Artificial Intelligence in Cervical Cancer Screening

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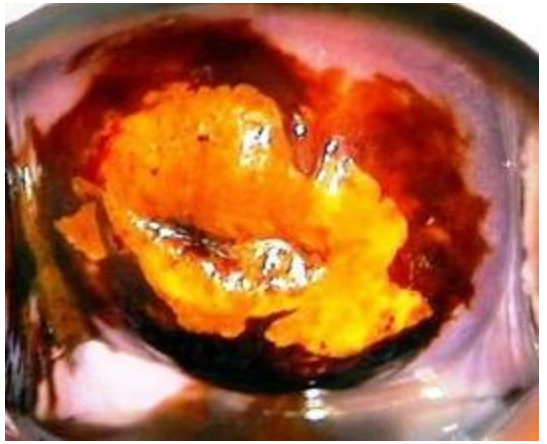
International Agency for Research on Cancer
World Health Organization

Which screening test is most suitable for the LMICs?

- Affordable
- Simple to learn and administer
- Appropriate balance between sensitivity and specificity
- Does not require laboratory infrastructure
- Point of care

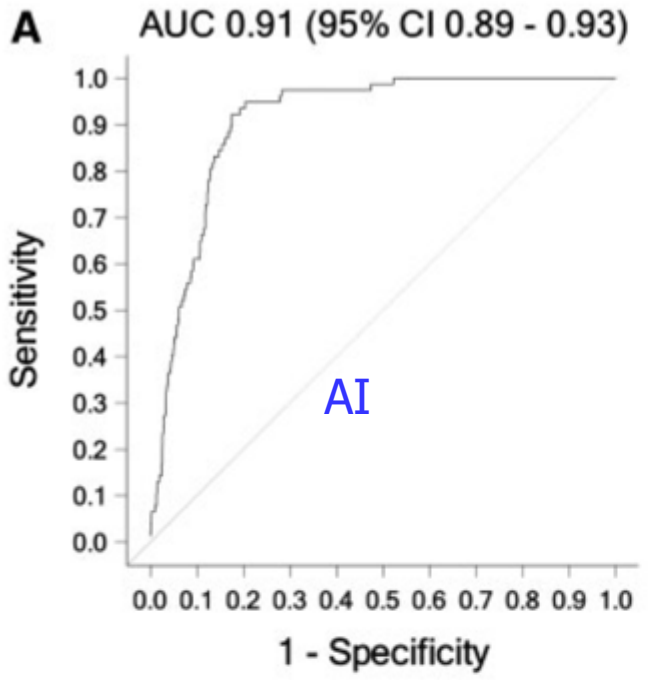
“Perfect Storm” - Factors driving AI Today

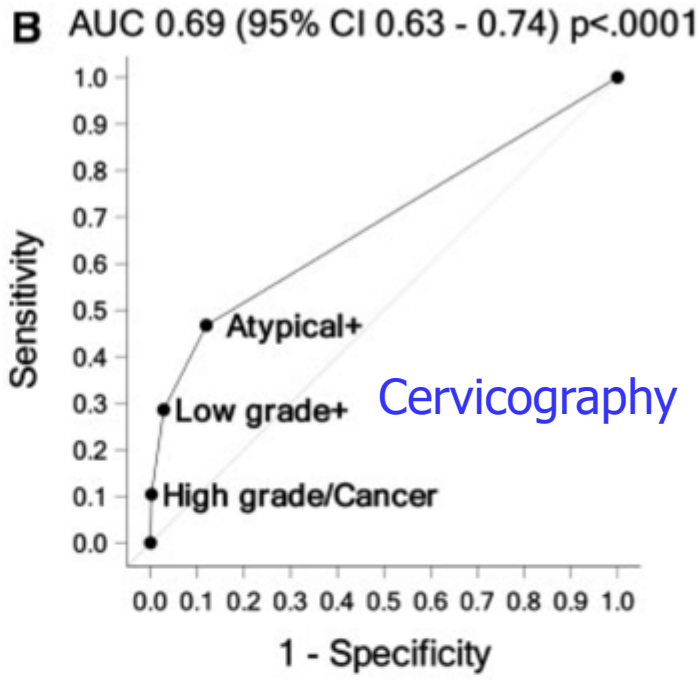


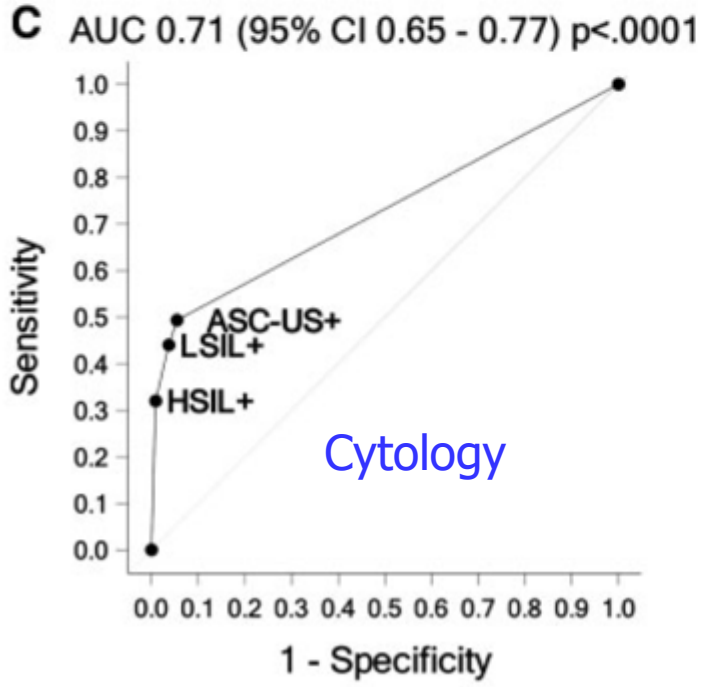
Automated visual examination

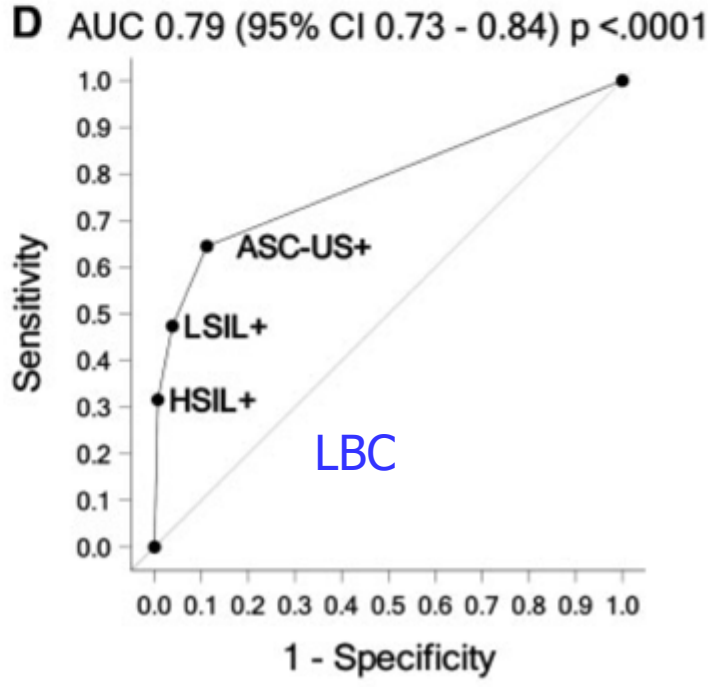
Performance based on digitized images collected from screening trial

JNCI J Natl Cancer Inst, 2019, Vol. 111, No. 9









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Key Features

aiTab
A powerful touch screen tablet allowing for adequate patient data storage and AI tasks to be completed locally

AI
Internally developed AI and NLP algorithm that allows classification of LSIL vs HSIL in the identification of pre-cancer and detection of cancer

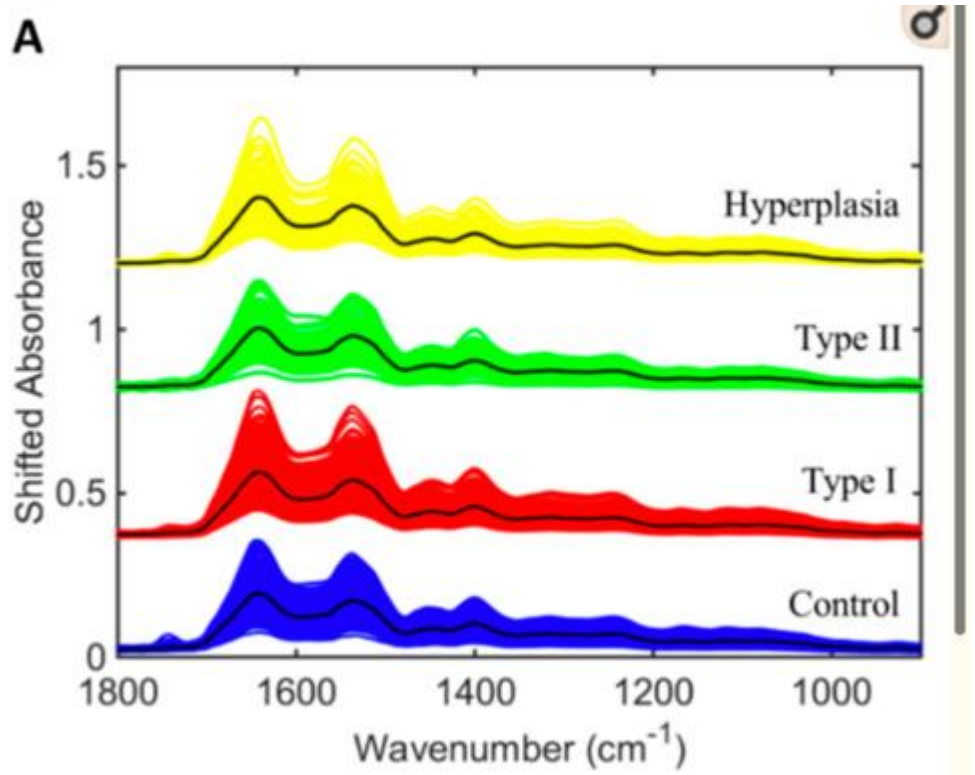
nAVE
USB based peripheral with specialized illumination, customized ISP and low light sensor

Secure Cloud
eHIE (enhanced Health Information Exchange) allowing for storing, markup


FOCUS
MODE

: Scientists Apply Raman Spectroscopy to COVID-19 Testing

lenging aspects of the COVID-19 pandemic has been the lack of testing needed to c
se biochemicals that can be expensive and difficult to produce. These test



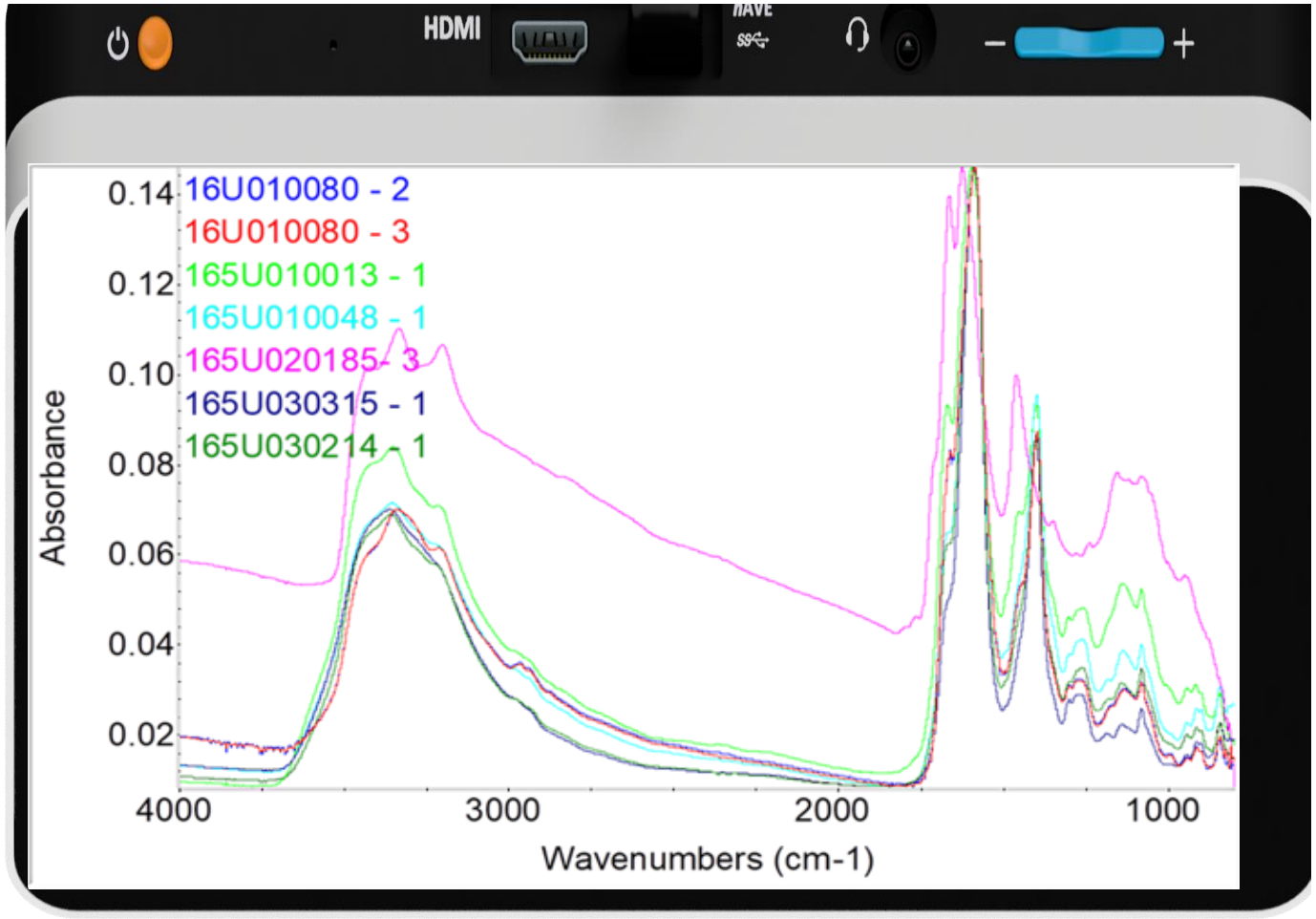
Detecting Endometrial Cancer by Blood Spectroscopy: A Diagnostic Cross-Sectional Study

by Maria Paraskevaidi [1,2,*], Camilo L. M. Morais [1], Katherine M. Ashton [3], Helen F. Stringfellow [3], Rhona J. McVey [4], Neil A. J. Ryan [5], Helena O'Flynn [5], Vanitha N. Sivalingam [5], Sarah J. Kitson [5], Michelle L. MacKintosh [6], Abigail E. Derbyshire [6], Cecilia Pow [5], Olivia Raglan [2], Kássio M. G. Lima [7], Maria Kyrgiou [2,8], Pierre L. Martin-Hirsch [9,†], Francis L. Martin [1,†] and Emma J. Crosbie [5,6,†]

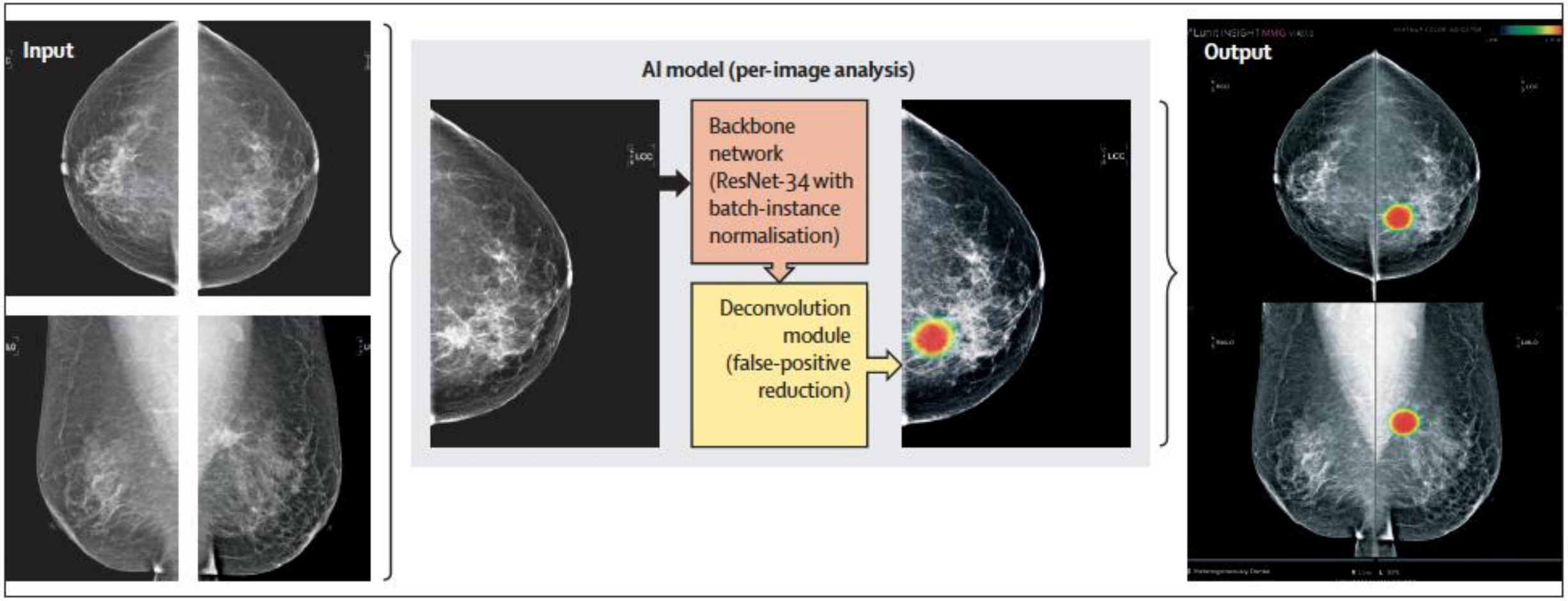
Cancers (Basel). 2020 May; 12(5): 1256.

Spectroscopy to detect urinary HPV:
- proof of concept study

- Urine samples were selected from the IARC bio-bank using the following criteria:
  - High risk HPV negative (N=50)
  - High risk HPV positive and genotype known (N=50)
  - 10 samples from known CIN 2/3

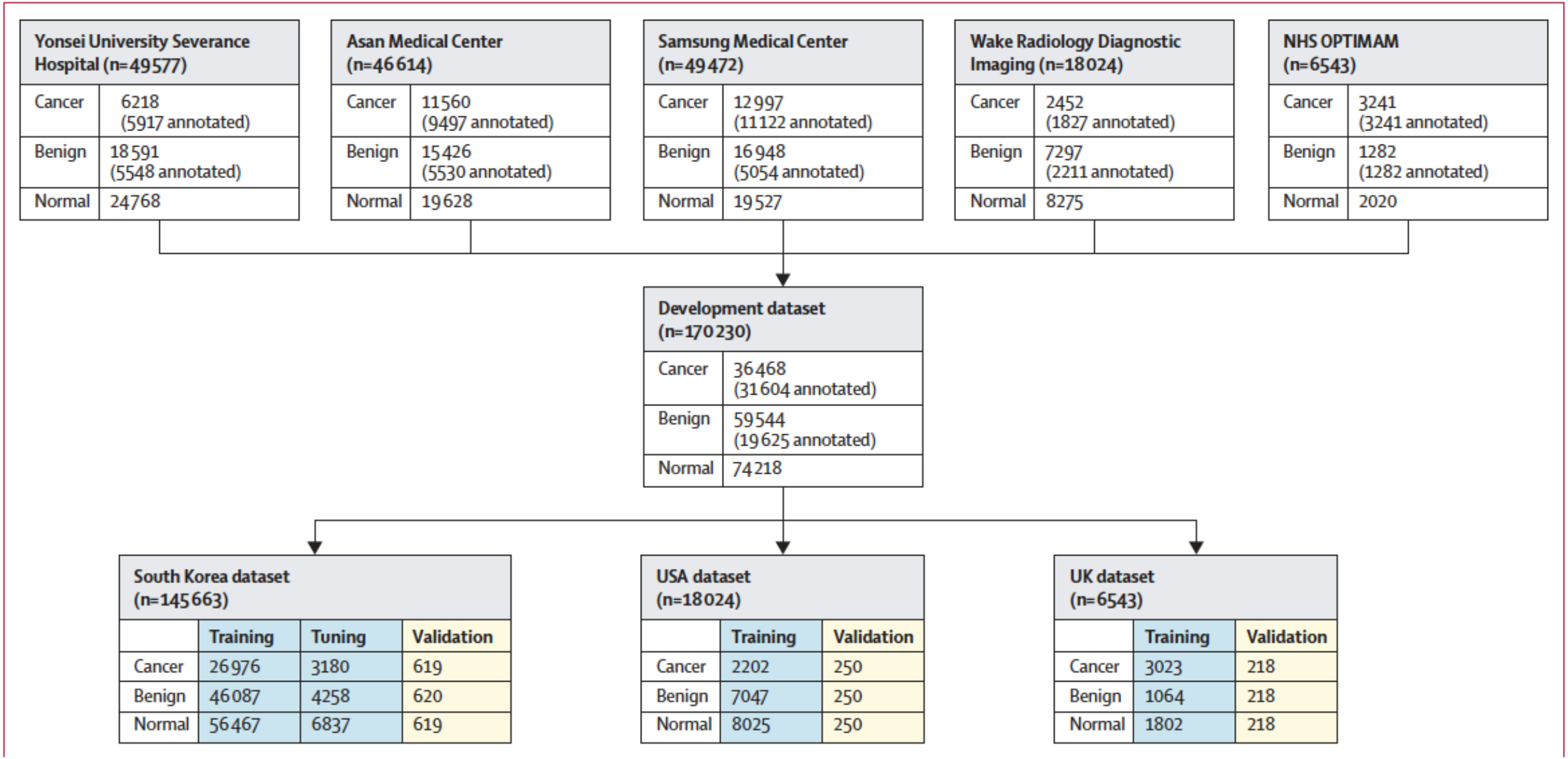


AI-based diagnostic support software



Lancet Digital Health 2020; 2: e138–48

Development dataset generation and partitioning



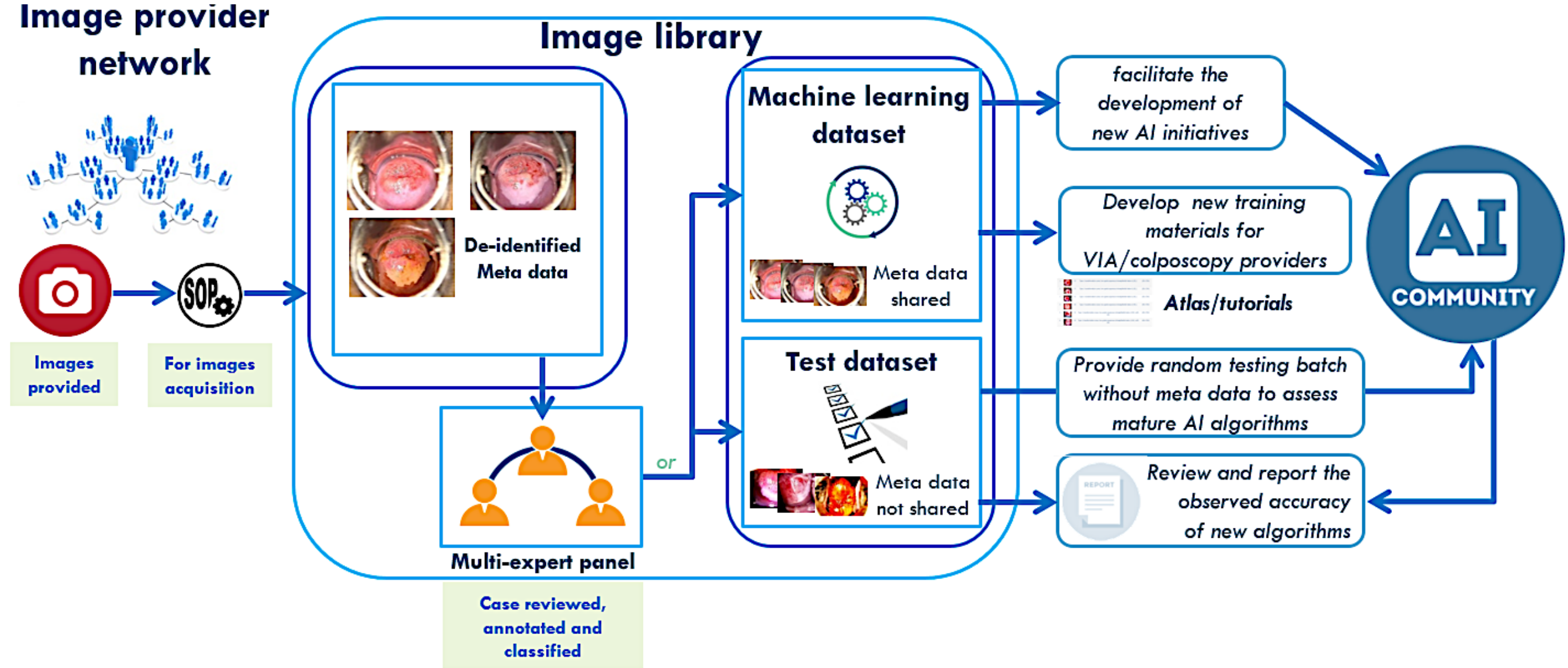


Image provider network
Image library
De-identified Meta data
Machine learning dataset
Meta data shared
Test dataset
Meta data not shared
Multi-expert panel
or
Images provided
For images acquisition
Case reviewed, annotated and classified
facilitate the development of new AI initiatives
Develop new training materials for VIA/colposcopy providers
Atlas/tutorials
Provide random testing batch without meta data to assess mature AI algorithms
Review and report the observed accuracy of new algorithms
AI COMMUNITY