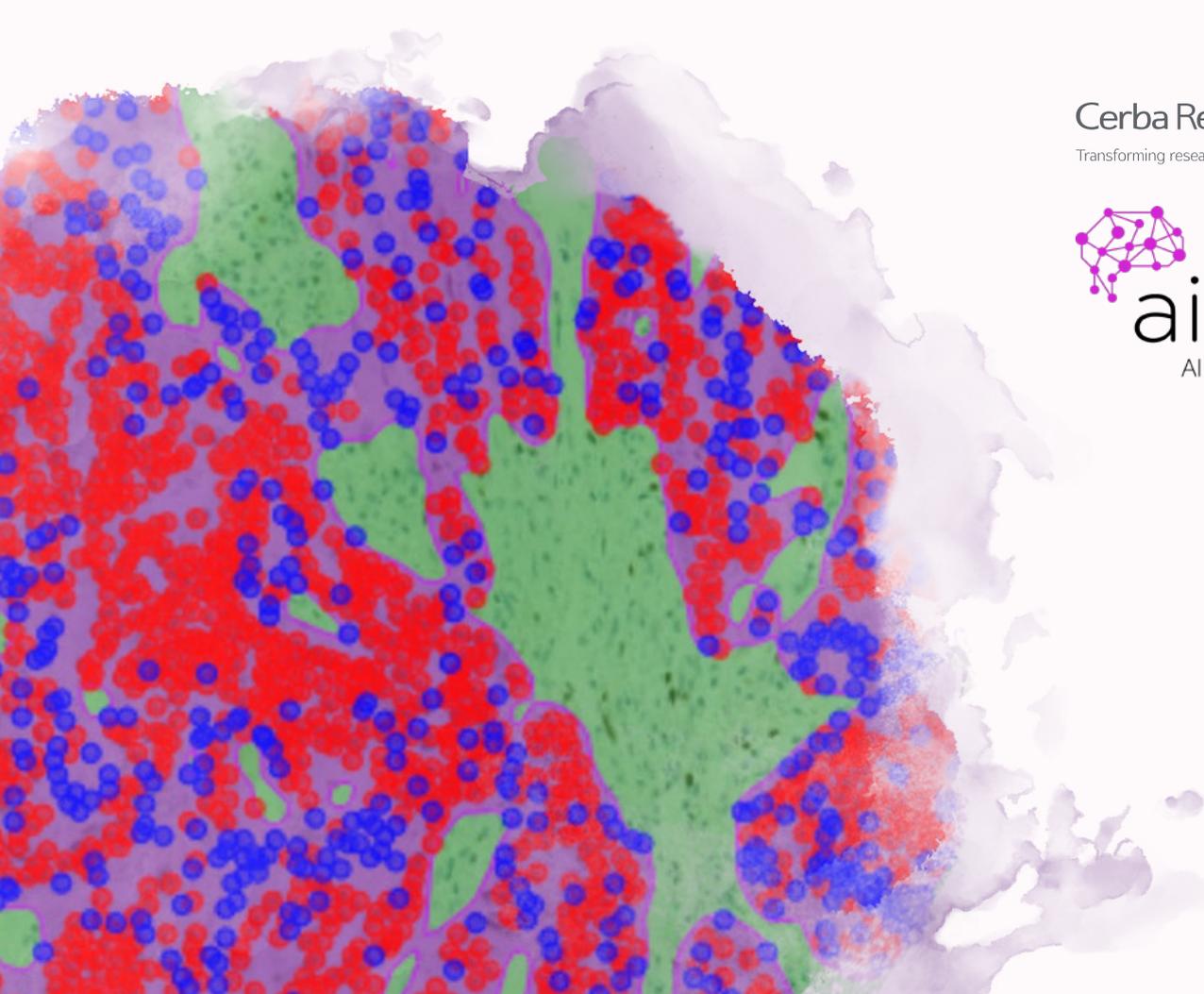


Cerba Research Case Study: Evidence For The Utility Of AI In Ki-67 Quantification In Solid Tumors

Why Ki-67?

Although it is an important biomarker in oncology (mostly in breast and prostate), Ki-67 immunohistochemistry (IHC) analysis has yet to be standardized. Working groups have provided guidelines for Ki-67 scoring in different cancer types to limit pathologist's variability.^{1,2} AI solutions to assist scoring have recently emerged in the evaluation of Ki-67 as rapid and robust solutions.

In this study, we compared the results of Ki-67 scoring performed with Aiforia® platform (deep learning AI platform) against three independent pathologists on various solid tumors.



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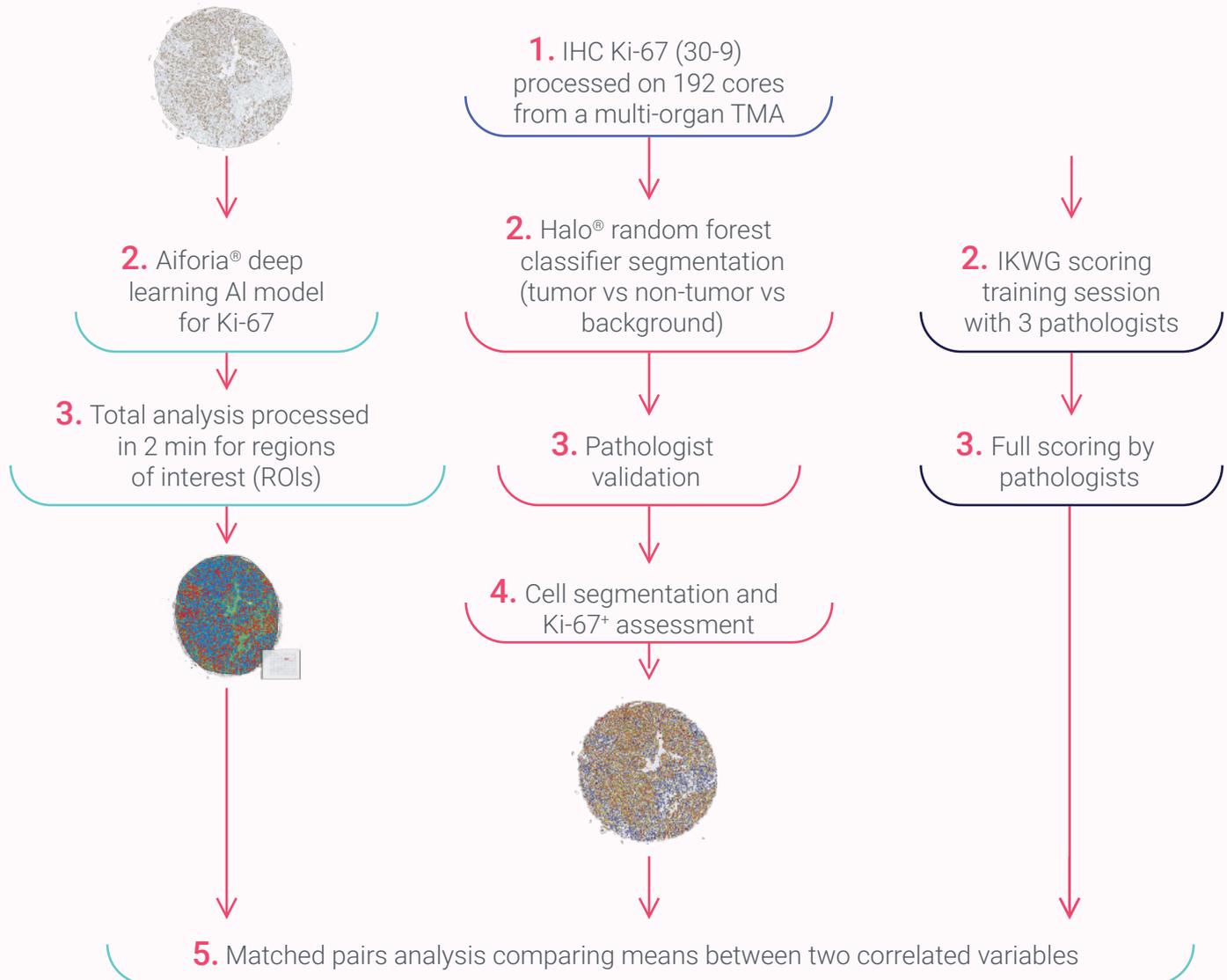


aiforia®

AI for image analysis

The Workflow

Cerba Research stained 192 tumors of various origins including breast and prostate with the CONFIRM anti-Ki-67 clone (30-9) (ROCHE monoclonal primary antibody (IVD)) on the Ventana Benchmark Ultra. Three pathologists were appropriately trained following the International Ki-67 Working Group (IKWG) recommendations and scored tissues accordingly.³



Key Takeaway

Out of 192 cores, only 158 were analyzed due to absence of tissue and/or pathologists unable to score. Ki-67⁺ cells were detected in 24.38 - 28.71% of the tumor cells on average depending on the analysis approach applied. The study shows a very high consistency of results obtained for Ki-67 scoring between the two image analysis softwares ($r^2 = 0.95$) on solid tumors analyzed (n=158). The correlation obtained between the pathologists was however weaker (mean $r^2 = 0.83$), despite appropriate training and following guidelines, but remains within an acceptable range.

AI Data Quality And Speed Of Execution

Rania Gaspo, Dir. Global Therapy Area Lead. from Cerba Research, comments on the results: "In a nutshell, this work shows that recent AI-based image analysis tools such as Aiforia[®] platform provide valuable assistance in the field of image analysis and allowed us to drastically reduce inter-pathologist variability in the Ki-67 scoring of solid tumors. We were also positively surprised with the speed of execution of Aiforia[®] platform that was able to process regions of interest for all cores in just 2 minutes, saving us a lot of time and effort".

The Study Was Presented At ESMO 2023

Read more on the ESMO poster: "Pichon X, Gaspo R, Iglesias S, Kumar D, Tliba M, Burrer R, Finan A. Evidence for the utility of artificial intelligence (AI) and image analysis in Ki-67 quantification in solid tumors. Presented at: ESMO annual meeting; October 20-24, 2023; Madrid, Spain".

References

¹ Polley MY et al. An international study to increase concordance in Ki-67 scoring. *Mod Pathol*. 2015 Jun;28(6):778-86. doi: 10.1038/modpathol2015,38.

² Nielsen TO et al. Assessment of Ki-67 in Breast Cancer: Updated Recommendations From the International Ki-67 in Breast Cancer Working Group. *J Natl Cancer Inst*. 2021 Jul 1;113(7):808-819. doi: 10.1093/jnci/djaa201.

³ Welcome to Ki-67-QC calibrator. URL [<http://www.gpec.ubc.ca:8080/tmadb-0.1/calibrator/index>].

