
TAGCyx and Toray Launch Joint Research Initiative to Combat Preeclampsia during Pregnancy as Part of Efforts to Stem Japan’s Declining Birthrate

Tokyo, Japan, January 4, 2024 – TAGCyx Biotechnologies, Inc., announced today that it has embarked on joint research into blood purification therapy for preeclampsia with Toray Industries, Inc. and the University of Tokyo.

This initiative will clarify the pathophysiology and timing of interventions in driving to commercialize the world’s first truly efficacious treatment for preeclampsia by 2030.

Preeclampsia is a potentially dangerous pregnancy complication characterized by high blood pressure. Severe preeclampsia can harm mothers and fetuses by causing kidney, liver, brain, and other organ damage and fetal growth failure. It occurs in 3% to 5% of pregnancies (see Citation 1). It is a key cause of death and long-term complications in pregnant women and newborns. One mechanism of its pathogenesis could be the fms-like tyrosine kinase-1 protein (sFlt-1; see Glossary note 1) in mothers’ blood (Citation 2). There is a pressing need to develop effective treatments for this disease.

The joint research aims to develop an adsorption column that selectively adsorbs tyrosine kinase-1 and has high anti-thrombogenic properties to prevent blood component losses in expectant mothers, having the column adsorb and remove sFlt-1 from maternal blood while it is circulating outside the body. By removing the causative agent, the blood purification therapy does not transfer the drug to the fetus, eliminating an issue in drug discovery. This therapy should thus be simple to apply in clinical settings.

TAGCyx is engaged in the research and development of DNA nucleic acid aptamers (Glossary note 2) with high target selectivity and blood stability through its proprietary platform technology, Xenoligo[®], consisting of a world-leading artificial base pairing technology and a mini-hairpin technology. TAGCyx has obtained a candidate aptamer that selectively recognize sFlt-1 and confirmed selective adsorption of sFlt-1 using the aptamer immobilize material. TAGCyx has also confirmed that sFlt-1 can be removed from the blood of patients with preeclampsia. Toray commercialized TORAYMIXIN[®] as a column to remove bacteria-derived endotoxins in blood by developing a compound that binds endotoxins with fibers, incorporating it into the column. Before embarking on this joint research, the company combined technology amassed through TORAYMIXIN with proprietary anti-thrombogenic polymer technology it innovated in developing artificial kidneys to create a fiber technology offering improved anti-thrombogenic properties. TAGCyx and Toray combined their own proprietary technologies and have already confirmed the fundamental concept of fixing sFlt-1 binding nucleic acid aptamers onto the fiber, for the selective adsorption of sFlt-1.

This joint research will develop sFlt-1 adsorption columns with a view to commercialization

while constructing an animal model in the laboratory of Associate Professor Takayuki Iriyama of the University of Tokyo Hospital to verify the efficacy of the sFlt-1 adsorption column and analyze serum from preeclampsia patients.

This joint research will be conducted under the Development of Medical Devices and Systems for Advanced Medical Services program of the Japan Agency for Medical Research and Development.

Glossary

1. sFlt-1 is a soluble isoform of fms-like tyrosine kinase-1 (Flt-1) that inhibits angiogenesis. Elevating blood concentrations of sFlt-1 inhibits angiogenesis and vascular endothelial dysfunction, leading to such key preeclampsia symptoms as hypertension and urinary protein. Insurance coverage for predicting the onset of preeclampsia by measuring sFlt-1 levels began in 2021, and is now in practical use.
2. A nucleic acid aptamer is a molecule in which a single-stranded DNA takes on a three-dimensional structure enabling it to bind specifically and with high affinity to a particular molecule, resulting in advanced functionalities.

Citations

1. Sato M. Obstetrics and Gynecology 2019; 86: 163-9.
2. T. Chaiworapongsa et.al. Nat Rev Nephrol. 2014; Aug;10(8):466-80.

Corporate Profiles

TAGCyx Biotechnologies, Inc., is a biotech company that exploits its proprietary Xenoligo® drug discovery platform technology in seeking to create highly functional nucleic acid drugs and medical devices by deploying nucleic acid aptamers incorporating artificial bases.

Corporate website: <https://tagcyx.com/en/>

Technology information portal: <https://tagcyx.com/en/techinfo>

Toray Industries, Inc., is a basic materials manufacturer that creates advanced materials across a range of fields, including fibers, resins, chemicals, films, electronics and information-related materials, carbon fibers and composite materials, pharmaceuticals and medical products, and water treatment, by leveraging its core technologies of organic synthetic chemistry, polymer chemistry, biotechnology, and nanotechnology.

Corporate website: <https://www.toray.com/global/>

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