschung GmbH	e-Matrix Innovations GmbH	enhanced Scientific Service Plattform	eSSP offers a new user friendly data platform for performing and enhancing pharmacological, scientific and medical studies with a focus on oncological treatment and personalized data access for the patients. eSSP offers an open data interface which can be configured for the following tasks: - physiological data collected ambulatory from patients outside the hospital (HRV, ECG, body temperature, cuffless blood pressure, peripheral blood perfussion,..) - psychological data based on validated psychological questionnaires. The data input is processed and checked on the data platform and the data set is prepared for statistical analysis and/or export. eSSP offers also available medical certified sensors as part of a one-stop-shop to ensure quick and reliable data collection and analysis. The eSSP interface offers also short- and longterm analysis and comparison of data with individual or collective reference data. The data collection is supported with mobile apps and bluetooth data transfer to the eSSP server. The customer pays for the service of data collection and data cleansing and for preparation of statistical solid basis data.
MyHere	FramX AS	Personalized medicine against prostate cancer	Prostate cancer is affecting as many as 1 in 7 men before age 75, and accounts for 30% of all male cancer. Through App-enabled patient empowerment services we can provide personalized medical follow up by expert resources for a fraction of the cost of the traditional follow up model. The new delivery model allows us to increase the quality of service while making it more affordable than today's alternatives. Furthermore, patients can also donate data in a smarter way than before to ensure that this valuable resource does not become unusable to researchers due to issues with managing data owner consent. The Personalized medicine against prostate cancer project is aimed at making excellent medical follow up available to all men, with the motto of providing user with the right medical follow up at the right time. Smart data donation allows for better access for researchers to continue the improvement for the future.