

TISSUE ENGINEERED CELL SHEETS FOR PREVENTION OF STRICTURES IN PATIENTS UNDERGOING ESOPHAGEAL ENDOSCOPIC SUBMUCOSAL DISSECTION

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Conclusion

Transplantable cell sheets could safely be produced from patients' oral biopsies. As a result of the non-enzymatic harvesting, the cell sheets maintained many qualities typically lost during conventional cell detachment (such as extracellular matrix proteins, cell-to-cell contacts) while remaining highly viable. The cell sheets could subsequently be transplanted to patients after endoscopic submucosal dissection (ESD). No adverse effects were observed and the risk and severity of strictures appears to be less after transplantation, but this remains to be confirmed in a controlled trial.

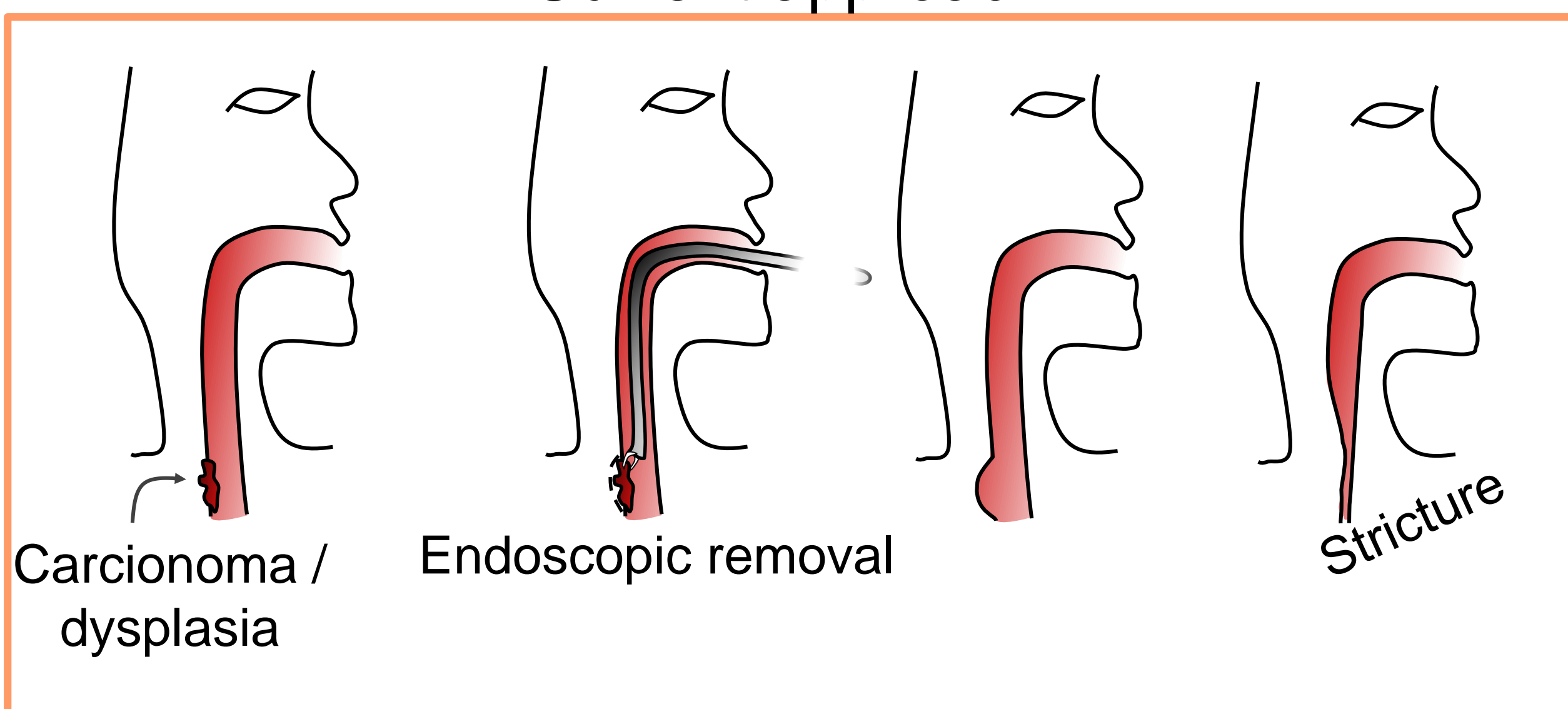
Introduction

Superficial (pre-) cancerous lesions of the esophagus can effectively be removed using ESD. However, the high incidence of stricture development after such therapy remains a major clinical concern. We have previously shown that cell sheets grown from autologous oral mucosa promotes esophageal healing in a Japanese patient cohort.

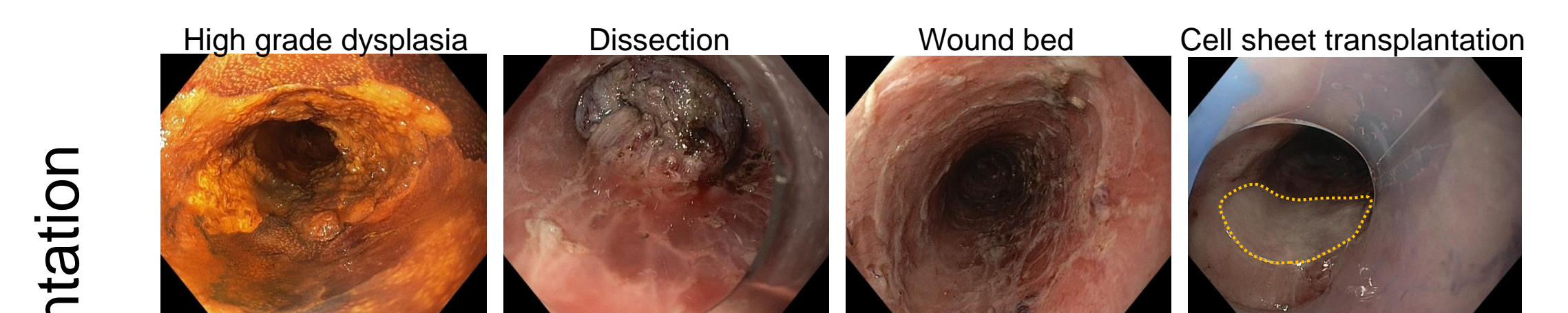
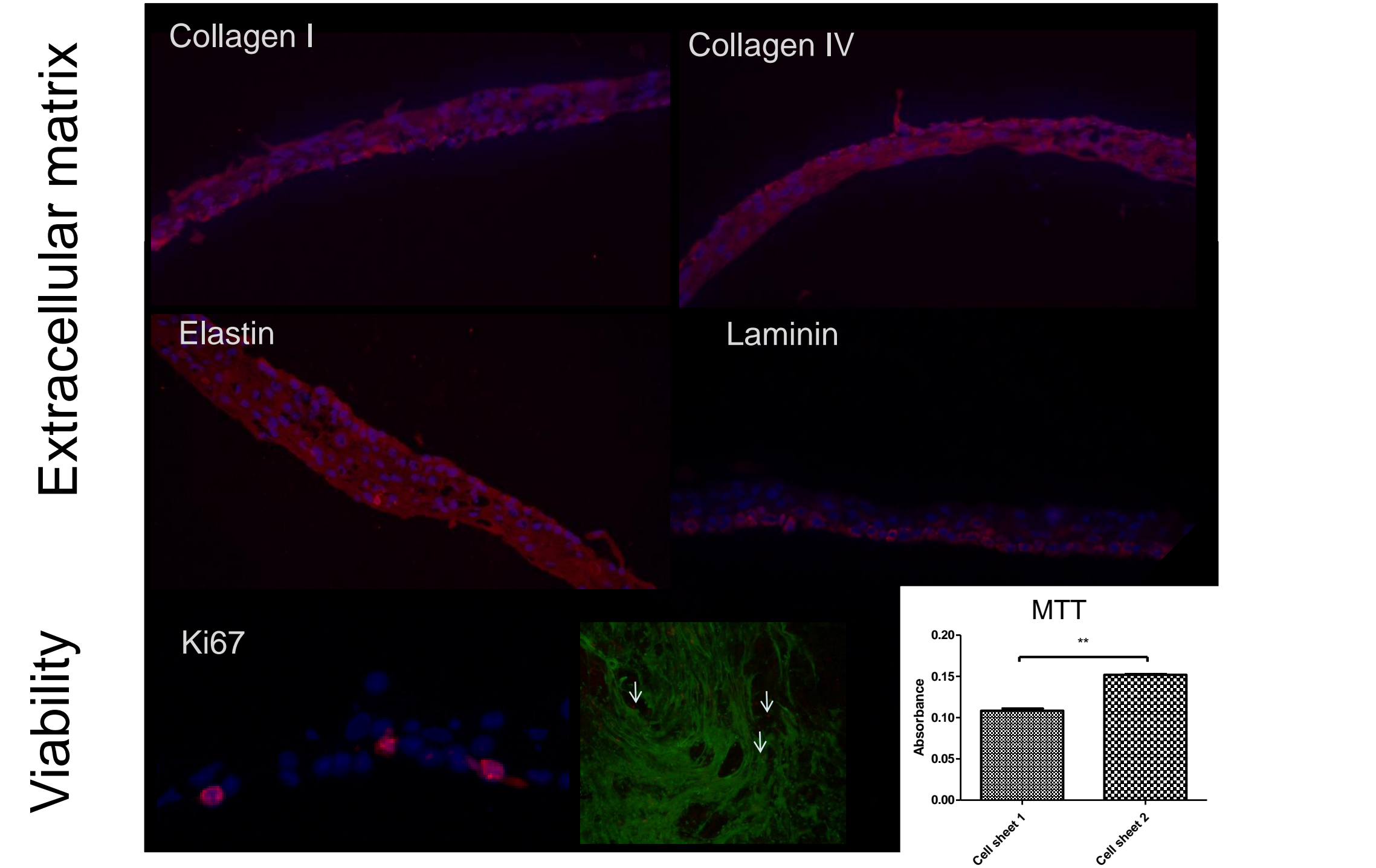
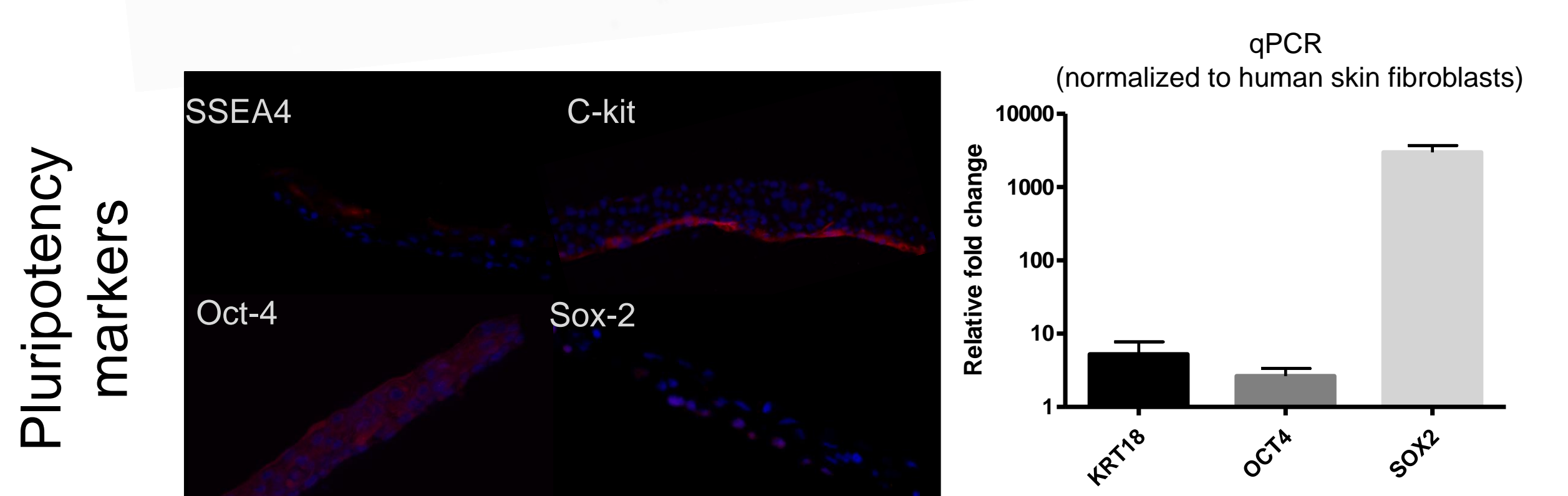
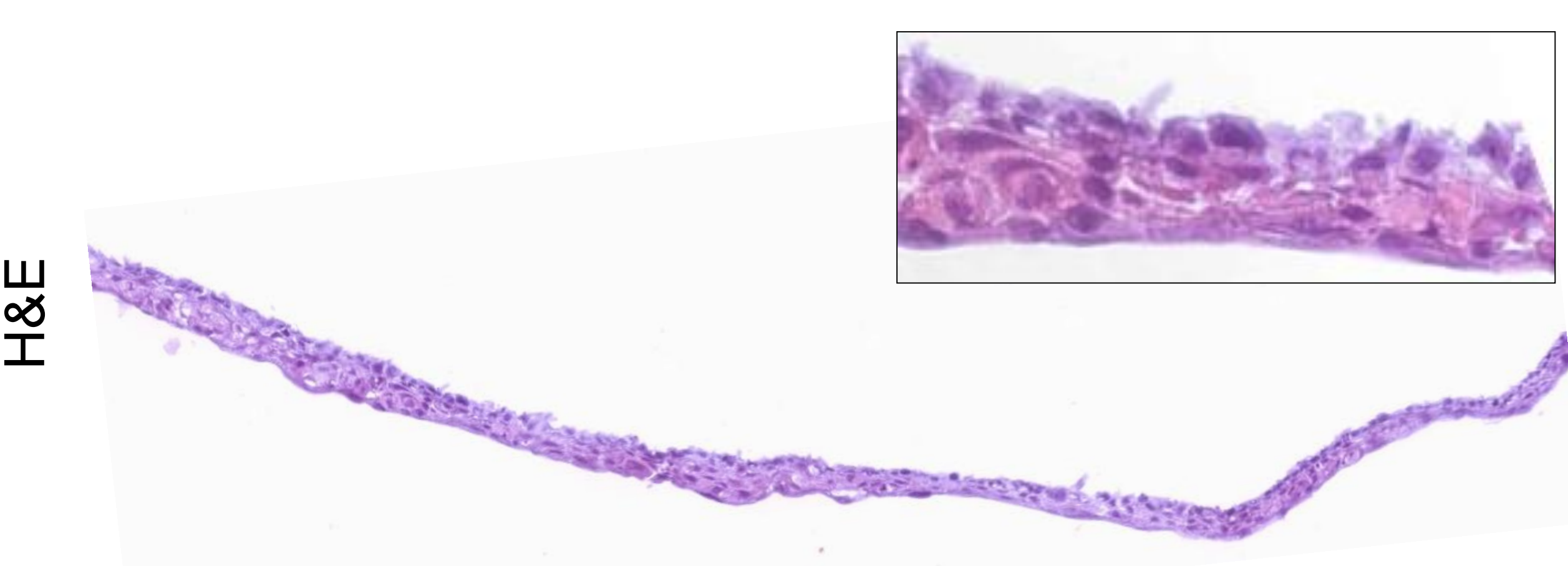
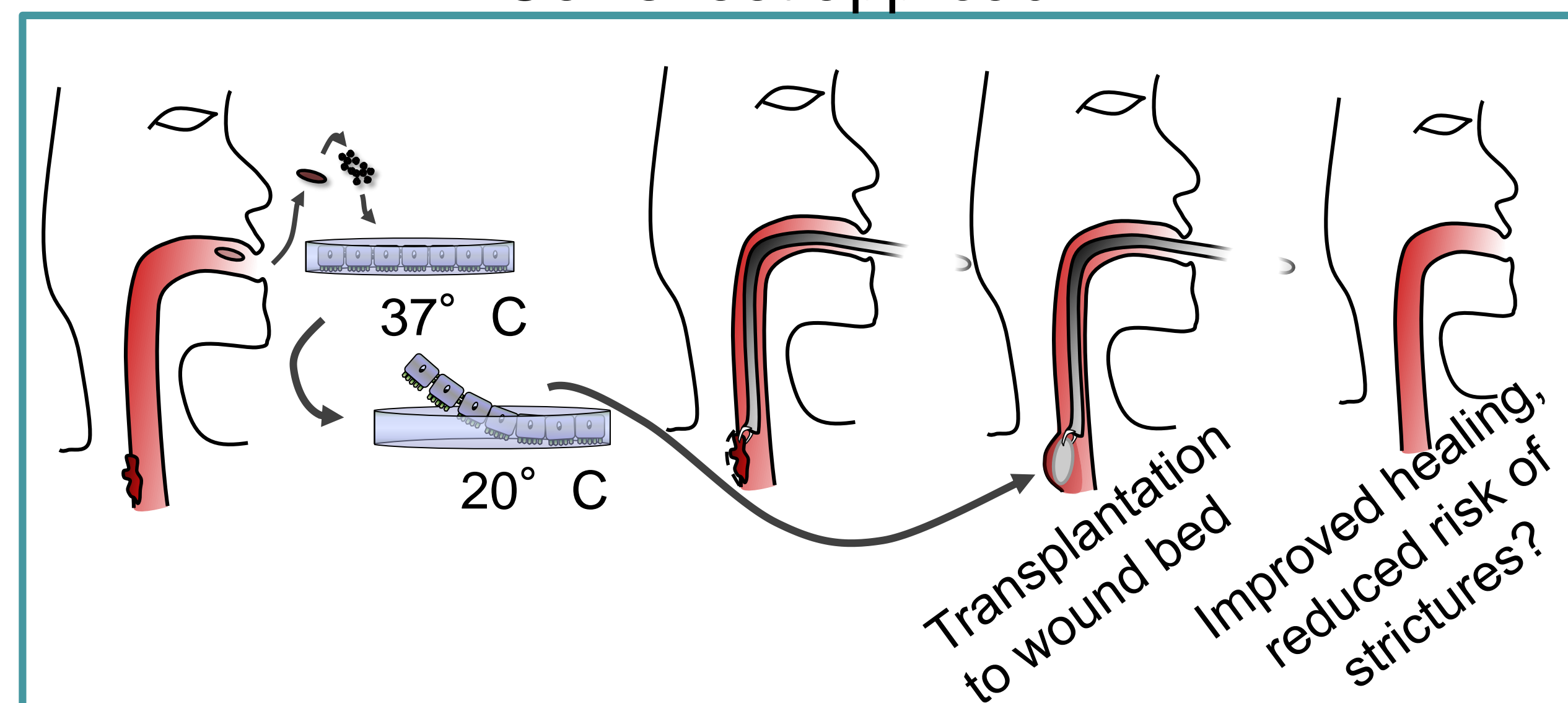
Aim

The aim of this study was to transfer the cell sheet technology from Japan to Sweden, including all steps: oral biopsy, cell isolation and culture, cell sheet harvesting, characterization and finally transplantation. We further aimed to prove the techniques' safety and feasibility in a European setting.

Current approach



Cell sheet approach



Patient	Defect (length/circumference)	Transplanted cellsheets (n)	Time to re-epithelialization (weeks)	Stricture formation	Treatment
1	5 cm; 75%	2	2	No	NA
2	5 cm; 100%	6	3	Yes	Dilatation; 4 sessions
3	10 cm 100%	5	3	Yes	Dilatation; 5 sessions
4	8 cm; 100%	5	3	Yes	Dilatation; 3 sessions
5	9 cm; 75%	5	3	No	NA
6	4 cm; 100%	4	2	Yes	Dilatation; 2 sessions
7	4,5 cm; 75%	6	2	No	NA

Acknowledgements

We would like to thank Kjell Hultenby at Electron Microscopy Unit (EMIL) at Karolinska University Hospital, Huddinge for help with transmission electron microscopy.

Ethical approval

The project was approved by Stockholm Ethical Review board (number: 2011/1886-31/3).

Financial disclosure

The temperature responsive culture plates are supplied by Cellseed Inc for which dr Okano is a founder and member of the Board of Directors. Dr Yamato is a shareholder in CellSeed Inc.

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