International Color Consortium

ICC Medical Imaging Working Group

Whole Slide Imaging summary

20th June 2014

Color in Medical Imaging Summit work item

International Color Consortium

Calibration slide for histopathology

- **Problem statement**
  - One reason for differences in whole slide imaging is the lack of a suitable calibration process which means that the same slide can look very different from system to system
- **Proposal**
  - Vendors that have worked in this area should pool their resources to develop a calibration system for digital microscopes
- **Participants**
  - Organisations: ICC, DICOM WG26, FDA
  - Individuals: <teleconference><others>
  - Project coordinator: Craig Revie

Why standard methodologies for the assessment of the color transfer properties in digital microscopy?

1. **Evidence of color performance of slide scanners will facilitate technology comparisons (not only with the optical microscope) and provide an approach to the bench test requisites for the regulatory review of such devices.**
2. **A methodology for measuring would allow for consistency within and among systems/vendors which is required to allow the development of robust computer-assisted detection and diagnosis approaches.**
3. **In addition, the methodology could be part of procedures for system and component QC/QA.**

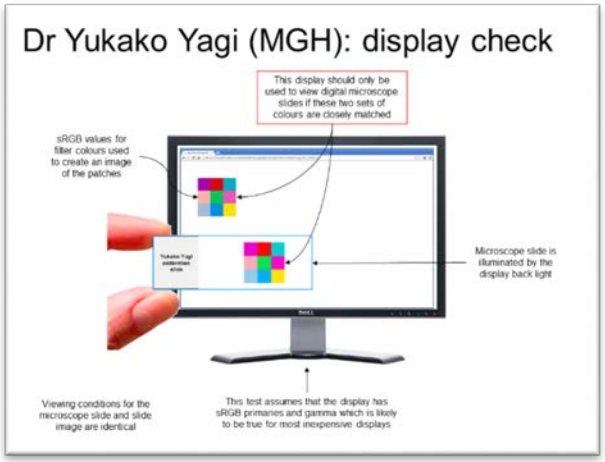
Aldo Badano, FDA Laboratory of Imaging Physics

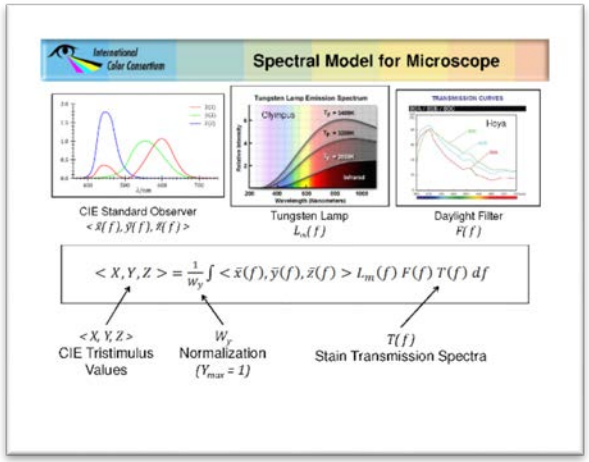
Why standard methodologies for the assessment of the color transfer properties in digital microscopy?

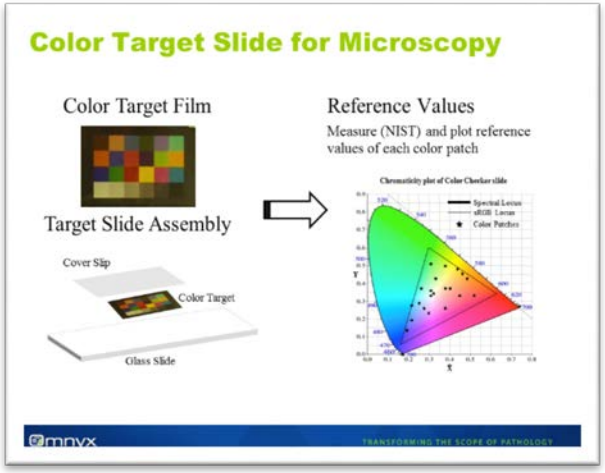
4. **Such a test might increase opportunities for innovation at all levels of the imaging chain by providing a standard methodology to identify components with improved performance.**
5. **The use of the methodology will contribute to the understanding of the limitations of digital systems in terms of color performance.**
6. **A standard methodology will be useful for other areas of digital microscopy including novel stains/techniques (eg, multispectral).**

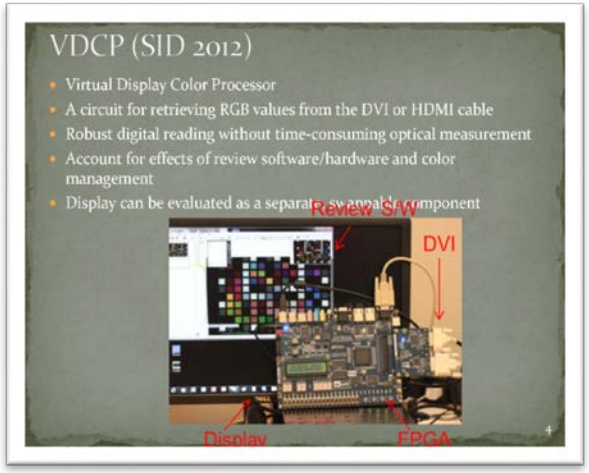
Aldo Badano, FDA Laboratory of Imaging Physics

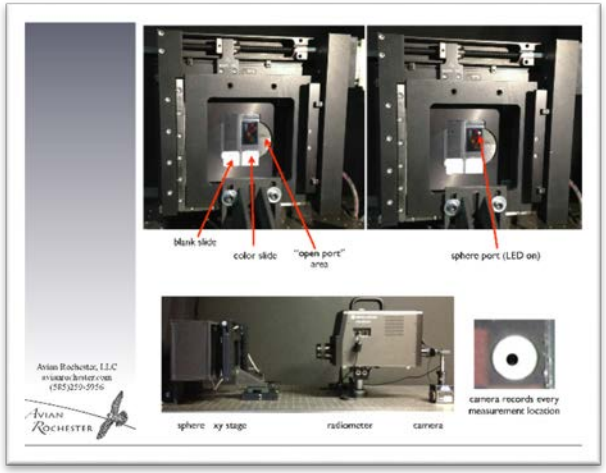
Calibration ideas shared by the group



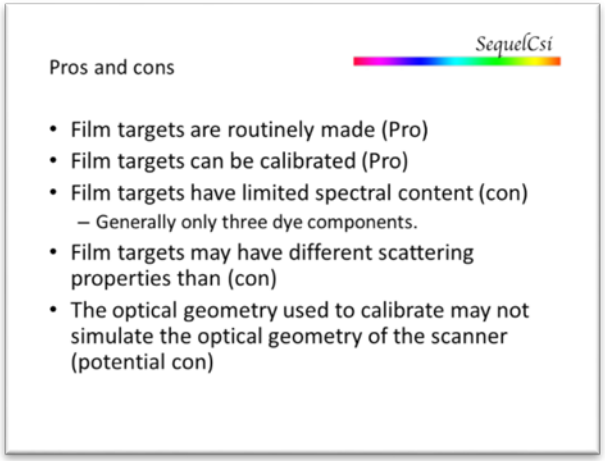


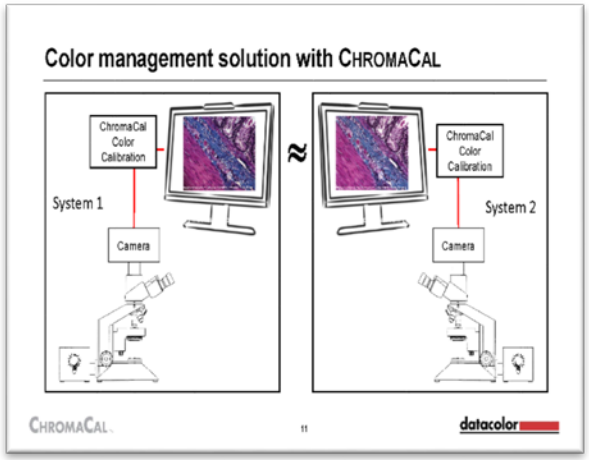


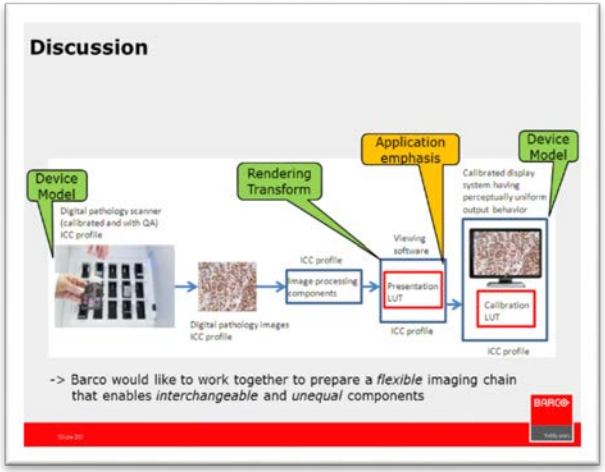


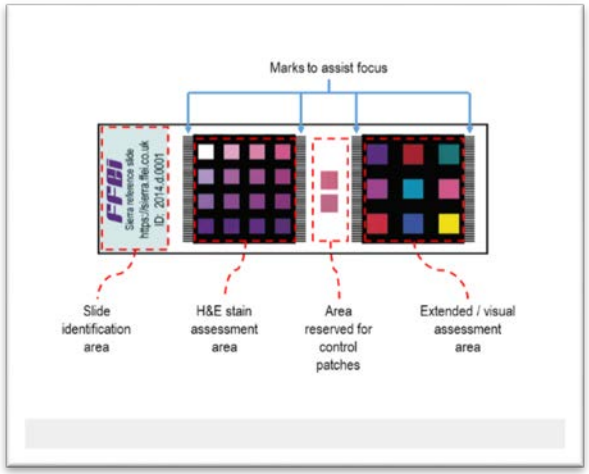


Calibration ideas shared by the group



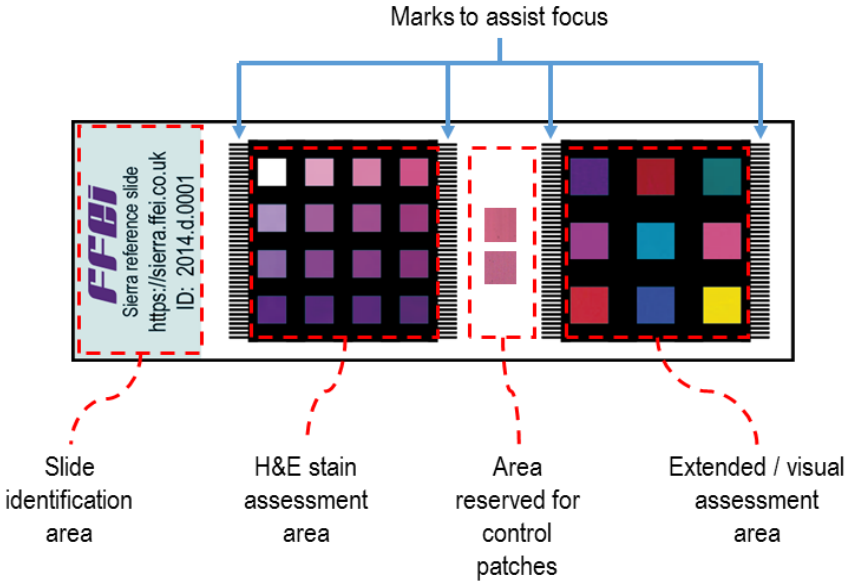






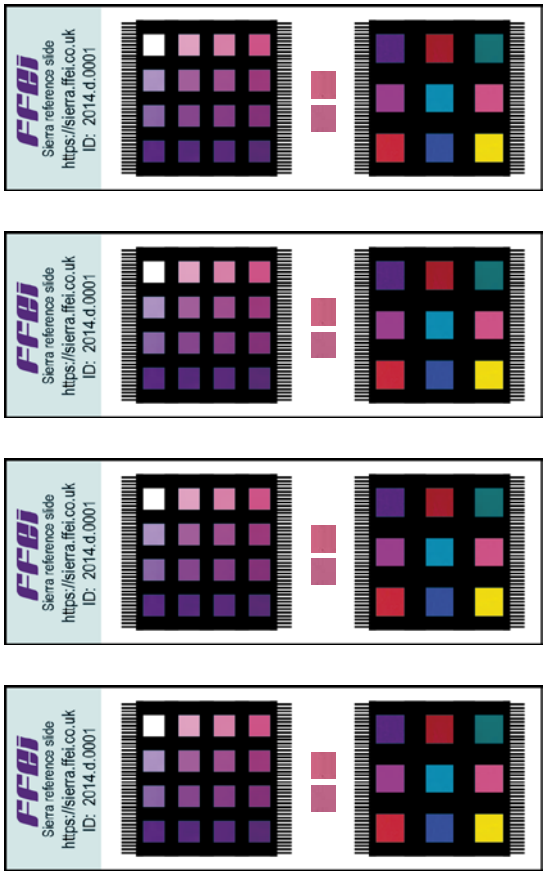
All presentations and audio recordings are available from www.color.org

Sierra calibration assessment slide



Slide comprises a number of patches of biopolymer stained using pathology stains to provide a good spectral match with colours typically viewed on digital microscope slides

Sierra: round-robin evaluation



Round-robin assessment planned to complete by end of 2014

Participants will:

- measure slide
- scan slide on calibrated scanner
- review stains and identify gaps
- provide feedback to the group

FFEI will measure the slide at start and end of the round-robin

Sierra: next steps

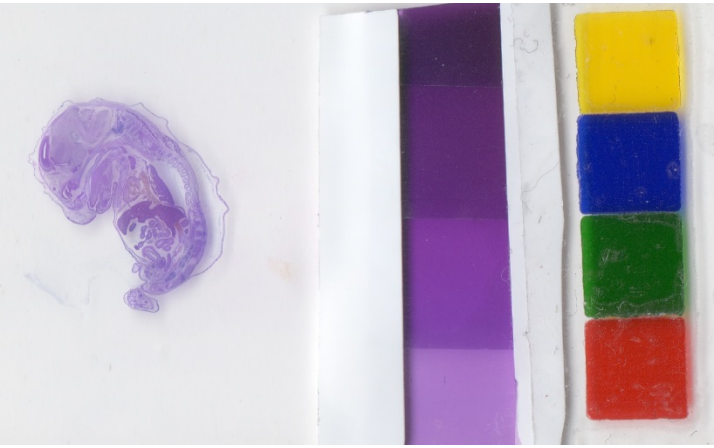
Project Sierra is a research project between FFEI Limited, Leeds Teaching Hospitals NHS Trust and University of Leeds funded primarily by FFEI Limited

We plan to build a second slide to be used to calibrate a digital microscope system using FFEI's biopolymer staining method

FFEI now invites participation in project Sierra to develop slide and supporting software and hardware and to develop a manufacturing process

Staining assessment: point of use QA

An embedded environment in the image that is responsive to all the processes applied to the image, from acquisition to display, and allows assessment of image quality at any time or point in the image life. For use on all mission critical images, x-ray, forensics etc.



Digital Pathology

X-ray

Discussion