

Living organisms and wet samples under an electron microscope: the NanoSuit[®].

Comparison of conventional/NanoSuit methods

By conventional method

- takes over all day
- needs fixation
- needs drying treatment
- possibility of deformation
- prevent from electrical charge

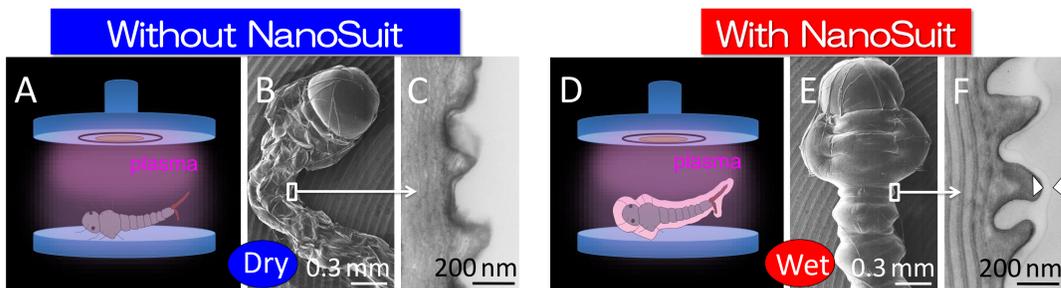
By NanoSuit method

- needs a few minutes
- living and wet samples
- wet fixated samples
- combine light and electron microscope
- usable EDS for living organisms

By plasma and electron beam irradiation for the NanoSuit solution

When living organisms are exposed to a high vacuum environment, they are dehydrated and degassed and deformed. However, it is possible to observe the ultra fine structure by the NanoSuit under high vacuum condition.

Effects by NanoSuit



When mosquito larvae without NanoSuit treatment (A) were put into the electron microscope, they were dehydrated and degassed (B, C), but when they were treated by the NanoSuit solution (D), the NanoSuit thin membrane are formed on their surface and kept their life (E, F).

Intellectual property right

- PCT/JP2012/072982
- PCT/JP2013/074141
- PCT/JP2015/052404
- 特願2016-237703 etc.

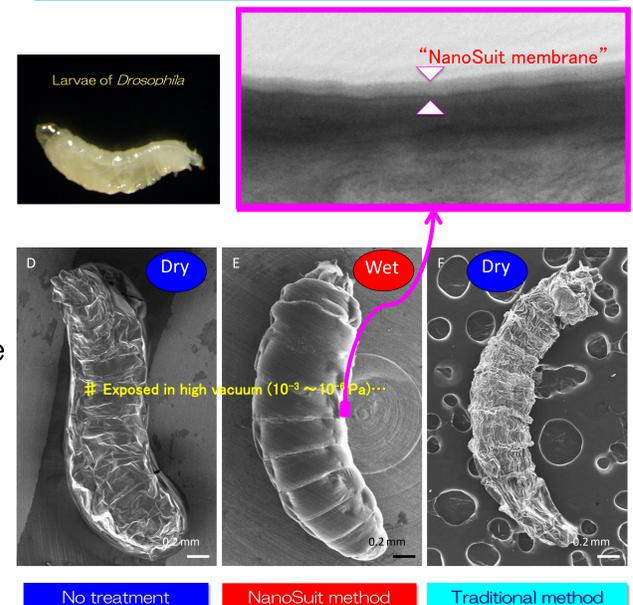
website

<http://www.kurzweilai.net/how-a-nano-suit-will-let-you-survive-in-a-vacuum-if-youre-a-bug>
<http://news.sciencemag.org/physics/2013/04/nano-suit-protects-bugs-space-vacuums>

References

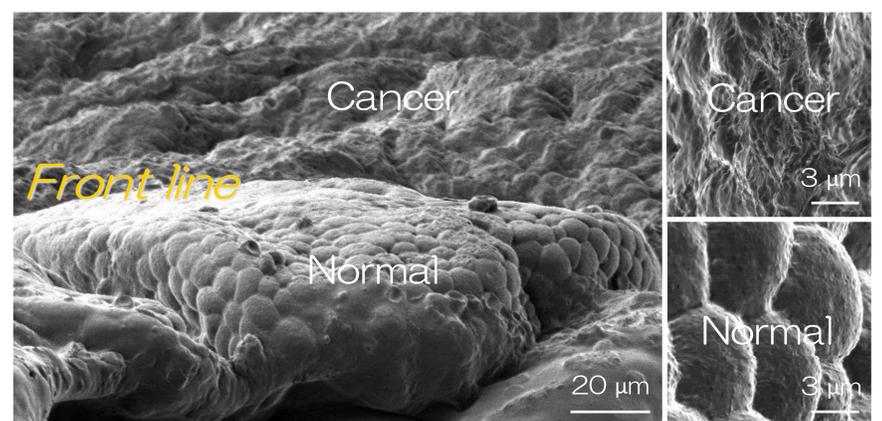
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3. Takaku Y. et al. Proceedings. Biological Sciences, 282(1802), pii: 20142857, 20156
4. Ohta I. et al. Microscopy, 63(4), 295-300, 2014.
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Overview of the method



- (1) Nano-thin films are formed on individual microorganisms, tissues, cells, bio-microparticles.
 - (2) The NanoSuit keeps the liquid / gas of the living/wet samples.
 - (3) Almost all biological samples can be observed electron microscopy as they are.
 - (4) Self-standing thin film can be made from solution.
- Usable for industrial applications.

Can observe various biological samples



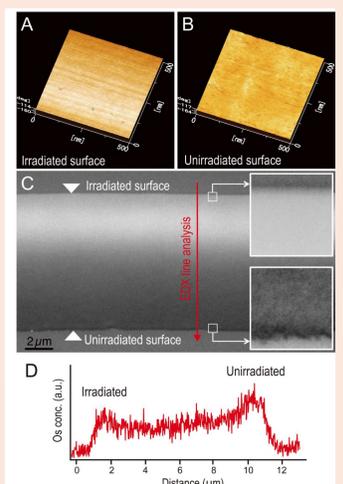
Can observe various samples such as human tissue, plant, single cell, virus.

Industrial application of NanoSuit

NanoSuit membranes can be made from a variety of materials (table).



The self standing membrane (upper figure) possesses special characteristics by plasma polymerization (A-D).



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