

어큐아이디(ACCUID), 유해 신원확인이 가능한 유일한 제품

제주 4.3 항쟁 유해 유전자검사에 활용중

유해를 발굴하는 목적은 유해를 가족의 품으로 돌려드리기 위함입니다.

유해를 발굴해서 가족관계를 확인할 수 있는 제품은 SNP 마커를 활용한 어큐아이디가 유일합니다.

유해에서 DNA 를 추출하는 것은 고도의 기술력이 요구되며 추출되는 DNA 의 양은 1 조분의 1 그램인 피코그램(pg) 단위입니다.

일루미나사의 노바섹 장비로 DNA 를 분석하려면 100 나노그램(ng) 이상의 DNA 가 필요하여 유해 분석에는 적합하지 않습니다. 당사가 세계 최초로 개발한 어큐아이디는 서울대학교 법의학교실 이승덕 교수 연구진과 공동개발되었으며 미국 어피메트릭스(Affymetrix)사에서 OEM 생산되는 제품으로서 일루미나 NGS 장비가 필요로 하는 DNA 량의 2000 분의 1 인 50 피코그램으로도 분석이 가능합니다.

어큐아이디는 법의학 분야에서 활용이 가능하도록 극미량 시료에서 분석이 가능한 것은 물론 169 개의 SNP 마커를 통해 인종과 상관없이 3 촌 관계(자-손자-증손자, 삼촌-사촌)까지 가족관계 확인이 가능합니다. 법의학 분야에서 기존에 활용되는 STR 검사는 직계가족인 1 촌간의 가족관계 확인만이 가능하여 70 년 가까이 매장되었던 유해의 가족관계 확인에는 한계가 있습니다.

디엔에이링크 이종은 대표는 “당사는 국과수 유전자감식 위탁사업, 국방부 6.25 전사자 유해/유가족 유전자검사 용역사업, 제주 4.3 항쟁 유해/유가족 유전자검사 용역사업 등을 수행한 경험이 있으며 법의학 분야 국제 공인성적서 발행이 가능한 공인시험기관(KOLAS)입니다. 정부 요청시 6.25 전쟁에서 사망한 미군 및 국군 전사자 유해의 신원을 확인하기 위해 당사의 어큐아이디 기술을 제공할것다”고 밝혔다.



AccuID 제품

* 첨부된 보도자료는 어큐아이디 개발 초기단계부터 당사의 어큐아이디를 보도해 온 미국 Genomeweb 의 기사 내용입니다.



DNA Link Joins Powered by Affymetrix Program, Developing Forensics Test

Feb 07, 2013 | [staff reporter](#)

NEW YORK (GenomeWeb News) – South Korean genomics-based biotech firm DNA Link has signed a Powered by Affymetrix Program agreement providing it a worldwide license to develop and commercialize a forensic test using Affy's microarray technology and the South Korea FDA-cleared GeneChip System 300Dx v.2, Affy announced today.

DNA Link has developed a SNP marker-based assay called AccuID Chip for personal identification. The chip combines Affy's target resequencing array technology and multiplexing PCR technology, resulting in the genotyping of hundreds of SNP markers in a single experiment. The chip can also be used on a variety of forensic samples, including DNA samples, Affy said.

"The advantage of using SNP markers is that they possess lower mutation rates than STR markers, thus are more stable in terms of inheritance which could aid parentage testing, kinship analysis, ethnicity, or predicting phenotypic characteristics," Jong-Eun Lee, CEO of DNA Link, said in a statement. "This novel forensic test, AccuID Chip, can be used complementarily with existing STR tests and to build a more comprehensive forensic database."

DNA Link is headquartered in Seoul and specializes in SNP research and personalized genomics. Its AccuID Chip is not available in the US as an *in vitro* diagnostic.

Dara Wright, vice president of Clinical Applications Marketing for Affy, added that DNA Link is the first Powered by Affymetrix partner in South Korea and will provide other partners in the program access to the personalized genomics market in that country.

Powered by Affymetrix allows other companies to license GeneChip technology to develop microarray products. Other partners in the program include Roche Diagnostics, Johnson & Johnson's Veridex, and BioMérieux.

Financial and other terms of the deal with DNA Link were not disclosed.

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DNA Link's Chip-Based Forensic Test Could Help ID Korean War Remains

Feb 12, 2013 | [Justin Petrone](#)

Premium

This story has been updated from a previous version posted on Feb. 9 to include additional comments from DNA Link and Affymetrix.

A new array-based test could aid in identifying the remains of thousands of unknown soldiers from the Korean War.

Jong-Eun Lee, CEO of DNA Link, told *BioArray News* that the test, called AccuID, is already available through the firm's laboratory in Seoul, South Korea.

According to Lee, DNA Link's forensic testing service relies on a custom targeted resequencing array manufactured by Affymetrix. AccuID has been developed for human identification purposes, Lee said, adding that its "most useful application" is for genotyping highly degraded samples, such as old bones.

In particular, he said that DNA Link is focusing on the remaining cases of unidentified Korean War casualties to find living relatives so that the soldiers' remains can be returned to their families. Fought between 1950 and 1953, the Korean War is estimated to have claimed between one and two million lives. Lee said that about 130,000 Korean soldiers are still missing from the conflict, and the Korean Department of Defense has located the remains of about 7,000 of those war casualties.

Currently, the Korean DoD is using short tandem repeat-based method to identify those remains by matching them with living relatives of those missing soldiers, but the matching rate is "extremely low" due to the condition of the DNA, Lee said.

DNA Link is in the process of persuading the DoD to adopt its chip for that program.

"We have some good preliminary results using other old DNA and their living relatives," Lee said. He noted that the Korean program is focused on Korean soldiers, and that cases involving US soldiers are handled by the US Department of Defense. About 8,000 American servicemen who fought in Korea are still listed as missing by the US DoD.

A self-described medical genetics research company, DNA Link provides services for several US and European vendors, including Affy, Agilent Technologies, Fluidigm, Illumina, Pacific Biosciences, and Roche. Earlier this week, the company announced that it had obtained a license to develop and commercialize a microarray-based forensic test on Affy's GeneChip platform.

In Lee's opinion, microarrays have "many advantages" over other technologies, including PCR-based microsatellite genotyping, Fluidigm's integrated fluidic circuit-based approach, and genotyping by sequencing.

With regards to microsatellite, or STR, genotyping, Lee said that SNP markers are "easier to type, interpret, and scale up" compared to STR markers.

"We have data that shows many SNP markers being genotyped by our chip on the samples [that] were unable to [be] genotyped with existing STR marker kits," said Lee.

He added that DNA Link selected an array-based approach over adopting next-generation sequencing for its forensic test because it "requires less DNA" and because Affy's arrays are "quite reliable and easy to make in large quantities."

He also noted that Affy's installed base of GCS 3000Dx v.2 instruments around the world was a rationale for making the test available as a GeneChip, as those interested in using AccuID "don't have to invest in machines."

Though the 3000 Dx has been cleared by the Korean Food and Drug Administration, Lee said that forensic tests like AccuID do not require regulatory clearance in South Korea.

From Affy's perspective, the launch of AccuID is a gateway to the Korean market for its diagnostic partners.

Mindy Lee-Olsen, vice president of marketing services at Affy, told *BioArray News* that the firm maintains similar relationships with 16 diagnostics firms — including Roche, Pathwork Diagnostics, and Skyline Diagnostics — that have developed and launched tests on Affy's technology platform ([BAN 6/26/2012](#)). In total, 60 tests have been developed or are in development, Lee-Olsen said.

According to Lee-Olsen, the addition of DNA Link, a service provider that offers testing on the 3000 Dx v.2, could technically enable those firms to eventually offer their tests to Korean customers.

"In the event of DNA Link, there are no formal agreements at this time that name them as a menu integrator [or] test outlet, but it is a possibility down the road," Lee-Olsen said.

Such relationships could expand the market for DNA Link's test too.

Lee said that his company is "absolutely interested" in providing DNA Link's chips to partners in other countries, and noted that the company selected SNP content for AccuID that would allow the test to "perform well on other ethnic groups."

Looking ahead, Lee said that DNA Link is planning a new version of AccuID that will feature additional markers including "ancestry informative markers for ethnic differentiation, phenotype markers like ABO blood type," and markers for hair and eye color. He said that DNA Link is working with Affy on the next version of the chip.

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Korean Firm DNA Link Positions New AccuID Forensics Chip as Alternative to STRs, Sequencing

Sep 03, 2013 | [Justin Petrone](#)

Premium

As next-generation genomic tools are increasingly being considered for use in forensics, one Korean company is looking to carve out a niche for itself.

Seoul-based DNA Link recently introduced AccuID, an Affymetrix-manufactured resequencing array for genotyping that is available as a service and a kit.

DNA Link claims it has generated unpublished data demonstrating that the current version of AccuID can determine the identities of missing persons and human remains better than commercial microsatellite genotyping products.

In addition, the firm is at work on a new version of AccuID that will contain content suitable for other kinds of forensics applications, such as police investigative work, CEO Jong-Eun Lee told *BioArray News*.

"We are putting [ancestry informative markers] for population identification and phenotype markers like eye color, skin color, and blood types" on the array, Lee said.

He said that the new version, scheduled to launch in the first half of 2014, "should draw interest from police cases as well as missing person cases."

DNA Link's main focus to date in forensics has been determining the identity of human remains. In February, the company announced that it has been using the 169-SNP array to identify remains from the Korean War ([BAN 2/12/2013](#)).

Separately in February, DNA Link and Affymetrix announced an agreement that allows DNA Link to commercialize forensic tests for human remains identification and other diagnostic assays.

According to Jean Marc Terral, DNA Link's vice president of business development, the company sees AccuID as more sensitive than PCR-based microsatellite genotyping, also referred to as short-tandem repeats, or STRs, the current standard approach in forensics laboratories.

"Practically SNPs can and most certainly will replace STR in the not too distant future, once costs go down," Terral told *BioArray News*.

He provided an internally produced report that showed that DNA Link was able to genotype 64 markers in a degraded bone sample collected from Jeju Island, the site of a 1948 Communist uprising in which between 16,000 and 60,000 people died.

Meantime, STR kits from Life Technologies' Applied Biosystems business typed zero markers. Terral said that a paper discussing the study should be published later this year.

At the same time, Terral acknowledged that microarrays are still more expensive than STR analysis, and thus will not likely immediately compete with that technology for criminal forensic analysis "even though you gain a better discrimination power or [fewer] false positives."

He said that the next version of AccuID might help DNA Link attract more forensics labs involved in law enforcement cases because it will contain SNPs for various physical traits used for identification.

Comparing technologies

While DNA Link targets forensics labs with its AccuID chips, a number of labs are developing what could become competitive offerings using next-generation sequencing technologies.

As *In Sequence* reported in June, a research group from the University of North Texas Health Science Center has been evaluating Life Technologies' Ion AmpliSeq Human Identification SNP panel for use in forensics, comparing it to a SNP panel run on the Illumina Genome Analyzer. Another team at Western Carolina University is doing mitochondrial sequencing on Illumina's MiSeq to detect rare variants below 1 percent frequency ([BAN 6/25/2013](#)).

As a service provider, DNA Link has the ability to develop forensics panels for use on sequencing platforms. According to its website, it offers sequencing on Illumina, Roche, and Pacific Biosciences instruments.

But the company believes that microarrays have been vetted to a greater extent and are easier to use than sequencing, according to Terral.

"Microarrays have been around longer than NGS, [and] are easy to standardize and validate, while the Affymetrix resequencing array is as accurate as Sanger chemistry sequencing," Terral said.

"Assuming a scientific agreement that SNPs are more informative compared to STRs ... comparing NGS to the Affymetrix resequencing array amounts to comparing technologies on reliability, ease of use, throughput, and automation," he added.

Terral noted that the current turnaround time for AccuID is about 48 hours versus "several days" using different sequencing platforms.

He also noted that Affymetrix's global installed base of GCS 3000Dx v.2 instruments was another factor in DNA Link's decision to make the test available as a GeneChip, meaning that labs that already own the vendor's equipment would not need to make additional capital investments to run AccuID.

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DNA Link's AccuID Forensics SNP Microarray Used to Identify Remains from 1948 Korean Uprising

Aug 05, 2014 | [Justin Petrone](#)

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NEW YORK (GenomeWeb News) – DNA Link, a Korean provider of microarrays for forensic analysis, has partnered with researchers at Seoul National University to identify the victims of a massacre that took place more than 60 years ago.

Tens of thousands of people perished in the Jeju Uprising, a series of events that took place between April 3, 1948, and the second half of 1949 on the island of Jeju. A Communist-supported insurrection against the American-backed government was put down by Korean military and paramilitary forces, with total casualties estimated between 19,000 and 30,000.

Between 2006 and 2011, remains belonging to about 400 individuals who died during the uprising were collected from the island and sent to Seoul National University's Forensics Lab for identification.

However, given the degraded nature of the samples, the researchers at Seoul National University opted to use a SNP microarray designed by DNA Link, rather than conventional approaches, for part of the effort.

"Short tandem repeat markers have been the conventional method for human identification in forensics," Yoon Soo Kim, an R&D team researcher at the Seoul-based company, told *BioArray News*.

"However, STR was not a suitable choice in the case of Jeju Uprising because the remains were buried in their natural state for over 60 years, which caused a high degradation of the DNA," said Kim. "So the STR results provided only limited information, usually no more than a second degree of relationship, without a clear confirmation on the genetic relationship."

Founded in 2000, DNA Link has developed a 169-SNP, Affymetrix-manufactured resequencing array for the identification of such samples. Given the higher SNP content and the sensitivity of the technology, the company has shown that its platform has the ability to identify broader familial relationships, increasing the possibility of matching remains with families.

The company last month [discussed its approach](#) in a paper in the journal *Forensic Science International: Genetics*. Among its touted advantages are the abilities to genotype highly degraded DNA; to make an identification from small amount of DNA; to identify beyond second degree of kinship like siblings and aunts and uncles; to confirm the relationship between remains and their families; and to reduce the time, effort, and cost in analyzing DNA, Kim said.

Although more than six decades have elapsed since the Jeju Uprising, an organization called the Jeju April 3 Peace Foundation has worked to track families of those who died, including those whose remains were never found.

"It is true that some close relatives have also deceased due to the 60 year time lapse, but some are actually alive, especially their children, along with siblings and nephews and nieces, to offer their DNA for the matching process," he said.

Through its collaboration with Seoul National University, DNA Link's array has been used to successfully match the remains of 15 individuals with families tracked through the Jeju April 3 Peace Foundation. According to Kim, the firm's partners at Seoul National University requested AccuID analysis on 21 samples for which STR analysis showed only partial matches. Of the remaining samples four were genotyped but matched no families, and two were too degraded to be genotyped.

"The short version of the story is that we have identified familial relationships using AccuID beyond a second degree of kinship from remains that were buried for more than 60 years," said Kim.

While DNA Link is hoping that its success in identifying the Jeju Uprising results will lead to the further use of its platform in that project, the company is also looking to raise its international profile based on its experience in Korea.

"We are still in the process of reaching international markets," said Kim. "We have received some requests on chip service from Iraq and other Middle Eastern and North African areas," he said. "We are trying to build as many solid references as we can before properly entering the international markets, and we believe our recent paper in *Forensic Science International: Genetics* can be a part of that," he added.

To reach customers in those markets, DNA Link is [working with its partner](#) Affymetrix. The two firms have a Powered by Affymetrix agreement, which "goes beyond mere technology adoption, and in fact works on a relationship-based collaboration," Kim said.

Under the terms of the agreement, Affymetrix provides support to DNA Link as a manufacturer and co-marketer, including the introduction of the firm to some of its initial contacts in the Middle East. "It is an ongoing partnership that supports DNA Link at every step of our success," said Kim. Other firms with similar Powered by Affymetrix agreements include Almac Diagnostics, SkylineDx, and TessArae.

As DNA Link looks into opportunities abroad, it is also close to deploying a second version of its AccuID chip next month. In addition to containing personal identification markers and Y markers for sex determination, the newer version will include more personal identification markers and phenotype markers, such as SNPs for hair and eye color.

The addition of new content should expand the utility of AccuID going forward, Kim maintained.

"When the number of markers are added in the future, we expect AccuID to identify even fourth degree of kinship whereas the existing techniques are limited to identifying immediate families like parent-child relationship and some siblings," he said.

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