

Spatial and Temporal Mapping of Cervical Lesions Using Cervical Cell Lift ; A Two-Year Longitudinal Observation

M. Miyazaki¹, N. Egawa¹, A. Shirz², A. Nishimura³, T. Motohara³,
K. Nagasaka⁴, R. Crawford², J. Doorbar¹.

¹Cambridge University - Cambridge (United Kingdom),

²Cambridge University Hospital - Cambridge (United Kingdom),

³Kumamoto University - Kumamoto (Japan),

⁴Teikyo University - Tokyo (Japan)



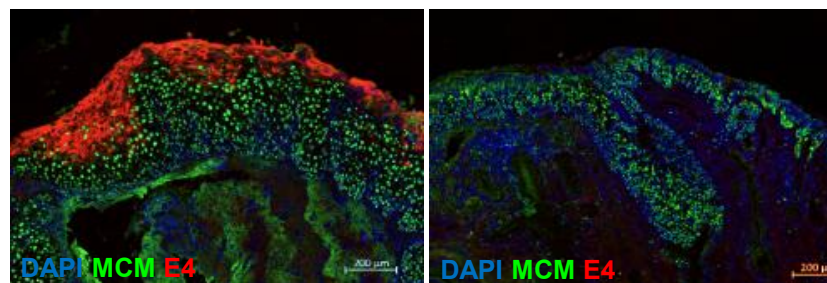
Principle of Cervical Cell Lift: From Lesion Biology to Spatial Mapping

Cervical Cell Lift (CCL) = Non-invasive spatial mapping of cervical lesions while preserving epithelial topology

→ Enables grading & localization of lesions without biopsy

→ Capable of detecting **HSIL**

MCM/E4 patterns in tissue lesions



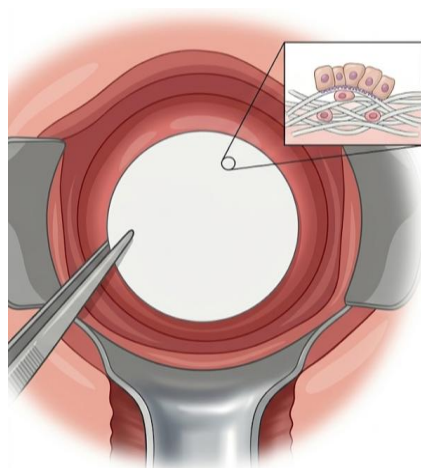
CIN1(LSIL)

CIN2-3(HSIL)

MCM+ = Proliferating cells

E4+ = Productive HPV infection

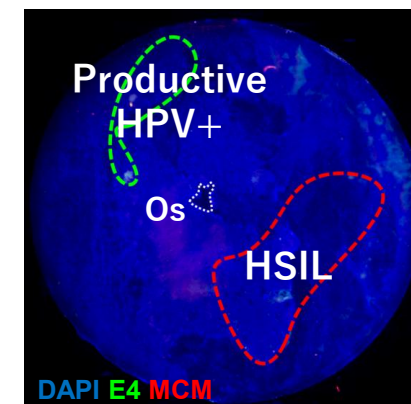
Methods



Apply nitrocellulose
membrane to cervix for 15
sec



Fixation



MCM / E4 staining and
spatial mapping

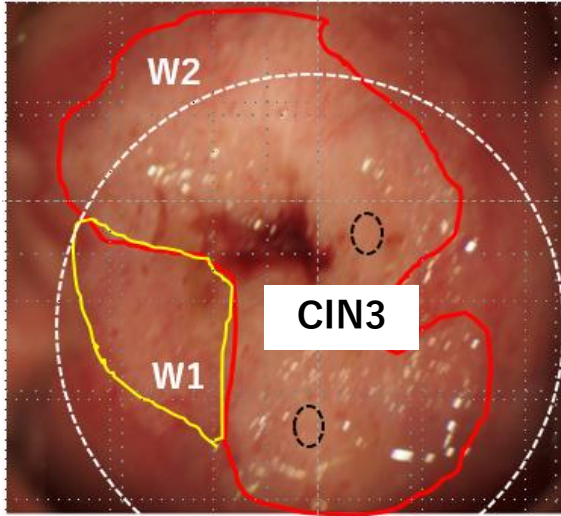
Aim

Can CCL track lesion changes over time and reduce the need for repeated biopsies?



Patient Information and CCL–Cone Tissue Spatial Mapping

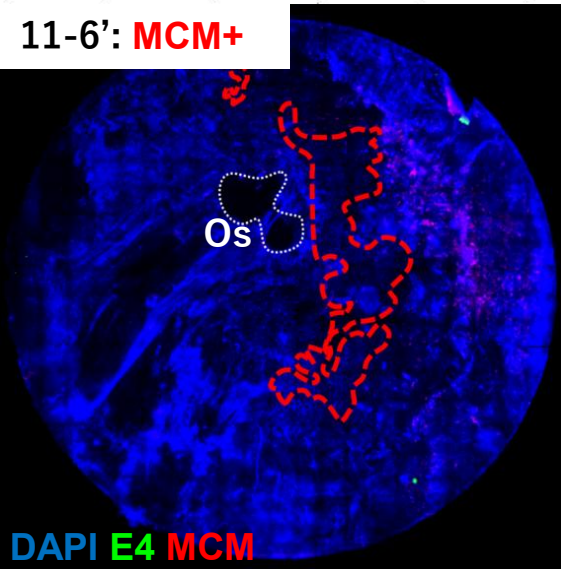
PI: Age : 40, Cytology: HSIL, HPV67+



Conization



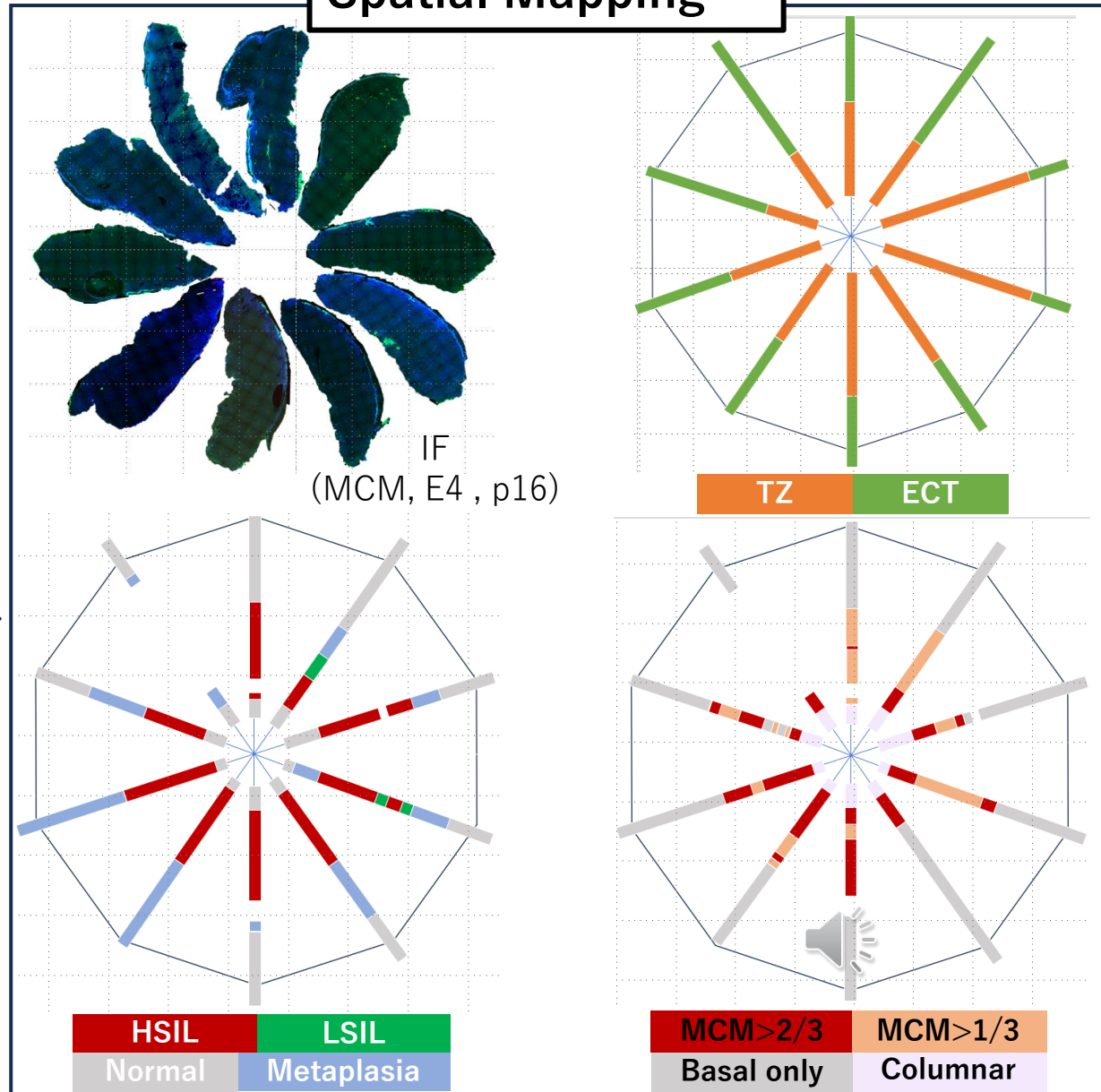
Final histology: **CIN3,**
negative margins



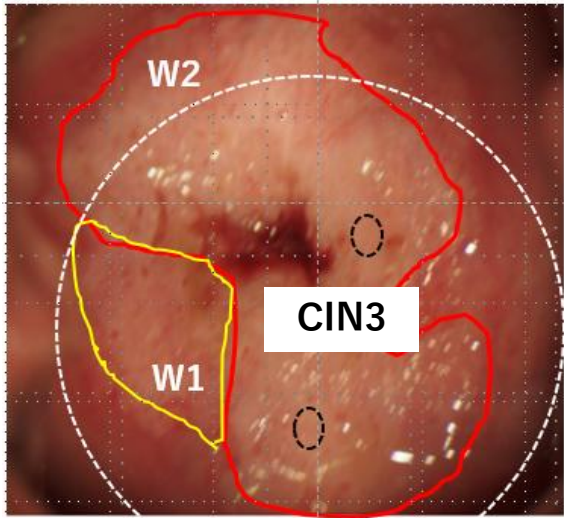
X-1M 1st Consultation

X

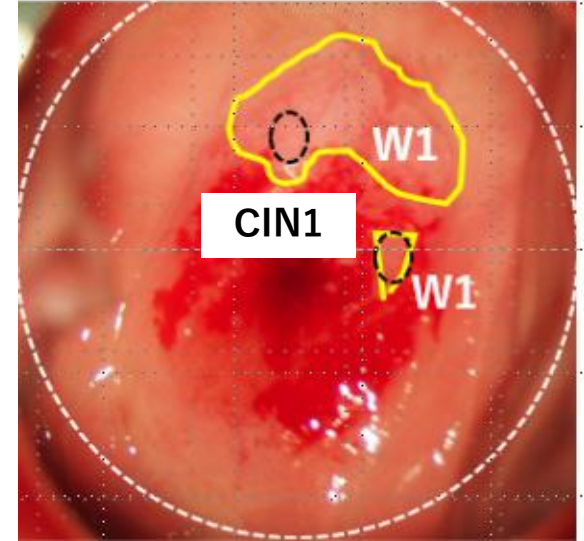
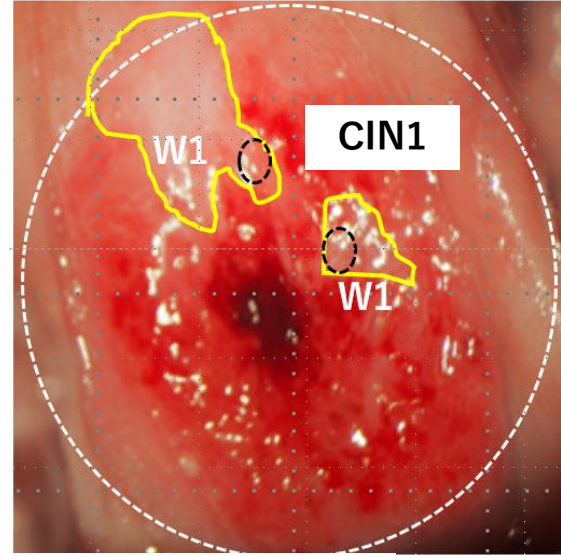
Spatial Mapping



Two-Year Longitudinal Observation

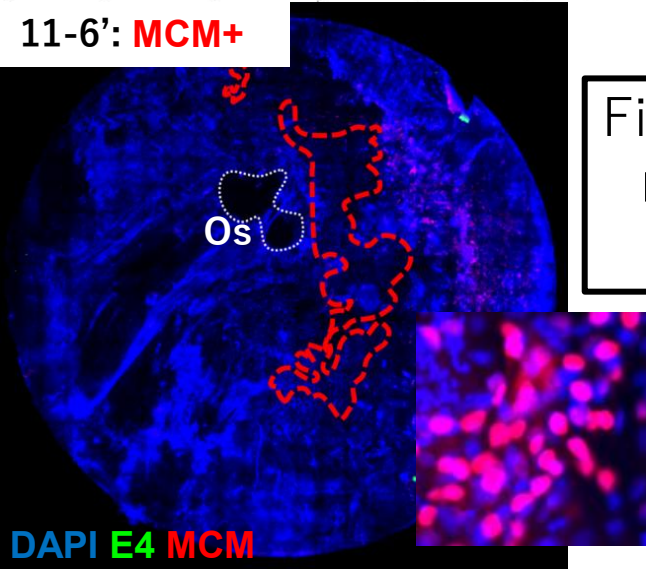


Conization



Final histology: **CIN3,**
negative margins

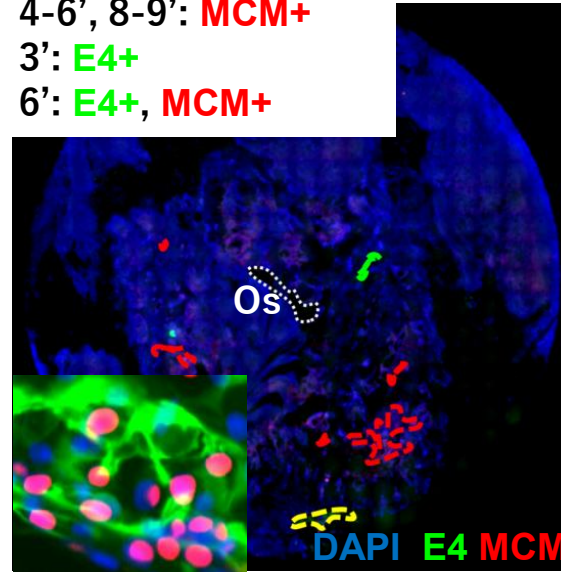
11-6': **MCM+**



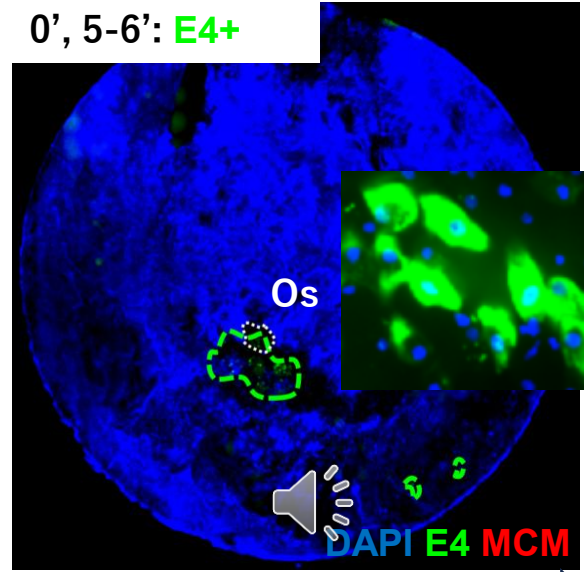
4-6', 8-9': **MCM+**

3': **E4+**

6': **E4+, MCM+**



0', 5-6': **E4+**



X-1M 1st Consultation

X

X+15M(LSIL)

X+30M(LSIL)

Discussion & Conclusion

Spatial Mapping

- CCL could visualize biomarker distribution on the cervix non-invasively
- Two-year follow-up showed spatial and temporal changes of the lesion

Concordance with Histology

- CCL spatial mapping showed concordance with conization histology in this case
- This suggests CCL can reflect regional lesion distribution

Non-invasive Follow-up

- CCL may support non-invasive follow-up and help reduce repeated biopsies
- Larger studies are needed to confirm clinical usefulness

