Cancer Interception and Screening with Liquid Biopsy

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MaTOS Genitourinary
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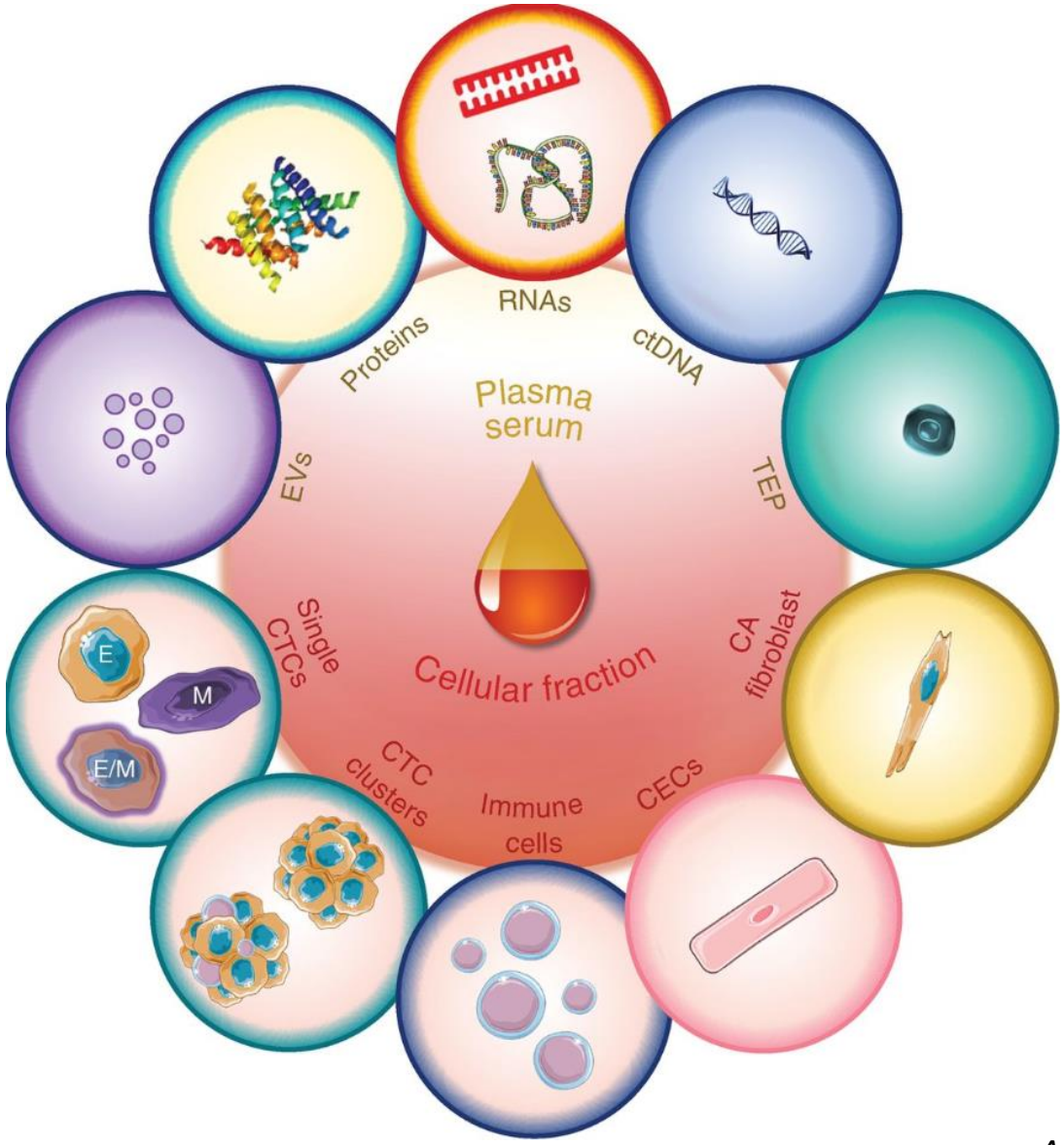
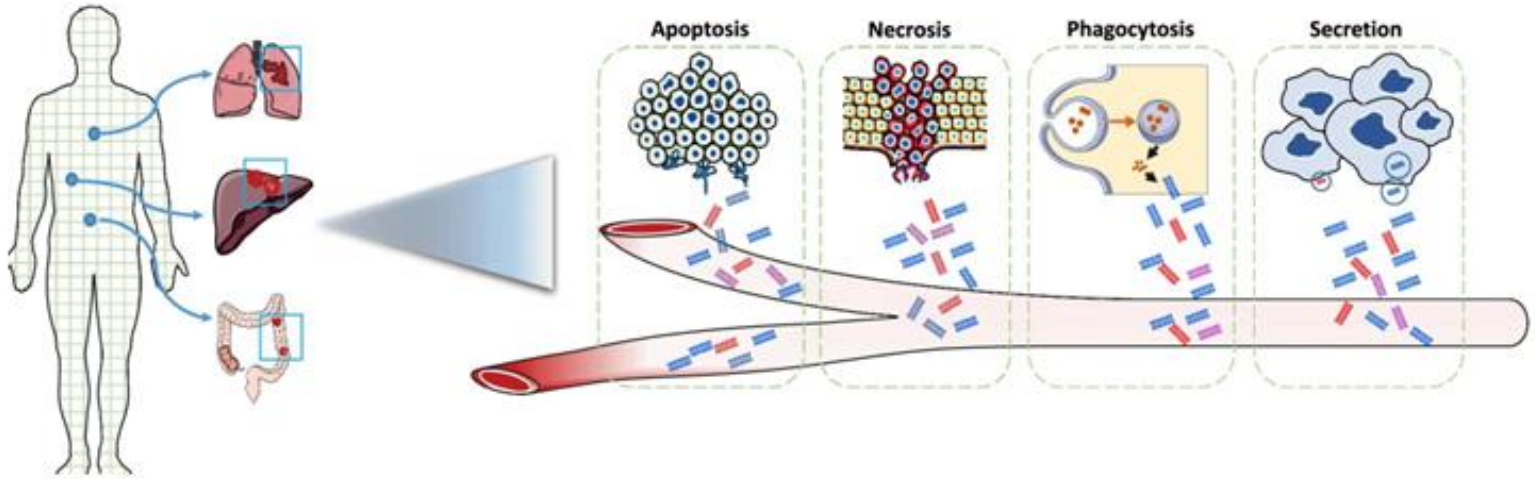
The liquid biopsy



Alix-Panabieres, Pantel Cancer Discovery 2021

What is circulating tumor DNA?

- Short fragments (post-apoptotic) of tumor-derived DNA in the blood (or urine)
- Mixed with cell-free DNA from non-cancer cells
- “Real time” analysis: half-life of ctDNA in plasma ~2-3 hours
- Tumor informed vs tumor-agnostic assays



Underhill H Current Opin 2021

Current Examples of “Liquid Biopsies” in Cancer Screening

- Proteins: PSA, CA-125, Nodify xl2 (lung cancer)
- Extracellular vesicles (EVs): ExoDx Prostate IntelliScore (EPI)
- mRNA: selectMdx (prostate cancer)
- cfDNA: Shield™ (colorectal cancer)
- Autoantibodies: Nodify cdt (lung cancer), Oncimmune EarlyCDT (lung cancer)

Test	Target Detection	Molecular Origin	Specificity (%)	Sensitivity (%)	Turnaround Time ($)
Shield™ [1]	Colorectal cancer	cfDNA	92	91	2 weeks ($895)
Nodify cdt [2]	Lung cancer	Autoantibodies	98	28	1 day ($649)
EPI [3]	Prostate cancer	mRNA	30	92	1 week ($790)
SelectMdx [4] (Belgium)	Prostate cancer	mRNA	53	89	5 days ($365)
4Kscore [5]	Prostate cancer	Proteins (4 prostate specific kallikreins)	27	97	3 days ($760)

[1]Chung DC, et al. NEJM 2024, [2]Healey GF et al JCT 2017, [3]Margolis E, et al. Prostate Cancer Prostatic Di 2021, [4]Haese A, et al. J Urol 2019, [5]Parekh DJ, et al Eur Urol 2014

ExoDx Prostate IntelliScore (EPI) as a predictor of outcome in high grade PC

Fig. 2: Patient Biopsy Rates and GG ≥ 2 HGPC Probability by EPI Score.

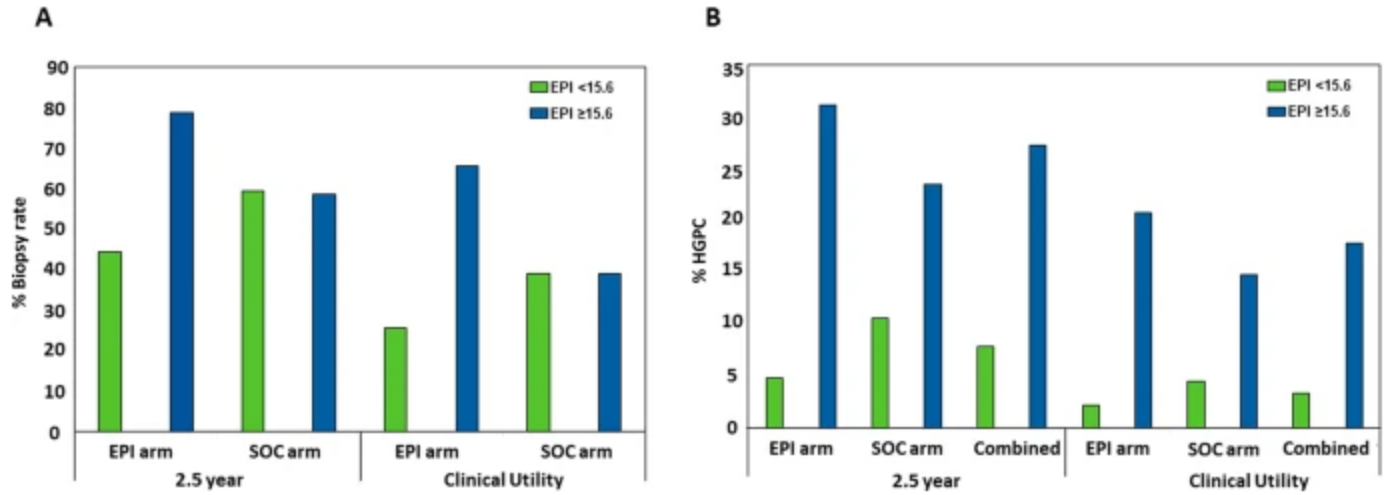
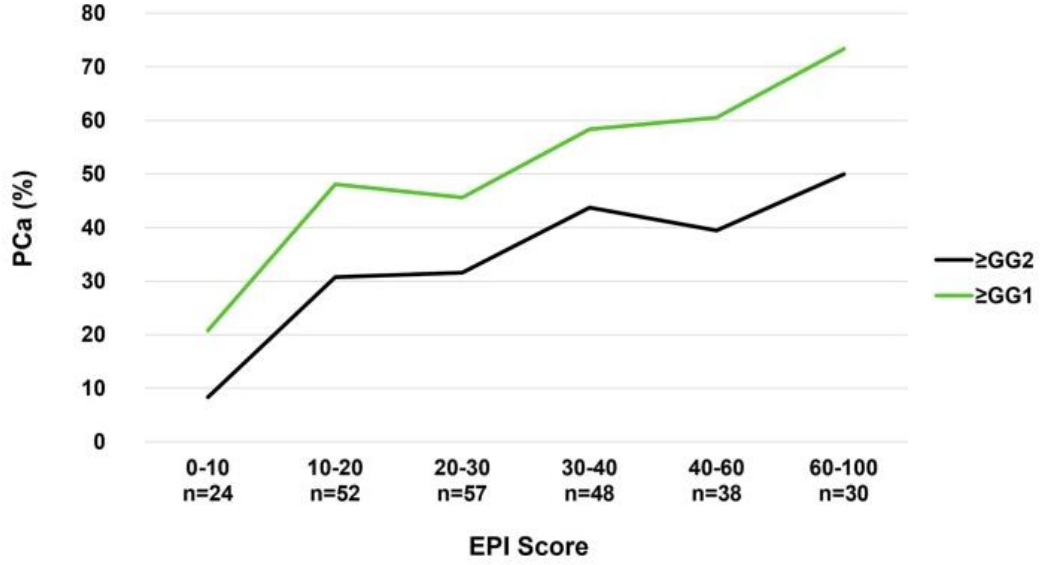


Fig. 3: Overall Probability of Identifying ≥ GG2 PC by EPI Score in the SOC Arm.



Men with low EPI score (<15.6) significantly defer time to first biopsy and remain at very low pathologic risk at 2.5 years

Tutrone R, et al. Nature 2023

Multi-cancer detection platforms

Test	Targets Detection	Molecular origin	Specificity (%)	Sensitivity (%)	Cost
Dxcover[1] (UK)	Brain, beast, CRC, kidney, lung, ovarian, pancreatic, prostate	Spectroscopic pan-omics	58	97-99%	$300
Galleri[2]	Bladder, CRC, Head and neck, lung, lymphoma, ovarian, pancreas	Methylomics	99.5	17-90%	$949
CancerSEEK[3]	Ovarian, liver, stomach, pancreas, esophagus, CRC, lung, breast	cfDNA	99	43-78	

[1]Cameron JM et al. Sub Cancer Res 2023, [2]Klein EA, et al Ann Oncol 2021, [3]Cohen JD, et al Science 2018

Conclusion

- Liquid biopsies that can detect cancer early will improve patient prognosis and survival
- Currently liquid biopsies are not considered a standard method for the diagnosis and conformation. Predominantly used as a complementary test to tissue biopsy
- Most current liquid biopsy techniques lack the detection capability required for early-stage cancers
- Variable sensitivities and specificities (low in early stage tumors)

Conclusions, continued

- Multi-cancer detection platforms need to be both specific and sensitive in detecting early-stage tumors
- A combination of both tumor and non-tumor derived signals, in a pan-omics approach could lead to the successful early detection of cancer

Thank You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