

Award received	Project title (English)	Project summary (English)
<p>Special Grand Prize - Saudi Innovation Excellence Prize & Gold Medal with Jury Congratulations</p>	<p>Live-attenuated Influenza Vaccine with Alpha-1,3-Galactosyltransferase Expression to Enhance Immune Response</p>	<p>The project focuses on creating a live-attenuated influenza vaccine that expresses α-Gal epitopes on the surfaces of infected cells. By introducing a gene for alpha-1,3-galactosyltransferase into the neuraminidase gene segment of the influenza virus, the vaccine promotes the opsonization of these infected cells by anti-α-Gal antibodies, thereby enhancing the immune response triggered by the vaccine. This innovative approach aims to improve the efficacy of influenza vaccination.</p>
<p>Gold Medal with Jury Congratulations</p>	<p>A Multimodal Medical Screening and Disease Monitoring Platform to Serve Healthcare Professionals, Patients, and Families in Primary Health Settings with Clinical Standard Readout, Environmental Versatility, and Accessibility</p>	<p>The project aims to provide healthcare professionals, patients, and families with a portable Electrical Impedance Tomography (EIT) system for the early detection and monitoring of vital organs such as the lung, liver, kidney, heart, and brain. Designed for use in primary healthcare settings like clinics, community centers, and homes, this non-invasive technology utilizes advanced microelectronics to measure impedance distribution in organs and generates clinically standard readouts through AI-enabled processing. The EIT system is validated by clinical professionals, offering a unique solution for disease detection and monitoring in community, clinic, and home environments.</p>
<p>Gold Medal with Jury Congratulations</p>	<p>AI-Powered Blood Pressure Monitoring for Everyone</p>	<p>The project focuses on developing a non-invasive method for measuring blood pressure using AI and the built-in sensors of mobile devices, such as microphones, motion sensors, and cameras. This innovative approach allows for convenient home healthcare and continuous monitoring without the need for additional hardware. Key features include the ability to compute various vital signs, telemedicine integration, emergency care capabilities, personalized drug dosage optimization, cost-effectiveness, high scalability, and privacy protection, ensuring that no identifiable data is exposed.</p>
<p>Gold Medal with Jury Congratulations</p>	<p>Circulating Thrombospondin-2 (TSP2) - A Novel Fibrosis Biomarker for Patients with Type 2 Diabetes and Metabolic Dysfunction-Associated Steatotic Liver Disease</p>	<p>The project focuses on using circulating thrombospondin-2 levels as a simple and non-invasive blood biomarker to predict the presence and progression of advanced liver fibrosis. This biomarker is significant for identifying critical stages of steatotic liver disease, which can influence disease progression in patients with type 2 diabetes and related metabolic disorders.</p>
<p>Gold Medal with Jury Congratulations</p>	<p>Compositions and Methods of Gamma-delta T Cell Extracellular Vesicle-based Tumor Vaccines</p>	<p>The project focuses on utilizing extracellular vesicles derived from $\gamma\delta$-T cells as a versatile platform for cancer vaccine development. This approach enhances immune activation and exerts antitumor effects, offering a scalable and ready-to-use solution for various cancers. The technology highlights include the use of $\gamma\delta$-T-EVs to deliver tumor antigens, stimulate immune responses, and directly eliminate tumor cells, ensuring improved safety, effectiveness, and broad applicability in cancer treatment.</p>

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Gold Medal with Jury Congratulations	Hypoxia-Primed Mesenchymal Stromal Cells and Their Derivatives Enhance Lung Injury Repair	<p>The project focuses on preconditioning mesenchymal stromal cells under hypoxic conditions, which simulates the oxygen deprivation seen in tissue damage. This process stimulates the secretion of therapeutic extracellular vesicles enriched with angiogenic factors that facilitate tissue regeneration following acute lung injury. These enhanced extracellular vesicles play a crucial role in promoting recovery from acute lung injuries associated with respiratory diseases.</p>
Gold Medal with Jury Congratulations	Methods to Prepare Vdelta2-T Cells Derived Exosomes for Treatment of Epstein-Barr Virus-Associated Cancers	<p>The project focuses on developing techniques to produce exosomes from Vdelta2-T cells (Vδ2-T-Exos) aimed at treating EBV-associated cancers. These exosomes selectively target and kill tumor cells while enhancing T-cell antitumor immunity, providing a stable, scalable, and safer cancer therapy option. The innovation introduces Vδ2-T-Exos, which not only induce apoptosis in EBV-related tumor cells but also bolster T cell-mediated immunity, offering high bioavailability and low side effects, thus presenting a promising cell-free immunotherapy for effective treatment of EBV-related cancer</p>
Gold	3D Biomimetic Personalized Drug Screening Platform for Acute Myeloid Leukemia (AML)	<p>The project focuses on a drug testing platform specifically designed for leukemia, featuring a biomimetic 3D osteogenic niche (3DON) composed of stromal cells encapsulated in collagen. This setup mimics the bone marrow microenvironment, providing more physiologically relevant drug response results for patients' cancer cells. The platform offers personalized drug testing services that assist doctors in selecting the most effective treatments, allowing cancer cells to respond to drugs in a more accurate manner reflective of their natural environment.</p>
Gold	AI-enabled Precision Healthy Longevity Medical System	<p>The project aims to transform healthcare by utilizing AI to analyze multi-omics data for predicting and intervening in aging and age-related diseases, thereby shifting the focus from reactive to proactive care. Key features include AI-powered multi-omics analysis to gain insights into aging, personalized interventions for longevity, predictive disease risk models, a Longevity.Omics SaaS platform for clinics, certified labs, and physician training. Additionally, it enhances drug discovery through comprehensive multi-omics database and AI acceleration, ultimately converting traditional reactive sick care into proactive, precision healthcare.</p>

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Gold	All-natural Self-driving Nanorobot for Precise and Rapid Colon Cancer Therapy	<p>The project focuses on developing an orally administered nanorobot by natural biomaterials for colon cancer treatment. This innovative nanorobot possesses self-driving function within the human colon, allowing it to specifically recognize colon cancer cell. Key technological highlights include enhanced drug delivery efficiency due to its self-driving ability, superior biocompatibility by using all-natural biomaterials, non-invasive cancer treatment for clinic patient, and a low-cost fabrication technique, making it a more practical option for colon cancer patients.</p>
Gold	Broadly Protective Live-attenuated Influenza Vaccine by Codon Usage Bias	<p>The project focuses on developing a live-attenuated influenza vaccine that incorporates numerous silent mutations to shift its codon usage towards that of avian species, while preserving the same protein expression. This vaccine is designed to be attenuated in mammalian hosts, providing effective protection. Key highlights include the introduction of hundreds of silent mutations into the influenza virus to ensure it remains attenuated in mammals and minimize the risk of reverse mutation, its efficient replication in chicken eggs for vaccine production, and its potential to offer broad protection against various influenza virus subtypes.</p>
Gold	DeepDrug	<p>DeepDrug presents an expert-led AI-driven multi-drug combination repurposing method to enable the treatment of Alzheimer's Disease (AD) at significantly reduced costs and much higher efficiency. Key innovations include the integration of expert-led knowledge into a signed bidirectional biomedical graph with weight assignments for drug targets and drugs; the encoding of the constructed biomedical graph into a new embedding space via a graph neural network; the use of LLM extraction techniques to identify additional genetic biomarkers closely related to AD, and additional drug candidates; the exploitation of drug-gene score, drug-disease, protein-protein, or drug-target associations. DeepDrug slashes drug development time from decades to years; makes life-saving therapies affordable globally; allows pharma companies to save resources, doctors to gain better tools, and patients to get hope sooner; provides a blueprint for battling Parkinson's, ALS, and more.</p>

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Gold	Development of Safe and Effective Platform for Administration of Lutetium-177 DOTATOC Peptide Receptor Radionuclide Therapy for Neuroendocrine Tumours or Other Tumours Highly Expressing Somatostatin Receptors	The project focuses on the establishment of a novel and safe platform for administering lutetium-177 DOTATOC therapy specifically for neuroendocrine tumors and other tumors that highly express somatostatin receptors. This innovative platform has undergone clinical testing and has demonstrated its safety without any gastrointestinal or renal side effects in real patients after lutetium-177 therapy, making it a credible platform for effective radioligand delivery. This platform has been patented in many countries and regions.
Gold	Innovative Applications of Propriety Respiratory Organoids: Novel Alveolar Organoids Derived from Nasal Cells, Cultivation of Previously Uncultivable Human Viruses, and Organoid-based Assays for Predicting Real-world Antiviral Efficacy	The project's objective is to advance respiratory organoid technology to develop a novel human alveolar model for biomedical research, translational applications, and personalized medicine. Additionally, it aims to establish organoid-based virus culture systems for propagating and studying uncultivable human and animal viruses. Furthermore, the project will develop organoid-based neutralization assays for assessing and predicting the real-world efficacy of therapeutic antibodies against respiratory pathogens.
Gold	Multiview, Markerless, Magnetic Location (3M) Surgical Navigation System	This project presents an innovative surgical navigation system, whose core technology is the integration of multiview visual recognition, markerless localization and magnetic localization technologies, as well as artificial intelligence vision algorithms and light-field imaging technology. The system adopts economical color image sensors and magnetic field detection arrays, abandoning the traditional infrared reflective marking scheme, and instead realizes high-precision positioning and tracking of surgical instruments and implants based on multi-dimensional information such as object feature recognition, texture analysis, and magnetic marking, with excellent anti-obscuration performance. The system has following advantages: an adaptive multi-view camera that intelligently avoids intraoperative occlusion; AI-driven markerless tracking for precise identification of instruments; optical-magnetic dual-modality for a wide range of surgical procedures; and easy integration into existing operating room equipment for strong compatibility and significant cost-effectiveness.
Silver	DYNAMIC: Diversely Neuromorphic Adaptive Mechanism for Interactive Creation	The project leverages neuromorphic cameras and diffusion models to convert event data into interactive, text-driven videos. This energy-efficient system is designed to support applications in augmented reality (AR), virtual reality (VR), creative arts, and low-light surveillance, such as wildlife monitoring for conservation purposes. Key technological features include smart cameras that capture rapid light changes even in dim conditions, a text-to-video capability that transforms simple text into smooth and clear videos, instant usability without additional setup, and low power consumption. This system supports various applications in artistic creation, AR/VR, outdoor live broadcasting, and filmmaking under challenging conditions.

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Silver	Hybrid Robotic Hand for Human-Like, Intricate Fabric Manipulation	<p>The project introduces an innovative robotic hand designed for garment production, featuring two articulated fingers and a mobile vacuum tip. This hybrid robotic hand automates repetitive and intricate handling tasks by mimicking human hand movements, thereby streamlining post-production processes such as screen printing, ironing, and packaging with a single tool. Its dual grippers and mobile suction enable human-like dexterity, allowing it to pick up fabric laid flat, separate layers, and grasp single sheets with exceptional precision.</p>
Silver	Improving Personalized Management of Diabetic Retinopathy with Chinese Herbal Supplement	<p>The project utilizes Chinese medicine theory and AI to predict anti-VEGF resistance in diabetic retinopathy through fundus image analysis, achieving an impressive 85% efficacy for precision herbal therapy. This innovative approach combines traditional diagnostics with AI biomarkers, enabling personalized treatment plans. Key advancements include the use of a multi-head attention mechanism for precise predictions of biological treatment responses and a novel Chinese herbal supplement designed specifically for anti-VEGF non-responders, demonstrating a 70% overall efficacy compared to the 40% typical of standard anti-VEGF treatments.</p>
Silver	Intelligent Visual Sperm Selection	<p>Our AI-powered sperm sorter identifies and isolates high-quality sperms with optimal motility, morphology, and DNA integrity, aiming to improve ART success rates, reduce treatment burdens, and enhance access to effective fertility solutions.</p>
Silver	Interaction-based Droplet Sorting (InDroS)	<p>Interaction-based droplet sorting (InDroS) will decipher the cell-cell interactions at single cell resolution, by precisely pairing various types of cells in microscale droplets and rapidly selecting cell pairs with unique interactions for bioanalysis.</p>
Silver	Lactoferrin: from Dietary Supplement to Drug Candidate for Acute Lung Injury Treatment	<p>The project explores the protective effects of lactoferrin, a milk protein known for its antimicrobial properties, against highly pathogenic influenza infections. This research highlights lactoferrin's novel anti-inflammatory and antiviral activities in individuals severely affected by the influenza virus, suggesting its potential repurposing as a therapeutic agent for lung damage caused by pandemic pathogens. By leveraging this nutritional supplement, the project proposes a cost-effective dual treatment strategy for acute lung injury induced by respiratory diseases.</p>

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Silver	Secreted CDCP1 as a Novel Blood-borne Biomarker for Noninvasive Diagnosis and Precision Treatment of Nonalcoholic Steatohepatitis (NASH)	The project focuses on the discovery of sCDCP1 as a reliable biomarker for Nonalcoholic Steatohepatitis (NASH), the most prevalent chronic liver disease. The project includes the development of an ultrasensitive assay for the noninvasive diagnosis of NASH and a sCDCP1 siRNA nanodrug that demonstrates excellent efficacy in treating the condition. This innovative approach aims to enhance both diagnosis and treatment precision for NASH.
Silver	The Use of Novel Antibodies Against LANCL1 as a Diagnostic and Therapeutic Target for the Management and Treatment of Cancer	The project focuses on developing monoclonal antibodies to target the protein LANCL1 in order to treat liver cancer. By specifically targeting LANCL1 on the surface of liver tumor-initiating cells (LTICs), the invention aims to inhibit the initiation and growth of liver tumors, which are known to be deadly and globally impactful. LANCL1 serves as a novel cell surface marker that drives LTIC functions, making it a promising target for therapeutic intervention in liver cancer management.
Silver	UMeAir: Better Air, Better Health for You and Me	UMeAir creates a smart platform to provide accurate near real-time personalized air pollution and health alert and advice for asthmatics and the general public. Powered by DeepAIR, an advanced AI model, UMeAir capitalises on urban big data to accurately predict air pollution levels in high temporal-spatial resolution, enabling citizens to make better health decisions in response to changing air quality anytime anywhere.
Bronze	Aoede Neuromuse™: A Versatile Music Intelligence Empowered by Brain-computer Interfaces	The project introduces an innovative system that utilizes proprietary neural encoding and decoding technologies to transform brain signals, such as EEG, into music and chords that reflect a user's personal experiences. This technology revolutionizes music creation and therapy by converting various sensory experiences into musical compositions, employing custom EEG-decoding models to capture emotions and generate tailored therapeutic music for mental well-being. Additionally, it harnesses the brain's inherent capacity to analyze music with professional-like precision.

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Bronze	Cinnamaldehyde Prodrug for Rheumatoid Arthritis Treatment	<p>The project utilizes cinnamaldehyde, a food additive, as an anti-inflammatory agent and successfully develops an innovative reactive oxygen species-responsive prodrug system for treating rheumatoid arthritis. This system effectively protects the functional groups of both cinnamaldehyde and the anti-rheumatic drug penicillamine by conjugating them together. The resulting prodrug can self-assemble into nanoparticles, which effectively accumulate at inflamed joints. When activated by reactive oxygen species at the inflamed sites, the nanoparticles release cinnamaldehyde and penicillamine, exerting therapeutic effects without generating any by-products. The prodrug nanomedicine demonstrates excellent stability, tissue selectivity, and precise drug release capabilities. Importantly, compared to traditional medications, this nanomedicine exhibits higher biosafety and superior therapeutic efficacy. The development of the cinnamaldehyde-based prodrug offers a novel solution for targeted drug delivery in the treatment of rheumatoid arthritis.</p>
Bronze	Mastery of Fixture-Free 3D Sewing	<p>"Mastery of Fixture-Free 3D Sewing" presents an innovative 3D sewing system that leverages AI to automate the creation of 3D fabric parts without the need of fixtures. This technology enhances cost-efficiency and versatility while addressing labor shortages across various applications, including garments and automotive interiors. Key features include a fixture-free operation within 14 seconds without puckering (reducing time by 50–75%), innovative mechanisms that control sewing direction without disrupting fabric feeding, fast edge sensing for real-time fabric alignment, and high-precision narrow seam allowances of less than 5mm, making it a highly effective solution for diverse sewing needs.</p>
Bronze	MiConnection: Novel Modular Integrated Construction (MiC) Connection Systems for High-rise Concrete and Steel Buildings	<p>This invention introduces five novel and practical solutions to critical connections in high-rise concrete and steel modular buildings. By optimising the load-transfer mechanisms and construction technologies, this series of solutions effectively ensures the structural safety of high-rise modular buildings while significantly improving construction productivity, thereby overcoming the dual constraints of efficiency and quality inherent in modular buildings with conventional connection solutions.</p>
Bronze	Multi-functional Corneal Bandage (MFCB) for the Treatment of Diseases at the Ocular Surface	<p>The project focuses on a near-infrared sensitive hydrogel material designed to treat various ocular conditions, including dry eye, eye infections, pterygium and eye cancers. MFCB safely releases heat, antibacterial, and anticancer agents when exposed to near-infrared irradiation, offering a biosafe and broad-spectrum solution against bacteria and abnormal growing cells. This multi-functional bandage is specifically tailored for addressing ocular diseases.</p>

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Bronze	Recurr-NET: A Multimodal Pre-operative Image-based Deep-learning Model for Predicting Hepatocellular Carcinoma Outcomes	The project focuses on developing a multimodal artificial intelligence model that integrates imaging and clinical data to predict outcomes for liver cancer after surgery. This innovative model demonstrates superior performance compared to traditional clinical scores and histology markers. It addresses the challenge of liver cancer recurrence by providing accurate predictions of recurrence risk post-surgery, thereby enhancing management strategies for healthcare providers. The artificial intelligence model leverages CT scans and patient data, significantly improving risk prediction capabilities in clinical settings.
Bronze	SMART: Snapshot Medical Analysis and Real-time Therapies with Compressive Imaging	The project combines compressive imaging with real-time processing to enable ultra-fast diagnostics and therapies, transforming medical imaging by analyzing compressed data in dynamic clinical settings. Key technological features include the use of conventional cameras enhanced with smart optics for rapid image capture, instant processing of essential data to minimize result delays, and an all-in-one package that integrates advanced cameras with user-friendly software. This innovative system enhances healthcare by accelerating imaging and diagnosis, allowing doctors to provide quicker and more efficient care.
N/A	A Personalised Mindfulness AI Mobile Application for Well-being of Medical Students	The project aims to develop a mobile app that utilizes AI to provide tailored mindfulness training for medical students. By incorporating real-time physiological monitoring and structured pathways, the app enhances users' meditation skills and emotional regulation, ultimately promoting their overall well-being.