Developing training tools for detecting cervical cancer with HRME

Akane Katayama, Sonia Gomez Parra, and Rebecca Richards-Kortum
TOMODACHI Program and Department of Bioengineering, Rice University, TX, USA
Department of Mechanical Engineering, Meiji University, Kawasaki, JAPAN

Introduction
Threat of cervical cancer

- More than 85% of cervical cancer death occurs in developing countries.
- In developing countries, there are low resources for cervical cancer screening.
- Richards-Kortum Lab is developing low-cost high-resolution microendoscopy (HRME) to detect cervical cancer in the initial phase.

Tablet interface (Surface Pro/Microsoft)
USB cable connected to HRME

HRME
Lens
Tube
Objective
Diaphragm
Filter
CCD

Schematic view of optical system
Operation procedures
- Proflavine is applied to tissue surface
- Blue light diode(LED) illuminates
- Fluorescence from the proflavine-stained surface is collected by the fiber bundle
- Matlab based image analysis algorithm analyzes the image automatically
- Calculating the average nuclear to cytoplasm ratio

High Resolution Micro Endoscopy (HRME)

Fiber Bundle
Objective
Diaphragm
Emission Tube
Filter
Filter
Lens

Excitation Filter
LED


Conclusions and Future plans

Future Plans
- No dots are found
- Images are blurry
- Some dots are imaged not clear

References

Acknowledgements
This research was conducted as part of the 2017 TOMODACHI STEM @ Rice University Program which is funded by a grant from the TOMODACHI initiative, a program of the U.S.-Japan Council.

I would like to thank Professor Rebecca Richards-Kortum and Sonia Gomez Parra for their support of my research and participation in this program.