

Cybernetics initiatives have started at the KING SKYFRONT!



(Cybernetics Medical Innovation Base Tower A)

In January 2023, CYBERDYNE operation of Cybernetics Medical Innovation Base Tower A began. We interviewed Dr. Yoshiyuki Sankai, President and CEO of CYBERDYNE Inc., known for its business centered on cutting-edge Cybernetics Technology such as Wearable Cyborg HAL. We asked what CYBERDYNE is trying to achieve in KING SKYFRONT.

Aim of entering KING SKYFRONT

“Promote and develop new medical technology through regenerative medicine and drug discovery utilizing Cybernetics technology (Fusion composite technologies that combine bio/medical systems with AI, robots, and information systems) for the fifth industrial revolution.”

(Dr. Sankai) Many people think our company is a tech company, so they may wonder why we are entering KING SKYFRONT. It is because we have also worked on pioneering the field of regenerative medicine, such as cell culture.

Cybernetics is a new field combining “Human” + “Cyber-physical space”. To realize “Cybernetics Medical Health Innovation” for people and society, we will create a new “Cybernetics Industry” following the robotics and IT industries. We will also work to realize a “Techno Peer Support Society” where people and technology coexist and mutually support each other. These initiatives to pioneer the future will also be the primary initiatives toward the fifth industrial revolution. “Human” initiatives in the context of KING SKYFRONT would be initiatives related to biotechnology and medicine. Therefore, we will promote initiatives utilizing Cybernetics Technology as “technologies that fuse and combine bio/medical systems with AI, robots, and information systems.”

We have been working on cell culture for 17 years and have been presenting the results internationally to interact with professionals in the field of regenerative medicine. CYBERDYNE conducts research and development, commercialization, and international expansion of various fields from biotechnology, medical technology, sensing technology, robots, data accumulation/analysis/AI processing, data linkage, and our Cloud system called C-Cloud. The opening of Cybernetics Medical Innovation Base Tower A means that partnerships and collaborations with related companies will become even more activated and accelerated.

Now, “formation of co-creation space” and “Cybernetics innovation” have started to go forward in this place. It will also serve as a hub for interdisciplinary fusion.



(Yoshiyuki SANKAI, Ph.D. President & CEO)

In regenerative medicine, the topic of "Cybernic Treatment" with the world's first Wearable Cyborg HAL is starting to become a popular topic of discussion. A combination of regenerative medicine treatment and Cybernic Treatment could become the next phase of this innovation. We conducted a post-marketing surveillance study on a combination treatment using HAL and the latest nucleic acid medicine for four years. This research confirmed a remarkable therapeutic effect that had never been seen before. We also have a new-generation robotized bioreactor that we can provide to the personnel we will collaborate with at KING SKYFRONT. We want to play our part through these initiatives to make big waves of innovation from Japan that we are about to witness.

It was seven years ago when we acquired the land in KING SKYFRONT. Due to the Olympics, we had to wait for the right time to commence the construction. We completed it in March 2022 at the same time as the opening of the Tamagawa Sky Bridge. Our facility started operation in January 2023.

Features of “Cybernic Medical Innovation Base Tower A”

"Laboratories that enable collaboration with other institutions in the building, extensive technical and financial support system, and facilities suited for clinical trials."

(Dr. Sankai) First, all rooms are designed as wet labs for regenerative medicine. Their compartments range from 100m² to 800m², and those who wish to collaborate can choose their space according to their business and the nature of their collaboration with us. We have prepared a structure that allows tenant companies to conduct business activities efficiently together with our cutting-edge technologies and our business so that we can maximize synergies. Also, we have set up spaces for clinical trials on the 4th floor.

KING SKYFRONT is only 800m away from Haneda International Airport, and the Tamagawa Sky Bridge's opening has become even more convenient. I am excited to create medical innovations with companies that have similar visions..

In addition, our group has been making investments in bio-related companies. Companies we collaborate with in this building can also hope for funding opportunities from our CVC (CEJ Fund). We are the only tech company in the world that offers such an environment.



(Wearable cyborg HAL®)

I want to introduce one of our applications called “Cyvis” We just finished filing our application for medical devices in April. Data such as cardiac activities, brain activities, body temperature, activities, and respiratory status (optional) can be viewed on a single unit of Cyvis. All data can be shared in the Cloud. For companies that develop regenerative medicine and drugs, Cyvis will be a perfect application that enables scientific analysis and evaluation by continuous measurement of the data of patients for more than one week. It would be an excellent device for companies that want to measure, collect, analyze, process AI, link, and visualize such data..

Also, people who work in cell culture can add cells and functions using our robotic bioreactors so that they will find the significance and attractiveness of collaboration with us.

Expectations for KING SKYFRONT ~Message from Dr. Sankai~

Let's fuse different fields and join us in pioneering the future!

(Dr. Sankai) We are a future-pioneering company. We focus on solving social issues and creating a better future utilizing a new field of "Cybernic". However, I think the same goes for everyone, but there are limits to what we can do on our own. If we work together regardless of our backgrounds, it will open up ways to a better future.

Towards creating the future, I have also worked to change laws and regulations. A good example is that “Pharmaceutical Affairs Law” has changed to “Pharmaceutical and Medical Device Act.” This experience will be helpful for our challenges in the KING SKYFRONT. We would have to live up to the expectation of the Kanagawa Prefecture and Kawasaki City officials who enthusiastically invited us to KING SKYFRONT. I hope this initiative in the small part of Kanagawa prefecture will escalate to the next level.

To institutions located at the KING SKYFRONT and companies considering moving in, let's work together and create the "Fifth Industrial Revolution" toward the realization of a techno peer support society where people and technology coexist and mutually support each other.

Thank you very much, Dr. Sankai.

【For those interested in moving into Cybernic Medical Innovation Base Tower A】

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(Head office of CYBERDYNE
where this interview was held.)



Succeeded in identifying a group of cells that plays a leading role in the secretory function of vascular endothelial growth factor (VEGF) under the ischemic environment from human mesenchymal/stem cells

～Developed an innovative method for identifying cell groups that contribute to the pharmacological effects of cell-based products～

On June 2nd, 2023, the research group of Dr. Yoji SATO, Head, Division of Cell-Based Therapeutic Products, National Institute of Health Sciences (concurrently serving as part-time researcher at KISTEC), Dr. Takumi MIURA, Section Chief, Division of Cell-Based Therapeutic Products, National Institute of Health Sciences, Dr. Jun KAWAI, Full-time Researcher, Next Generation Life Science Technology Development Project, KISTEC (concurrently serve as visiting principal researcher at Laboratory for Large-Scale Biomedical Data Technology, RIKEN Center for Integrative Medical Sciences), Mr. Hajime KOUNO, research Associate, Laboratory for Advanced Genomics Circuit, RIKEN Center for Integrative Medical Sciences (at that time) and Dr. Akihiro UMEZAWA, Director, National Center for Child Health and Development, identified a cell subpopulation that specifically contributes to the ability of a cell population called human mesenchymal stromal stem cells (MSCs) to secrete vascular endothelial growth factor (VEGF) in an ischemic environment.

Details of the research results were published in the British scientific journal STEM CELLS Translational Medicine on 2 June 2023.

Paper title: Single-cell RNA-seq reveals LRRC75A-expressing cell population involved in VEGF secretion of multipotent mesenchymal stromal/stem cells under ischemia

Click here for details
<https://www.kistec.jp/aboutus/press/pr20230602/>

KUHS published a paper on improvement of the ME-BYO index functions

～KUHS will accelerate academic research on ME-BYO～

On May 16th, 2023, Graduate School of Health Innovation, Kanagawa University of Human Services (KUHS), located in King Skyfront, published a paper on an empirical research project on the ME-BYO index in *Frontiers in Public Health*. The index has been promoted by Kanagawa Prefecture, and the school used the data from the Kanagawa ME-BYO prospective cohort study. In collaboration with Kanagawa Prefecture and research institutions therein, the school has been fostering human resources that would revolutionize social system and technology, and has been engaging in research activities that would achieve a healthy longevity society.

The purpose of the research is to contribute to the measures for pre-symptomatic disease, by collecting comprehensive data of lifestyle habits from healthy people, and their data from health checkups and medical examinations, including their genome information, turning those data into big data, and

consequently, revealing their disease risk. It has been carried out in the whole area of Kanagawa Prefecture, with support from around 5,000 residents

Paper title: The ME-BYO index: A development and validation project of a novel comprehensive health index
<https://www.frontiersin.org/articles/10.3389/fpubh.2023.1142281/full>

Click here for details
https://www.kuhs.ac.jp/shi/news/details_02096.html

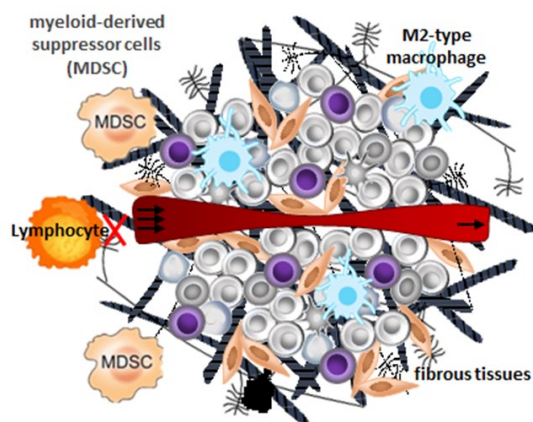
Why are intractable cancers "intractable"?

According to the National Cancer Center Japan, 26.2% of men and 17.7% of women died from cancer in 2021. Cancer treatment technology has made great progress compared to the past when it was said that one in three people would die from cancer. However, it is also true that some cancers, such as pancreatic cancer, are still difficult to be cured. Then, why are intractable cancers "intractable"? The reason lies in the soil (cancer microenvironment) in which the cancer takes root. The worse the prognosis for cancer, the more the immune system is deterred, creating a more hospitable environment for cancer. There, fibrous material proliferates abnormally, and blood vessels are crushed, making it inaccessible to immune cells that attack cancer cells. At the same time, oxygen is reduced, but cancer cells have learned how to survive in hypoxic conditions. It is known that the degree of hypoxia has a strong correlation with prognosis, and the technology to observe the "cancer microenvironment" in real-time using MRI and other techniques is very important for formulating treatment strategies.

References:

https://iconm.kawasaki-net.ne.jp/activities_column.html

<https://pubs.acs.org/doi/abs/10.1021/acsnano.1c04263>



New institutions at Kingsky Front

Two institutions will move into the Kingsky Front. Jiksak Bioengineering Inc. (Cybernetics Medical Innovation Base Tower A), and YTT Medical Co., Ltd. (Tonomachi Connect).

Please welcome them!

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<https://ws.formzu.net/fgen/S11051741/>

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