

Advanced Functional Fibres

Dr. Richard Kwok, ST Kinetics

Advanced Functional Fibres could be an exciting area researchers would like to work to develop new materials for tomorrow.

For many decades, industries are using standard polymeric materials for commercial and military applications. Researchers are trying very hard to look for new materials for higher performance in term of mechanical strength and toughness.

To achieve this, one way is to develop new process on existing materials and the second option will be to development new material.

My paper will discuss on developing a new hybrid material using a new process. It is about exploring using existing materials couple with silkworm silk and or spider silk via a custom build multi-tip nanofibre electrospinning process.

Breakthroughs like discovery of wonder polymeric material and graphene do not always happen, and look into Natural silk-based materials from silkworms and especially spiders, because they are excellent candidates to give high mechanical strength and thermal conductivity.

With our current research, our researchers are able to enhance the strength of the silkworm silk by another 30% in strength and an additional of 50% more in elongation. With the right pre and post -processing of the material, there is a possibility we could functionalizing the product to deliver intrinsic and durable properties for materials of tomorrow.

In short, Advanced Functional Fibres could be functionalized and open the vast possibilities materials to achieve: antimicrobial, permanent colours, special smells that could be therapeutic, highly conductive for rapid cooling, and the list continues as technology advances.