



A4L_BRIDGE

Alliance4Life Bridging the Research and Innovation Gap in Life Sciences

HORIZON-WIDERA-2023-ACCESS-03 - 10113653

D11.1 Database of unique assets for industry/stakeholders

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1 INTRODUCTION

The Alliance4Life Assets Database was elaborated as a tool to disseminate information on selected research tools, technologies, and services developed by member institutions of Alliance4Life. It was inspired by similar initiatives from renowned institutions like Oxford and Cambridge Universities. The assets represent the innovation potential of leading research organisations in Central and Eastern Europe and are offered for licensing, co-development, or research collaboration. They can be further developed in partnership not only with industry and technology transfer professionals but also with academic researchers looking to build on existing results.

The assets are displayed in an online catalogue that includes:

- **Research tools and materials** – such as antibodies, viral vectors, cell lines, or biological samples
- **Technologies** – including protocols, detection methods, and experimental approaches
- **Services** – analytical or consultation services offered by research teams across the Alliance

Each entry is presented in a structured format, including a summary of the asset, its potential applications, current development stage, and availability type. The database is openly accessible, and all assets can be filtered by type, institution, or keyword. Contact details are provided for each item to facilitate direct communication and follow-up.

As proposed in the A4L_BRIDGE project, the website is hosted at the BMC SAS and is accessible via web portal of the Alliance4Life so that different stakeholders can search for and find desired items, see [Database of A4L Assets and Technologies](#).



Assets & Technologies

The A4L Assets Database complements the Alliance4Life catalogue of core facilities and supports the long-term goal of improving research translation and knowledge transfer in the Widening region.

By making these assets visible and accessible, the platform encourages new partnerships between academia and industry and supports the broader mission of Alliance4Life to strengthen scientific excellence and innovation capacity in Central and Eastern Europe.

2 SUBMISSION FORM

The database is intended to become a dynamically growing catalogue of assets that can be updated anytime new asset is developed. A4L_BRIDGE partner institutions can submit their assets to the database using a structured template that was designed and optimised based on consensus to suit partner-specific expertise and needs.

ASSET SUBMISSION TEMPLATE

TITLE *(max 120 characters)*

DATABASE NUMBER *(abbreviation of the partner and number, e.g. #BMC-001)*

CATEGORY *(research tools, diagnostics, pharmaceuticals, technology, devices) **

SUMMARY *(brief description, max 300 characters)*

BACKGROUND *(explanation of the topic and current state-of-the-art, TRL is optional, max 600 characters)*

FEATURES AND KEY BENEFITS *(of product / service, applications, max 600 characters)*

REFERENCES *(to research papers or patents, max 600 characters)*

AVAILABILITY *(licencing, service, research collaboration)*

CONTACT *(Institution, address, mail address of TT office in partner institution)*

RELEVANT IMAGE(S) or GRAPHICAL ABSTRACT

**One asset can be categorized in more than one category.
(e.g. antibodies as research tools and as diagnostics).
New category can be always added in future if needed.*

3 COLLECTION OF ASSETS

This collection lists currently available submissions from the A4L_BRIDGE institutions.



#CEITEC MU-001

CATEGORY
Pharmaceuticals

Novel Specific Inhibitors of FGFR1 Signalling

SUMMARY

The researchers from Masaryk University developed a DNA-aptamer-based inhibitor that, in contrast to FGFR TKIs, inhibits FGFR1 but not the other existing FGFR variants (FGFR2, FGFR3, and FGFR4). In contrast to the current generation of TKIs, which targets the intracellular (kinase) domain of FGFR, the aptamer targets its extracellular domain; it significantly facilitates its potential administration to patients. The nature of the aptamer, being a short oligonucleotide, warrants its high (shelf) stability and low production costs and toxicity. The inhibitor activity and biological stability can be tuned through chemical modifications.

BACKGROUND

Impaired FGFR signalling is associated with many pathological conditions, including growth disorders, degenerative diseases, and cancer. Current therapeutic approaches for targeting FGFR signalling are based on small-molecule inhibitors of FGFR catalytic activity (tyrosine kinase inhibitors, TKIs). However, TKIs lack specificity as they typically inhibit all four existing FGFRs (FGFR1-4) and several unrelated receptor tyrosine kinases, limiting their clinical use due to side effects and toxicity. Fifteen TKIs are currently in clinical trials for tumours caused by lesions in FGFR genes, such as FGFR amplification, activating mutations, and fusion oncogenes involving FGFRs.

FEATURES AND KEY BENEFITS

Higher specificity – due to the aptamer nature.
Lower toxicity – as it interacts with the receptor outside the cell. # New mechanism of action – it impairs the signalling but does not compete with the original FGF ligand.

REFERENCES

Patent application submitted

AVAILABLE

Seeking development partner, commercial partner, licensing, investment.

CONTACT

Lukáš Trantírek, TechTransfer@ceitec.muni.cz



#CEITEC MU-002

CATEGORY
Pharmaceuticals

Peptide Killers of Bacteria

SUMMARY

A method for designing unique peptides that can selectively target and Disrupt cellular membranes of pathogens without damaging human cells.

BACKGROUND

Increasing incidence of antibiotic resistance in bacteria, along with a steady decline in the Discovery of new antibiotics, presents a global health challenge. There is a need for the discovery of an alternative class of antibiotics, and antimicrobial peptides (AMPs) have emerged as a promising candidate for such new antibiotics. Especially, the peptides which are able to form leaky transmembrane pores in the bacterial cytoplasmic membrane are of particular interest as they can directly kill the antibiotic-resistant bacteria. Over the last few decades, a number of natural and synthetic membrane-permeabilising AMPs with various pore-forming abilities have been discovered. However, fundamental rules for the guided development of pore-forming peptides are missing. The determination of such rules is challenging because a single amino acid substitution has been reported to be enough to cause a dramatic change in the pore structure or even completely change the peptide's mode of action.

FEATURES AND KEY BENEFITS

Unique approach in designing antimicrobial peptides. # Wide use of this platform technology.

REFERENCES

Patent application submitted

AVAILABLE

Seeking development partner, commercial partner, licensing, investment.

CONTACT

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#CEITEC MU-003

CATEGORYTechnology
Research tools**Enhancing Plant Stress Resistance
via DIR13 Gene Expression****SUMMARY**

Method to increase plant resistance to abiotic stress, particularly drought and soil salinity, by upregulating DIR13 gene expression.

BACKGROUND

Abiotic stresses like drought and salinity significantly impact crop yields. Climate change exacerbates these challenges, necessitating innovative solutions. This invention focuses on enhancing plant resilience through genetic means.

FEATURES AND KEY BENEFITS

Applicable across various plant species. # Potential integration into existing breeding programs. # Improved crop yields under adverse conditions.

REFERENCES

Czech Patent No. 310293

AVAILABLE

Licensing, research collaboration

CONTACT

Jan Hejátko, TechTransfer@ceitec.muni.cz



#CEITEC MU-004

CATEGORY
Technology
Pharmaceuticals

High-Throughput Platform for Discovering RNA-Targeting Small Molecule Drugs

SUMMARY

RNAutriX begin with screening services, generating a proprietary dataset of RNA–small molecule interactions. Develops tools for drug design, scaffold generation, and off-target prediction. In the long term, RNAutriX will develop its own RNA-targeted therapeutics and custom HTS instrumentation, contributing unique RNA–ligand insights to accelerate the future of RNA-targeted drug discovery and development.

BACKGROUND

Over 80% of disease-driving proteins remain undruggable by current small-molecule drugs, leaving critical therapeutic gaps. RNA, a master regulator of gene expression and disease biology, offers a powerful alternative. However, its structural complexity and the lack of scalable discovery tools have limited its therapeutic potential. Most RNA-targeting strategies rely on predicted secondary structures, missing the true binding potential of tertiary (3D) RNA conformations. RNAutriX addresses this challenge through a high-throughput, structure-guided platform that identifies small molecules binding to functionally folded RNA – in an unbiased, experimentally driven manner.

FEATURES AND KEY BENEFITS

Physiologically relevant data using natural 3D structures. # Focused on biologically meaningful targets, not random fragments. # Fast, scalable, cost-effective, and accurate RNA-targeted drug screening.

REFERENCES

Patent pending.

AVAILABLE

Strategic Partners: Screen your libraries & co-develop RNA-targeted drugs. Investors: Support platform expansion, proprietary pipeline development, and capitalize on emerging RNA therapeutics.

CONTACT

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#BMC-001

CATEGORY

Biomarkers and diagnostics
Research tools and materials

Monoclonal antibody M75 for detection of hypoxia biomarker CA IX in cancer cells and tumour tissues

BACKGROUND

Carbonic anhydrase IX (CAIX) is a hypoxia-inducible enzyme that plays a crucial role in regulating pH in the tumor microenvironment [Ref. 1]. CA IX expression is strongly associated with cancer phenotype and is present in a broad range of human tumors. It serves as a reliable marker of hypoxia, correlates with tumor aggressiveness, response to therapy and prognosis, and aids in the differentiation and diagnosis of certain cancer types, while also being a potential target for imaging and therapeutic strategies. Detection of CA IX in various cancer models can also advance research of tumor biology and the development of novel anti-cancer therapies.

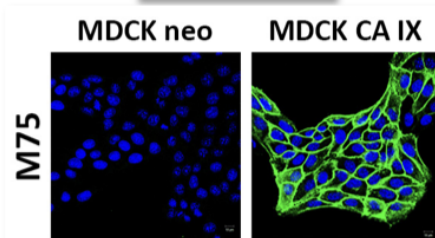
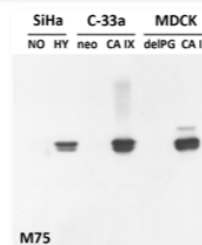
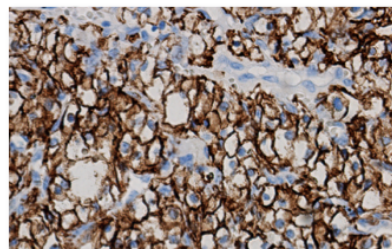


Fig. shows immunohistochemical staining of tumor tissue section with M75 MAb (upper image), detection of CA IX protein in cell lines by Western blotting (middle) and immunofluorescence analysis of transfected cells with constitutive expression of CA IX protein on the plasma membrane (lower image).

FEATURES AND KEY BENEFITS

Mab M75 recognizes repetitive linear epitope in the N-terminal PG region of the CA IX protein. It is suitable for detection of CA IX in FFPE specimens (incl. those archived for several years) and fresh-frozen human tissues as well as in fixed and fresh cells of human cell lines using the following immunodetection methods: immunohistochemistry, immunocytochemistry, Western blotting, ELISA, FACS and immunoprecipitation. M75 Mab was used in about 40% of studies related to CA IX detection in various patients' tissue specimens and is superior to other available antibodies [for more details, see Ref. 2].

AVAILABLE for non-exclusive licencing
or for research collaboration

CONTACT

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REFERENCES

- [1] Pastorekova S, Gillies RJ. The role of carbonic anhydrase IX in cancer development: links to hypoxia, acidosis, and beyond. *Cancer Metastasis Rev.* 2019 Jun;38(1-2):65-77. doi: 10.1007/s10555-019-09799-0.
- [2] Takacova M, Kajanova I, Kolarcikova M, Lapinova J, Zatovicova M, Pastorekova S. Understanding metabolic alterations and heterogeneity in cancer progression through validated immunodetection of key molecular components: a case of carbonic anhydrase IX. *Cancer Metastasis Rev.* 2021 Dec;40(4):1035-1053. doi: 10.1007/s10555-021-10011-5.



#BMC-002

CATEGORYDiagnostics, Technology
Research tools and materials***Coxiella burnetii* antigens for diagnosis of Q fever****SUMMARY**

Phase I and Phase II antigens of *C. burnetii* are essential for confirming Q fever infection and monitoring therapeutic outcomes in both humans and animals.

BACKGROUND

Q fever is an acute or chronic disease caused by the obligate intracellular Gram-negative bacterium *Coxiella burnetii*. This pathogen is primarily transmitted to humans through inhalation of contaminated aerosols from infected animals. The pathogen affects the general population, but especially veterinarians, meat processing plant workers, dairy workers, livestock ranchers, and people living near farms or slaughterhouses. Immunocompromised individuals, pregnant women, and people with pre-existing heart valve conditions are also at increased risk.

Unlike classical rickettsiae, *C. burnetii* is phylogenetically classified within the order *Legionellales* (class *Gammaproteobacteria*), in its own genus *Coxiella*. It is recognized by the World Health Organization as a priority pathogen due to emerging antimicrobial resistance. Due to its high infectivity and public health relevance, Q fever is a notifiable disease in many countries under directives such as 2009/99/EC..

FEATURES AND KEY BENEFITS

- Designed for the detection of antibodies against *C. burnetii* in human and animal serum samples.
 - Compatible with multiple serological techniques according to customer preference, including microagglutination reaction, complement-fixation test and enzyme-linked immunosorbent assay, and indirect immunofluorescence assay.
 - Phase I antigens - useful for confirmation and follow up of chronic Q fever
 - Phase II antigens - useful for detecting elevated antibody levels approximately 10 days post-infection, enabling early diagnosis of acute Q fever.
 - Rabbit sera (negative or positive for specific antibodies) available for use as controls.
- Antigens are produced under GLP certification using internally protected technology.



	MAR	CFT	ELISA		IFA
Coxiella burnetii antigens					
Phase 1	B1MA2	B1CF2	B1EL2	B1EL3	B1F2
Phase 2	B1MA1	B1CF1	B1EL1		B1F1
Control sera					
Positive	1PR5MA	1PR5CF	1PR5EL		1PR5IF
Negative	1NR5MA	1NR5CF	1NR5EL		1NR5IF

AVAILABLE

for non-exclusive
licencing or research
collaboration

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REFERENCES

- [1] Palkovicová K, Flores-Ramírez G, Quevedo-Díaz M, Csicsay F, Skultety L. Innovative antigens for more accurate diagnosis of Q fever. *J Microbiol Methods*. 2025 Jul;232-234:107106. doi: 10.1016/j.mimet.2025.107106.



#BMC-003

CATEGORYDiagnostics, Technology
Research tools and materials**Antigens for diagnosis of *Chlamydia* infections****SUMMARY**

These antigens are suitable for the serological detection and screening of infections caused by various *Chlamydia* species.

BACKGROUND

Chlamydia species are obligate intracellular bacteria that can infect humans and animals, often causing respiratory or reproductive diseases.

- *Chlamydia trachomatis* is a major cause of sexually transmitted infections in humans and can also cause neonatal pneumonia and conjunctivitis.
- *Chlamydia psittaci* causes psittacosis, a zoonotic respiratory disease transmitted from birds, which can manifest as pneumonia in humans.
- *Chlamydia abortus* is associated with abortion in livestock and can cause zoonotic infections in humans, particularly in pregnant women.

Surveillance of different chlamydial infections is crucial for assessing disease burden, implementing public health interventions, and preventing complications. The diversity of species and transmission routes necessitates tailored diagnostic approaches.

**FEATURES AND KEY BENEFITS**

- The antigens detect antibodies against *Chlamydia* species in human and animal serum samples.
- Suitable for complement-fixation test and enzyme-linked immunosorbent assay.
- Available antigens: *C. abortus*, *C. psittaci*, or *C. trachomatis* – supplied according to customer requirements.
- Rabbit sera (negative or positive for specific antibodies) available for use as controls.

Antigens are produced under GLP certification using internally protected technology.

	CFT	ELISA
Chlamydia antigens		
	B2CF	B2EL
Control sera		
Positive	2PRSCF	2PRSEL
Negative	2NRSCF	2NRSEL

AVAILABLE for non-exclusive licencing or for research collaboration

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#UMED-TECH-001

CATEGORYTechnology
Pharmaceuticals**A pharmaceutical composition for topical application and use thereof in the treatment of hemangiomas in children****SUMMARY**

The subject matter of the invention is a pharmaceutical composition for topical application containing a beta- adrenergic receptor antagonist and a corticosteroid and use thereof in the treatment of hemangiomas in children.

BACKGROUND

Current clinical observations indicate that haemangiomas occur in about 10% of infants. They have a pronounced clinical course that can lead to the development of tumour-like lesions in up to 76% of children by the age of seven.

There are currently several treatment options for haemangiomas. One commonly used approach is the oral administration of cardiac drugs, which accelerate the regression of the vascular lesions and often lead to their complete disappearance. The efficacy of these drugs in the treatment of haemangiomas was discovered incidentally, but due to their high efficacy, this therapy is now routinely used worldwide according to established treatment standards. However, a significant disadvantage of this method is that hospitalisation, an ECG examination and a cardiological consultation are required before treatment can begin.

The innovation presented in this application lies in a new formulation and route of administration for cardiac drugs. By delivering the active substance in a topical form, the need for hospitalisation and diagnosis prior to treatment can be eliminated.

FEATURES AND KEY BENEFITS

- Safety – Use of a known and clinically validated active pharmaceutical ingredient (API) with an established safety profile.
- No need for hospitalisation and diagnostic qualification.
- Ease of use – topical application without professional supervision.
- First class solution – there are currently no other products with this indication and route of administration.
- IP protected – the invention is protected by a patent already granted in Poland and the procedure for extending protection via the European Patent Office (EPO) is currently underway.

REFERENCES

Pat.244294 <https://ewyszukiwarka.pue.uprp.gov.pl/search/pwp-details/P.442316>

PCT patent application PCT/PL2023/050078 -

<https://www.wipo.int/search/en/results?q=PCT%2FPL2023%2F050078>

**AVAILABLE** for licensing**CONTACT** Medical University of Łódź, The Center for Innovation and Technology Transfer Ciitt@umed.lodz.pl

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#UMED-TECH-002

CATEGORY

Technology
Diagnostics**A method for *in vitro* diagnosis of multiple sclerosis****SUMMARY**

The invention concerns a method for *in vitro* diagnosis of multiple sclerosis (MS) based on the absolute count of lymphocytes with the CD49d+CD154+ phenotype autoreactive toward myelin proteins after the exposure of Peripheral Blood Mononuclear Cells to myelin peptides in the *in vitro* conditions. The method is useful for the early diagnosis of multiple sclerosis.

BACKGROUND

It is estimated that approximately 2.5 million people are affected by this disease worldwide, including around 45,000 in Poland. This represents a significant social problem, as the disease often excludes patients from social and professional life. One of the most critical challenges faced by neurologists is the early diagnosis of multiple sclerosis (MS), compounded by the lack of laboratory tests that can definitively confirm the disease.

The proposed test is based on the highly specific immune response of MS patients to autoantigens, specifically myelin proteins. The test involves the assessment of the expansion of a lymphocyte subpopulation with the CD49d+CD154+ phenotype within the total population of peripheral blood mononuclear cells (PBMCs). Due to the fact that this type of immune response is highly specific, the proposed test is also expected to exhibit high specificity (i.e., a low rate of false-positive results). Furthermore, since the test requires a flow cytometer—a sensitive device capable of analyzing individual cells—it is also expected to demonstrate high sensitivity (i.e., a low rate of false-negative results).

FEATURES AND KEY BENEFITS

- High diagnostic specificity and sensitivity – based on a unique immune response to myelin proteins, minimizing false positives and false negatives.
- Non-invasive and patient-friendly – the test is based on peripheral blood analysis and can be performed without invasive procedures.
- Early and reliable detection – enables earlier diagnosis of multiple sclerosis compared to currently available methods.
- First class solution – the method addresses a significant unmet clinical need, offering a novel diagnostic approach not covered by existing tests.

REFERENCES

P.445027 <https://ewyszukiwarka.pue.uprp.gov.pl/search/pwp-details/P.445027>
PCT patent application PCT/PL2024/050037-
<https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2024248642>

AVAILABLE for licensing

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#UMED-TECH-003

CATEGORY

Pharmaceuticals

Oleogel pharmaceutical composition of a glucocorticosteroids group drug and its application in the treatment of skin, dental and gynaecological diseases

SUMMARY

The subject of the invention is a pharmaceutical composition in the form of an oleogel containing a drug from the group of glucocorticosteroids and its use in the treatment of non-infected inflammatory conditions of the skin, also of allergic origin, dental and gynecological diseases responding to treatment with corticosteroids.

BACKGROUND

Known in the art solutions of compositions in the form of a gel containing a drug from the group of corticosteroids as active substances, although they provide stable and relatively durable gel compositions, their composition is relatively complex, and the content of water in the liquid phase, if no preservatives are used, provides an environment favorable for the growth of bacteria. The complexity of the composition of such preparations significantly increases the risk of allergic reactions, and the presence of a hydrogel often makes it necessary to use the said preservatives, which increases the risk of allergic reactions. There is therefore a great need for simple in composition, stable and preservative-free pharmaceutical compositions containing a drug from the group of glucocorticosteroids in the form of a gel for local use.

The aim of the invention was to provide a new anti-inflammatory and antipruritic composition in the form of a stable gel with a simple composition and not requiring the use of preservatives.

FEATURES AND KEY BENEFITS

- similar in composition and structure to the intercellular cement, increasing penetration and transport of medicinal substances
- unsaturated fatty acids are absorption promoters - facilitate penetration and permeation of the API
- simple composition provides a durable, convenient for administration to the patient's skin
- the lack of water prevents the development of microbiological contamination, and ensure longer shelf life.
- the drug formulated in this way carries a minimized risk of causing allergies associated with the administration of the drug

REFERENCES

P.245212 <https://ewyszukiwarka.pue.uprp.gov.pl/search/pwp-details/P.434460?lng=pl>
<https://worldwide.espacenet.com/patent/search/family/080001188/publication/PL245212B1?q=ap%3DPL434460%2A>



AVAILABLE for licensing

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#UMED-LAB-001

CATEGORYResearch tools
Diagnostics**Animal Research Facility**
– Modern Center for *In vivo* and *In vitro* Studies**SUMMARY**

A state-of-the-art research laboratory providing *in vivo* and *in vitro* studies on animal models and cell lines in compliance with international standards (GLP, ISO 17025:2018-02), supporting the development of pharmaceutical and biomedical sciences.

BACKGROUND

Animal Research Facility of the Faculty of Pharmacy, Medical University of Lodz, is a certified research center conducting experimental studies on animals and cell lines across a wide range of biomedical sciences. The facility operates in line with EU Directive 2010/63 and Polish regulations on the protection of animals used for scientific or educational purposes. Advanced infrastructure enables high-standard research, including studies on immunocompromised animals, GMOs, and *in vitro* cytotoxicity. The laboratory is equipped with an operating room and devices for metabolic and behavioral studies (AnyMAZE, Morris water maze, fear cages, Intellicage), and ensures SPF and IVC conditions.

FEATURES AND KEY BENEFITS

Compliance with GLP and PN/EN ISO 17025:2018-02
PCA certificate No. AB 1659 and GLP certificate No. 21/2024/DPL
Standardized studies in accordance with ISO 10993 (biological evaluation of medical devices: cytotoxicity, systemic toxicity, irritation, sensitization, local effects after implantation)
Advanced infrastructure: operating room, metabolic and behavioral testing equipment
SPF and IVC animal housing, capability for GMO research
Experienced, qualified staff
Broad research scope: toxicology, genetics, biopharmacy, neurology, oncology, immunology, experimental surgery, and more
Services available for scientific and business partners (outsourcing of research)

REFERENCES

PCA Accreditation Certificate no. AB 1659 - PN-EN ISO 17025:2018-02, ISO 10993-5,-6,-10,-11,-23
GLP Certificate no. 21/2024/DPL – *in vitro* tests in the area of cytotoxicity

AVAILABLE for service, contract research collaboration**CONTACT**

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Partner Address: ciitt@umed.lodz.pl



#UMED-LAB-002

CATEGORY

Research tool

Method / Process

Living Lab methodology in co-created and value/patient-oriented technologies and innovative solutions development

SUMMARY

The living lab methodology has been enriched with elements of value-based health care and patient-centered care approaches. It shifts its focus from merely testing new solutions to ensuring delivery of tangible health outcomes that matter most to patients. Patients are not passive subjects within the innovation process, but directly shape the development, implementation, and evaluation of health interventions. This enrichment transforms the living lab into a dynamic environment where multiple stakeholders—patients, caregivers, healthcare professionals, researchers, and policymakers—collaborate to co-design and validate services and technologies that are both effective and meaningful in real-world healthcare settings. As a result, it supports a more holistic and sustainable innovation process.

A further innovative dimension of this enriched methodology is the establishment of a Territorial Health Living Labs Network, created through collaborative efforts among different countries during the project. This international network allows for the exchange of knowledge, best practices, and culturally adapted solutions across diverse healthcare systems and regional contexts

BACKGROUND

The Living Lab methodology is a user-centered, open innovation approach that integrates real-life environments and stakeholders into the development and implementation of new innovations. It emphasizes co-creation, experimentation, and continuous feedback in actual use contexts. Living Labs are particularly useful for complex societal challenges, ensuring that innovations are practical, accepted, and adapted to real-world needs. In recent years, Living Lab methodology has gained popularity as a strategic tool for developing market-ready, user-driven innovations, especially in sectors like smart cities or industry 4.0. This makes the Living Lab methodology a powerful framework not just for innovation, but for developing solutions that are both technologically feasible and commercially viable.

FEATURES AND KEY BENEFITS

- user-centered innovation
- higher adoption
- real-life testing (authentic environments)
- more accurate insights
- multi-stakeholder collaboration (cross-sector input)
- shared ownership
- iterative development and faster improvements
- lower risk : early detection of flaws reduces costly mistakes at later stages;
- market relevance and competitive advantage (tailored solutions)
- faster time-to-market
- social and environmental impact (inclusive and sustainable)

AVAILABLE for service, research collaboration

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#UZSM-001

CATEGORY
Research tools

In vitro antibacterial activity screening

SUMMARY

Standardized antibacterial susceptibility testing of new chemical entities and biological extracts against standard and typed major bacterial pathogens.

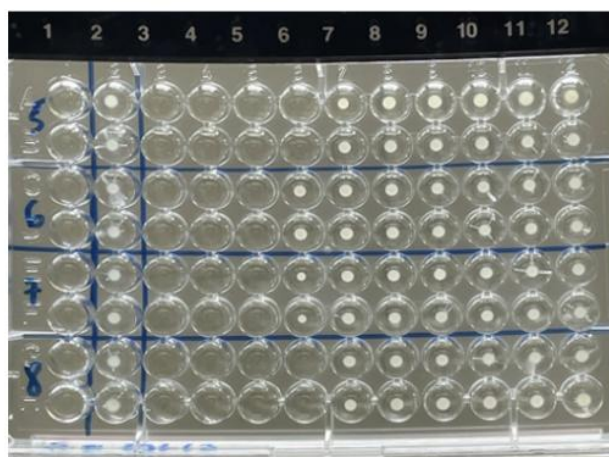
BACKGROUND

Antibacterial susceptibility testing is used in drug discovery projects to evaluate the activity of new substances against target bacterial pathogens. Standardized antibacterial susceptibility testing ensures determination of minimal inhibitory concentrations of novel chemical entities and biological extracts according to the current EU and US standards for efficacy and safety testing (CLSI, EUCAST). These standards are essential for demonstrating the antibacterial activity of products and their compliance with regulations.

FEATURES AND KEY BENEFITS

The primary susceptibility screening includes testing on a panel of sensitive strains: *Staphylococcus aureus* ATCC 29213, *Enterococcus faecalis* ATCC29212, *Moraxella catarrhalis* ATCC 23246 and *Escherichia coli* ECM1556 (TolC-Tn10) and includes standard antibiotic quality control. Secondary screening extends testing against a variety of bacterial pathogens according to targeted indication or resistance pattern. Substances are tested in microtiter plates, in serial dilutions using standard optimized media.

AVAILABLE for service, contract research collaboration



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#UZSM-002

CATEGORY
Research tools

In vitro cytotoxicity screening

SUMMARY

Cytotoxicity testing of new chemical entities and biological extracts against various cell lines.

BACKGROUND

Cytotoxicity testing is used in drug discovery projects to evaluate the safety profile of new substances. Cytotoxicity testing ensures determination of inhibitory concentrations of novel chemical entities and biological extracts, IC₅₀, that inhibit the growth of cells in a culture.

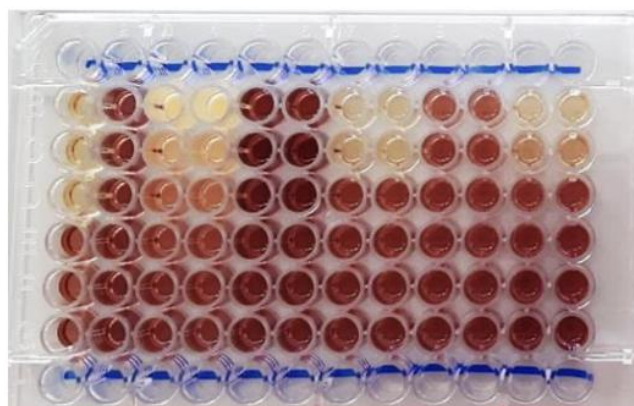
FEATURES AND KEY BENEFITS

In vitro cytotoxicity screening includes MTS cell viability assay which measures metabolic capacity of cells in culture. Substances are tested in microtiter plates, in serial dilutions using standard optimized media. Cell lines used include HepG2 and THP-1.

REFERENCES

Mosmann T (1983) Rapid colorimetric assay for cellular growth and survival: application to proliferation and cytotoxicity assays. J. Immunol. Methods 65(1-2): 55-63.

AVAILABLE for service, contract research collaboration



CONTACT

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#UZSM-003

CATEGORY

Research materials

Tumor tissue samples as a window into cancer biology

SUMMARY

The collection includes formalin fixed paraffin embedded tissue of breast cancer, prostate cancer, renal cell carcinoma and colorectal cancer, as well as testicular germ cell tumors.

BACKGROUND

The collections were sampled and stored because of different studies and now can be used for research purposes, including analysis of the tumor histology, protein expression, genetic and epigenetic changes etc.

FEATURES AND KEY BENEFITS

FFPE tissue samples can be used in ethically approved scientific studies, including cancer biology research and the identification of diagnostic, prognostic, and predictive biomarkers. Their preserved morphology and molecular content allow for retrospective and large-scale analyses essential for advancing personalized medicine and improving patient outcomes.

REFERENCES

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HPC1
HPC2/ELAC2
MSR1
BRCA 1
BRCA 2
PALB 2
AR

inheritance
genes
epigenetics
prostate biopsy
miRNA
prostate cancer
risk factors
metastatic potential

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#UZSM-004

CATEGORY

Research tools

Collection of human myocardial samples**SUMMARY**

The collection includes human left ventricular myocardial samples of failing hearts collected freshly after heart transplantation or left ventricular device implantation in Croatia. Several myocardial samples are from donors without known heart disease. Samples were freshly frozen after harvesting and stored at -80 °C.

BACKGROUND

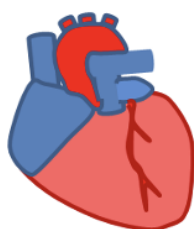
The samples are used for research purposes, including analysis of the expression proteins, genes, microRNA's, etc. Etiology of heart failure includes mostly ischemic and dilated cardiomyopathy. Each tissue donor gave written informed consent for samples collection. Ethical approval for the study and sample collection was obtained from ethical committees.

FEATURES AND KEY BENEFITS

The samples can be used for scientific studies approved by ethical committees. Such studies include analysis of cardiac disease pathogenesis either as a single experimental model or complementary to other experimental models (e.g. cell culture, knockout animals, etc).

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#UT-001

CATEGORY
Technologies

In vitro fertilisation (IVF) embryo selection method

SUMMARY

Our new method of selection of embryos suitable for uterine transfer and implantation relies on

- 1) contacting *in vitro* responder cells with extracellular vesicles isolated from an IVF embryo to be transferred into a female subject and/or with a conditioned medium from the IVF embryo,
- 2) determining, in the responder cells, an amount of at least one RNA transcript, and
- 3) predicting pregnancy outcome of the embryo transfer based on the determined amount of the RNA(s) transcript(s).

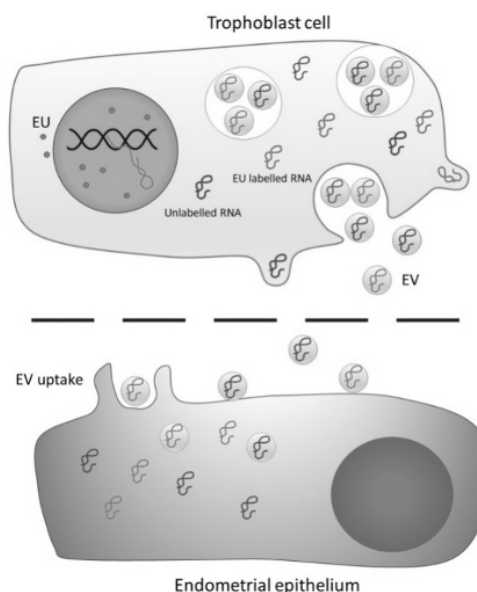
We have discovered specific RNA transcripts which expression level in endometrial cell lines (responder cells) are indicative of the embryo quality and allow to establish an implantation prognosis.

BACKGROUND

In vitro fertilization (IVF), is the most common and effective type of assisted reproductive technology to help women becoming pregnant. A critical step of this procedure is the transfer of the embryo produced in vitro into the women's uterus. Current IVF procedures face challenges in embryo implantation failure, as the communication between embryos and the uterine environment is not well understood, leading to inefficiencies in pregnancy rates, multiple IVF cycles needed, causing lasting economic, physical and mental health impact.

FEATURES AND KEY BENEFITS

- Higher successful implantation rates than with reference methods. *Example:*
Selecting embryos which conditioned culture media induces a decrease of ZNF81 expression (RNA transcript) in RL95-2 cells (endometrial cell-line) down to 4 million copies per 10 ng of input RNA would have result in a 79% of successful embryo implantations.
- Non-invasive/fully in-vitro;
- Quick, reliable, easy to standardize and cost-effective.
- Reducing number of unwanted multiple pregnancies,



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or for research collaboration

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#UT-002

CATEGORY
Technologies

Preeclampsia prognosis method (1st trimester)

SUMMARY

Our new, patent protected, preeclampsia (PE) prognosis method relies on a panel of at least four biomarkers, which concentrations in maternal blood serum are simultaneously measured in a single test tube, and at least one clinical cofactor.

With our method, it is now possible to predict the development of PE or the absence of development of PE as early as 10-14 g. week with a high accuracy (>93%). Moreover, the method of the invention drastically reduces the number of false- positive/negative and inconclusive predictions (<7%). The invention has been validated with blood samples collected within gestational weeks 10-14.

BACKGROUND

Preeclampsia (PE) is a severe complication during pregnancy, characterized by high blood pressure and organ dysfunction, affecting both the mother and fetus. Conventional assessment of PE risk is mainly based on maternal pre-known susceptibility factors and medical history. This model has low detection rate (~40%) for subsequent manifestation of PE. Therefore, application of other PE alerting parameters to be measured during the pregnancy have been sought for.

Current methods for predicting PE rely on clinical symptoms (e.g., hypertension, proteinuria) and biomarkers like PAPP-A and PIGF, but these lack sensitivity and specificity. Existing screening tests often require invasive procedures (e.g., uterine artery Doppler) or have limited applicability due to variability in laboratory measurements. As this is not a routine procedure in most clinics, there are limitations to develop this method further as a screening tool for a wide community of pregnant women.

FEATURES AND KEY BENEFITS

- **Early and Accurate Prediction:** The method allows for early prognosis of PE (as early as 10+0 to 14+1 gestational weeks), enabling timely interventions.
- **High Sensitivity and Specificity:** The combination of multiple biomarkers and clinical factors improves the accuracy of prediction compared to existing methods.
- **Drastic reduction** of false positive, false negative and inconclusive results;
- **Simplicity:** The test uses a simple blood sample, avoiding invasive procedures.
- Quick, reliable, easy to standardize and cost-effective method when performing the biomarkers

REFERENCES

EP Patent application 21765846.7 pending
US Patent application US18022000 pending

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TMLHE knockout mice model

SUMMARY

The TMLHE KO mouse (C57BL/6N) is a valuable model for studying lipid metabolism, mitochondrial dysfunction, and oxidative stress. With low acylcarnitines and reduced FAO, it enables cardiometabolic research, drug testing, metabolic reprogramming, and therapeutic screening.

BACKGROUND

This conventional (constitutive) TMLHE KO model (C57BL/6N background) is useful for research and drug development for diseases of lipid metabolism, oxidative stress, or mitochondrial dysfunction which is linked to over 50 chronic diseases. These include cardiovascular diseases, CNS, mitochondrial diseases and metabolic syndromes, aging and selective oncology cases such as prostate cancer and glioblastoma.

The TMLHE KO model can be used in testing **L-carnitine and acylcarnitine-related conditions**, as well as in **drug target, and mechanism of action studies**. TMLHE KO mice present a cardio- and mitochondria-protective phenotype.

FEATURES AND KEY BENEFITS

Features:

- Constitutive TMLHE KO on C57BL/6N background
- Reduced L-carnitine and acylcarnitine levels in blood and cardiac tissues
- Decreased fatty acid oxidation
- Cardio- and mitochondria-protective phenotype.

Key benefits:

- Models cardiometabolic protection and metabolic reprogramming
- Useful for studying lipid metabolism, mitochondrial dysfunction, oxidative stress
- Supports drug target validation and mechanism-of-action studies
- Applicable in **cardiovascular, CNS, metabolic, aging, and oncology** research.

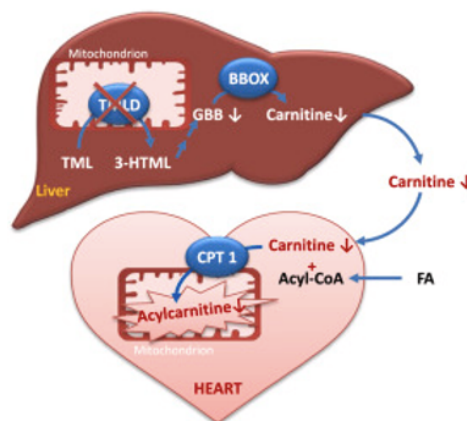
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Preclinical DMPK and safety testing in rodents

SUMMARY

Preclinical pharmacokinetic and safety studies in rodents assess ADME, bioavailability, and clearance to guide dosing. Using routes like oral, IV, or minipumps, and advanced analytics, the service identifies toxic effects, target organs, and supports safe, effective drug development.

BACKGROUND

Pharmacokinetics (PK) help determine a compound's bioavailability and clearance, guiding dosing strategies by tracking drug exposure over time. PK studies assess absorption, distribution, metabolism, and excretion (ADME) in mice and rats by measuring drug levels in plasma, tissues, or urine at set intervals. In safety studies, we identify target organs and monitor adverse effects from single or repeated dosing. Single-dose studies define the maximum tolerated dose, while repeated-dose studies reveal cumulative toxicity and potential organ damage.

FEATURES AND KEY BENEFITS

- Peroral, subcutaneous, and intravenous routes of administration;
- Slow-release minipumps, direct intracerebroventricular injections and other specific methods can be used for the administration of compounds.
- Analytics by LC-MS, GC-MS, or using fluorescent, luminescent measurements as well as scintillation counting. Metabolite identification can be performed using HRMS.
- Comprehensive overview of the compound's safety profile by examining immediate and long-term toxicological effects.
- General safety testing and advanced methods for to specifically study manifestations of nephrotoxicity, cardiotoxicity, liver and CNS toxicity.

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PK workflow

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(Bis(fluoroacetoxy)iodo)benzene, CAS: 57357-21-8**SUMMARY**

This iodine(III) reagent is of interest to the medicinal chemistry and synthetic organic chemistry communities. It is an efficient and versatile tool for generating new fluorine-containing compounds for drug development. Specifically, photoredox-catalyzed radical fluoromethylation applications of alkenes[1] and heterocycles[2].

BACKGROUND

Organofluorine compounds are of enormous importance in medicinal chemistry, as the fluorine atom can be found in many pharmaceutical drugs. The monofluoromethyl group ($-\text{CH}_2\text{F}$) is an interesting functional group that could act as an isostere of methyl, thiol, hydroxyl, methoxymethyl, and amine moieties, highlighting its potential value in drug development programs. The current reagent is an efficient and versatile tool for photoredox-catalyzed radical fluoromethylation applications of alkenes[1] and heterocycles[2].

FEATURES AND KEY BENEFITS

- Versatile tool for fluorine-containing compound synthesis (e.g., for new drug development);
- efficient generation of the fluoromethyl radical (CH_2F^*) under mild visible-light photoredox catalytic conditions;
- a solid, bench-stable reagent;
- ensures radical addition to alkenes or various heterocyclic substrates;
- the most versatile monofluoromethyl radical source with the broadest potential applications in synthesis.

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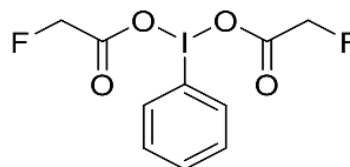


Fig. (Bis(fluoroacetoxy)iodo)benzene,
CAS: 57357-21-8

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#LIOS-004

CATEGORY
Research tool

MitoCLue: High-Throughput Cardiolipin Binding & Mitochondrial Accumulation Assay

SUMMARY

MitoCLue is a novel fluorescent probe that enables 3 complementary cardiolipin (CL) assays - binding affinity measurement, CL quantitative analysis, and CL imaging. Designed for both mitochondrial research and drug safety profiling, MitoCLue supports drug discovery with high-throughput, reproducible and biologically relevant results.

BACKGROUND

Cardiolipin (CL) is a key phospholipid responsible for mitochondrial function and structural integrity. Its depletion is a hallmark of many diseases such as heart failure, diabetes, and aging. While CL is a promising target for mitochondria-specific drugs and drug delivery systems, off-target interactions can cause drugs to accumulate in mitochondria, potentially leading to serious side effects. Until recently, there was no unified assay that would allow to estimate compounds' affinity to CL in a high throughput screening.

FEATURES AND KEY BENEFITS

1. Binding Affinity Assay

Features

Validated in 96-well format ($Z' > 0.7$), adaptable to 384-well
EC₅₀ determination across 6–7 log concentration range
Suitable for artificial membranes models or mitoplasts

Benefits

Screening of compound libraries for CL binding
Facilitates early-stage drug discovery and safety profiling
Standard plate reader compatible

2. CL quantitative analysis

Features

Direct quantification of CL in isolated mitochondria

Benefits

Comparative analysis of CL levels across tissues or conditions

3. CL imaging

Features

CL-specific probe suitable for confocal microscopy

Benefits

Visualizes mitochondrial distribution and CL-rich zones
Non-toxic to cells



#LIOS-004

CATEGORY
Research tool

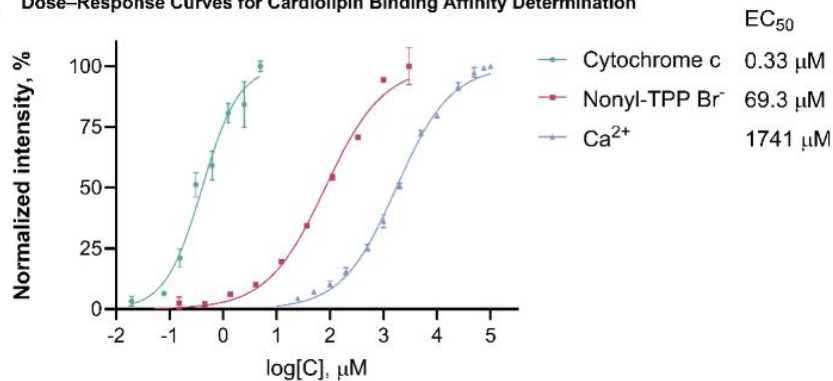
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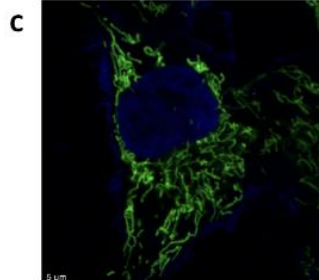
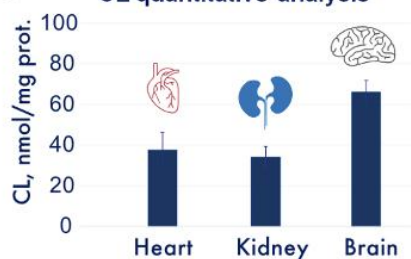
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A Dose–Response Curves for Cardiolipin Binding Affinity Determination



B CL quantitative analysis



- A. Dose–response curves of cytochrome c, nonyl(triphenyl)phosphonium bromide, and Ca²⁺ demonstrating their relative binding affinities to CL as measured by the MitoCLue assay.
 B. Total CL content in mitochondrial fractions isolated from mouse heart, kidney and brain.
 C. Confocal microscopy images of a live A2058 cell stained with MitoCLue (green) and Hoechst (Blue).

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Collection of primary human skeletal muscle cells

SUMMARY

The collection includes primary skeletal muscle cells (HSMCs) obtained from skeletal muscle tissue (*m. semitendinosus*) obtained as surgical waste during standard anterior cruciate ligament (ACL) reconstruction in subjects with ACL rupture. No tissue was harvested solely for research purposes.

BACKGROUND

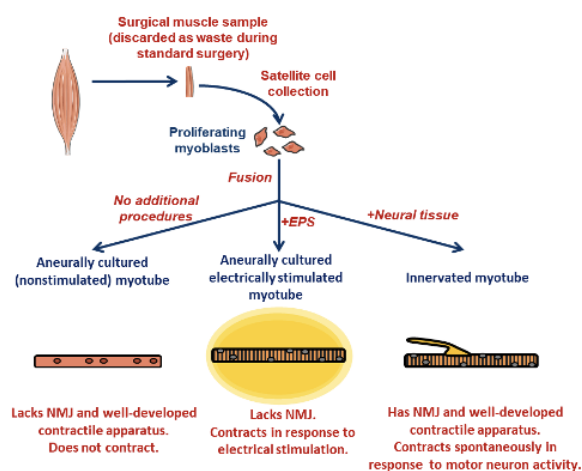
Primary HSMCs (myoblasts and/or myotubes) are used as an *in vitro* model for the study of skeletal muscle physiology (e.g. myogenesis, muscle repair, contraction and metabolism), skeletal muscle pathology and regeneration as well as therapeutic interventions on skeletal muscle. Primary HSMCs allow researchers to study cellular responses to various factors, e.g. nutrients, hormones, and drugs, under controlled conditions. Myotubes can be stimulated to contract by electrical pulse stimulation or innervation. Informed patient consent and ethical approvals for the collection and use of HSMCs for the above purposes were obtained.

FEATURES AND KEY BENEFITS

Primary HSMCs offer several advantages over other skeletal muscle cell models, such as L6 rat skeletal muscle cells and C2C12 mouse skeletal muscle cells: 1) primary HSMCs are of human origin, making them a more relevant cell model for human skeletal muscle than rat L6 cells and mouse C2C12 cells; 2) primary HSMCs can have similar metabolic properties to donor skeletal muscle, allowing researchers to study the underlying causes of metabolic changes in skeletal muscle cells *in vitro*; 3) when using primary HSMCs from multiple donors, researchers can gain insight into the inherent variability between individuals.

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4 CONCLUSION

The creation of publicly accessible catalogues of assets, comprising both legally protected intellectual property and internally registered innovations, hold significant value for research and academic institutions across Central and Eastern Europe. Such catalogues represent a practical instrument for facilitating innovation activities, fostering collaborations with industrial and academic partners, and enabling the broad dissemination of expertise within the scientific community.

For institutions in this region, presenting research tools, technologies, and services in a transparent, systematic format extends beyond simple record-keeping. It serves as a strategic measure for promoting the visibility of their scientific outputs, encouraging engagement with potential external collaborators, and streamlining the process of aligning institutional capabilities with emerging needs and opportunities. By sharing clear, structured information about each asset, including a summary, application areas, developmental stage, and availability, the catalogue supports more effective communication and partnership building.

This practice is especially important for Central and Eastern European institutions, as it contributes to narrowing the research and innovation gap compared to more advanced institutions in the countries of Western Europe. Enhanced visibility and accessibility of intellectual property and expertise support the generation of professional networks, facilitate access to funding sources, and increase the prospects for the practical application of research outcomes. These developments strengthen institutional reputations and encourage cross-border exchange of knowledge and skills.

The Alliance4Life Assets Database exemplifies this approach by providing an openly accessible, regularly updated overview of assets developed by leading research organisations in the region. Through this collaborative effort, Alliance4Life enables consistent advancement in research excellence and innovation capacity for its members. The development and refinement of such catalogues reflect an ongoing commitment to supporting progressive institutional development. As more organisations adopt such open and structured forms of communication, the opportunities for collaborative discovery and positive research impact throughout the European research landscape are likely to expand further.

To maximise its impact, the database will be actively promoted at national and international conferences, as well as at stakeholder matching events. Furthermore, all partner organisations will include direct access to the database on their respective webpages, ensuring visibility and fostering engagement across wider research and innovation communities.

Looking ahead, maintaining and expanding open catalogues of IP and know-how will underpin the progressive development of research organizations. By inviting engagement and cultivating trust among potential collaborators, these resources help anchor institutions as hubs of innovation and leadership in their regions. The ultimate reward is a research ecosystem that is more interconnected, outward-looking, and prepared to thrive on the global stage.