

Toyota to license its DNA analysis technology for breeding

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Toyota Motor Corporation (Toyota) has signed an agreement with Kazusa DNA Research Institute, Eurofins Genomics K.K., and GeneBay Inc. to license Toyota's unique GRAS-Di(1) DNA analysis technology that can dramatically accelerate selective breeding. Since the announcement of this technology in September 2016, it has received acclaim from Kazusa DNA Research Institute, Eurofins Genomics, and GeneBay, and from November 2017, will be put to practical use in contract-based analysis businesses in Japan and abroad. Until now, selective breeding involved repeated selection and mating of parent varieties, based on extensive past results, and evaluation of their offspring, in order to select new varieties with the desired characteristics. In September 2016, Toyota announced that it had paired its proprietary sample preparation technology(2) with a next-generation sequencer(3) to develop GRAS-Di, a new technology that can substantially simplify the process of identifying and selecting specimens with useful genetic information. It addressed limitations posed by conventional technology, enabling significant reductions in cost and man-hours. As a result, cost has been cut by approximately two-thirds and man-hours by approximately nine-tenths of the previous level. In signing the agreement, the parties described their evaluation and expectations. Kazusa DNA Research Institute indicated that "We expect that the technology will not only be used by research and development organizations but also widely by private companies." Eurofins Genomics commented that "The ability of this technology to analyze a large number of DNA samples easily and quickly at low cost will support further research and will significantly contribute to addressing world food and energy problems." GeneBay noted that "It is common industry knowledge that it is necessary to acquire a large amount of DNA and data, which was a hurdle for spreading the technology and applying it. We expect it to be widely used in agriculture and livestock, and many other industries." It is expected that GRAS-Di can be applied to general selective breeding, not only in agriculture, but for wide-ranging development in areas including the livestock, forestry, and fishery industries. Toyota believes that by introducing the technology to companies that intend to expand their businesses globally, the technology will contribute to addressing global issues through increased production of biofuels and foods and improvement of the disease resistance of crops. Consequently, Toyota will continue to actively disclose and share information in an effort to spread technology further. (1) GRAS-Di: Genotyping by Random Amplicon Sequencing-Direct (2) Technology that amplifies thousands to tens of thousands of locations on the genome with a high degree of repeatability as a means of amplifying the sequence of an analysis sample using a proprietary primer (nucleic acid fragments necessary for the synthesis and replication of DNA). (3) A device capable of analyzing tens of millions to billions of locations on the genome at the same time.



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