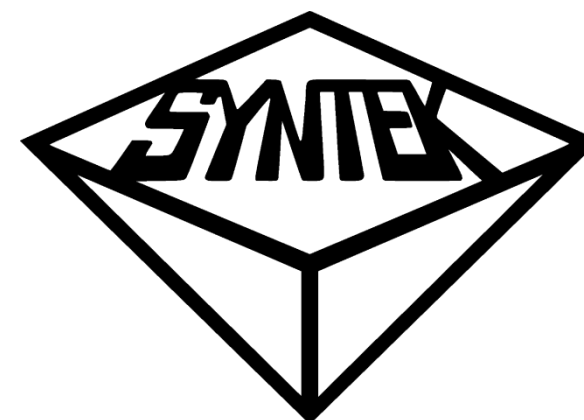




SEM 3D重建專用 SYM Cuesta收片系統

密涅瓦科技有限公司

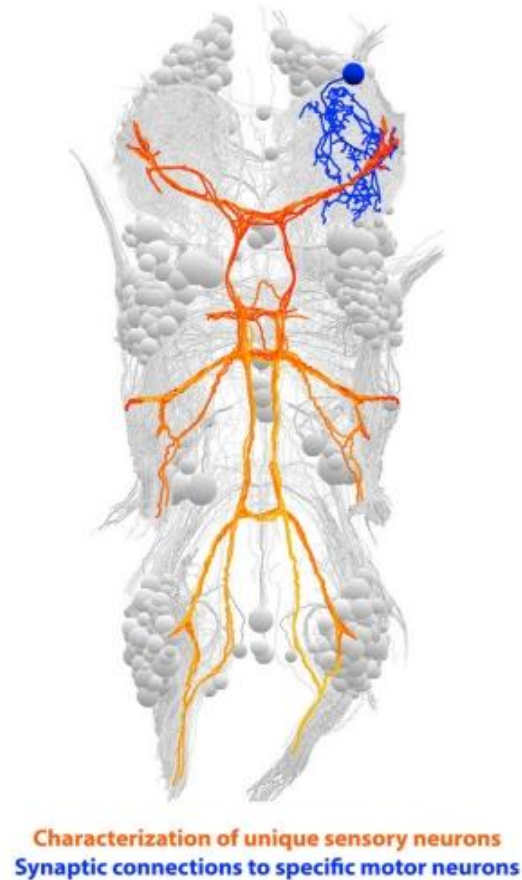
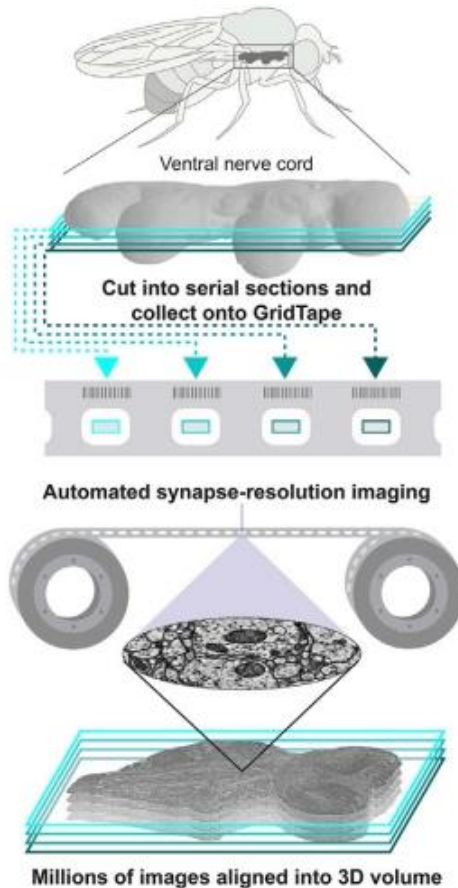
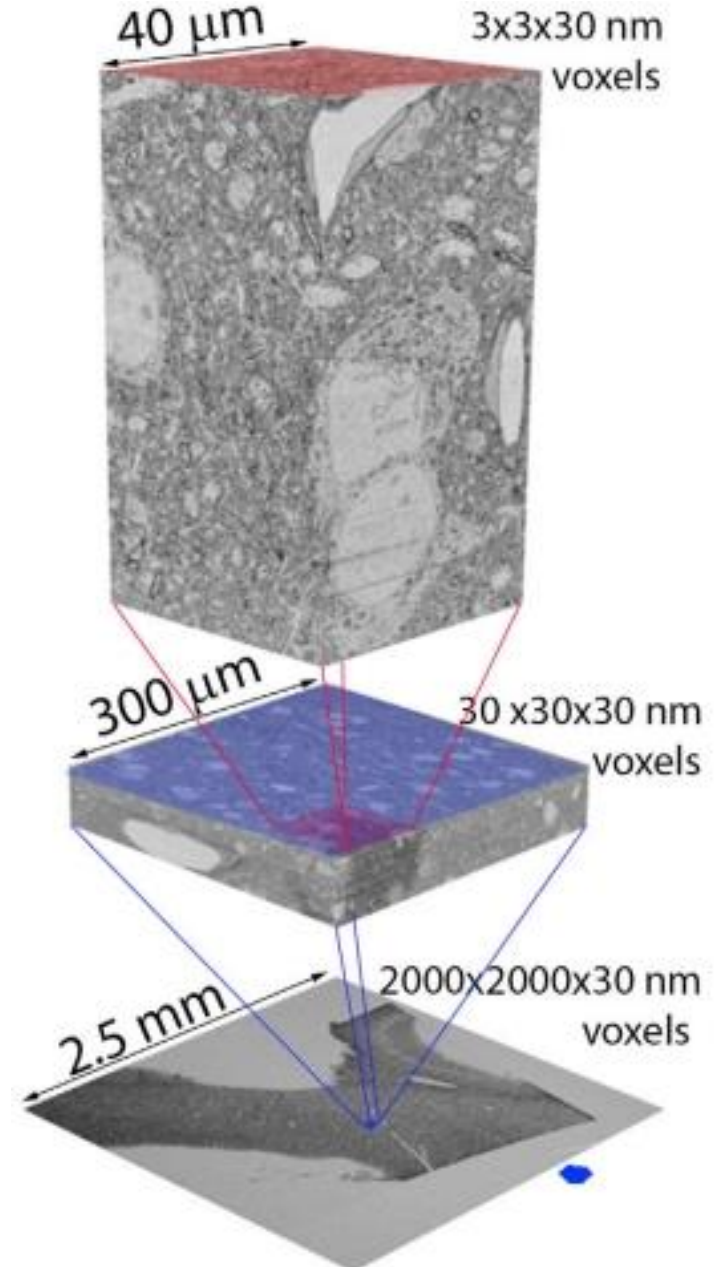
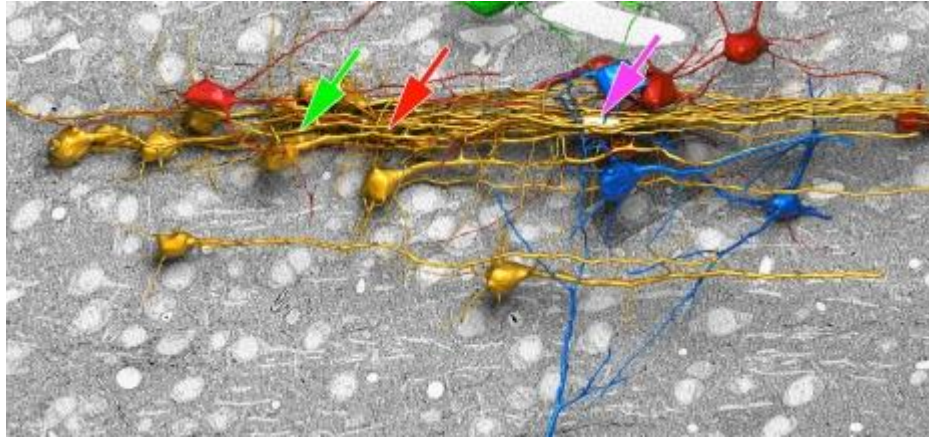
2025. 8. 29





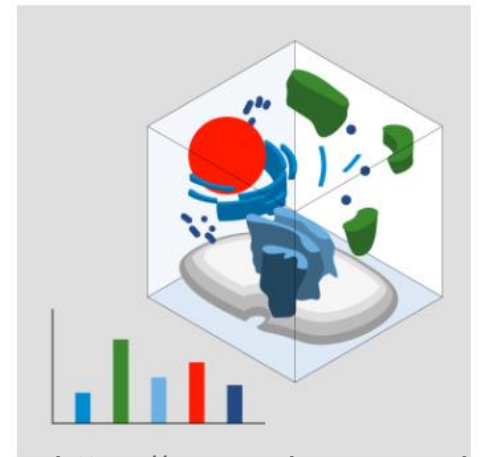
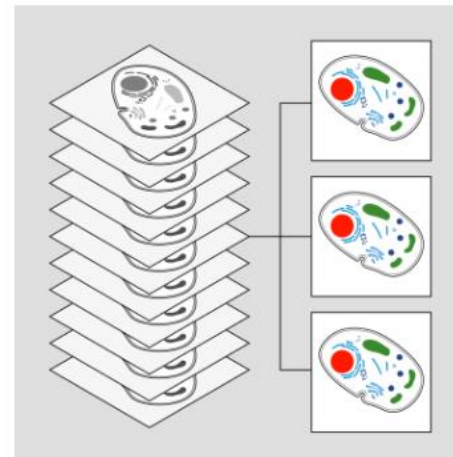
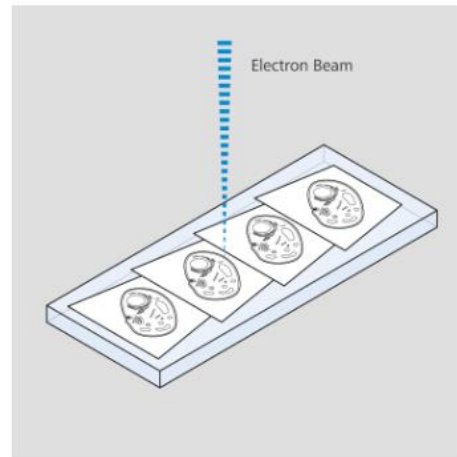
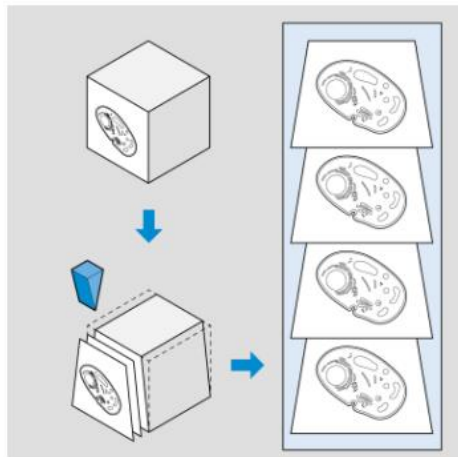
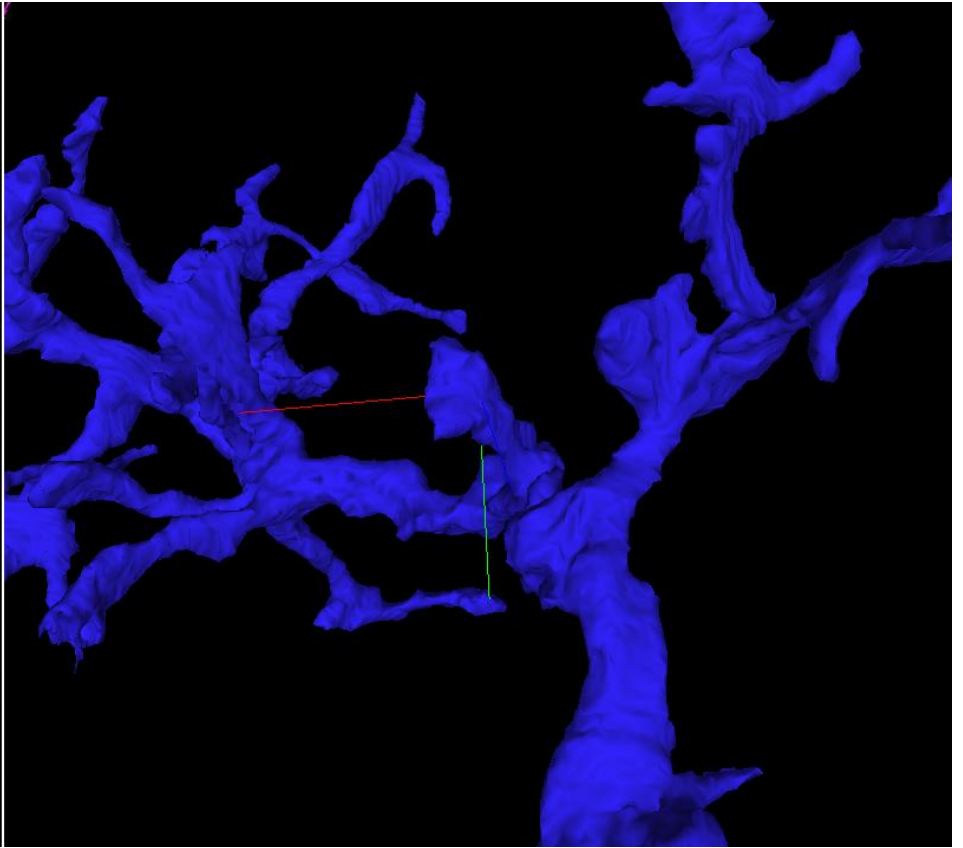
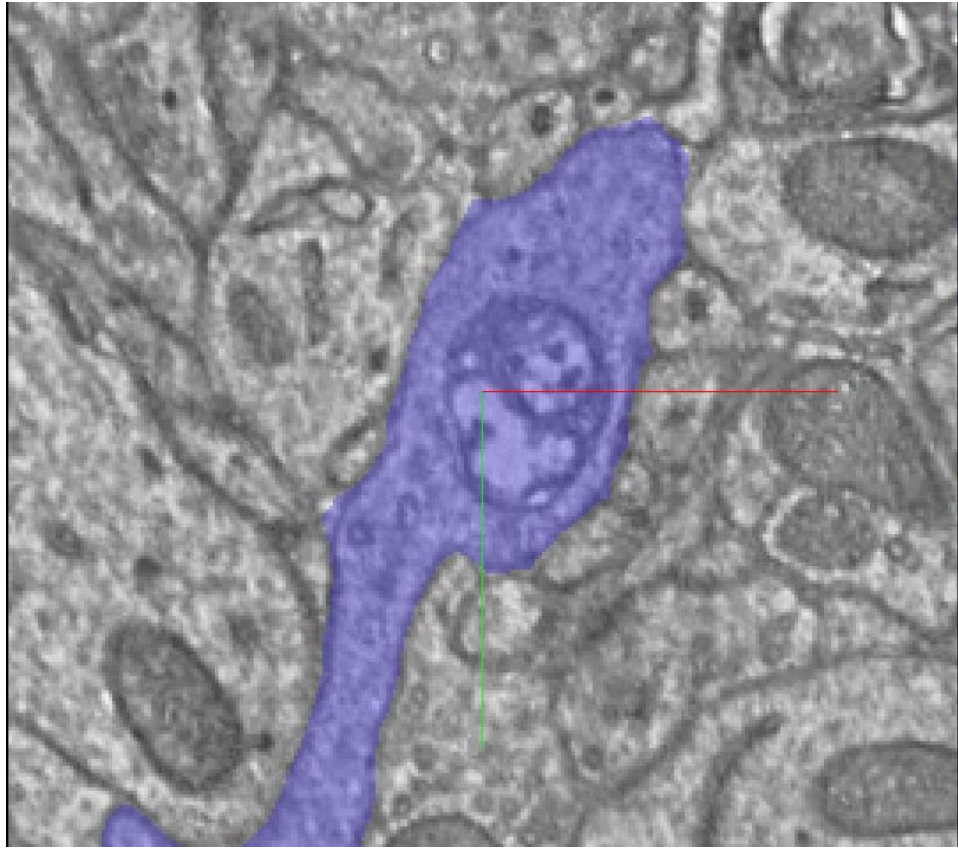
- 密涅瓦科技
- Syntek Co., Ltd.
- 切片機種類
- 樣品製備
- Volume EM
- Cuesta & Noventa

Volume EM



Characterization of unique sensory neurons
Synaptic connections to specific motor neurons

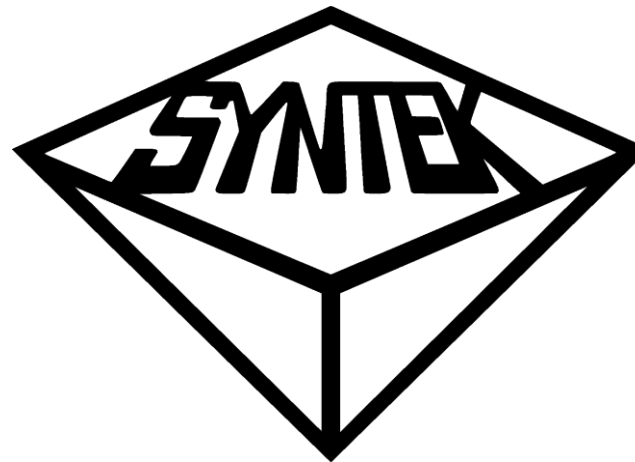
Volume EM





密涅瓦科技有限公司 Minerva Tech Co., LTD

RMC
Boeckeler



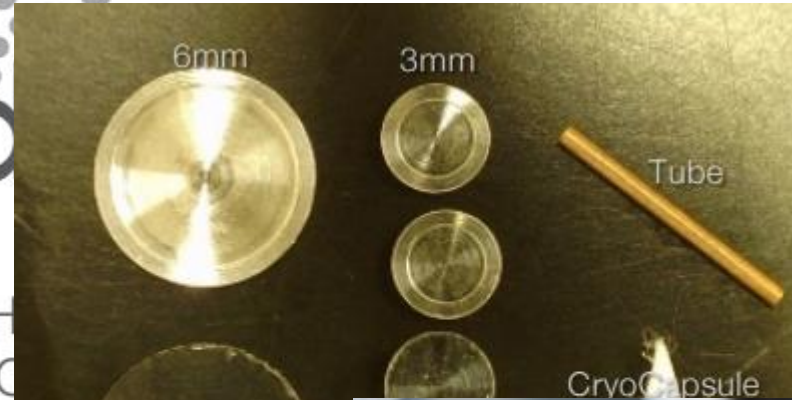
**Electron
Microscopy
Sciences**

POWERED BY BIOLYST

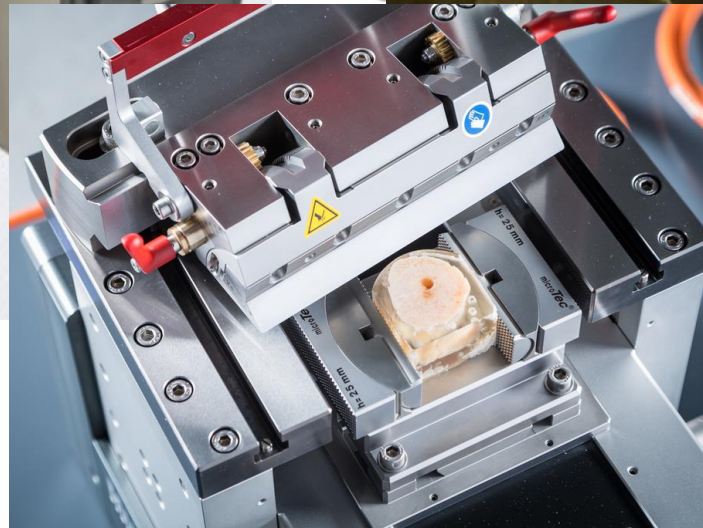
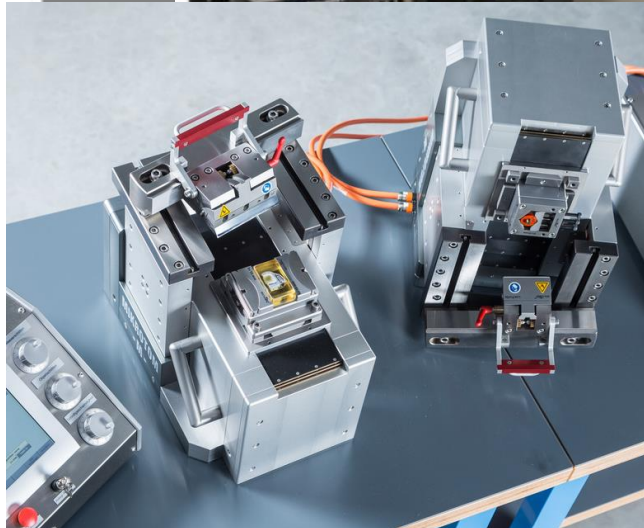
THE ULTRAMICROTOME COMPANY

密涅瓦科技有限公司 Minerva Tech Co., LTD

CR
CA
CE



tec[®]



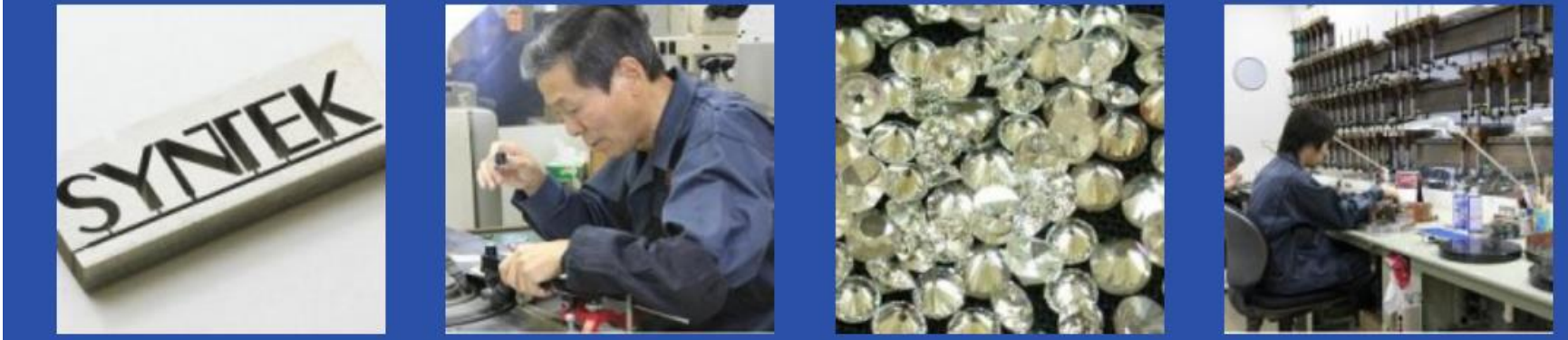
Instrument



Consumable

Surgipath





Fabulous Technology from Tokyo Japan

Using Syntek's excellent technology and matured skills, we believe we can solve your complex material processing needs. Even if someone else gave up your inquiry, don't forget to ask us. We probably offer you an alternative method that you have never seen. Syntek has been providing the excellent quality and thoughtful services for industrial diamond processing mainly – in Japan and more than 27 other countries since 1978.

What's the industrial diamond?

As you might know, diamonds are not used only for gems.

They are used for industrial parts for their hardness, chemical stability, high heat conductivity semiconducting, and surface characteristic. Actually, more than 90 % of diamonds are used in the industrial field, like diamond tools (end mill, cutter, bite, indenter, substrate or etc.), semi conductor, medical equipment, heat sink and more.

Diamond is a versatile material with many possibilities. There will be many more ways to utilize diamond in the future.

We, Syntek keep doing our research and development every day.

We produce accurate products as well as something extra.

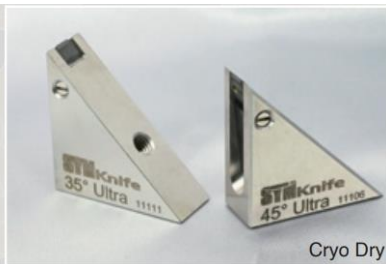
We keep opening new doors and exploring the possibilities of diamond.

We help to eliminate your stresses and troubles with this promising material.

Knock, and it shall be opened unto you



Cryo Wet



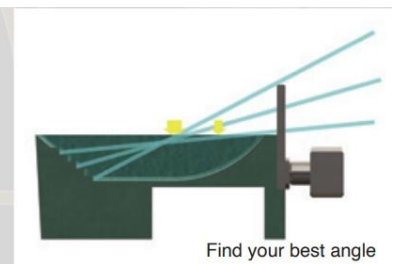
Cryo Dry



Ultra Wet



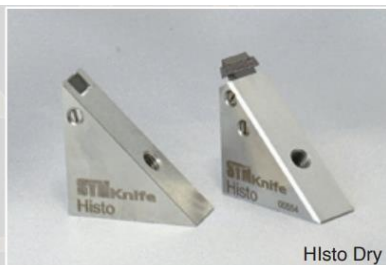
Ultra JUMBO



Find your best angle



Histo Wet



Histo Dry



For your advance preparation



Set on up to 4 grids

切片機種類

μM = 微米
NM = 奈米

常溫切片

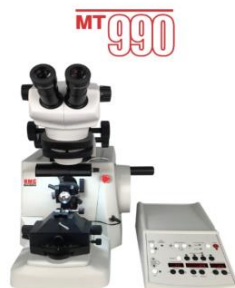
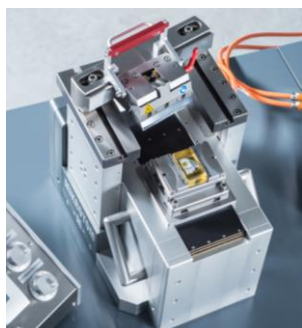
低溫切片

μM 切片

NM切片

μM 切片

NM切片



NX50, NX70

RMC切片機系統

超薄切片機



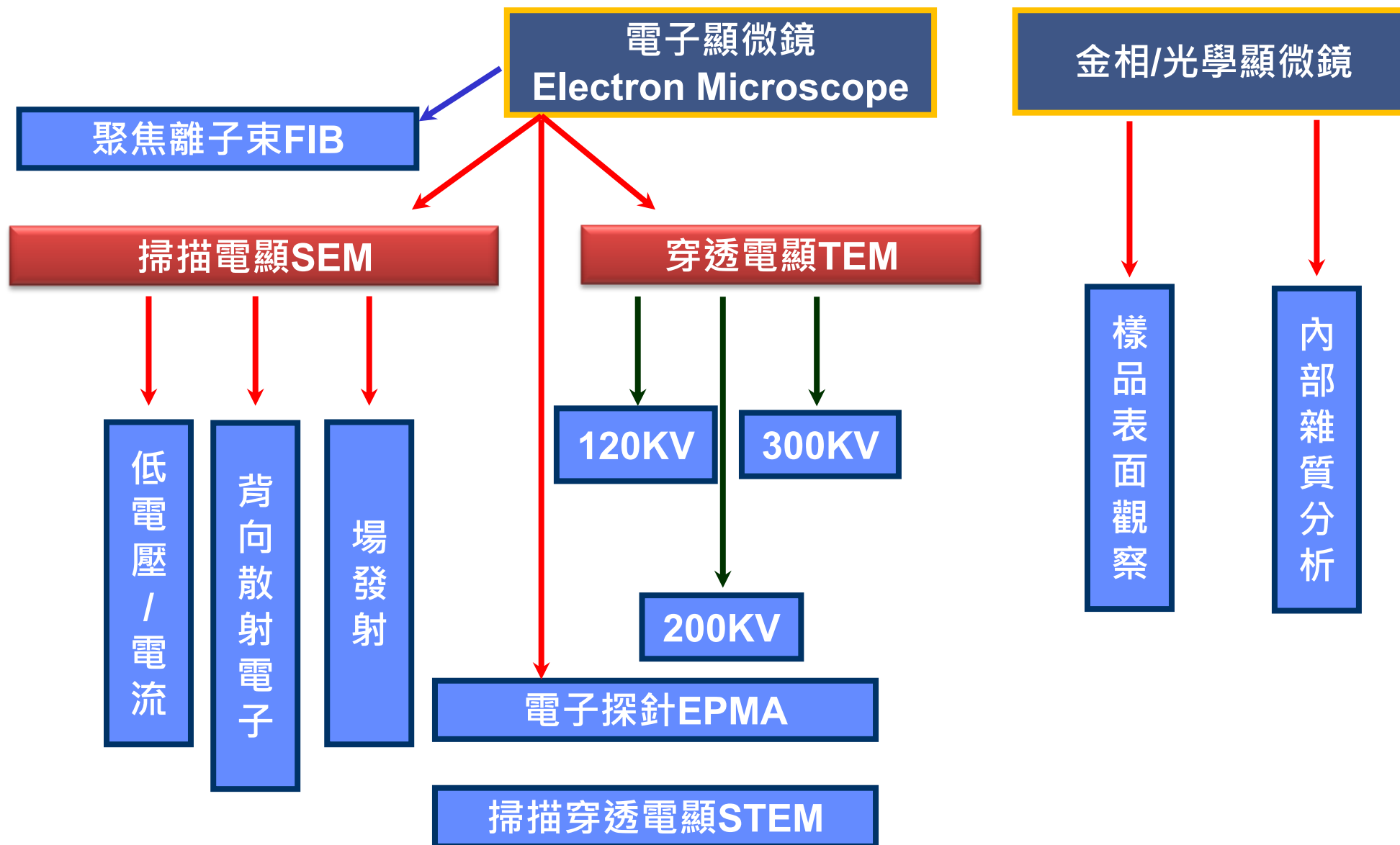
半薄切片機



前製備儀器



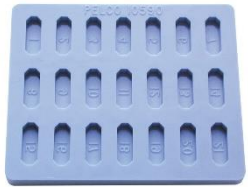
切片：光學顯微鏡/TEM 穿透式電子顯微鏡，分析內部材料散佈率和雜質
切光滑平面：EDS/SEM 掃描式電子顯微鏡，分析表面結構或元素分析



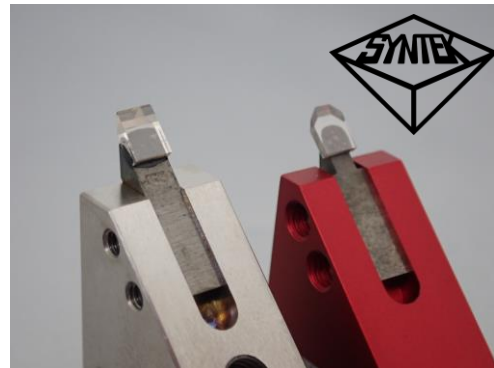
Sample preparation for EM

Embedding

60-65°C oven



Trimming



Sectioning



Staining /Coating

TEM/SEM

Sample preparation for vEM

1. 2 % (v/v) paraformaldehyde + 2.5 % (v/v) glutaldehyde in 0.1 M PB · 5-10 min
2. 2 % (w/v) OsO₄ + 1.5 % (w/v) potassium ferrocyanide in 0.1 M PB · 1 H · 黑暗環境
下放置冰上
3. WASH : MilliQ water(超純水) 3 min 5次 · 室溫
4. 泡在過濾好的 thiocarbohydrazide · 20 min · 室溫
5. WASH : MilliQ water(超純水) 3 min 5次 · 室溫
6. 2 % (w/v) OsO₄ · 30 min · RT · 黑暗環境
7. WASH : MilliQ water(超純水) 3 min 5次 · 室溫
8. 1 % (w/v) uranyl acetate · 4度C環境 · overnight

Sample preparation for vEM

9. WASH : MilliQ water(超純水) 3 min 5次 , 室溫
10. Walton's lead aspartate 60度C , 30 min
(Walton's lead aspartate : 0.02 M lead nitrate + 0.03 M aspartic acid , pH 5.5)
11. WASH : MilliQ water(超純水) 3 min 5次 , 室溫
12. 脫水 : 酒精ethonal 50% 、 70% 、 90% 、 96% 、 100% , 每次 5-10 min
13. 脫水 : 無水acrtone 10 min 2次 , 室溫
14. 滲透 : DurcupanTM ACM resin (HARD)
25% 、 50% 、 75% in acetone , 每次 1-2 H
15. 100 % resin overnight
16. 包埋 : 60度C , 3天

Sample preparation for vEM

RESIN : Durcupan™ ACM resin (HARD)

Component A : 11.4 g

Component B : 10 g

Component C : 0.3 g

Component D : 0.1 g

Section tools

切片刀種類 Knife

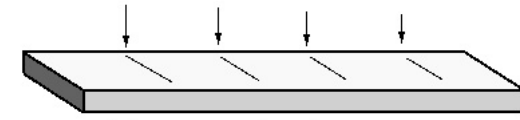
1. Glass : 便宜，用玻璃裂開之鋒利切口，需使用玻璃製刀機製作



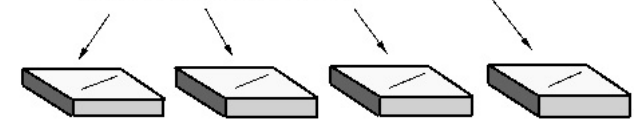
GKM2

Making Glass Knives

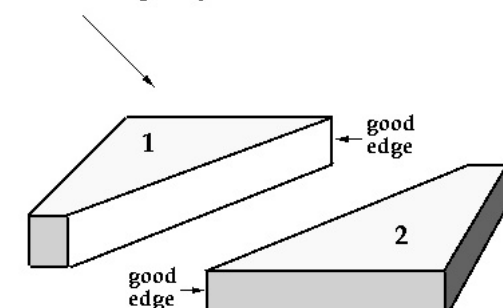
1. Clean prepared glass strips
2. Score at right angles with glass knife maker



3. Break into squares (25mm)



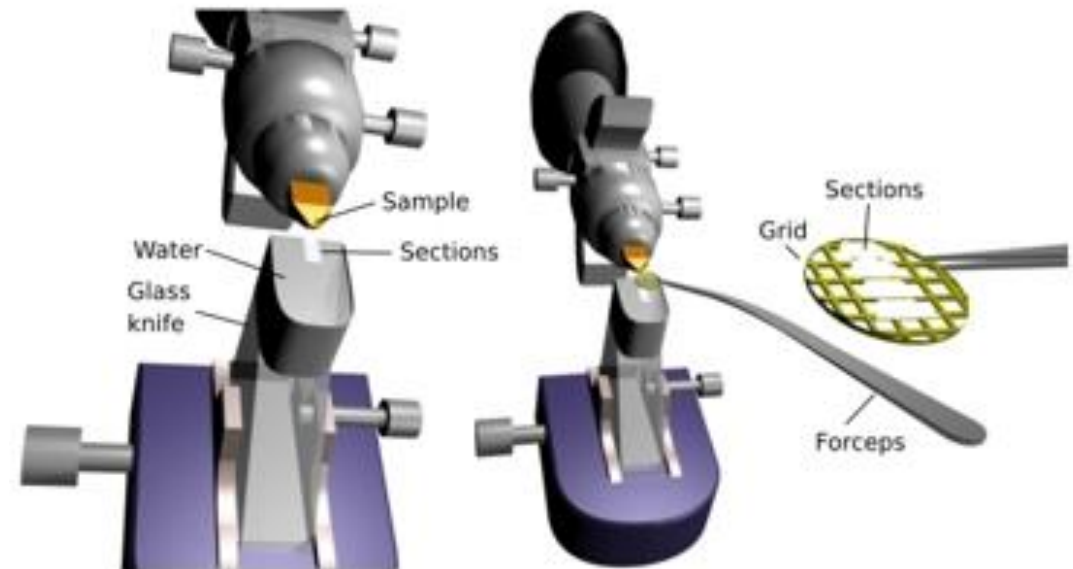
4. Score diagonally and break into two knives



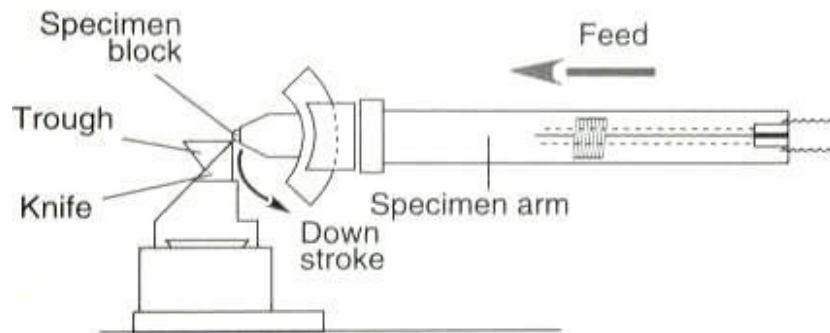
2. Diamond : 價格較高，硬度高，切片品質穩定，適合超薄切片



Sectioning



3. Ultramicrotomy



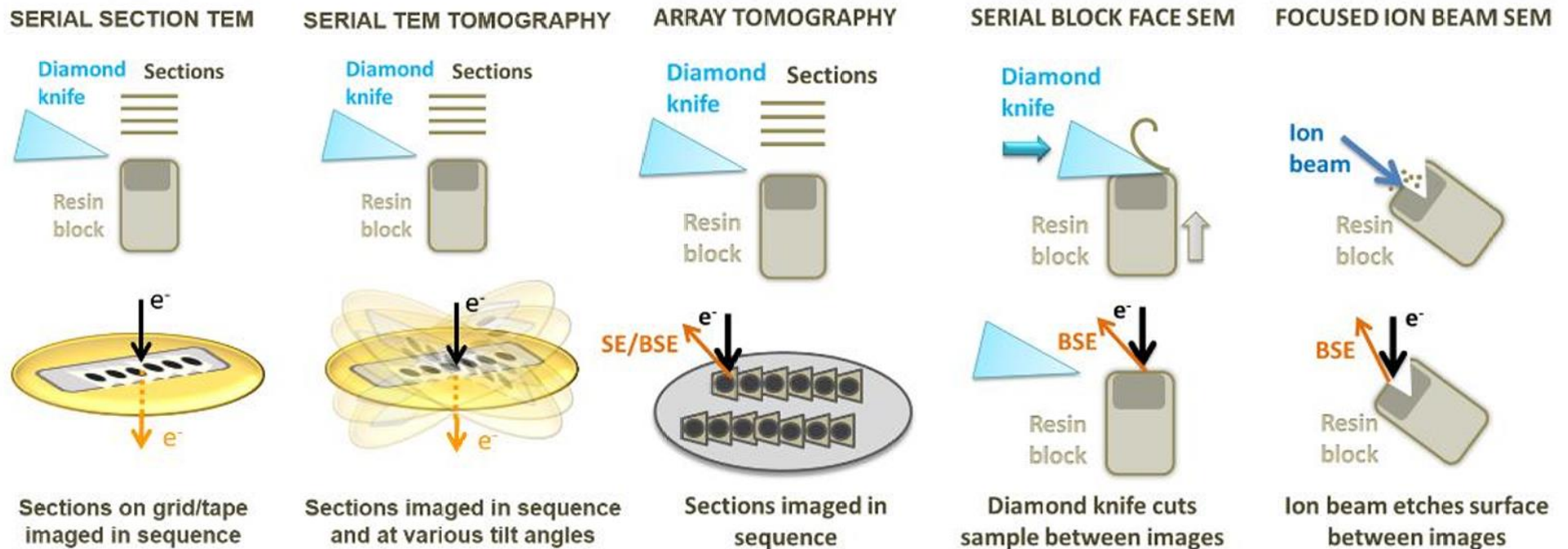


Volume EM

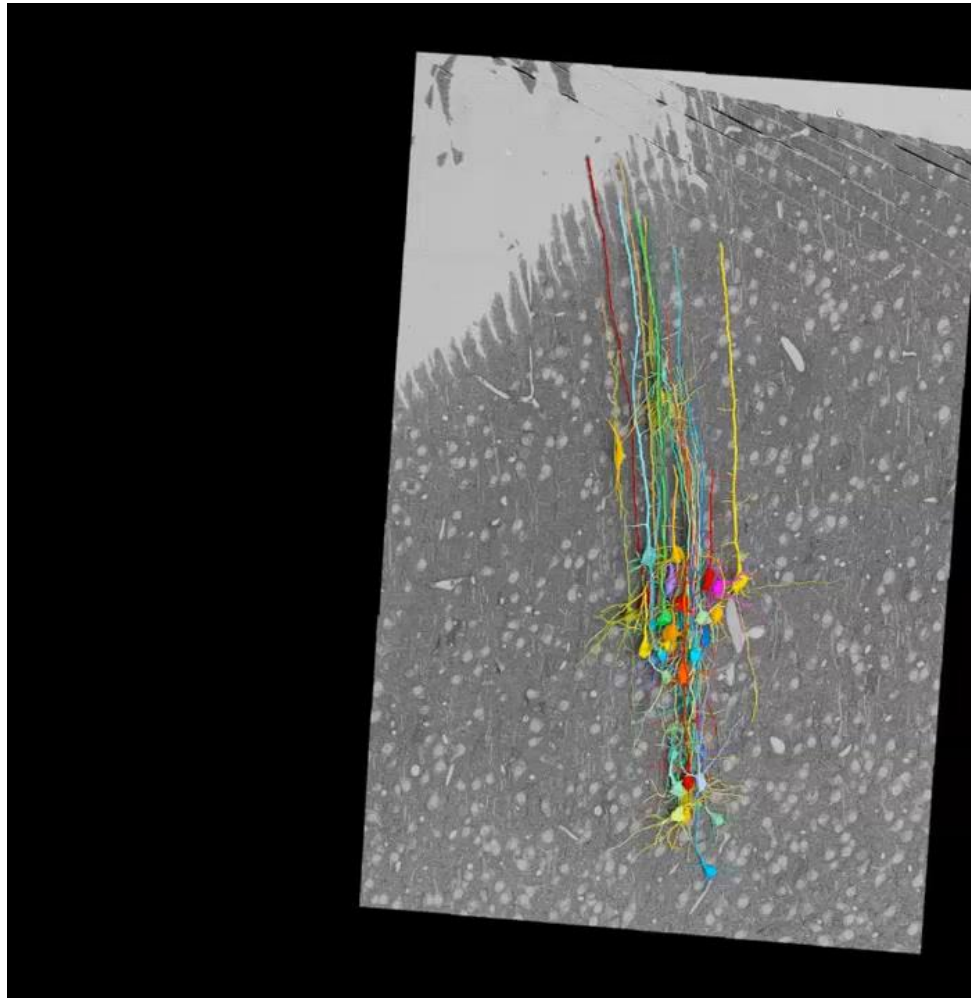
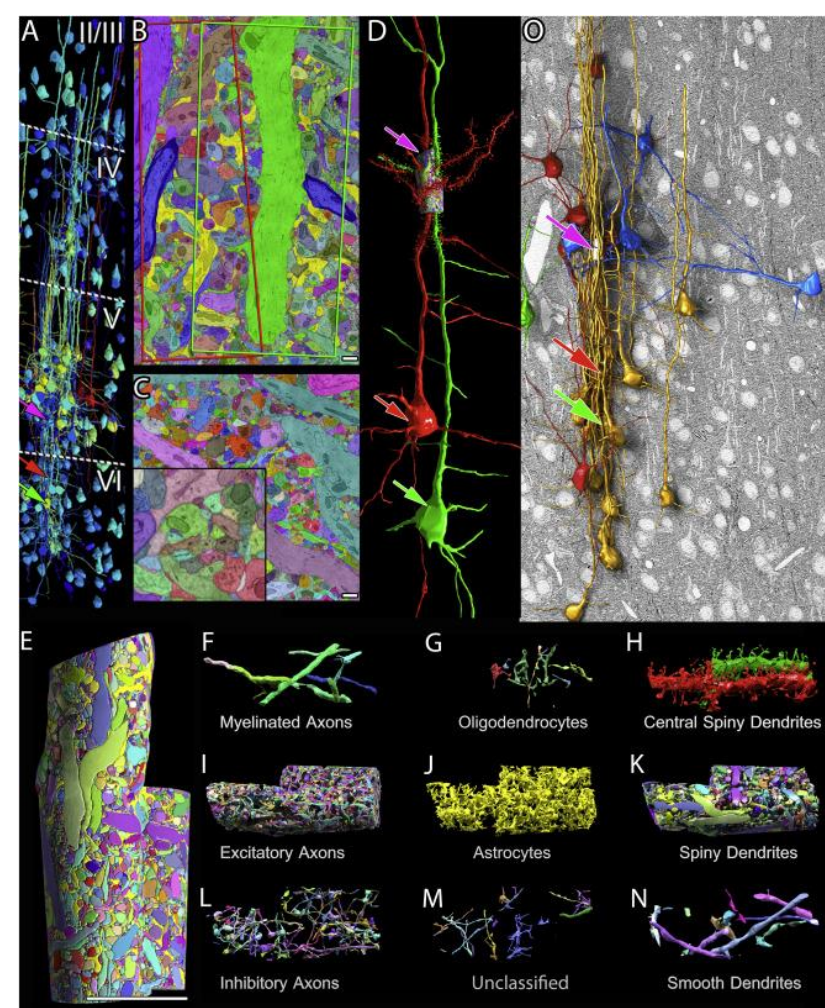
Volume electron microscopy or volume EM (vEM)

refers to a group of recently developed imaging approaches that use scanning and transmission electron microscopy (SEM and TEM) to allow the interrogation of cell and tissue ultrastructure in 3D, at μm to mm volume scales and nm resolutions

“Seven technologies to watch in 2023”

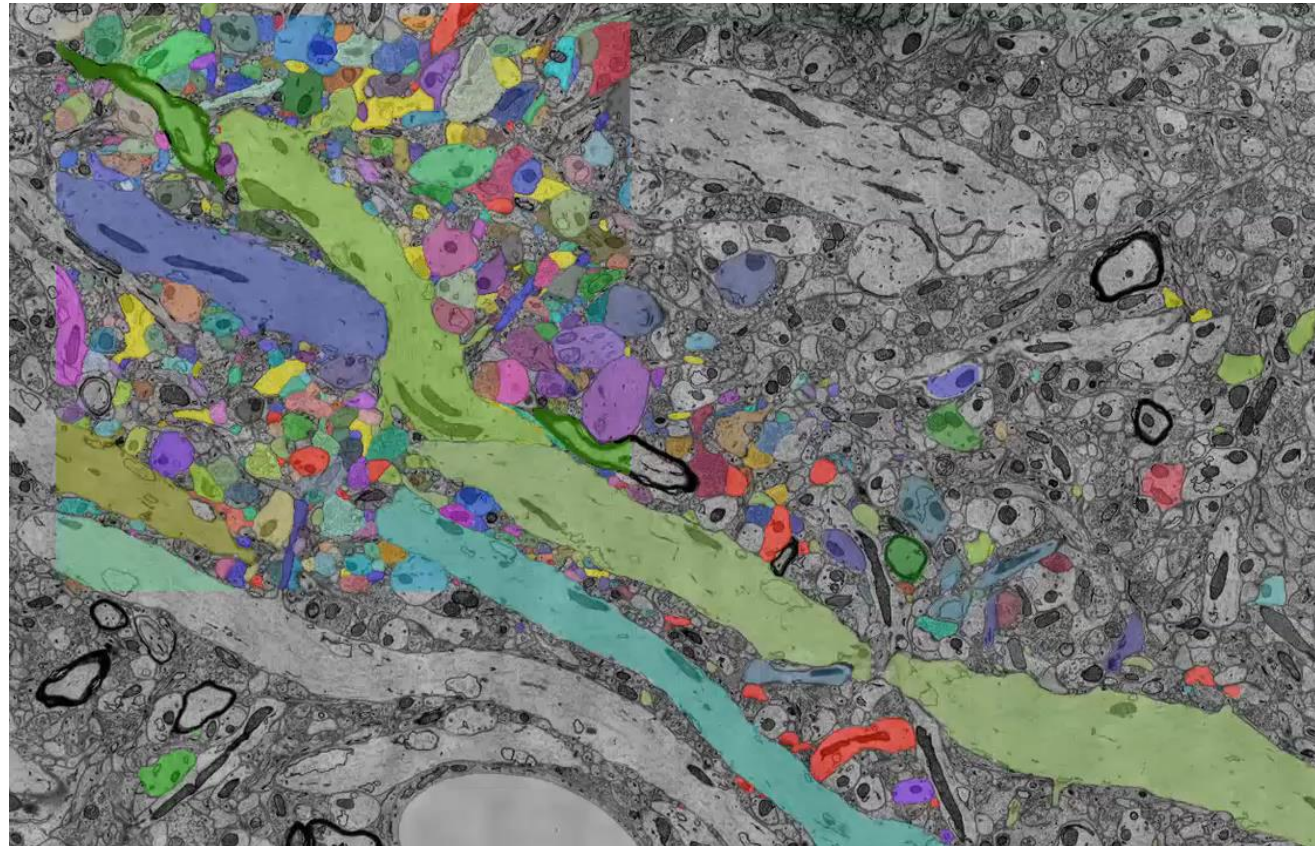
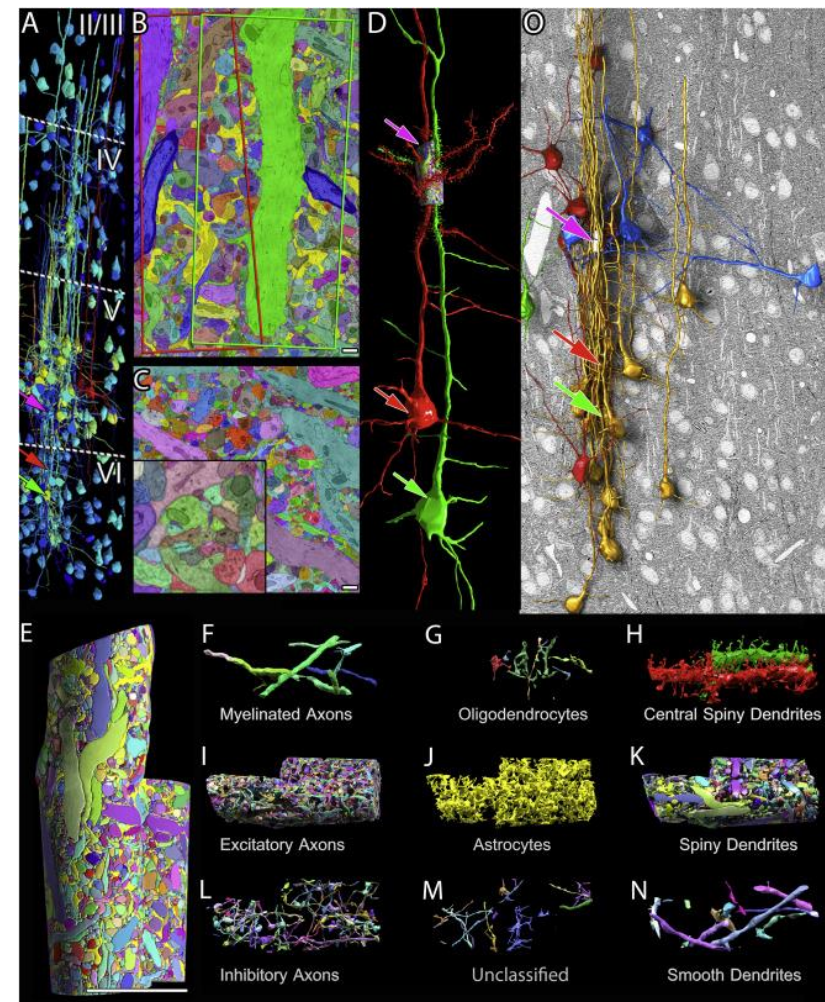


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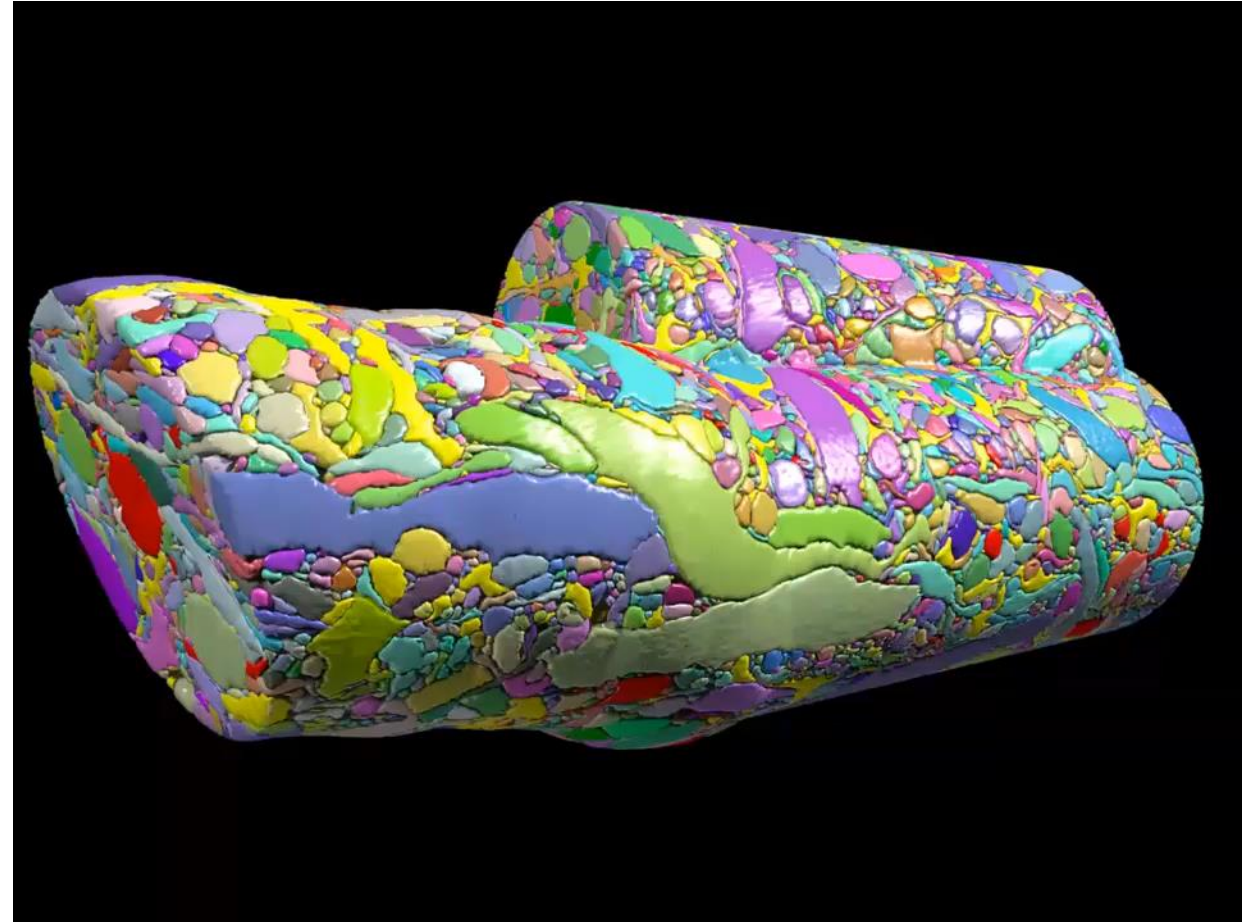
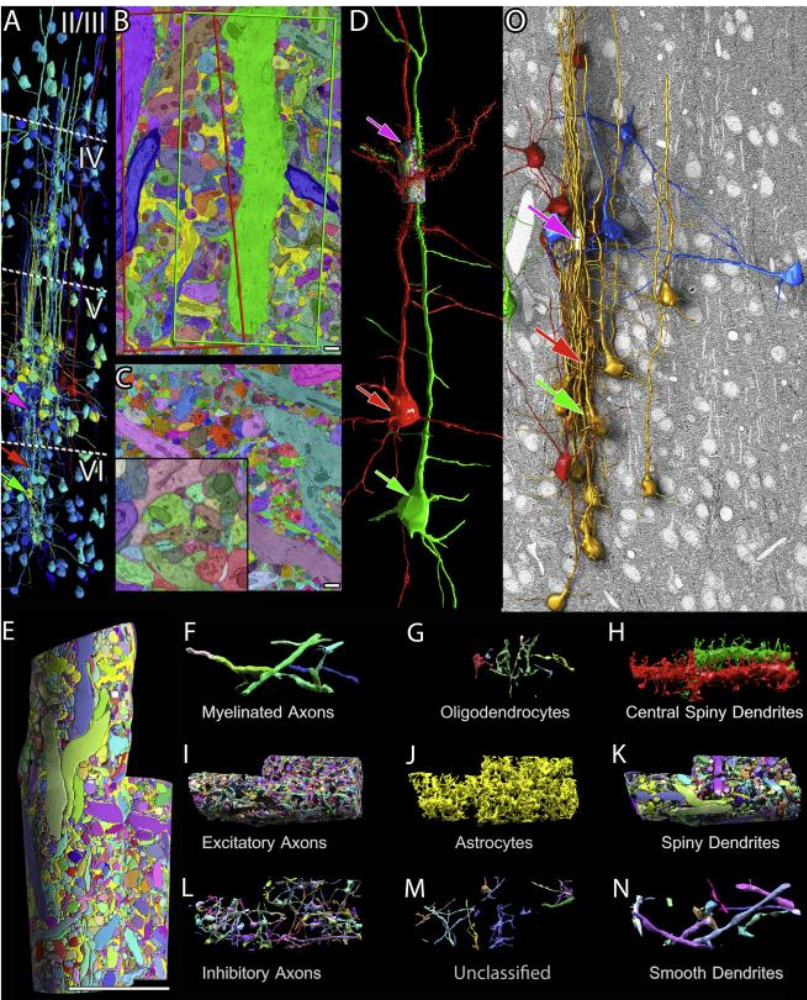


Kasthuri, Narayanan et al., (2015), "Saturated Reconstruction of a Volume of Neocortex," Cell, Volume 162, Issue 3, 648 - 661

Volume EM

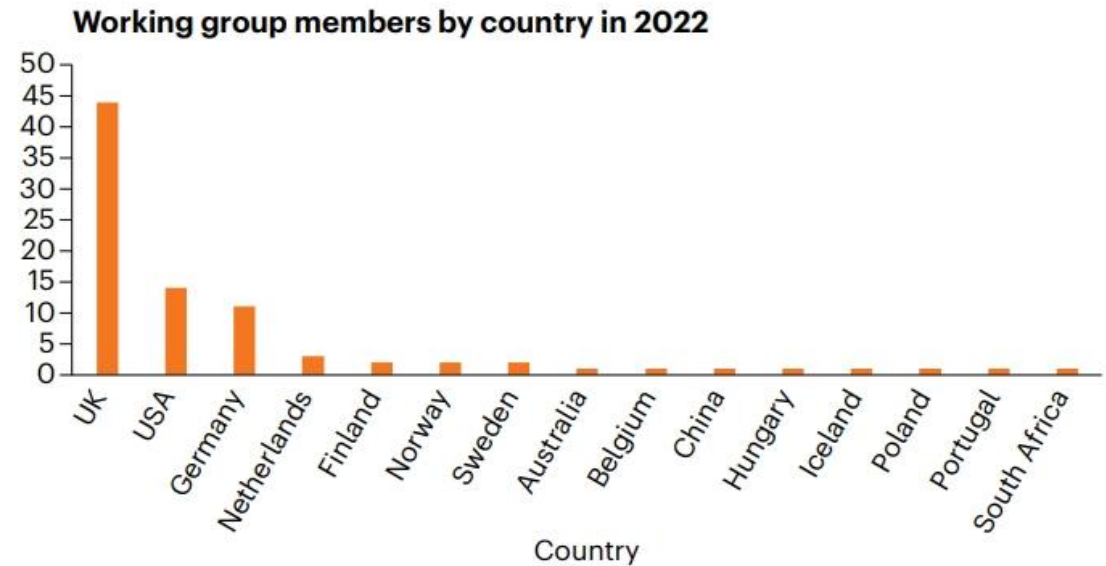
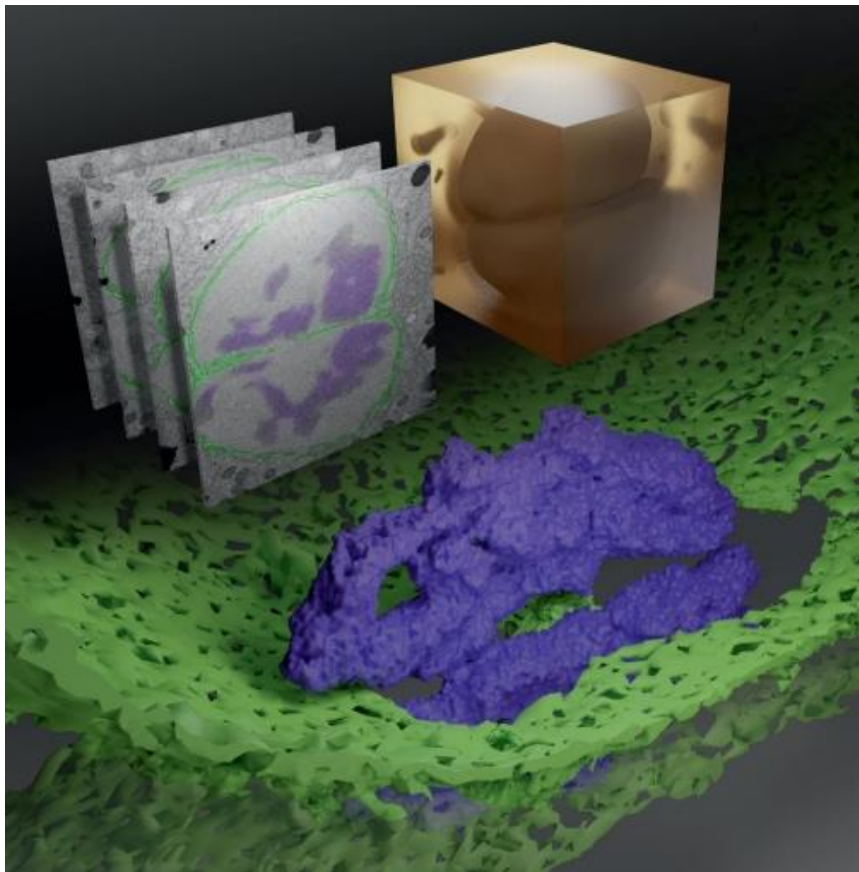


Kasthuri, Narayanan et al., (2015), "Saturated Reconstruction of a Volume of Neocortex," Cell, Volume 162, Issue 3, 648 - 661



Kasthuri, Narayanan et al., (2015), "Saturated Reconstruction of a Volume of Neocortex," *Cell*, Volume 162, Issue 3, 648 - 661

Collinson, L.M., Bosch, C., Bullen, A. *et al.* Volume EM: a quiet revolution takes shape. *Nat Methods* **20**, 777–782 (2023). <https://doi.org/10.1038/s41592-023-01861-8>



Volume EM Community Website
<https://www.volumeem.org/>



Functional connectomics
spanning multiple areas
of mouse visual cortex

Nature 2025

The MICrONS Consortium

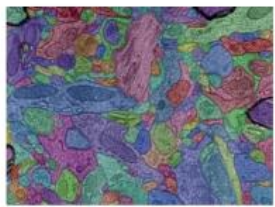
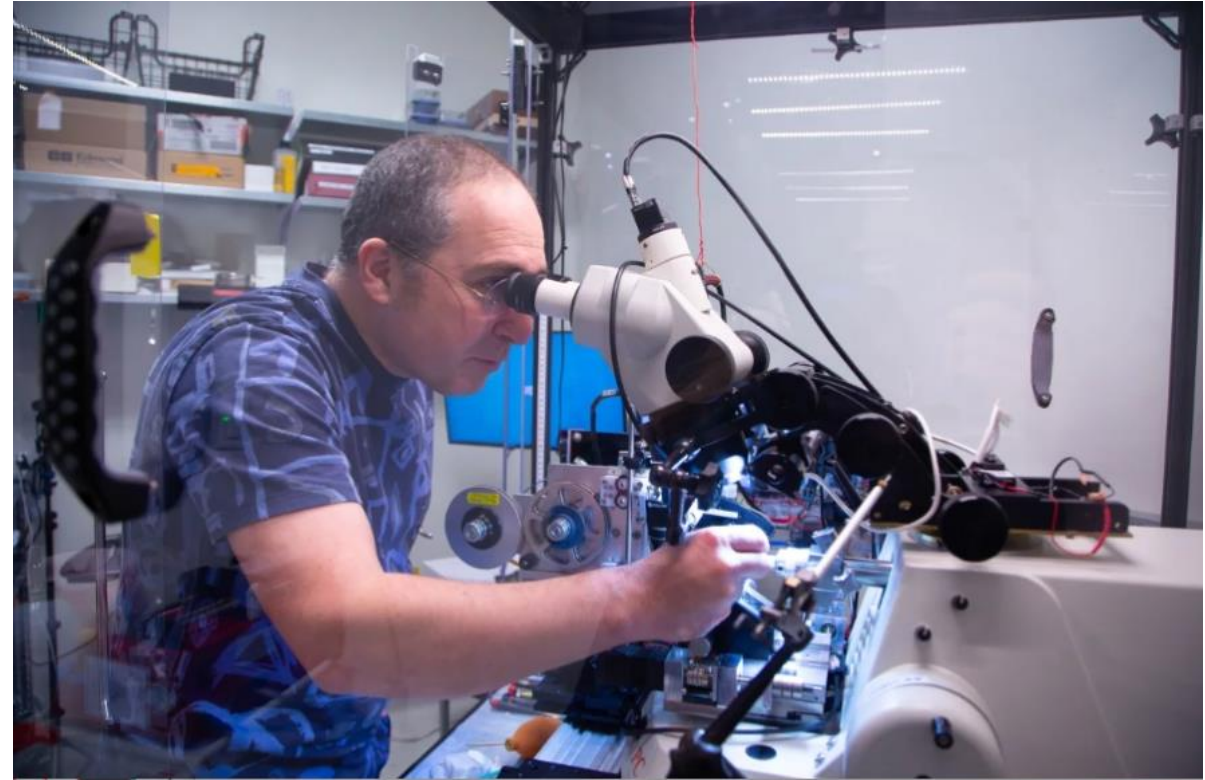
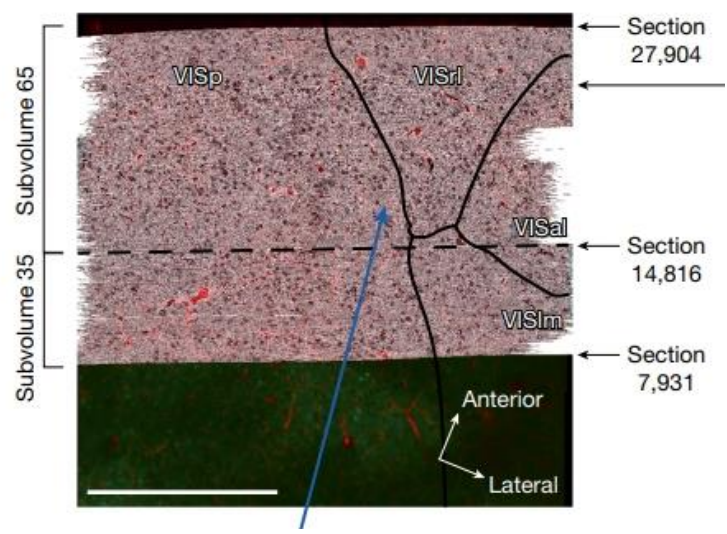
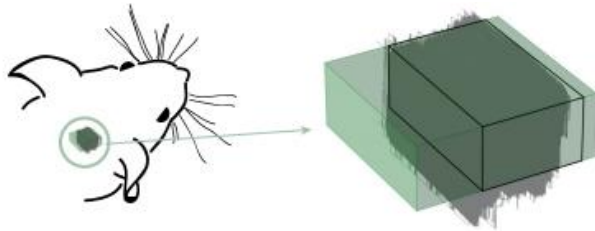
Allen Institute
for Brain Science

Princeton
University

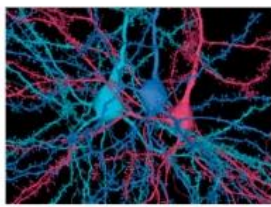
Baylor College
of Medicine

Explore the data at www.microns-explorer.org

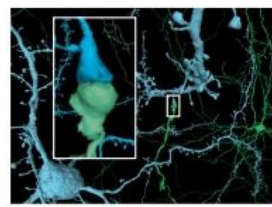
Volume EM



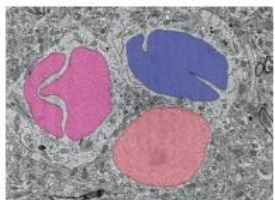
Cell segmentation



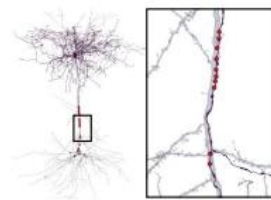
Cell meshes



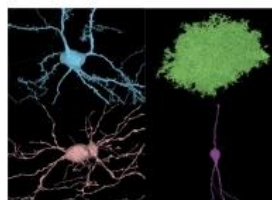
Synapse connectivity



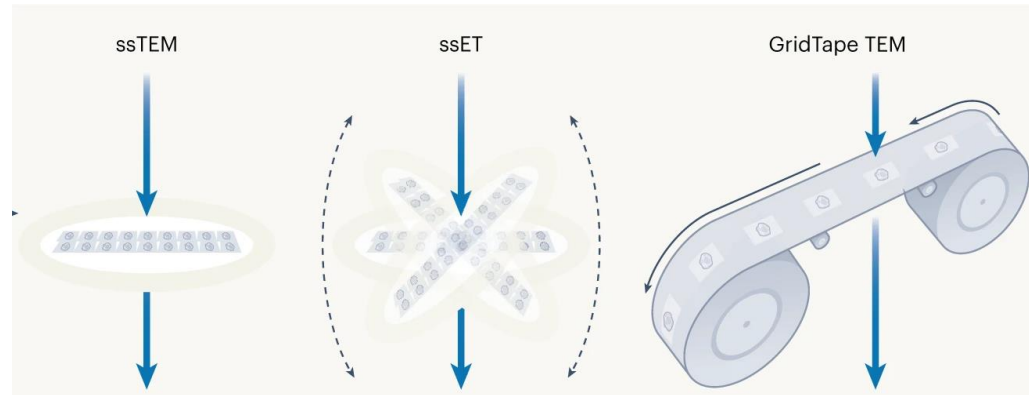
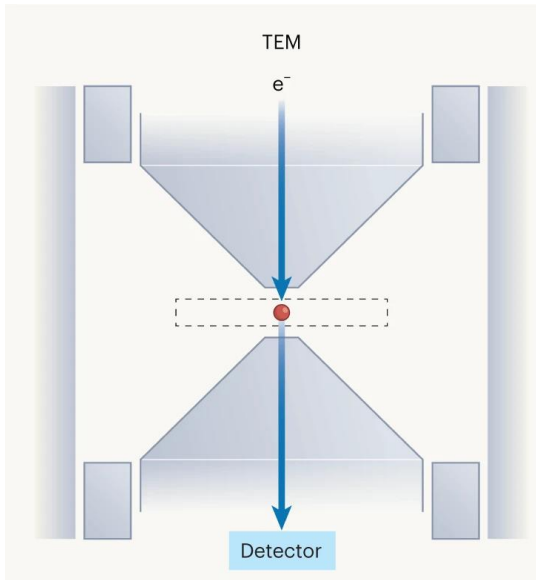
Nucleus segmentation



Proofreading status

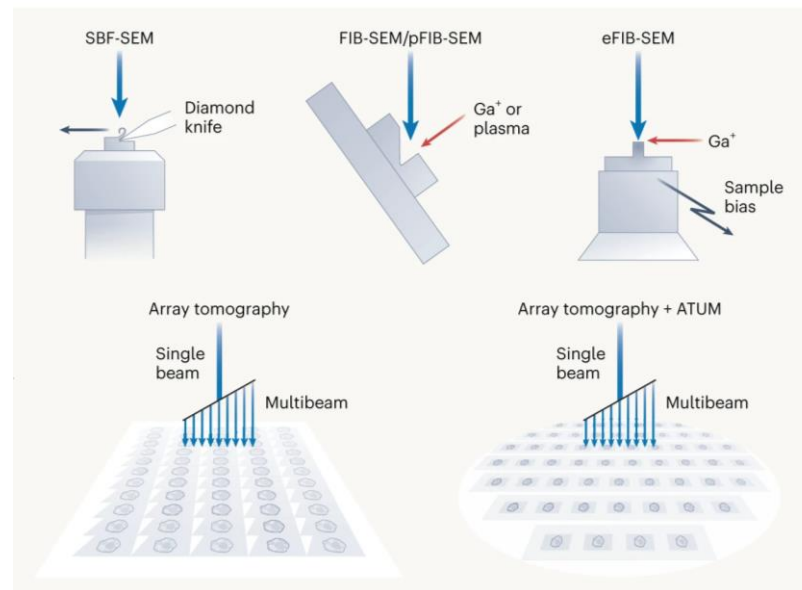
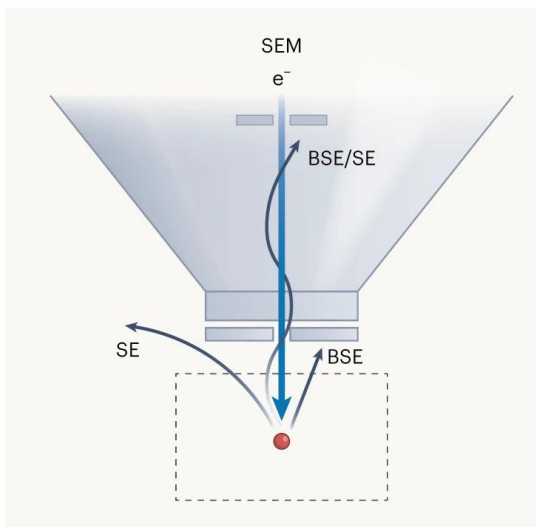


Cell types



TEM vEM Method :

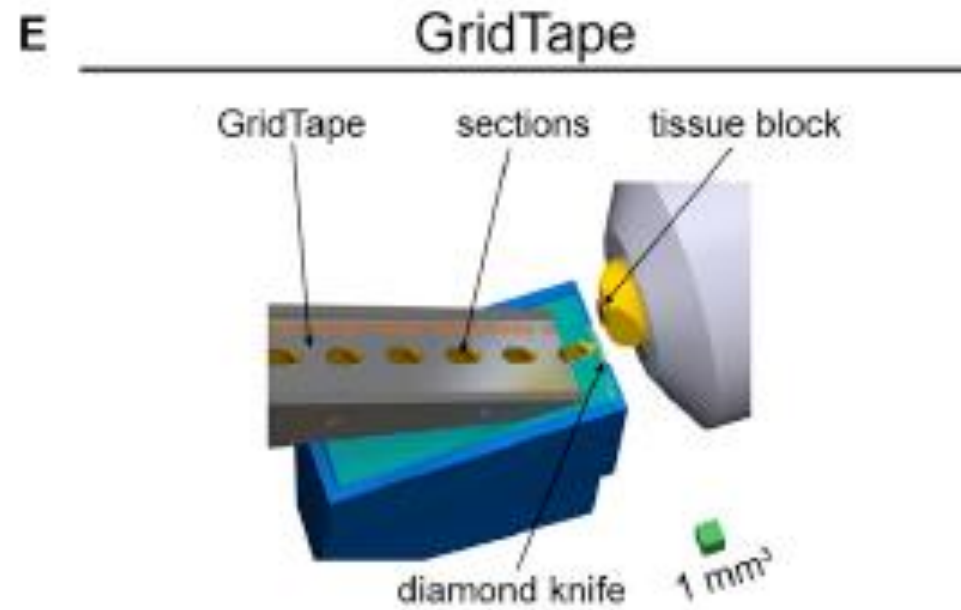
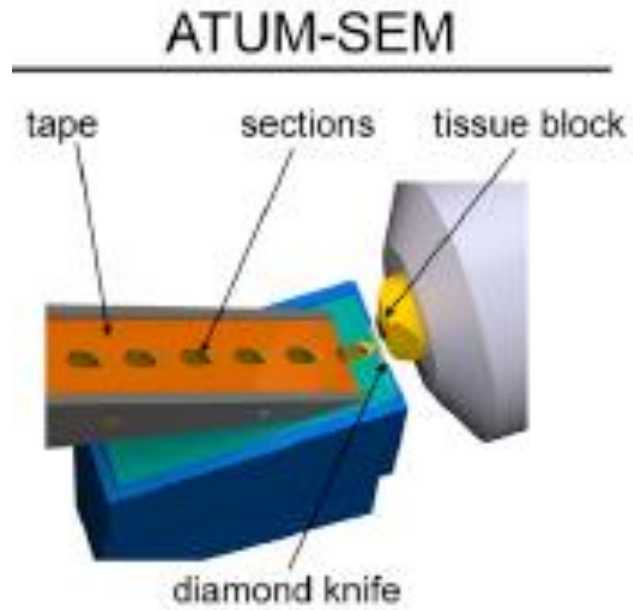
- Serial Section TEM(ssTEM)
- Serial Section Electron Tomography(ssET)
- GridTape TEM



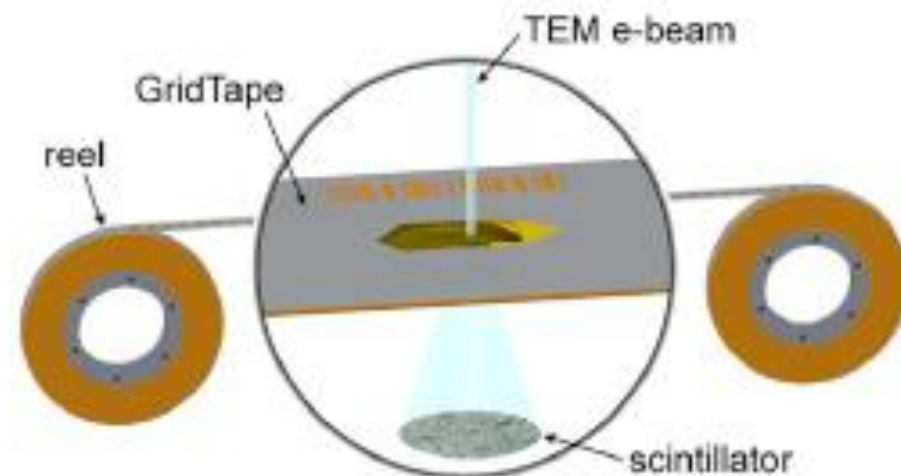
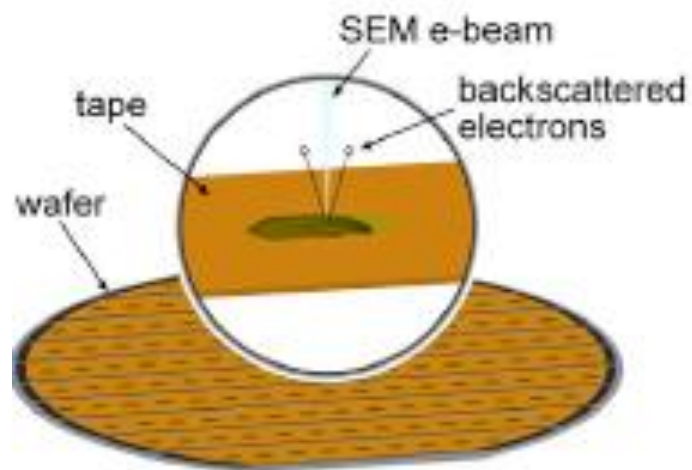
SEM vEM Method :

- Serial Block Face SEM(SBF-SEM)
- Focused Ion Bean SEM(p/FIB-SEM)
- Array Tomography
- Tape SEM

TAPE SYSTEMS

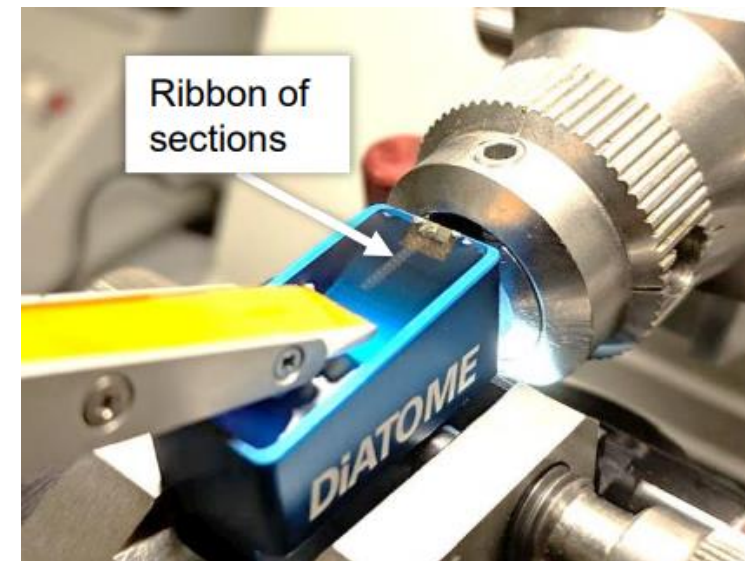
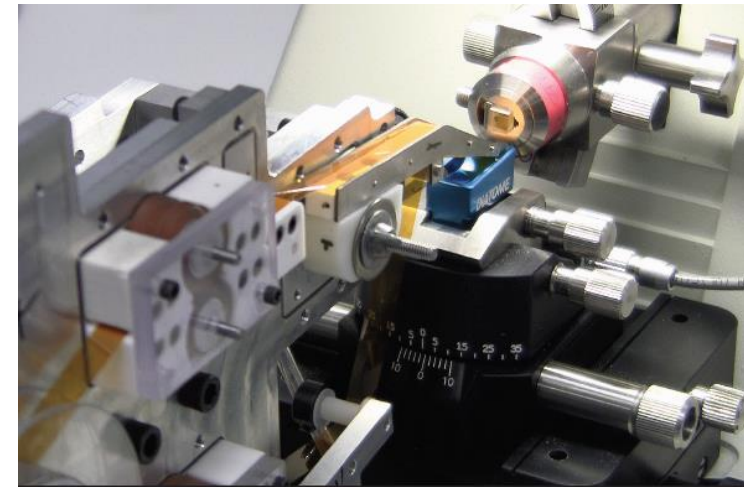


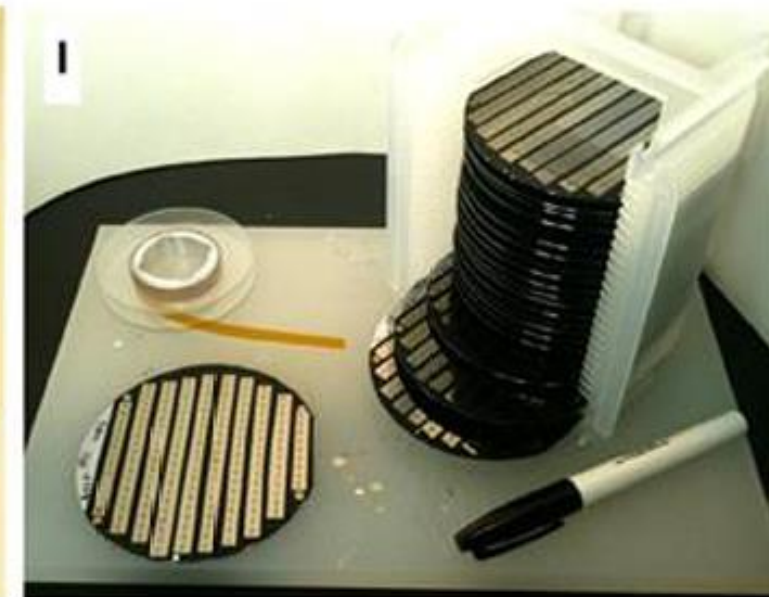
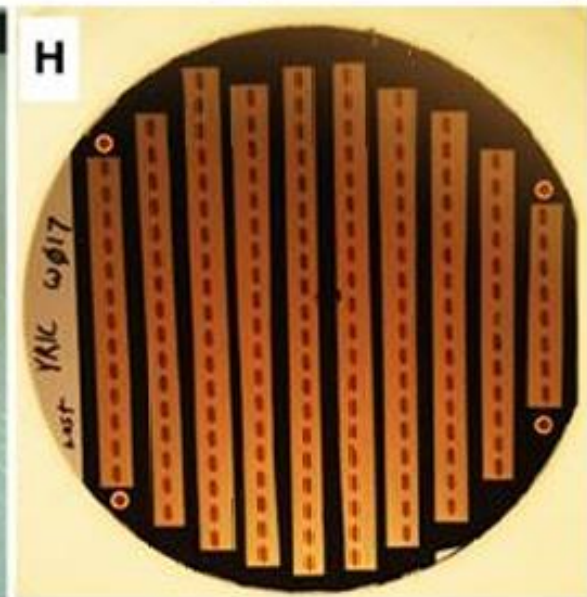
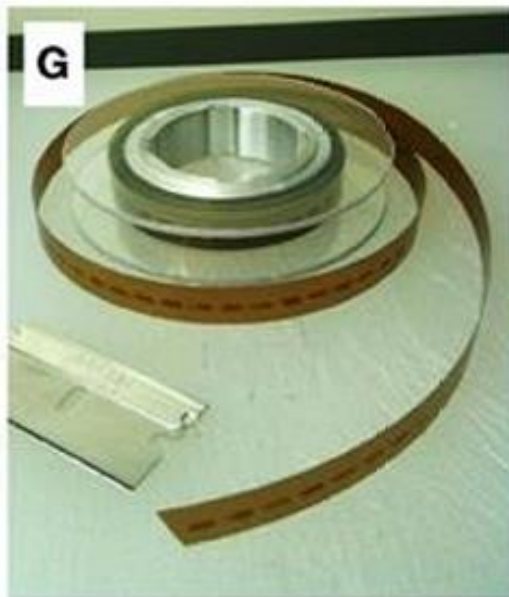
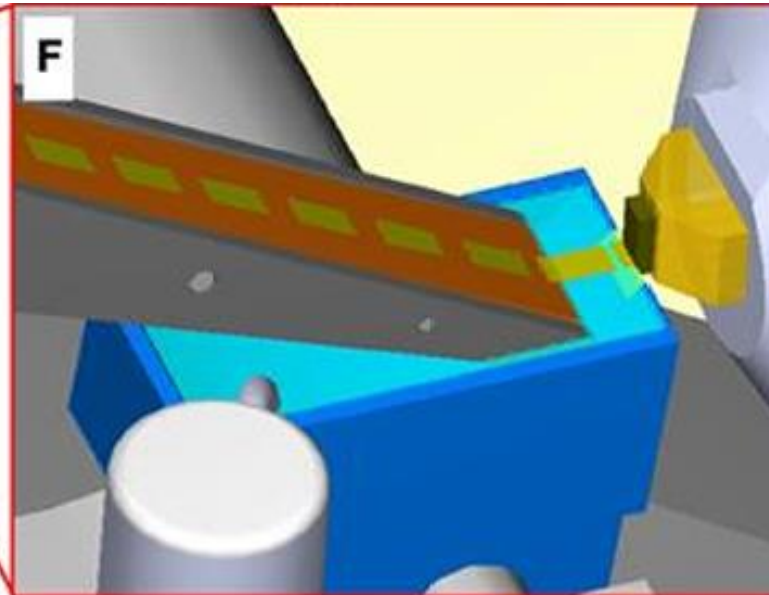
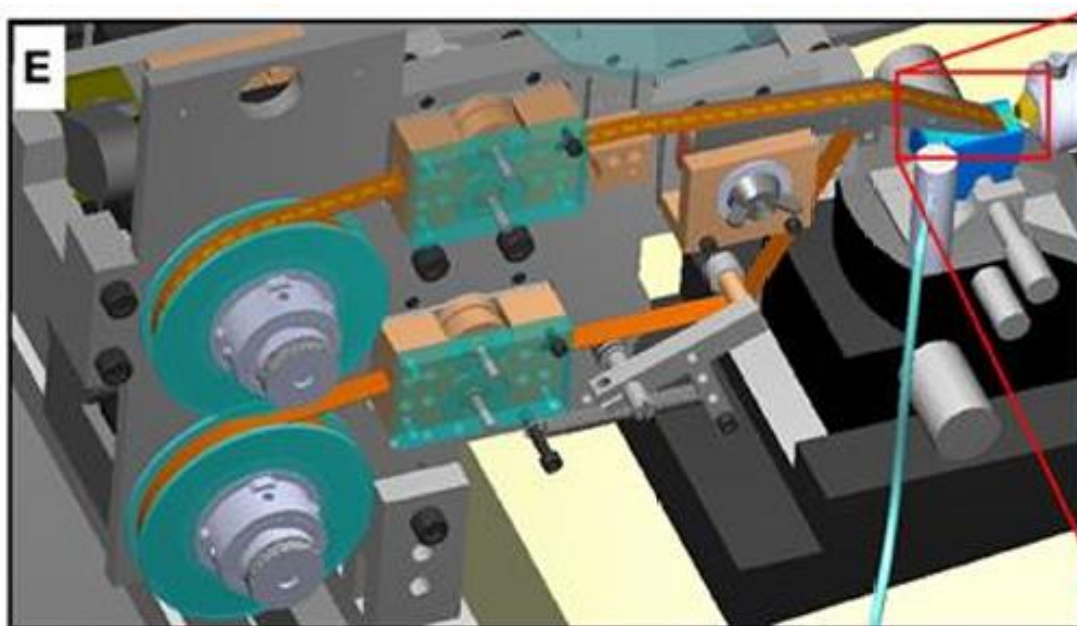
sectioning



imaging

Automated Tape Collecting Ultramicrotome



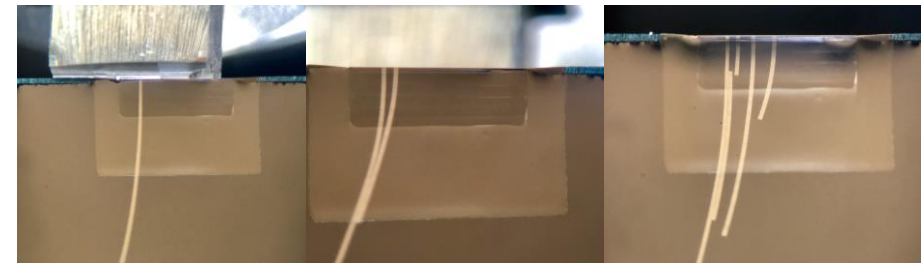
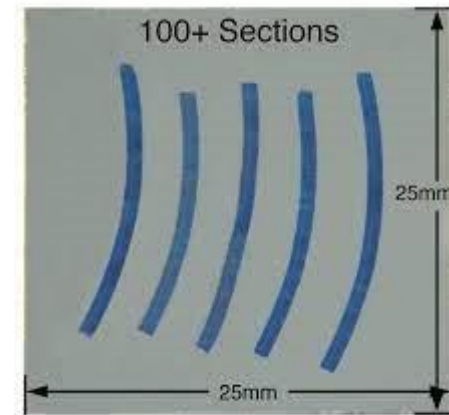
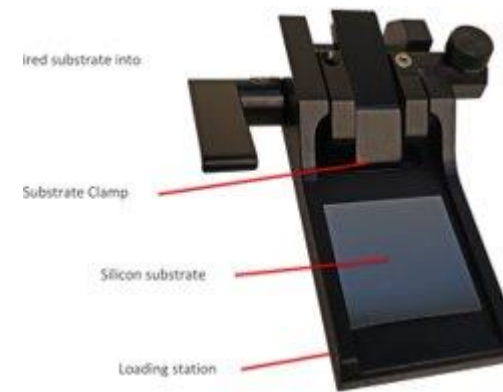


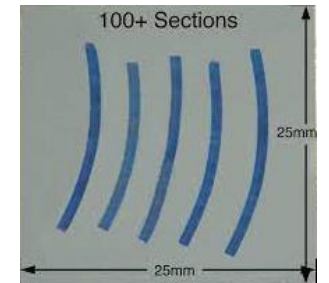
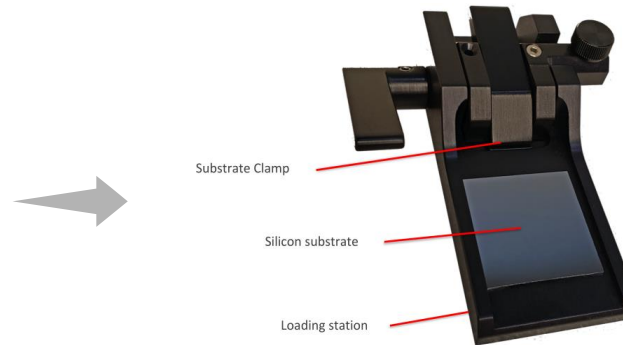
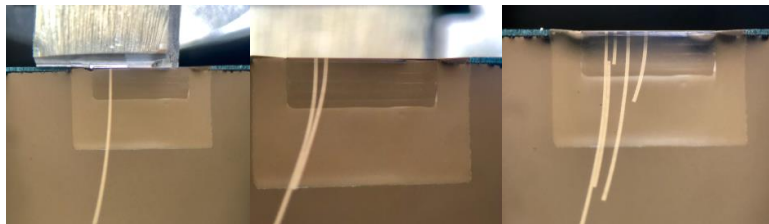
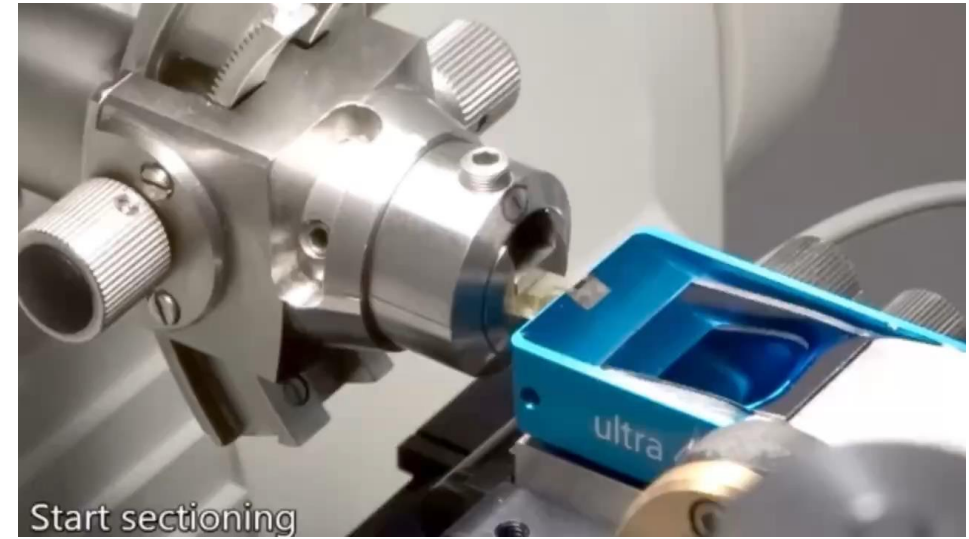
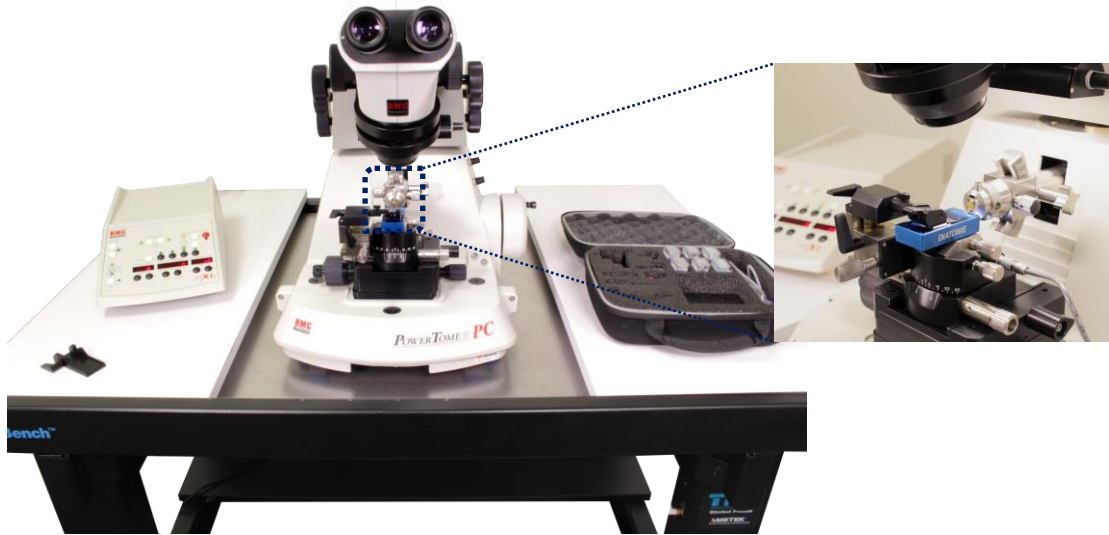
ASH2



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- X、Y、Z三軸運動，快速對準，操作便利
- 相容於各品牌超薄切片機，無需改裝原有設備
- 相容於各品牌鑽石刀提供精確的注水&排水系統，提供完美水位
- 收集的切片置於矽片上，可重複利用



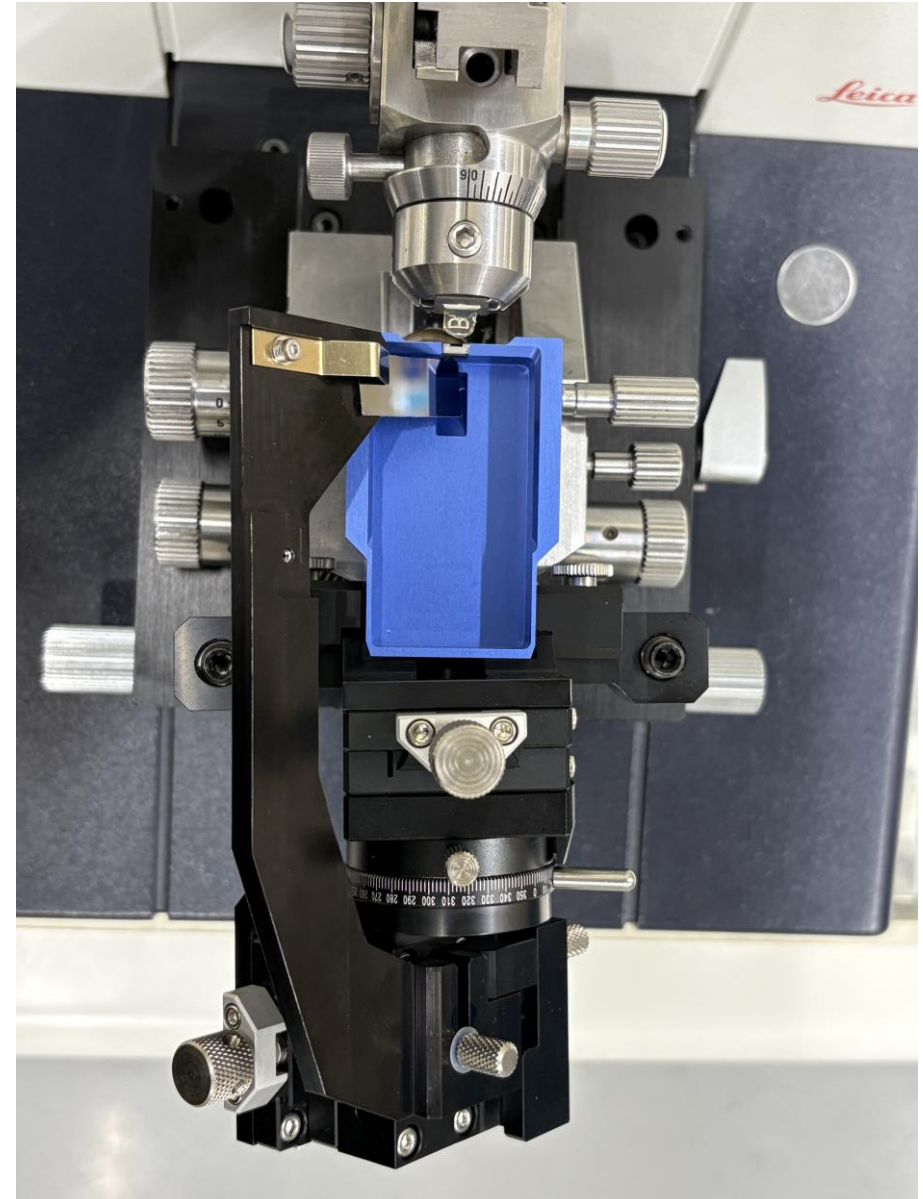
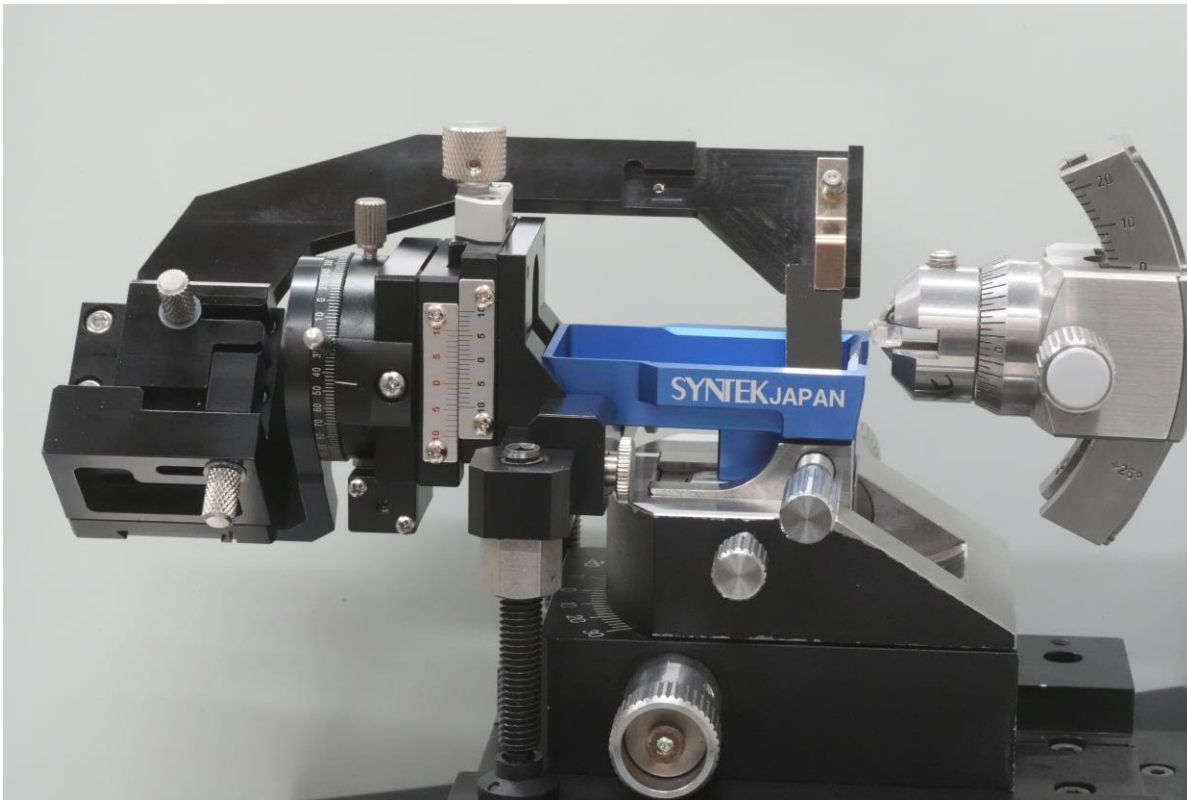




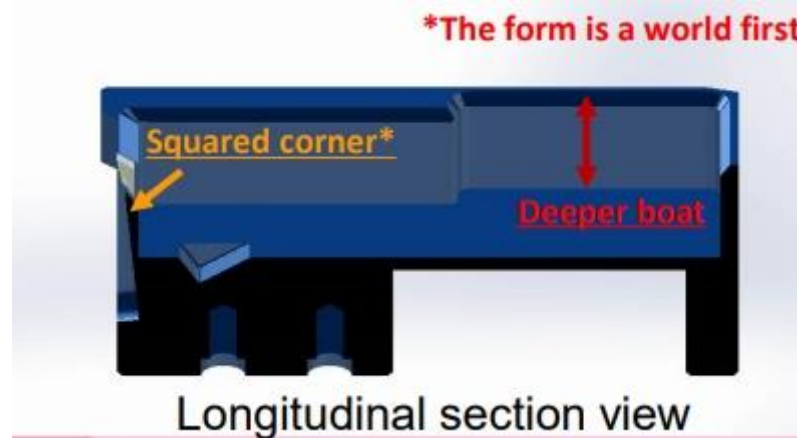
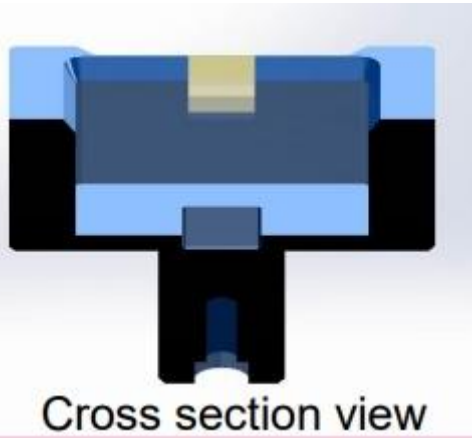
	入門 難度	難點	收片數量	特點
Grid Tape systems	高	架設後須校正與調整，須調整至每一切片能完整收入grid中	>10000	可收取大量切片，使用TEM做tomography，可得到最高的解析度與最少的gap
Tape systems	中	架設後須校正與調整，避免收片失誤	>10000	可收取大量切片
ASH2	低	收片時會有水流影響，需要小心調整條連續切片的位置，避免斷掉或黏到	~500	可簡易收取切片
Cuesta & Noventa	無	無	~300	可輕易收取切片，因一次收一條serial section，可避免serial section互相影響



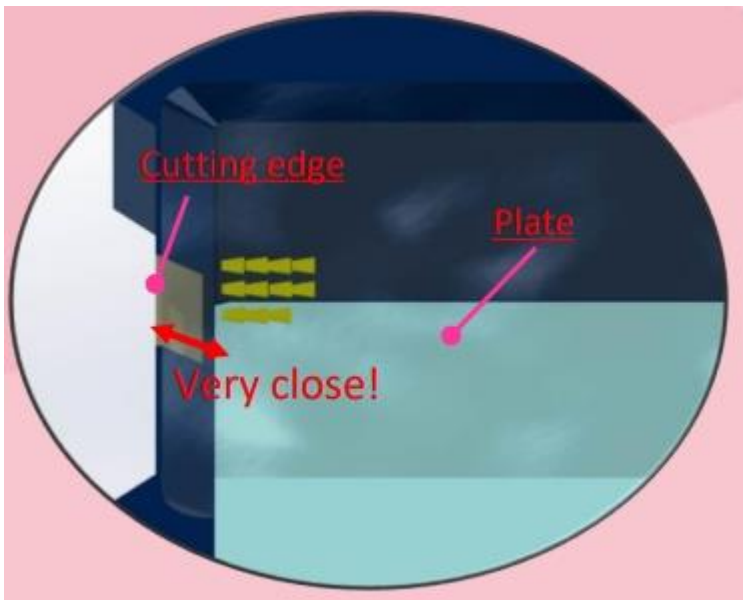
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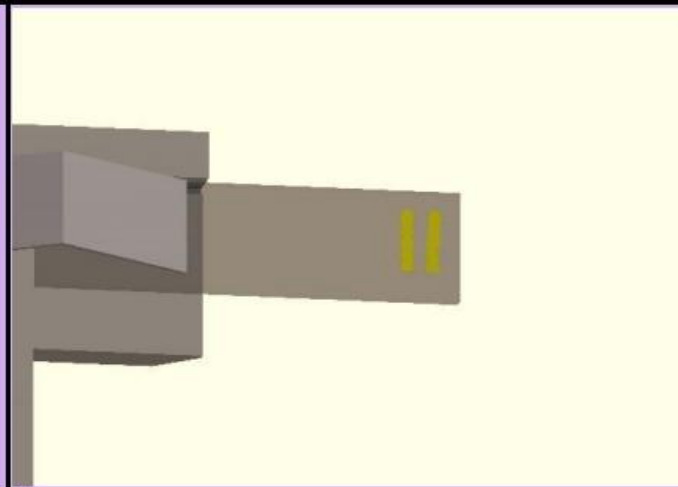
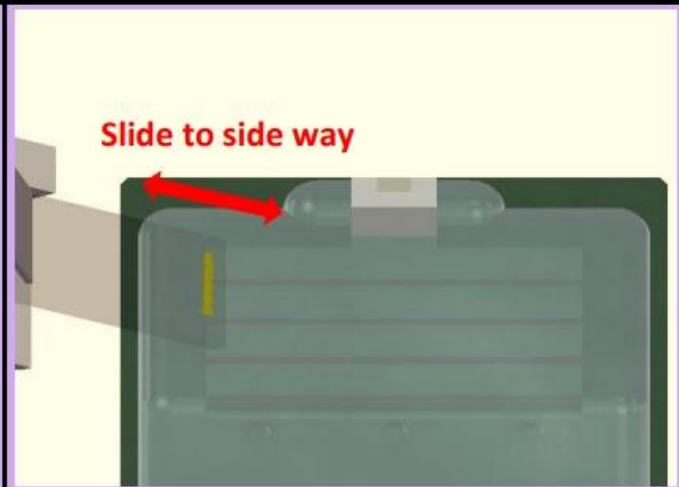
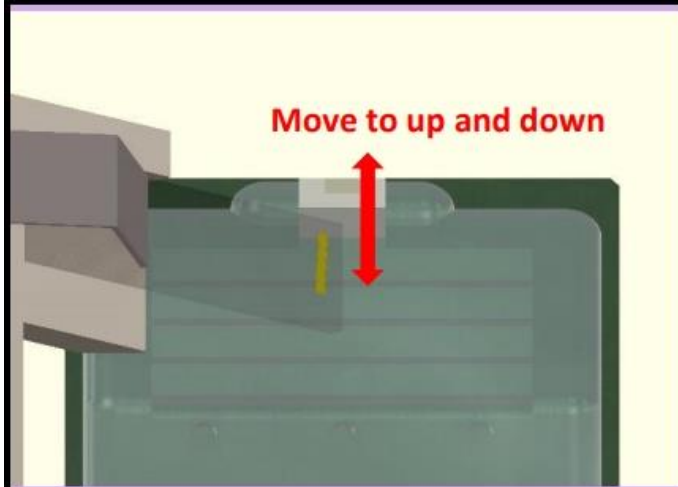
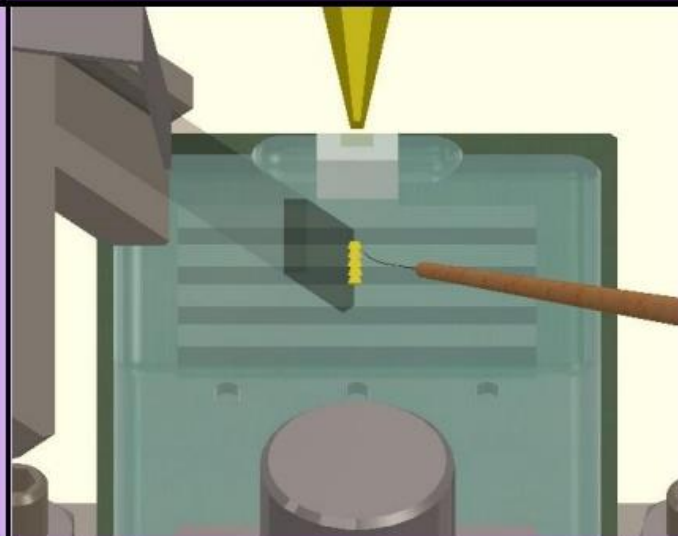
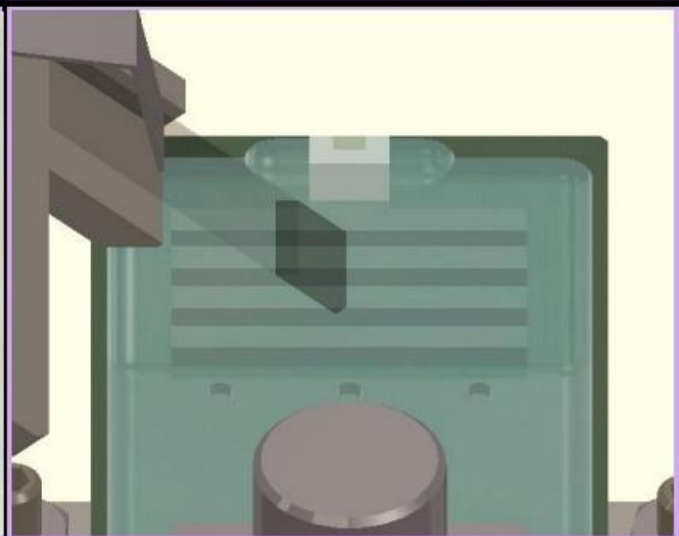
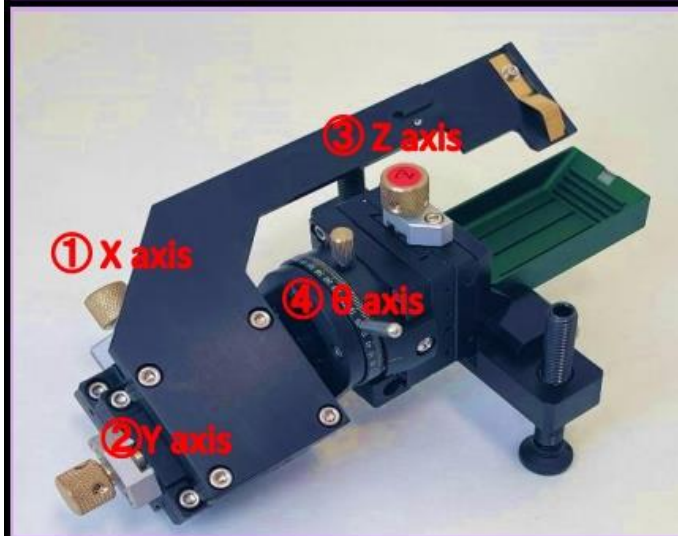
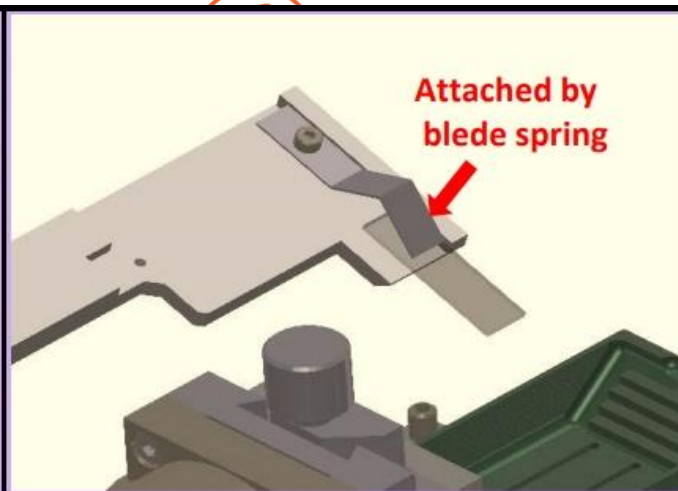
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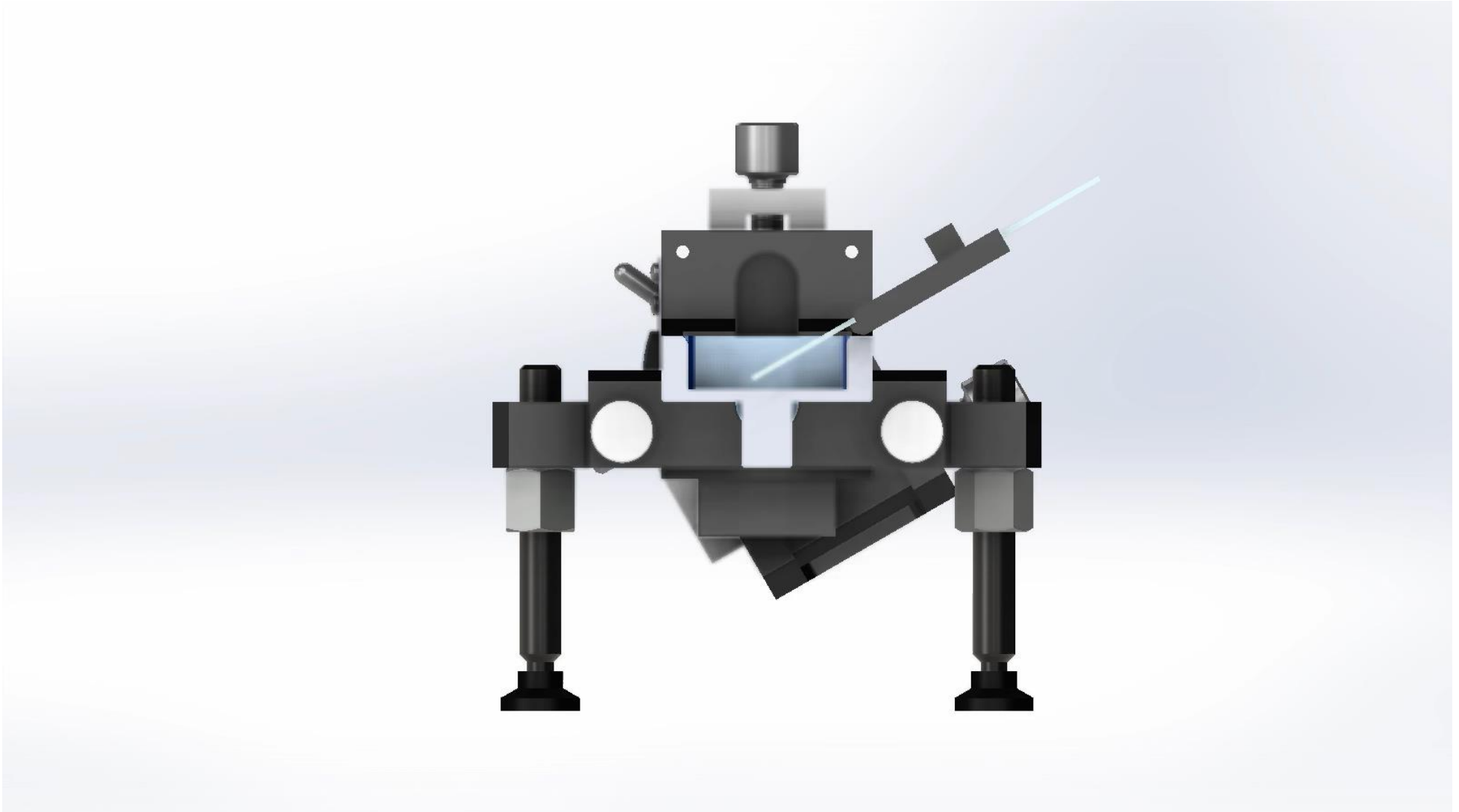


- The boat section is the deepest compared to other Jumbo types.
- Then, the lower part of the blade is vertical and the corners are squared, so glass plates or wafers can be stably installed in the desired position.



- The area around the blade has a simple shape.
- This makes it possible to approach the wafers and glass plates close to the blade, making the collection easier.

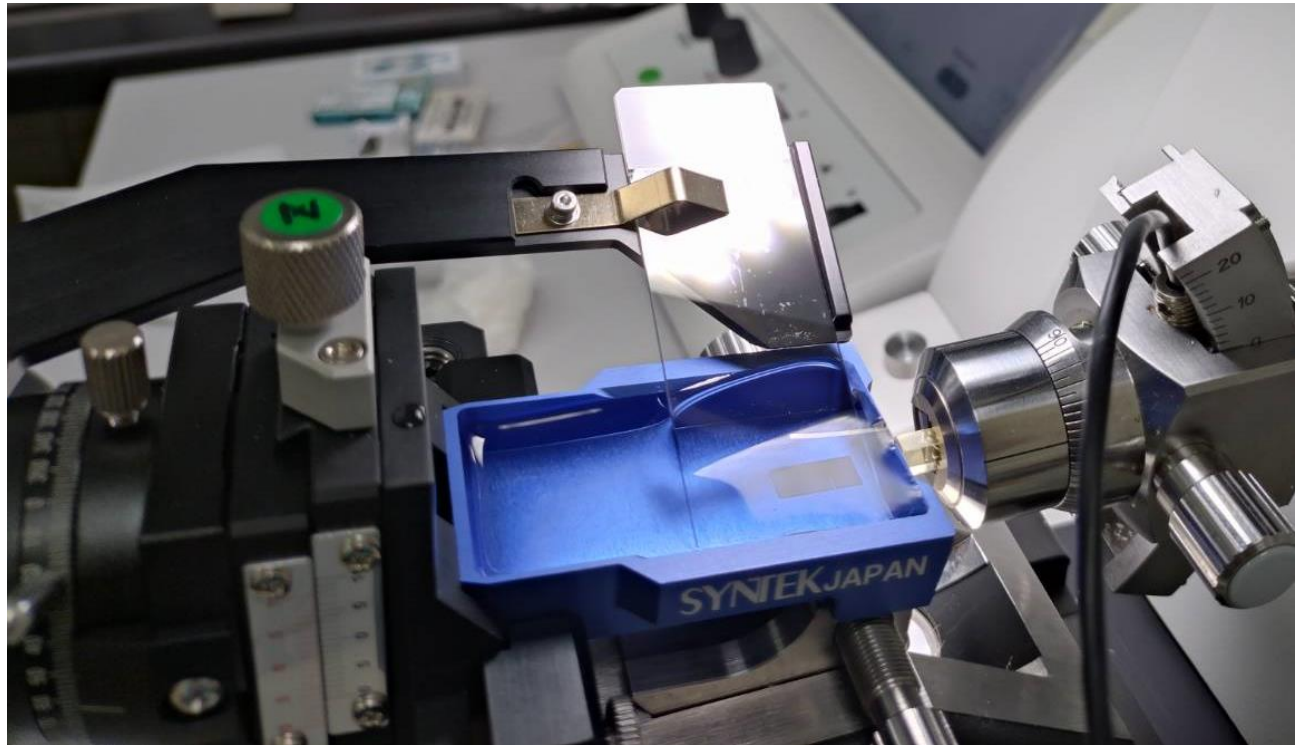
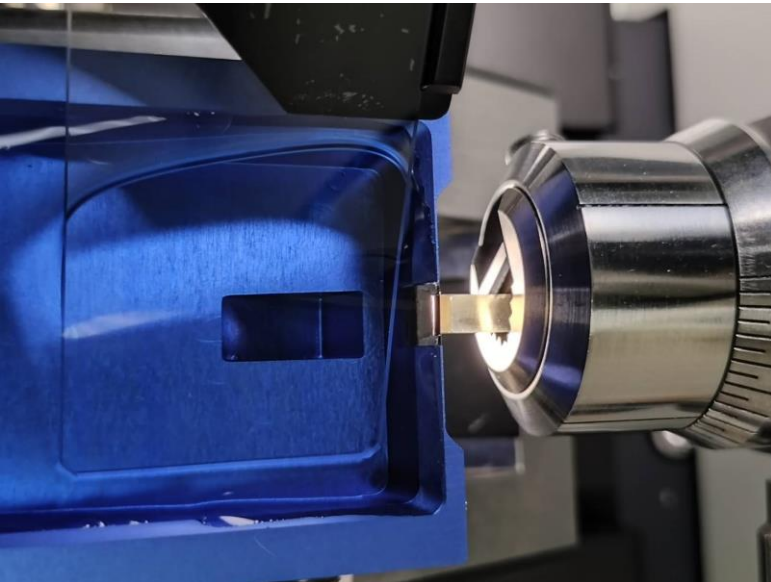
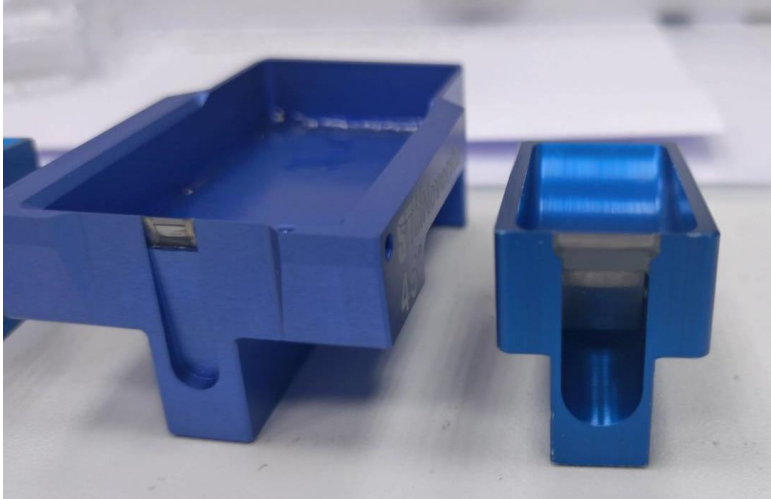




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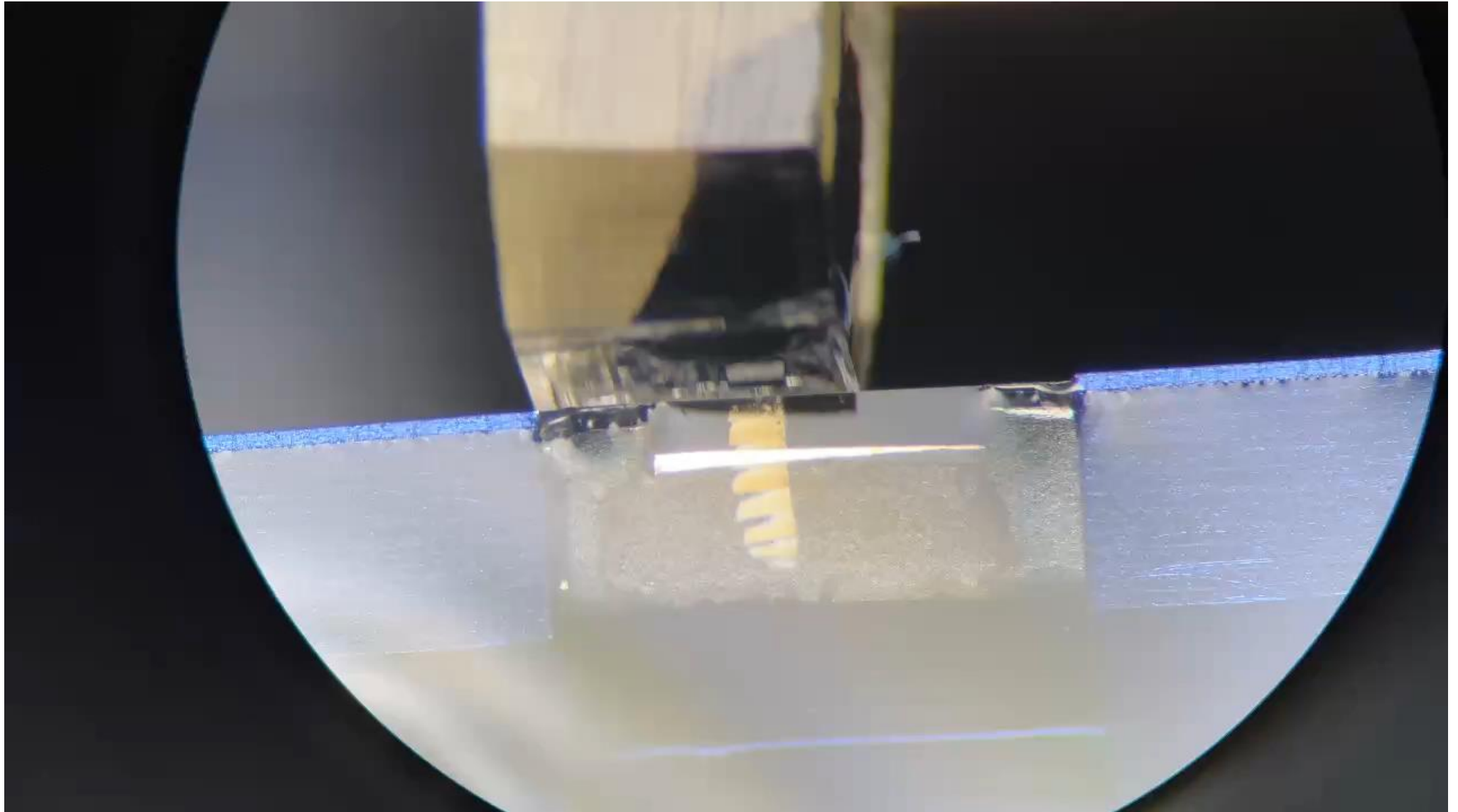
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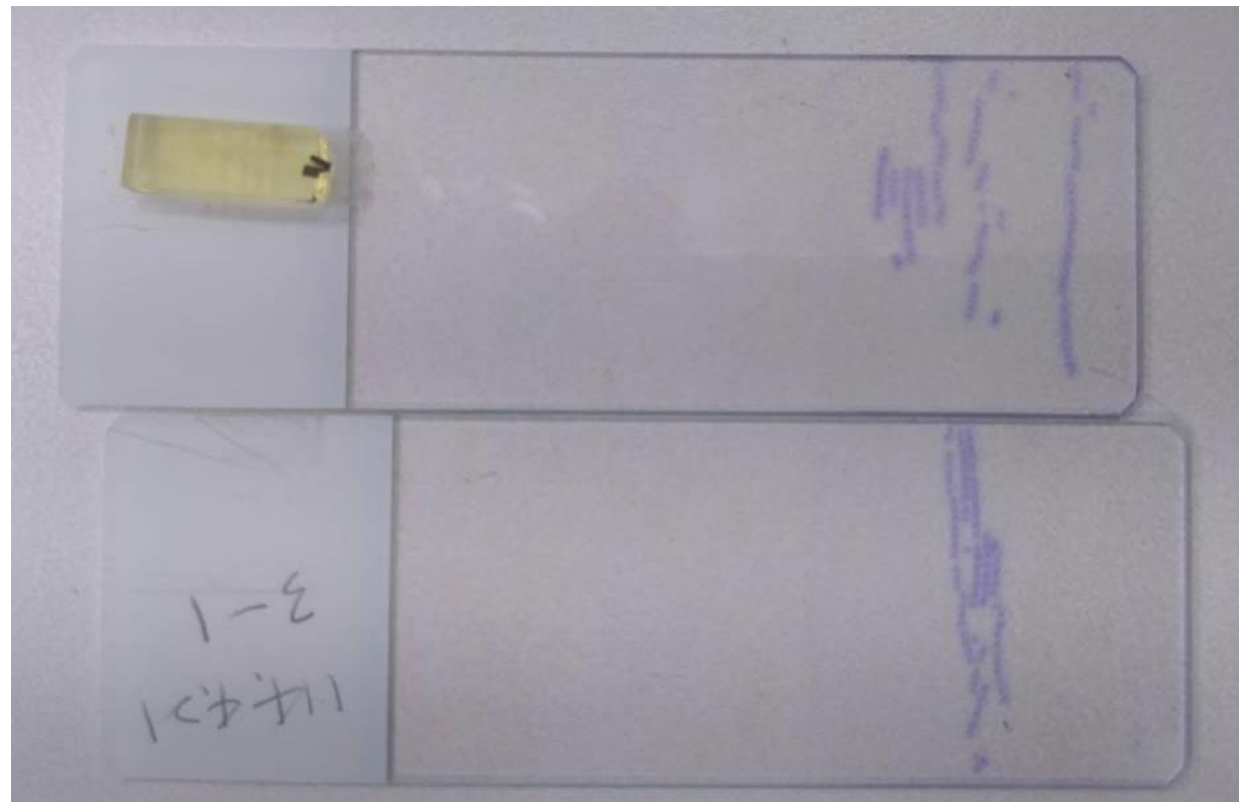
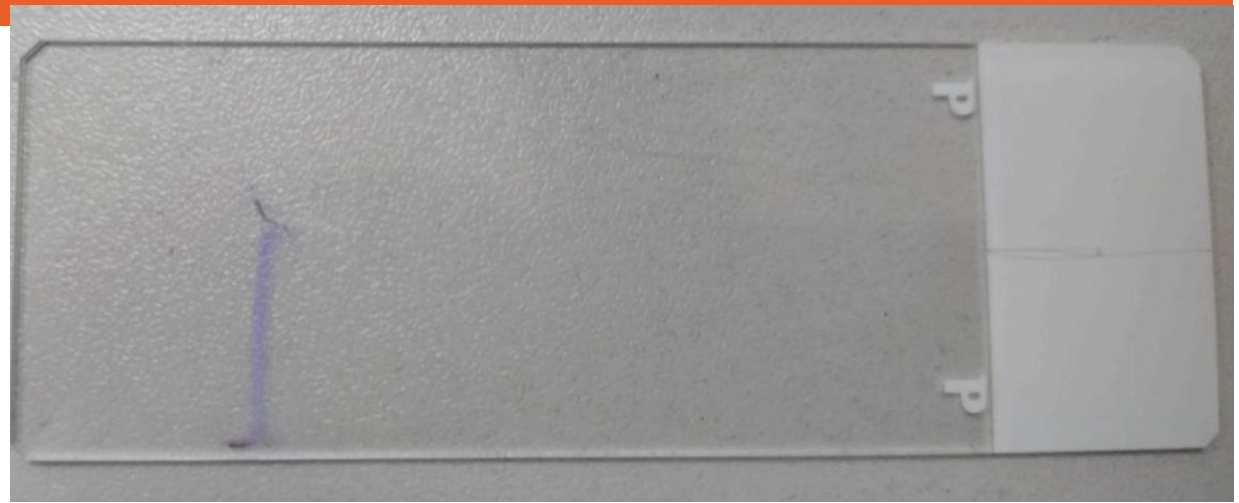


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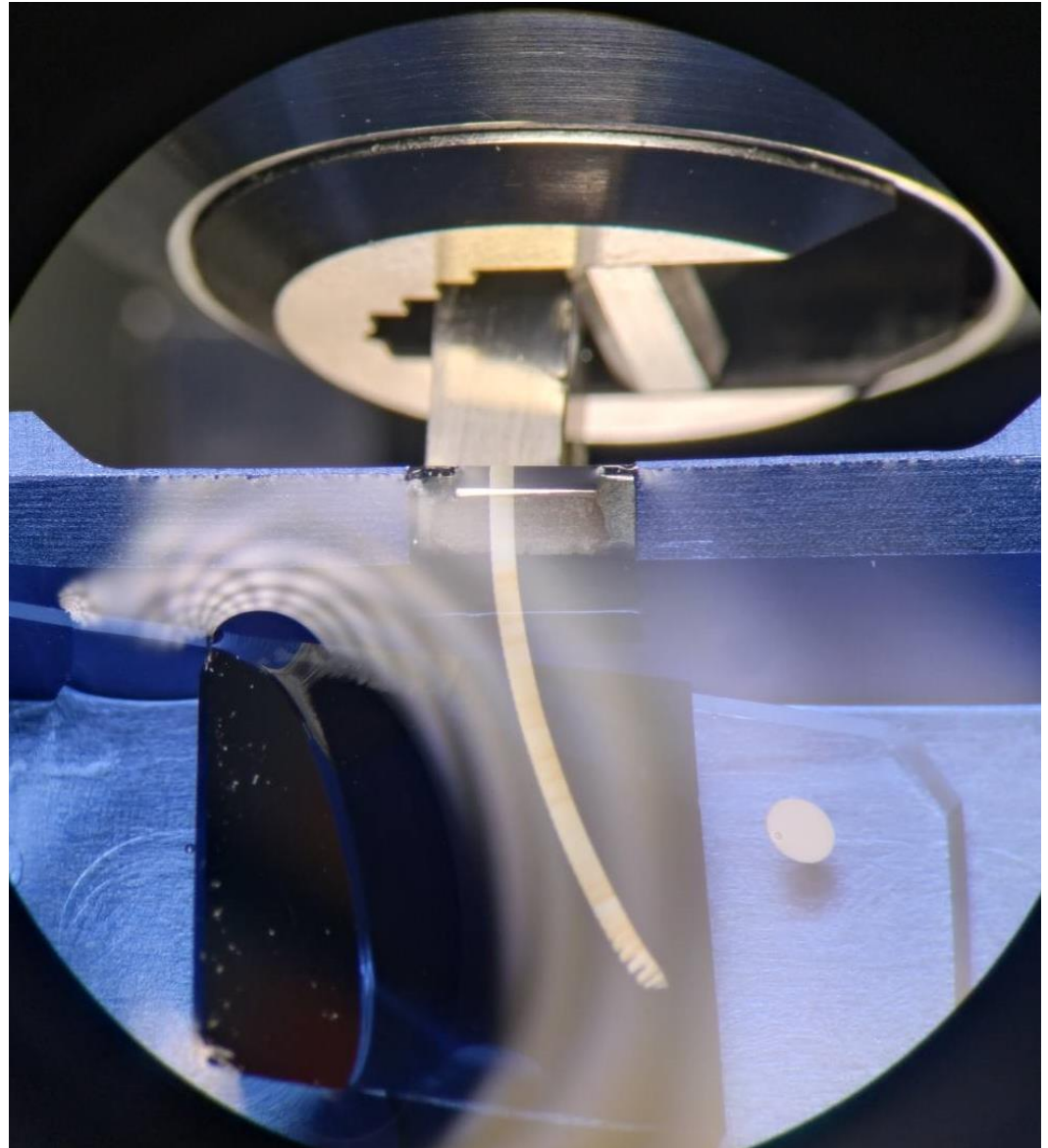
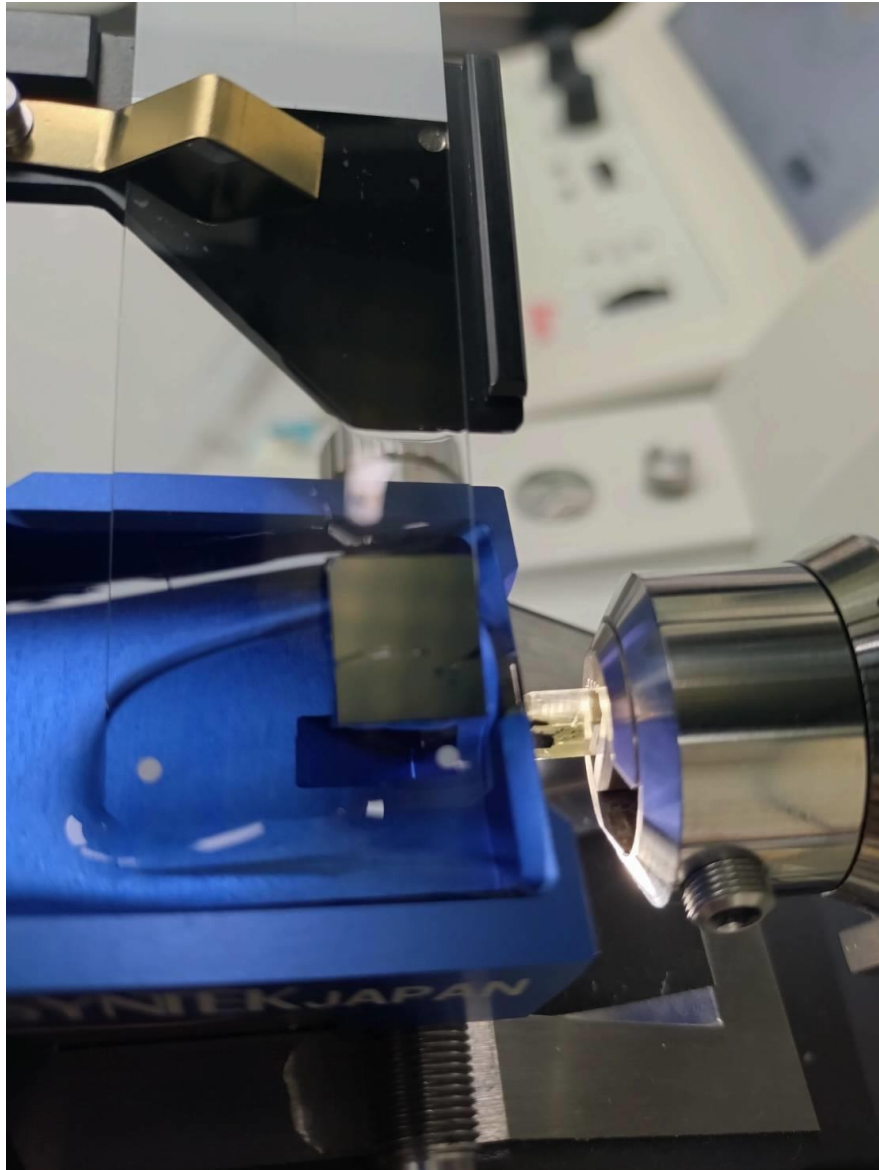




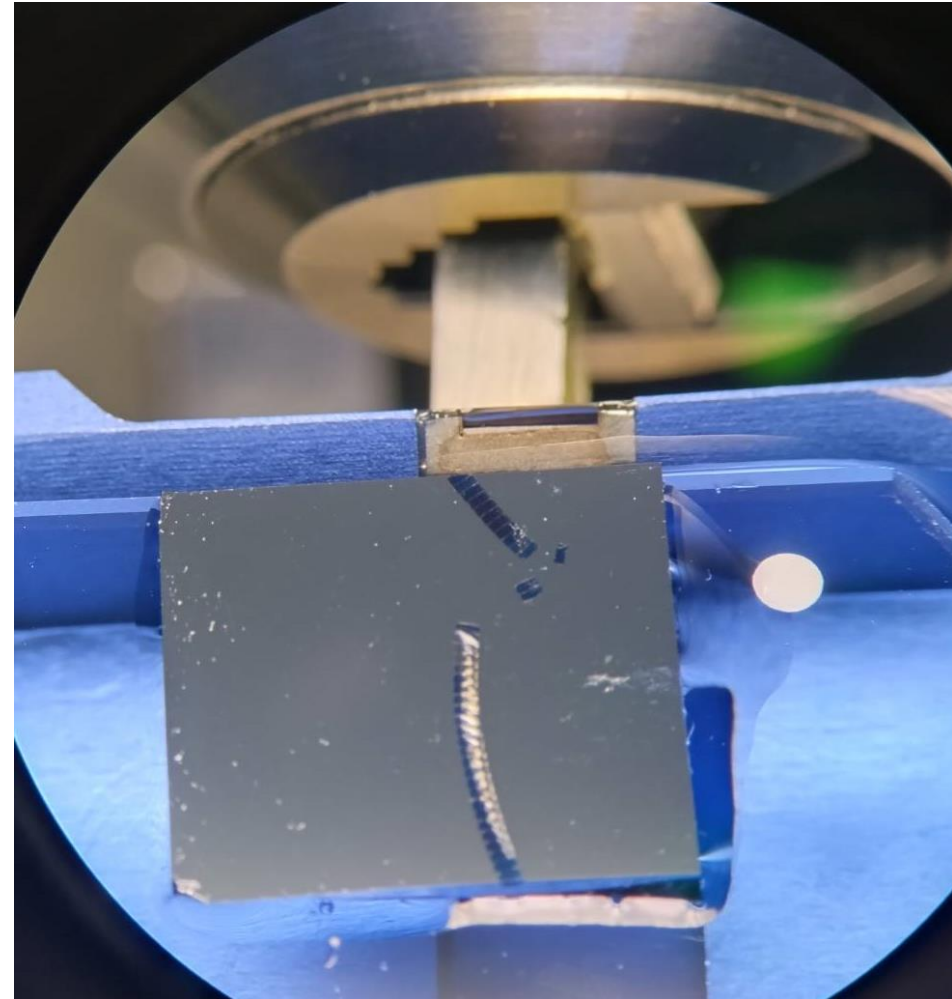
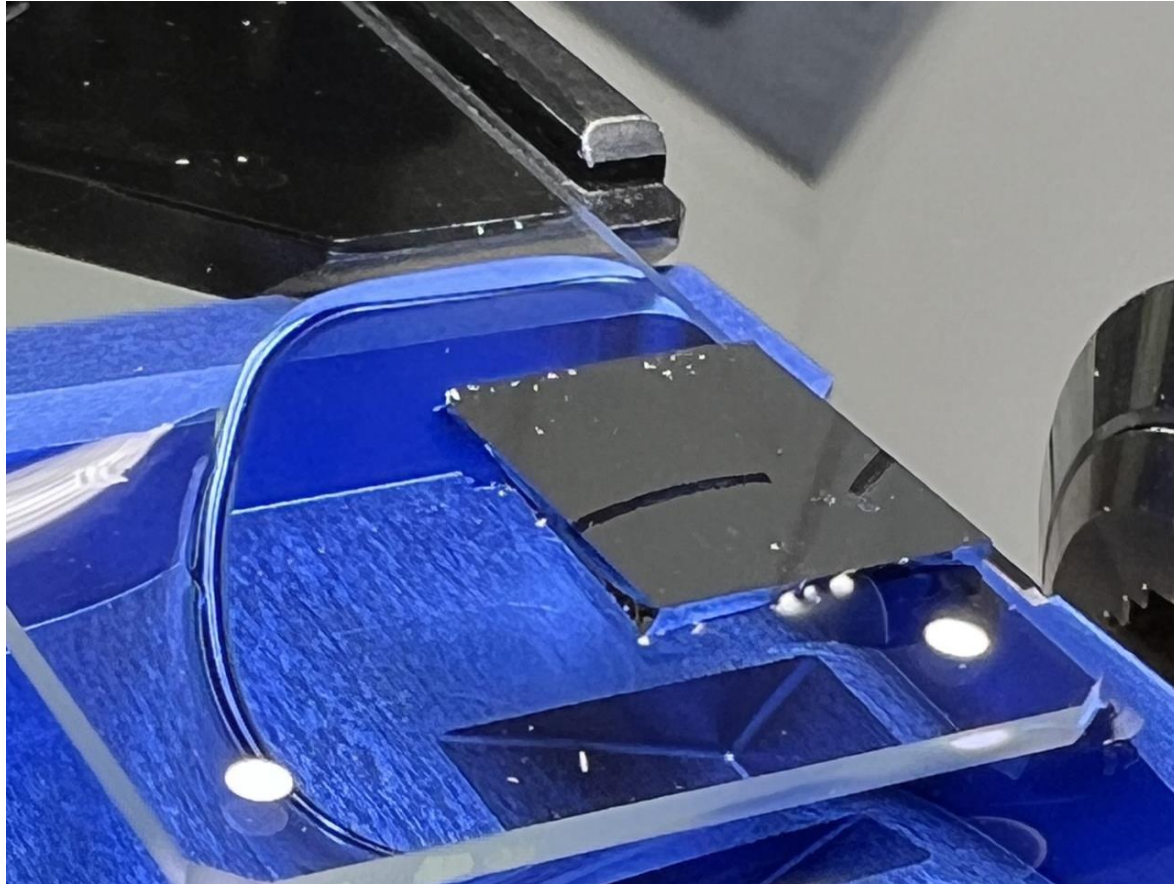
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THANK YOU

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