**CDW Holding Limited**
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**MEDIA RELEASE**

# CDW Publishes Research Papers on New Ways to Target Cancer Stem Cells

- **One paper on the anti-Cripto-1 antibody was published in the International Journal of Molecular Sciences.**
- **Another paper about cancer stem cell research was published in the prominent American Journal of Cancer Research.**
- **Cancer stem cell therapies targeting the Cripto-1 molecule could be highly effective in eliminating the root cause of relapses and tumour spread.**

**SINGAPORE, 1 March 2021** – SGX Mainboard listed CDW Holding Limited ("**CDW**", the "**Company**", or collectively with its subsidiaries, the "**Group**") is pleased to announce that two research papers on cancer stem cells co-authored by GSP Enterprise Inc ("**GSP**"), a subsidiary of CDW, and Okayama University, have been successfully accepted for publication in prominent scientific journals. The first paper highlighted the team's discovery of a new cell line, which can be used to test new cancer drugs aimed at targeting cancer stem cells. The second paper documented the successful use of the team's anti-Cripto-1 antibody in suppressing cancer cell growth.

***Background.*** Many cancer treatments failed because of strong resistance of cancer cells to treatment, leading to relapses and the spread of cancerous tumour growths[1]. Recent studies suggested that cancer stem cells (CSCs) are the main source of this resistance[2]. CSCs earned their name from their capacity for continuous proliferation and self-renewal. CSCs are only a small percentage of cells within a tumour but are highly capable of regenerating a tumour even after treatment, and inducing the growth of new tumours[3]. Understanding CSCs may therefore hold the potential to prevent relapse in treating many different cancers.

However, their characteristics and nature are not well understood, and there is a need to establish cancer stem cell lines that can be used in research. Human-derived cancer cell lines are widely used to study the biology of cancer, and to test new cancer treatments[4].

***The papers' findings.*** In the first paper co-authored by GSP and Okayama University, 5 different cloned cells were isolated from a cell line derived from human gliomas - a type of tumour that starts in the glial cells of the brain or the spine. Gliomas comprises about 30 percent of all brain tumours and central nervous system tumours, and 80 percent of all malignant brain tumours[5].

One of these clones, the U-251 MGSC1 cells, showed high expressions of stem cell markers, metastatic ability, the ability to form tumours *in vivo*, and was successfully characterized as CSCs. These made U-251 MGSC1 cells an excellent tool for developing effective therapeutic agents targeting CSCs, and for understanding the mechanisms of tumour development in the brain. Building on this success, the team hopes to establish other CSC lines derived from other types of cancers such as pancreatic cancer, breast cancer and lung cancer.

In the second paper, the Company's proprietary phage display library isolated a phage clone that showed an affinity for binding to the Cripto-1 protein in human cells. Phage display libraries were originally devised by molecular biologists as a tool to define the binding sites of antibodies, that allowed them to target certain harmful antigens. From this phage clone, a humanized artificial antibody targeting human Cripto-1 was developed.

This antibody shows good potential for use in the pathological diagnosis of cancer tissues, and also inhibited the growth of cancer stem cells by targeting Cripto-1. Experiments with multiple human cancer cell lines showed this antibody had the greatest impact on the growth of GEO cells expressed in colorectal cancer. IC50 is a measure of how much of a particular drug is needed to inhibit a given biological process or component by 50%. The IC50 of this antibody against GEO cells is comparable to the IC50 of Cetuximab, a type of anticancer drug used for the treatment of advanced bowel cancer and head and neck cancers that starts in the mouth and throat.

> ***"Researchers have found that cells which express high level of Cripto-1 also have a high ability to form tumours. Our research indicates that the Cripto-1 molecule is closely associated with the "stemness" of cancer.***
>
> ***Cancer stem cells are found in all cancer tissues, and are believed to cause new tumours and relapses. Yet, they are resistant to anticancer drugs and radiation therapy making them difficult to treat. Therefore, new anti-cancer therapies like ours designed to target this Cripto-1 molecule is expected to have greater success in eradicating the root cause of cancerous tumours."*** explained Professor Masaharu Seno[6], the lead researcher of the project.

In an earlier press release on December 1, 2020, the Group announced the development of a new therapeutic antibody targeting the Cripto-1 protein. The anti-Cripto-1 antibody works by binding itself to the Cripto-1 protein expressed on CSCs. The in-vivo cell growth inhibition tests conducted by Okayama University showed suppression in the tumour growth rate of 180% to 340% and reduction in tumour volume to less than half.

The acceptance of the papers to the prominent scientific journals marks an important milestone in validating the Group's efforts to develop more effective anti-cancer therapies using the vast antibody library acquired through GSP. The American Journal of Cancer Research is ranked Q1 in Oncology, and the International Journal of Molecular Sciences is ranked Q2 in Molecular Biology by the Scimago Journal & Country Rank. This placed them in the top 25% and 50% of journals in their respective fields by scientific impact.

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**About CDW Holding Limited (www.cdw-holding.com.hk)**

CDW Holding Limited ("CDW" and together with its subsidiaries, the "Group") is a Japanese-managed precision components specialist serving the global market focusing on the production and supply of niche precision components for mobile communication equipment, gamebox entertainment equipment, consumer and information technology equipment, office equipment and electrical appliances. The Group is headquartered in Hong Kong and has operations in Japan, China and the Philippines. The Company has been identifying new businesses to invest in with the potential for growth and entered as part of its diversification strategy and has made forays into the Life Sciences sector since 2016. The Company's aim for its Life Sciences business is to identify research-driven yet commercializable projects that can have a positive impact on the quality of human life.

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[6] Dr. Masaharu Seno is currently a professor at the Laboratory of Nano-Biotechnology, Okayama University. Masaharu has 287 publications in Biotechnology, Cancer Research and Cell Biology, with more than 6000 citations. Professor Seno formerly served at the National Cancer Institute, as well as the National Institutes for Health (NIH) in the United States.