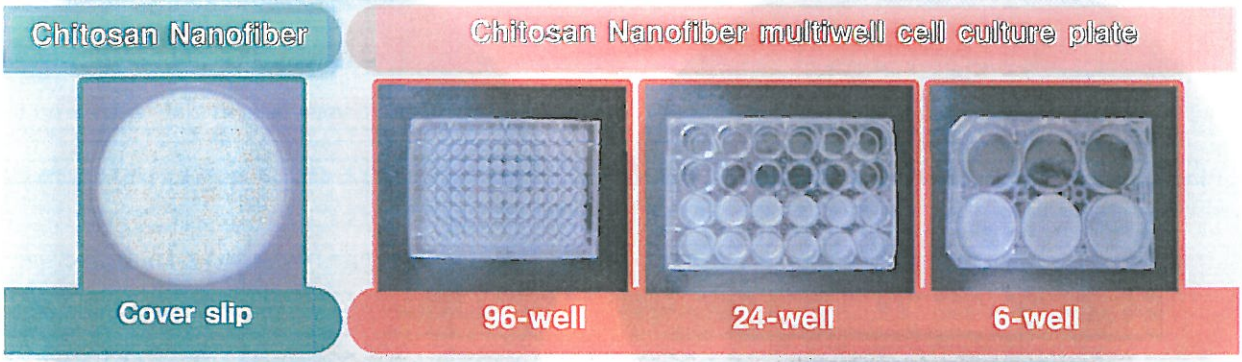
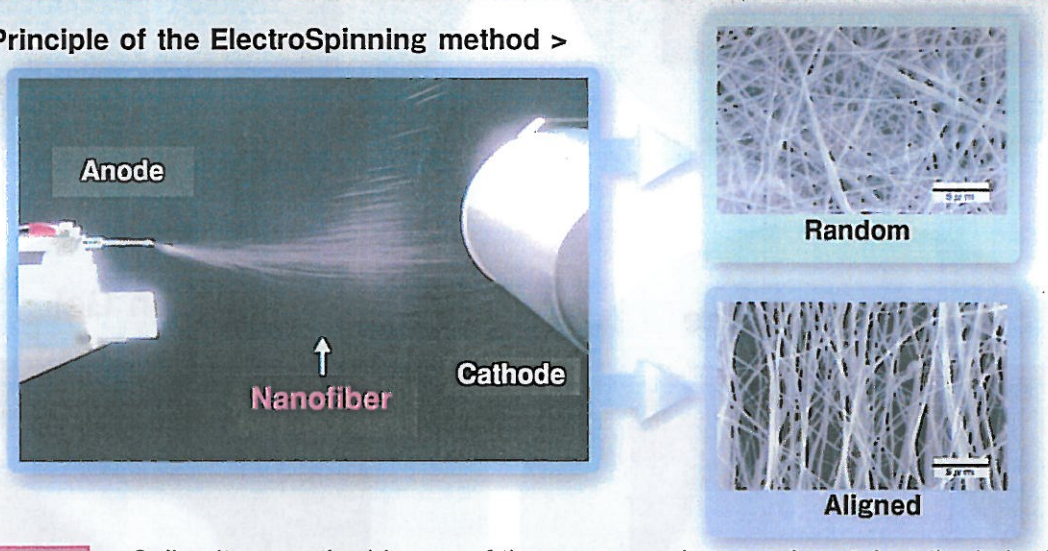
CHITOSAN NANOFIBER MATRICES
Cell & Tissue Culture Substrates

Hokkaido Soda Chitosan Nanofiber Products

- manufactured by ElectroSpinning process -



< Principle of the ElectroSpinning method >



Cell Culture method

Cell culture method is one of the most popular experimental methods in the medical and biological research. In recent years, animal experiments are being reduced worldwide, and the needs for alternative methods are increasing.

Scientists and researchers in the basic research and the drug development come to seek for good alternatives, such as improved cell culture methods, innovative high throughput cell culture systems utilizing cell chip, etc.

Chitosan

Chitosan is a polysaccharide polymer produced by alkali processing (deacetylation) of chitin, which is natural material found in various living things such as shellfish (shrimp, crab), insects and mushrooms. Unique properties of Chitosan, such as biocompatibility and biodegradability, can be designed by controlling the molecular weight of Chitosan and the degree of deacetylation, conversion rate to the Chitosan.

Production Process

Hokkaido Soda produces Chitosan from fresh crab, Cbionoecetes japonicus (Red Snow Crab) mainly from its leg shell. Extracted Chitosan is converted to nanofiber by the electrospinning method and the fiber is fixed on cover slips, cell culture plates, etc.

Unique Properties

One of distinguishing properties of Chitosan nanofiber is to become scaffolding material in cell culture. With Chitosan nanofiber, adhesiveness of cultured cell can be improved (compared to the culture in polystyrene plate or glass cover slip).

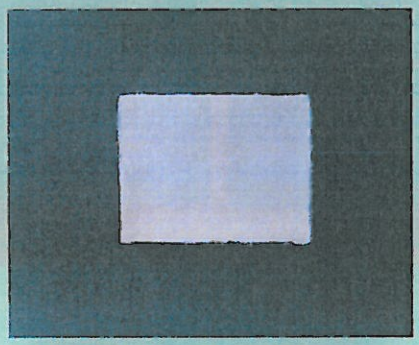
Chitosan nanofiber is hardly perishable and is an easy-to-use material for cell/tissue culture, compared to poly-L-lysine or collagen coated culture dish.

Hokkaido Soda's Other Chitosan Nanofiber Products

■ Nanofiber for Medical Material Development & Medical research

Hokkaido Soda is also developing new types of Chitosan Nanofiber Materials for possible application to medical and medical research use.

Chitosan Sheet



Porous Nanofiber

Chitosan Sponge

Chitosan Gel

■ Customized Nanofiber Materials

Hokkaido Soda has the R&D capacity to design other new form of Chitosan Nanofiber Materials. Customized products can be available on request.

For more information, please contact:

Distributor

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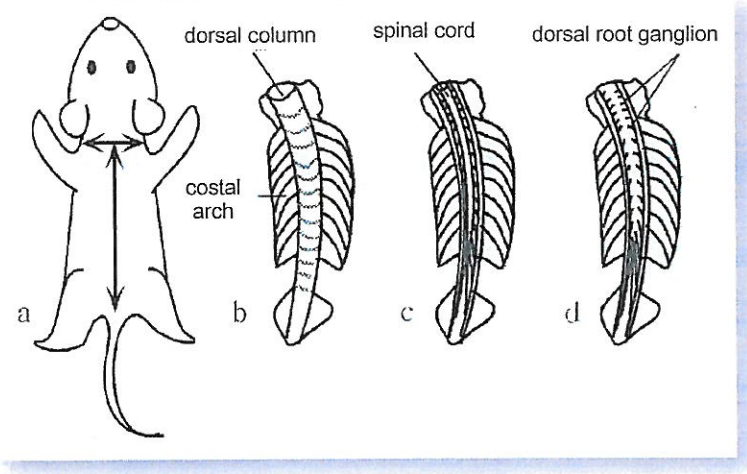
Case study 1 Adult mouse DRG culture on Chitosan coated coverslip



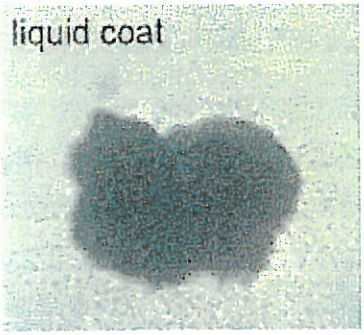
Decapitate an adult mouse and cut the skin of the back section in the middle (a).

Separate the dorsal tissue together with dorsal column as a whole (b). Cut the ventral side of the separated tissue, remove the dorsal column and expose the spinal cord under stereomicroscope (c). By removing the spinal cord (d), DRG (dorsal root ganglion) will appear. Retrieve each DRG one by one using tweezers.

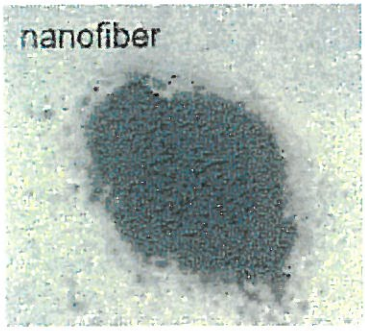
DRG did not adhere to the cover slip, on which either collagen type I or poly-L-lysine was applied. Even it did, the cell adhesivity was very weak, and only slight extension of neurite from the ganglion was observed.

In the case of liquid chitosan or chitosan nanofiber coated cover slips, cultured tissue adhered firmly to either cover slip. Both the migration of schwan cells originated from the tissue, and the neurite extension from the ganglion, were very good.

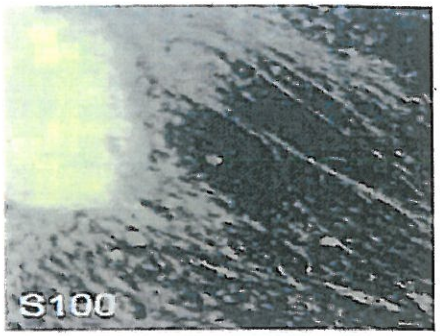
The neurite extension on the coverslip fixed with chitosan nanofiber was prominent; more than 10 times of that of Collagen type I or poly-L-lysine coated coverslip, and approximately 6 times of that of liquid chitosan coat coverslip.



Schwan cell/Liquid Chitosan



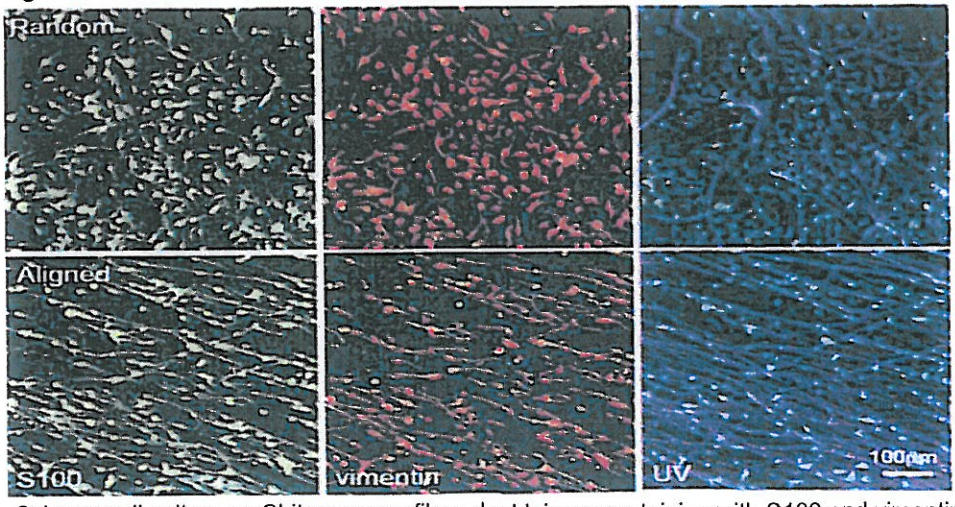
Schwan cell/Chitosan nanofiber



Schwan cell/Chitosan nanofiber

Case study 2 Cell culture on Chitosan Nanofiber coverslip

Schwan cell IM32 and primary mouse DRG (dispersed) were cultured on chitosan nanofiber. The affinity of cells to the aligned chitosan nanofiber was very good. Based on the evaluation of immunofluorescence assay, both schwan cells and neurite of DRG neuron almost grew in line with the axial direction of aligned nanofiber.



Schwan cell culture on Chitosan nanofiber, doubleimmunostaining with S100 and vimentin
(upper photo: Random Chitosan nanofiber / lower photo: Aligned Chitosan nanofiber)