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Korean scientists 3D print artificial corneas

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Research team replicated human corneal structure and fabricated a transparent cornea with the lattice pattern

Professor Dong-Woo Cho of Mechanical Engineering, Professor Jinah Jang of Creative IT Convergence Engineering, and Ms. Hyeonji Kim at Pohang University of Science & Technology (POSTECH), collaborated with Professor Hong Kyun Kim of Ophthalmology at Kyungpook National University School of Medicine, 3D printed an artificial cornea using the bioink which is made of decellularized corneal stroma and stem cells.

Because this cornea is made of corneal tissue-derived bioink, it is biocompatible, and 3D cell printing technology recapitulates the corneal microenvironment, therefore, its transparency is similar to the human cornea.

In the 3D printing process, when ink in the printer comes out through a nozzle and passes through the nozzle, frictional force which then produces shear stress occurs. The research team successfully produced transparent artificial cornea with the lattice pattern of human cornea by regulating the shear stress to control the pattern of collagen fibrils.

The research team also observed that the collagen fibrils remodeled along with the printing path create a lattice pattern similar to the structure of native human cornea after 4 weeks in vivo.

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