

Utilizing Machine Learning for Colon Cancer Staging, Classification, Diagnosis, and Prognosis Prediction

Presented by
Idahosa Clinton



<https://jcsmr.anu.edu.au/research/centres/sdcrl>



<https://builtin.com/artificial-intelligence/machine-learning-examples-applications>

Team (OncoML)



Sanzida Akhter Anee
MS, Bioinformatics,
Independent University
of Bangladesh,
Bangladesh



Dr. Clinton U Idahosa
MB;BS University of
Ibadan, Nigeria.

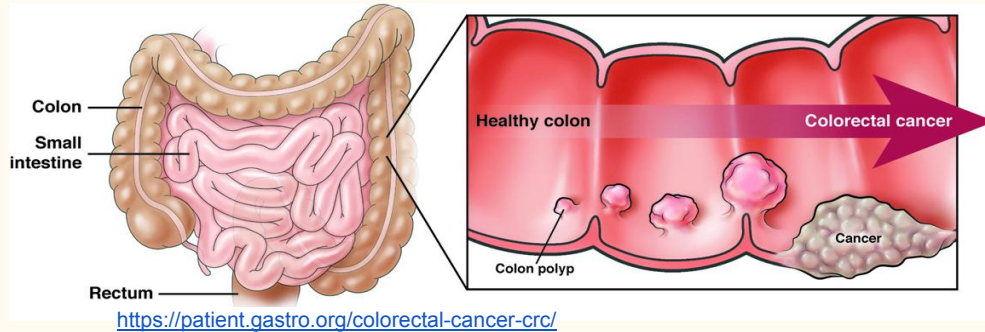


Stephie Raveloson, M.Sc.
University of Antananarivo,
Madagascar



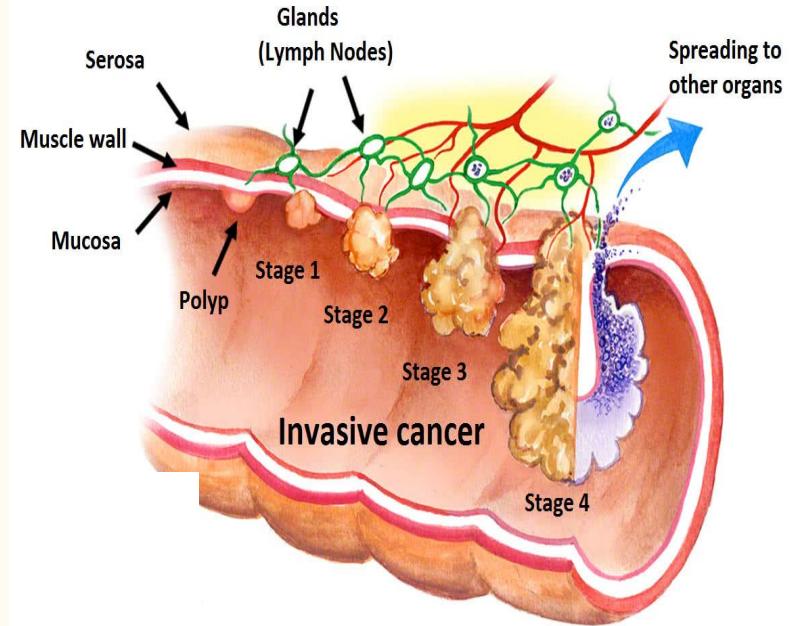
Oluwatosin Owolabi
B.Sc. Biochemistry,
University of Ibadan,
Nigeria.

Introduction



Problem

- Lymph node involvement
- Tumor heterogeneity
- Metastasis
- Post-surgical recurrence risk
- Over /under staging



A. Data processing



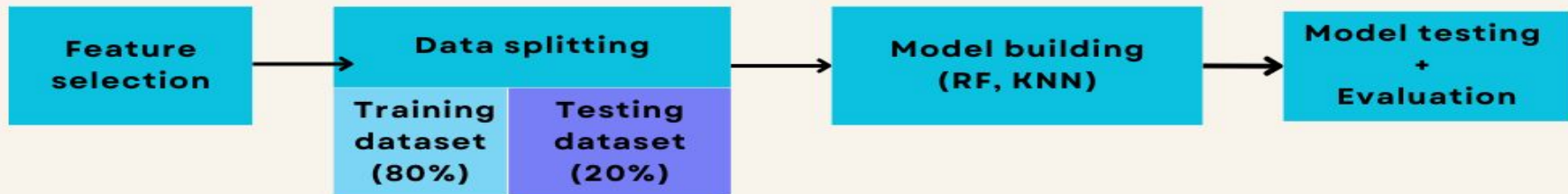
B. Marker screening



C. Stage feature screening



D. Machine learning model



Expected results

Improved accuracy in staging and diagnosis

- Random forest best perform colon and cancer staging diagnosis
- Accuracy of colon diagnosis >98% [3]

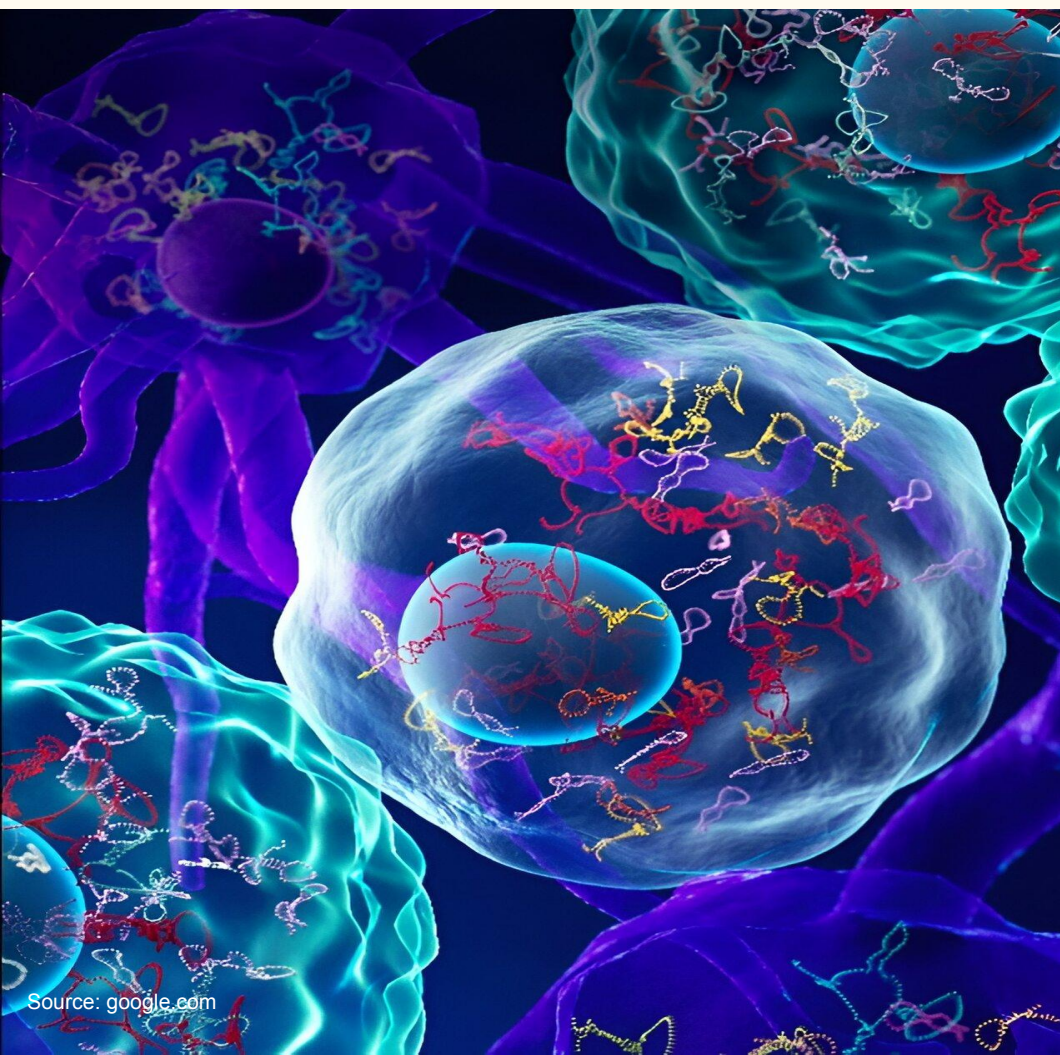
Predicting recurrence risk and survival

- Predict recurrence risk (gene expression profiles) stage II and III [4]

Identify biomarker

- Colon cancer prognosis associated genes

- ML screens new biomarker genes which enhances cancer treatment and targeted therapies.
- Enhanced ML model provides accurate diagnostic cancer staging.



Source: google.com

Thank You

References

1. Ness, R. M., Llor, X., Abbass, M. A., Bishu, S., Chen, C. T., Cooper, G., ... & Sambandam, V. (2024). NCCN Guidelines® Insights: Colorectal Cancer Screening, Version 1.2024: Featured Updates to the NCCN Guidelines. *Journal of the National Comprehensive Cancer Network*, 22(7), 438-446.
2. Colorectal Cancer Early Detection, Diagnosis, and Staging (2024). American Cancer Society.
<https://www.cancer.org/cancer/types/colon-rectal-cancer.html>
3. Su, Y., Tian, X., Gao, R., Guo, W., Chen, C., Chen, C., ... & Lv, X. (2022). Colon cancer diagnosis and staging classification based on machine learning and bioinformatics analysis. *Computers in biology and medicine*, 145, 105409.
4. Jiang, D., Liao, J., Duan, H., Wu, Q., Owen, G., Shu, C., ... & Wang, Z. (2020). A machine learning-based prognostic predictor for stage III colon cancer. *Scientific reports*, 10(1), 10333.
5. Guinney, J., Dienstmann, R., Wang, X., De Reynies, A., Schlicker, A., Soneson, C., ... & Tejpar, S. (2015). The consensus molecular subtypes of colorectal cancer. *Nature medicine*, 21(11), 1350-1356.