

< Press release >

**Aderans**



**Announcing a new structural protein project**  
**Novel hair material joint R&D**

~A fresh alternative that doesn't require human hair or petrochemicals~

Hair-related, beauty, health and wellness corporation Aderans Company Limited (Head Office: 1-6-3 Shinjuku, Shinjuku-ku, Tokyo 160-8429, Yoshihiro Tsumura, Group CEO, Representative Director, and President, hereinafter referred to as "Aderans") and next-generation biomaterials development corporation Spiber Inc. (Head office: 234-1 Mizukami Kakuganji Tsuruoka, Yamagata 997-0052, Director and Representative Executive Officer Kazuhide Sekiyama, hereinafter referred to as "Spiber") are pleased to announce initiation of a joint research and development project using Spiber's proprietary structural proteins to create novel hair materials.

Aderans offers comprehensive hair services globally in 19 countries and regions around the world, and has been continually searching for sustainable hair materials that can meet the needs of the countless individuals that worry about their hair. Starting in 1983, Aderans invested resources into artificial hair research following the expected decrease in commercial availability of human hair, and has created petrochemical fibers that are close to natural hair. However, the petroleum that serves as their raw material is an exhaustible resource. Looking ahead to the next 100 years, Aderans felt that it is necessary to find renewable alternatives, and decided to begin a joint R&D project with Spiber.

Spiber conducts cutting edge R&D devoted to the commercialization of sustainable structural protein materials as a new cornerstone material of industry, all to push forward its mission: contributing to innovative solutions to global issues. Spiber's structural proteins are produced through a fermentation process that uses plant resources as a raw material, instead of petroleum like nylon or polyester. These proteins can then be processed into a wide variety of material forms such as fibers, films, stiff resins, and more, and as such are gathering attention for their potential to be used in a variety of applications from a wide range of industries.

What motivates Aderans and Spiber's collaboration is not just the innovative use of bio-produced protein materials, but more fundamentally, the shared passion for contributing to people's happiness.

This collaboration will allow for the creation of novel hair materials by combining Spiber's structural protein fiber technology with the integrated hair development capabilities built by Aderans over many years. Spiber will use proprietary technologies to design proteins at the genetic level and produce them through fermentation in microorganisms. These proteins will be customized to meet the required properties for human hair, and new fiber spinning technology will be developed to create desirable fiber shapes and properties. Based on its wealth of accumulated knowledge of hair, Aderans will evaluate and develop an array of processing, dyeing, curling and additional necessary methods, and screen prototypes in an attempt to reproduce the unique feel and properties of natural hair. R&D regarding initial properties and processes has already begun since last year, and four patent applications have been already submitted. Both companies will continue to accumulate relevant know hows and techniques, aiming for a product launch in two years.

### **Samples currently under development**



### **About synthetic structural proteins**

Proteins, biopolymers which serve as some of the essential building blocks of life, are formed from straight-chain assemblies containing up to 20 types of amino acids. The characteristics of any one protein resulting from the order of these amino acids, and the process of evolution has driven the creation and refinement of the multitude of existing proteins which support life on Earth today.

Some proteins, such as enzymes and antibodies, are responsible for a variety of physiological functions within living creatures. Others, such as those found in the cytoskeleton of cells or in spider silk, play a more structural role. At Spiber, we call the latter type ‘structural proteins’. Examples of structural proteins include keratin, found in hair and nails, and collagen, an important component in skin and bones.

Synthetic structural proteins refer to those proteins which, for a specific purpose, have been designed or selected from within an almost limitless pool of possible amino acid combinations, and then produced via a microbial fermentation process. At Spiber, our proprietary technology allows for the creation of a hugely diverse range of such proteins, each with different features and forms. Due to their non-reliance on petroleum, Spiber’s synthetic structural proteins are biological, biodegradable, and accordingly provide a compelling, sustainable solution to the needs of the apparel industry, which is seeking to move away from microplastics and animal-derived materials. They also show great potential for use in lightweight components in the automobile and transportation industries.

### **Aderans’ effort on artificial hair development**

Real human hair is used for many made-to-order wigs. In 1983, Aderans began researching artificial hair which could replace human hair, and provide an alternative material to ensure a more stable supply of wig products. As a substitute for human hair cuticles in 1987, Aderans succeeded in creating artificial cuticles with spherulites on the surface of polymeric materials, providing excellent color and style retention properties. This new material was commercialized under the name “Cyber Hair” from 1991.

Furthermore, Aderans has also seen success with its development of “Vital Hair®” (patent No. 5127443 / “Natural Hair® for women”), which changes with rain, water, or moisture and can express properties much closer to natural hair. This was first commercialized in 2006.

Finally, although Aderans’ artificial hair is made of polyamide, PVC is not used during the production process in consideration of the environmental, the result of which decreases the material’s likelihood to generate pollutants even when incinerated.

## ■ About Aderans

Founded: March, 1969

Location: 1-6-3 Shinjuku, Shinjuku-ku, Tokyo 160-8429

CEO, Representative Director and President: Yoshihiro Tsumura

Since its establishment in 1968, the Aderans Group has been a leading company in comprehensive hair solutions, with the core values of "making people around the world smile," "the best products," "the best technology and knowledge," and "heartfelt hospitality." Aderans globally provided products include wig sales, hair transplantation, and more are spread among five brands: "ADERANS" for men, "Ladies' Aderans" for women, "FONTAINE," "BOSLEY" for hair transplantation, and hair systems provided by "HAIRCLUB."

## ■ About Spiber

Founded: September 26, 2007

Location: 234-1 Mizukami Kakuganji Tsuruoka, Yamagata 997-0052, Japan

Representative Executive Officer: Kazuhide Sekiyama

Established in 2007, Spiber Inc. is a biotech startup based in Yamagata, Japan. Spiber's revolutionary protein materials have garnered wide attention for their potential to serve as sustainable mainstay industrial materials, due to their low environmental impact, biodegradability, and non-reliance on traditional petroleum resources. Spiber's co-founders, Kazuhide Sekiyama and Junichi Sugahara, began researching spider silk protein synthesis in 2004 at the Keio University Institute for Advanced Biosciences in Tsuruoka, Yamagata. Their efforts led to the development of Spiber's proprietary QMONOS® protein material, as well as the successful establishment of the world's first mass production techniques for its production. In addition to fibers, woven and knit textiles, and non-woven fabrics, Spiber's molecularly designed protein materials can also be processed into resins, films, gels, and composites. As a key member of the Japanese Cabinet Office's Impulsing Paradigm Change through Disruptive Technologies Program (ImPACT), Spiber is engaged in the promotion of research and development endeavors with over 40 partner enterprises and research institutes, and is working to create a platform for the development of protein materials which references the latest developments in fields such as information technology, synthetic biology, polymer science, and materials science and engineering. Through its multidisciplinary research and development endeavors, Spiber is comprehensively accumulating vital intellectual property required for the industrialization of protein materials.

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