Drug Discovery Technology Alert. Peptide Short Circuits Chronic Pain Pathway; Cell Delivery for Chronic Inflammation Treatment; Stabilized GPCR Platform for Drug Discovery

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This issue profiles a peptide that short circuits the chronic pain pathway, applying cell delivery for chronic inflammation treatment, and a stabilized GPCR platform for drug discovery.

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DEVELOPMENT OF DUAL ACTION ANTIBODY BY KOREAN PHARMACEUTICAL COMPANY

The complex mechanism pathway of refractory diseases such as cancer and immune disorders usually associate with more than two targets. Therefore, monoclonal antibodies (mAbs) designed against single targets are insufficient to achieve the blockade of the diseases etiology. Therefore, the more efficient therapies by antibody treatment are by combination of two single targeted antibodies or combination of mAb and chemotherapeutic agents.

PharmaAbcine has been adopting dual-targeted specific antibodies as a more efficient way to target two different tumor antigens in a cell and to increase their ability to kill cancer cells or cells tumorigenesis. By governing multiple targets simultaneously at the same site, dual-action antibody has efficacy advantages beyond simply coadministering two separate drugs and could achieve enhancement in efficiency for cancer treatment.

According to Jin Sang, Yoo from PhamAbcine, PharmAbcine next-generation bi-specific antibody with dual specific DIG and PIG technologies, adopted a full IgG (Immunoglobulin G) format and have shown much better efficacy over single targeted mAb even with the low doses. Currently, several developed DIG-bodies are in preclinical stage. In addition, the company mentioned that they discovered dual specific antibody targeting cancer stem cell (or cancer initiating cell) derived from patients and will be tested in well established *in vitro* and *in vivo* systems.

As dual specific antibody is an antibody that binds to two different targets, therefore it enables higher specificity and synergic effect. Apart from that, dual specific antibodies could be beneficial to patients' treatment cost, since lesser amount of drug will be required compared to monospecific antibodies. In addition, according to various review reports, these dual specific antibodies have advantages over simple coadministration of two mono-specific antibodies and may reduce the costs of development. Yoo further commented that there are various formats of multispecific antibodies, which are currently under development, for instance BiTEs (Micromet Inc.), Trifunctional Ab (Fresenius Medical Care AG & Co./TRION Pharma GmbH), Diabody (Imclone LLC), DVD-Ig (Abbott Laboratories Services Corp.), Two-in-one (Genentech Inc.), CVX body (Pfizer Inc.), DIG-body and PIG-body (PharmAbcine Inc.). Some of these molecules are in the clinical trials after confirmation of their efficacies *in vivo* and *in vitro*.

Yoo further told *Technical Insights* that technology review published by the Massachusetts Institute of Technology (MIT) in 2010 predicted dual action antibody as a remedy against cancer on the list of 10 emerging technologies. Therefore this technology would potentially create an impact in the pharmaceutical sector and eventually dual/multispecific antibodies can be sole alternative to overcome the unmet medical need of monotargeting antibody or multitargeted small molecule inhibitors. Therefore, PharmAbcine will continue harnessing their dual specific platform technology feature where they can conjugate with the selective potential biomolecule under the DIG pipelines, which perform similarly to antibody-drug-conjugate (ADC). Antibody for cancer specific marker and induction of cytotoxicity are the ingredients of the developmental concept of the ADC-like dual action antibody of which function against target tumor will be further elucidate.

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