

KUIC Technology Profile

Electrospun Fibrous PCL Scaffolds for Tracheal Defect Repair

Summary:

KU researchers have developed a biomimetic scaffold for tracheal tissue regeneration, using polycaprolactone (PCL) electrospun fibers.

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Overview:

Tracheal repair procedures date back to the late 19th century, and yet no predictably effective treatment exists for tracheal stenosis to restore normal function to the trachea without the use of an autologous tissue graft or the sacrifice of native tissue. Even with the use of an autologous graft; the size, shape, and stiffness of the graft is often not ideal.

How it works:

KU researchers have developed a biomimetic scaffold for tracheal tissue regeneration, using polycaprolactone (PCL) electrospun fibers. These scaffolds were tested in induced tracheal defects in rabbits. After implanting manufactured PCL scaffolds into elliptical-shaped defects in rabbit tracheas, the scaffolds maintained a robust, airtight trachea free of any breathing distress, and exhibited evidence of cell infiltration into the scaffold and tissue regeneration.

Why it is better:

Countless tissue engineering and regenerative medicine studies have attempted to regenerate tracheal tissue (from synthetic materials), with a small number of successful human trials that have only recently appeared. This approach endeavors to fill a void in tracheal tissue engineering with a clinically relevant approach. In addition, this is the first time to utilize electrospinning for scaffold fabrication in tracheal tissue engineering.

Patents:

WO [2013/025819](#)

Additional Web Content:

Contact the inventor, [Michael Detamore](#).