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**Joint development between AnGes and Osaka university for DNA vaccine targeting novel
Coronavirus (COVID-19)
Completion of Plasmid DNA vaccine for preclinical studies**

Regarding joint development between Osaka University and AnGes for DNA vaccine targeting novel coronavirus announced on March 5, production of the plasmid DNA vaccine has been completed for preclinical studies. The animal testing will be launched shortly.

【Overview of the development of DNA vaccines targeting the novel coronavirus】

The preclinical studies will be conducted to evaluate antibody productivity, efficacy and safety by administration to the mice, rats and monkeys. This process enables us to proceed to clinical trials for healthy volunteers.

【Overview of the development of preventive DNA vaccines against the novel coronavirus, using plasmid DNA manufacturing technology-Reference information from the March 5 and 13 press release】

- Joint development of DNA vaccine against novel coronavirus between AnGes and Osaka University (Department of Clinical Gene Therapy; Department of Health Development and Medicine) based on the previous achievement of plasmid DNA product.
- The manufacturing process can be established in a shorter period of time with the manufacture of DNA vaccines, compared with the vaccine with using inactivated viruses (attenuated vaccines) or the vaccine with using genetically modified virus protein.
- The manufacturing operations will be undertaken by Takara Bio Inc. that possesses manufacturing technology and facilities of plasmid DNA.
- Daicel is developing an intradermal gene transfer method, using this new administration device, and promote research with Osaka University (Impulse Science for Medicine; Department of Health Development and Medicine), aiming at its clinical application.
- Use of this new administration device is expected to increase the efficiency of intradermal genetic expression and antibody production capability, enabling the development of more efficient DNA vaccines.

<About DNA vaccine>

DNA vaccines are safe and can be produced in a short time period without using any dangerous pathogens. By inoculating a circular DNA (plasmid) encoding the protein of the target pathogen, the pathogen protein is produced in the body and immunized against the pathogen. Unlike attenuated vaccines, DNA vaccines are safe as they have no pathogenicity.

The impact this will have on the full-year consolidated results for this fiscal year is currently being examined.

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