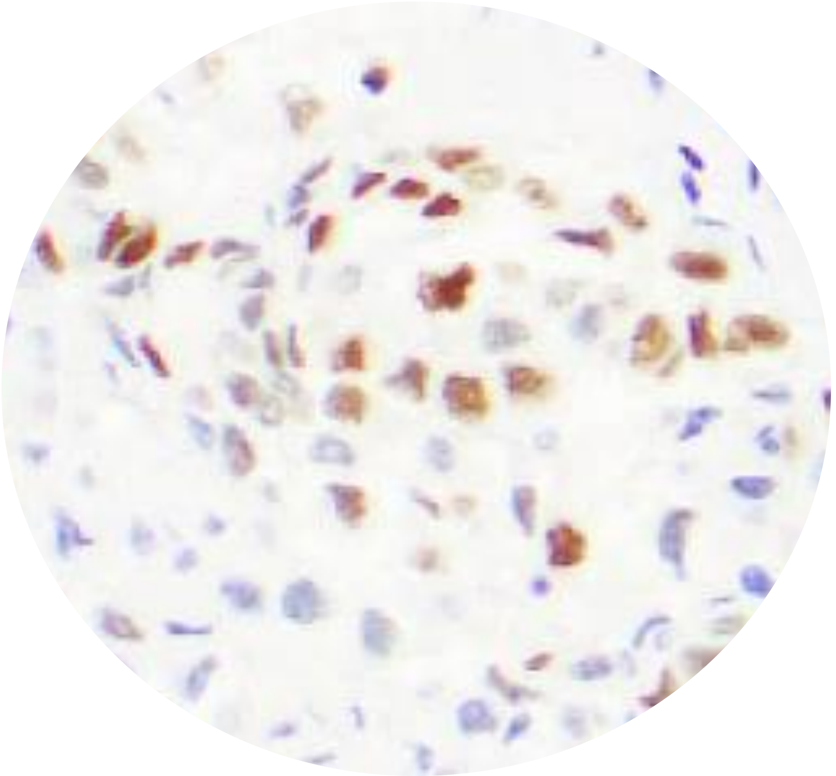
Boston Cell Standards:

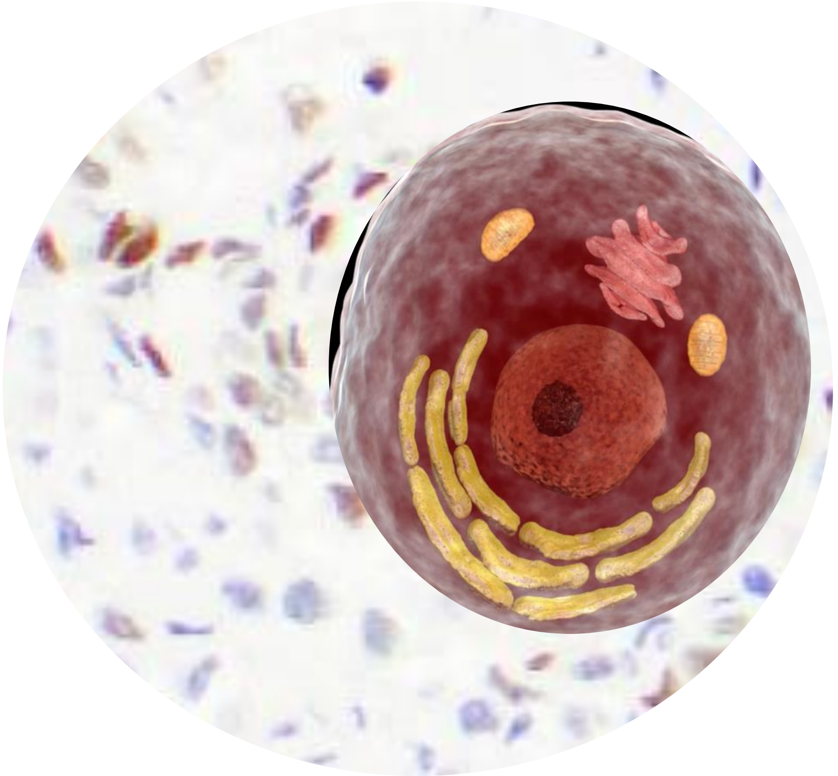
The Development of our Technology



Since IHC is performed on tissues and cells, quality control also used tissues and cells.

However, this precluded applying the same mathematical principles of quality control as are followed in clinical pathology.

Notably, calibration and statistical process control (SPC).

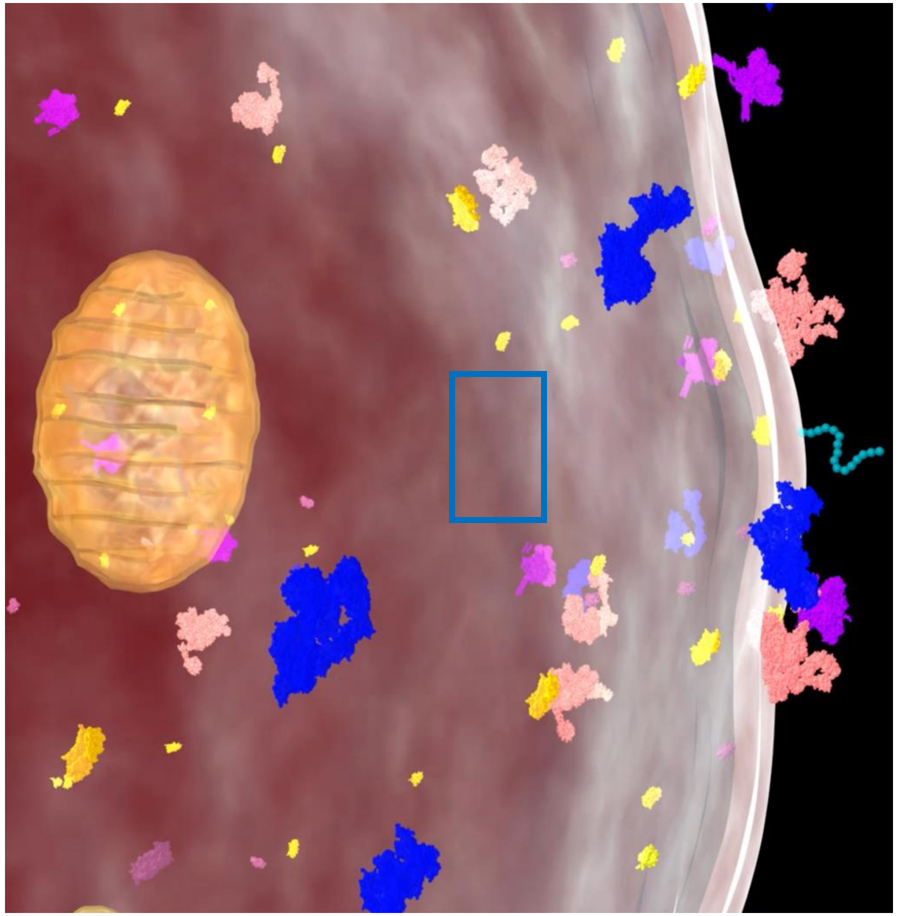


Solving this dilemma required a method to measure biomarker concentrations on cells.

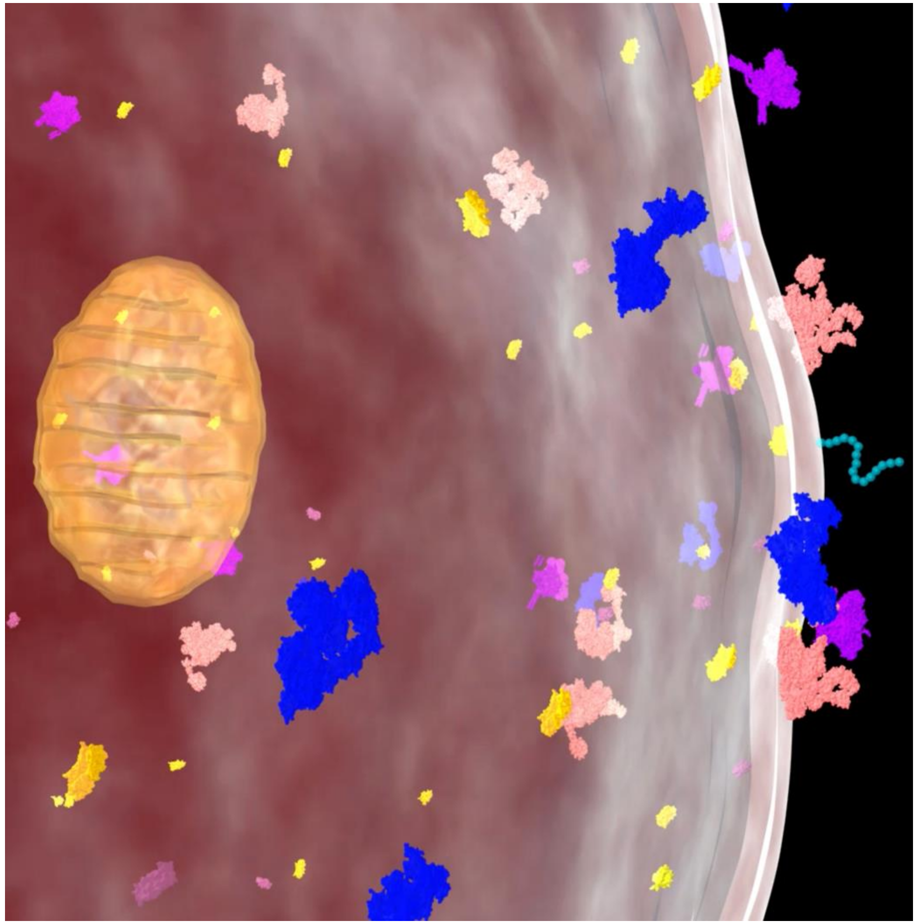
Consider one of those cells in this magnified view

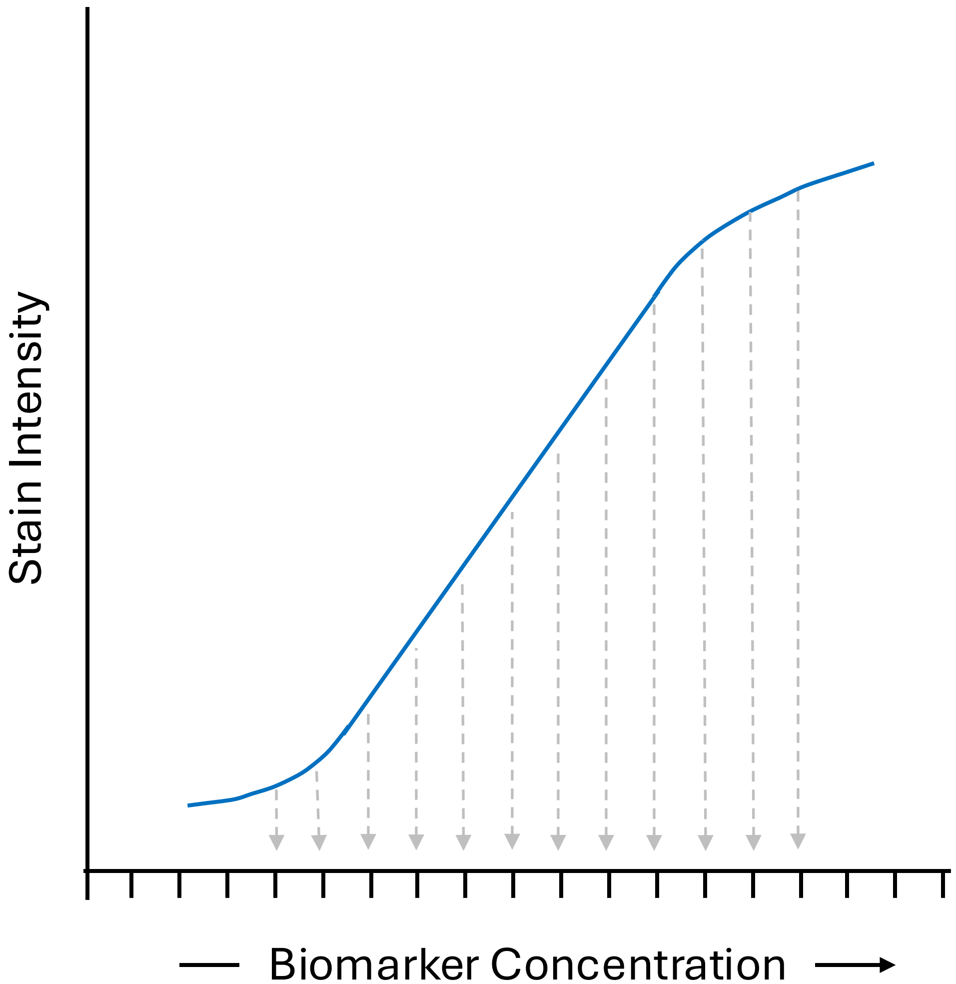
Calibration and SPC require a new tool.

Something like cells but with reproducible and known concentrations of whatever biomarker being measured.



Magnifying a portion of the cell even further . . .

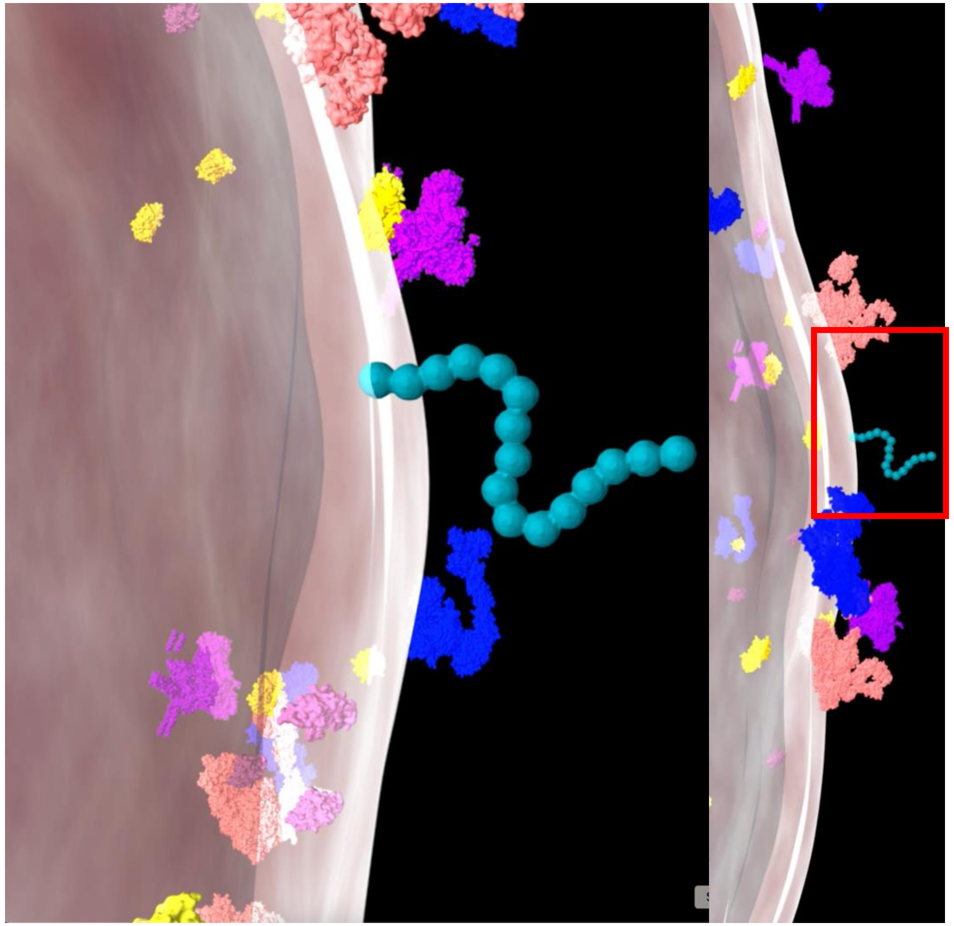




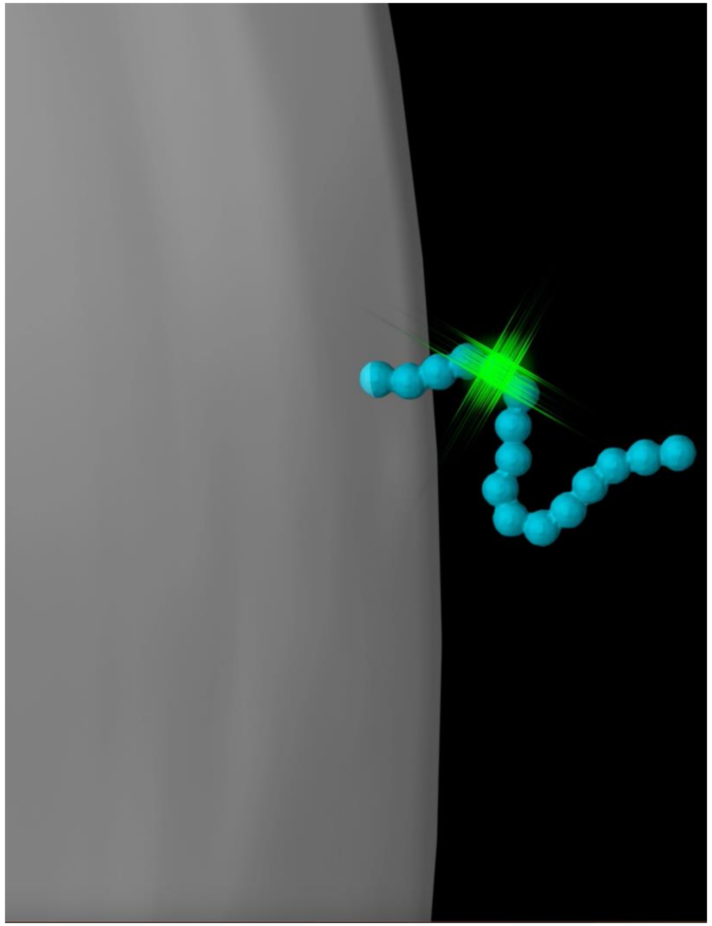
Calibration and SPC require a new tool.

Something like cells but with reproducible and known concentrations of whatever biomarker being measured.

. . . and they're needed at a series of biomarker concentrations.

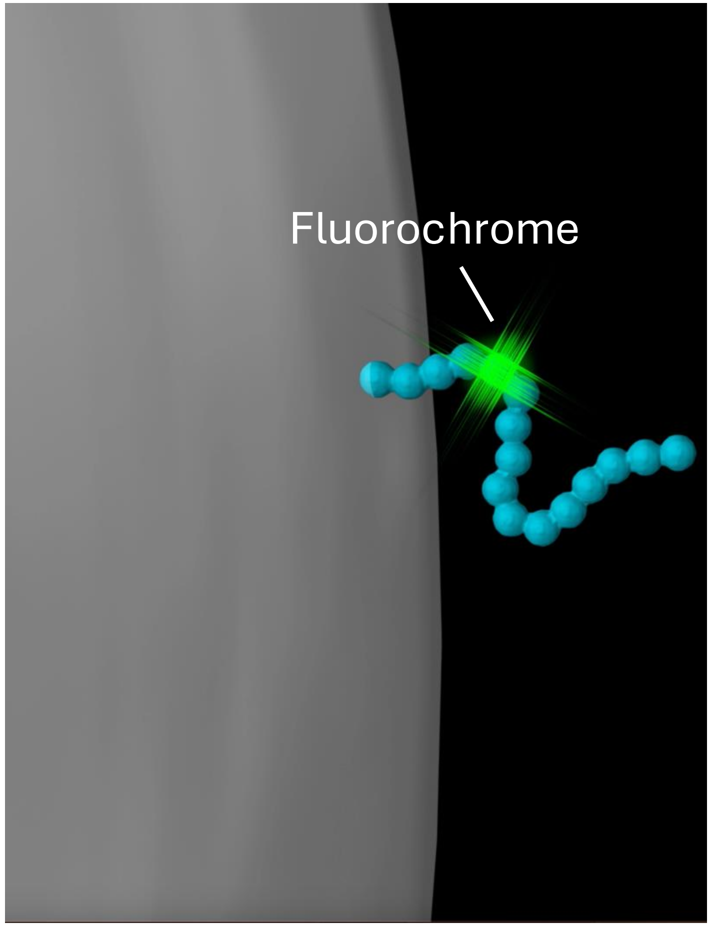


‘Synthetic cells’ solved the technical challenges.

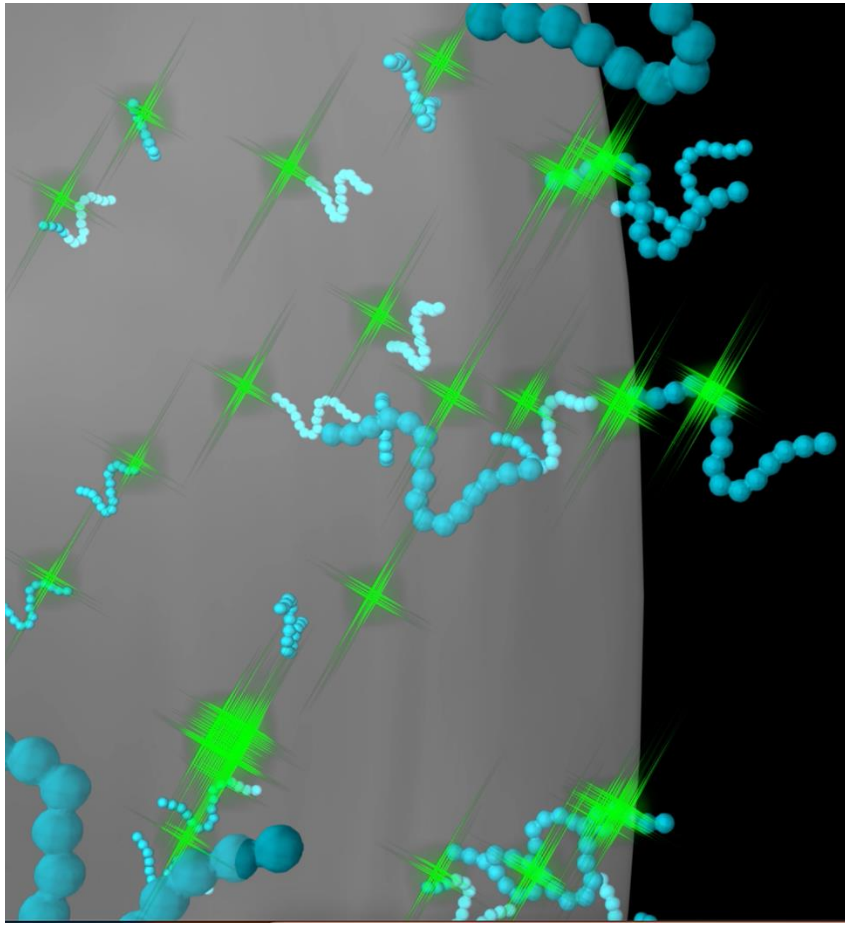


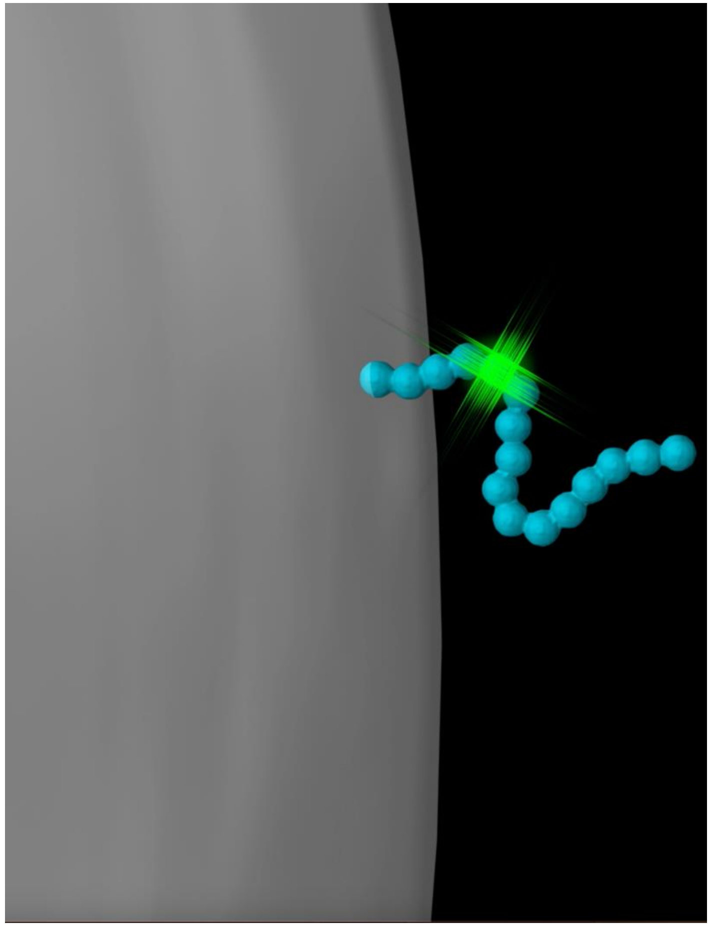
Cell-sized clear microbeads with a covalently attached cellular biomarker.

BCS developed a new method to quantify IHC biomarker concentration traceable to a NIST primary standard.



A new traceability method of measurement using a fluorescent linker enables a single NIST Standard Reference Material to serve as a universal IHC standard.

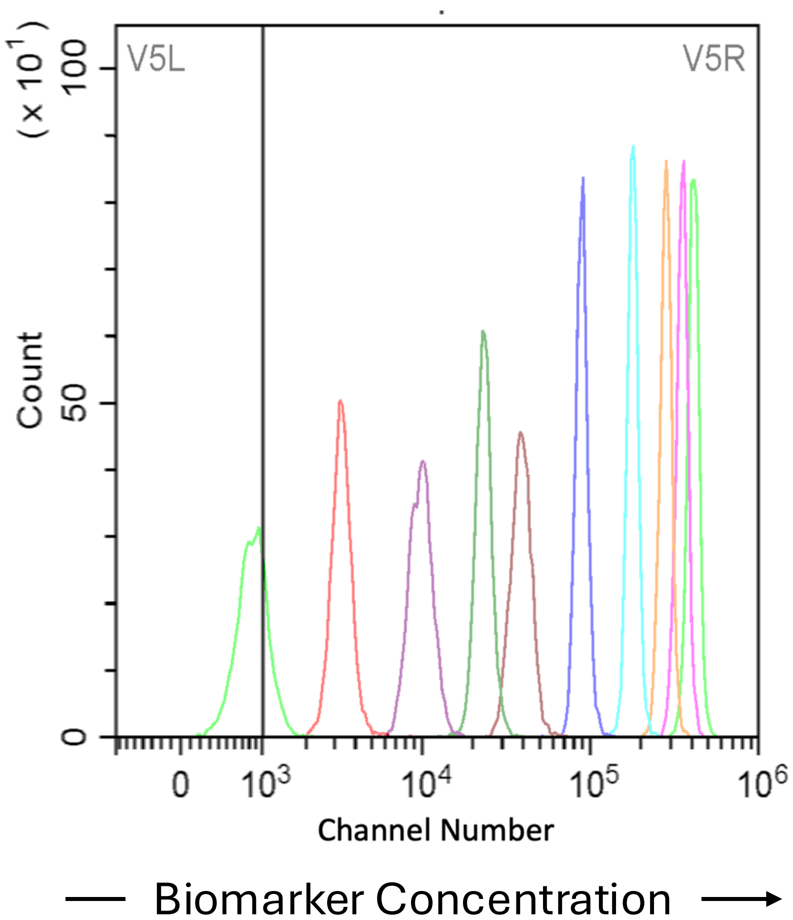




As well as high biomarker concentrations.

That means we can create ‘cells’ with low biomarker concentrations.

And anything in between.



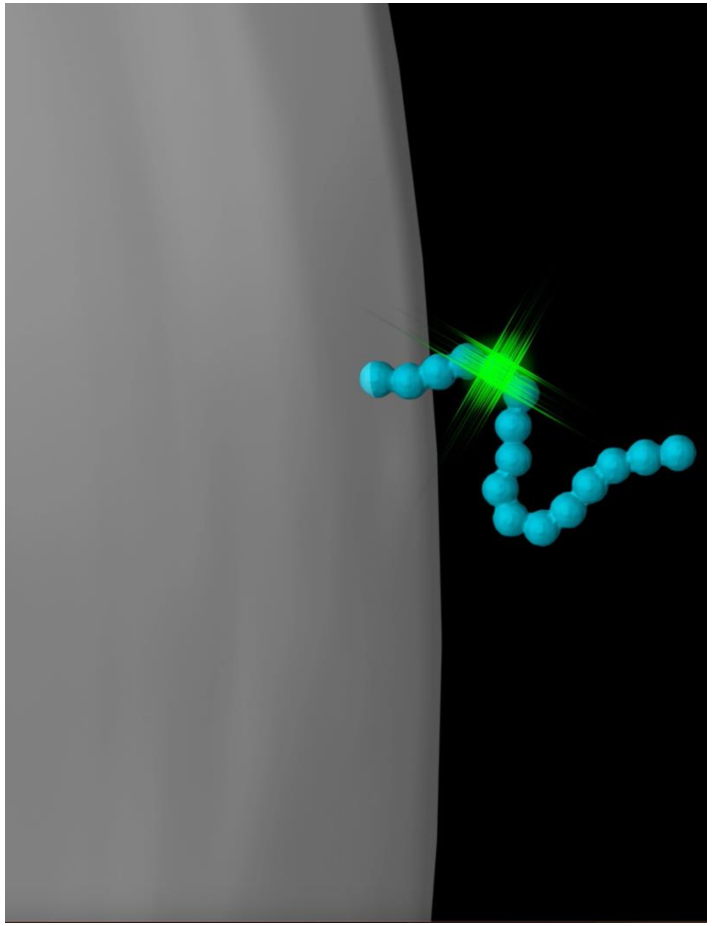
With BCS' technology platform, we can create a series of 'cells' at a broad range of biomarker concentrations.

. . . and each 'cell' sample is homogeneous.

We also discovered that peptides can be practical IHC biomarkers because they're always linear epitopes.

. . . even though most antibodies recognize conformationally-dependent epitopes.

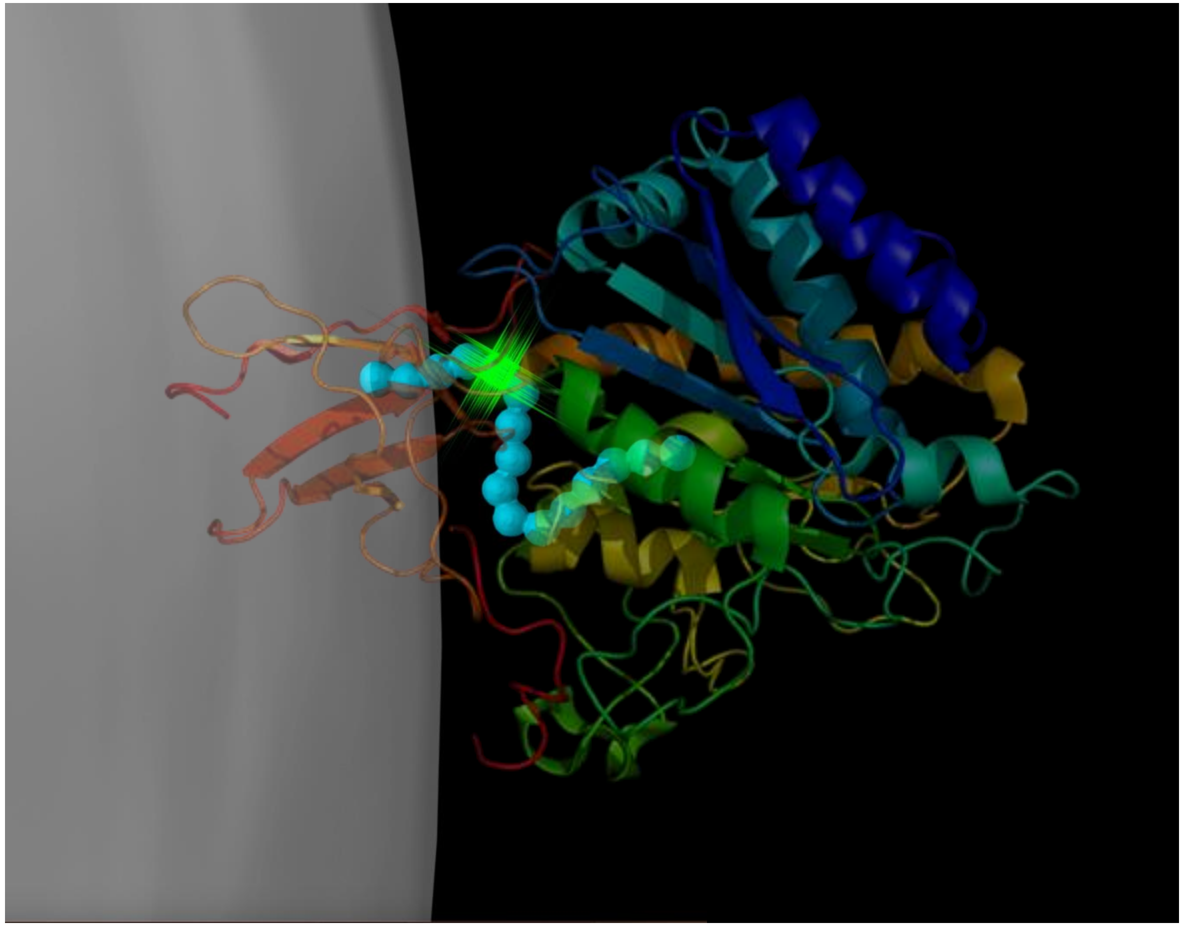
Peptides are useful biomarkers when the proteins themselves are unstable or unavailable.

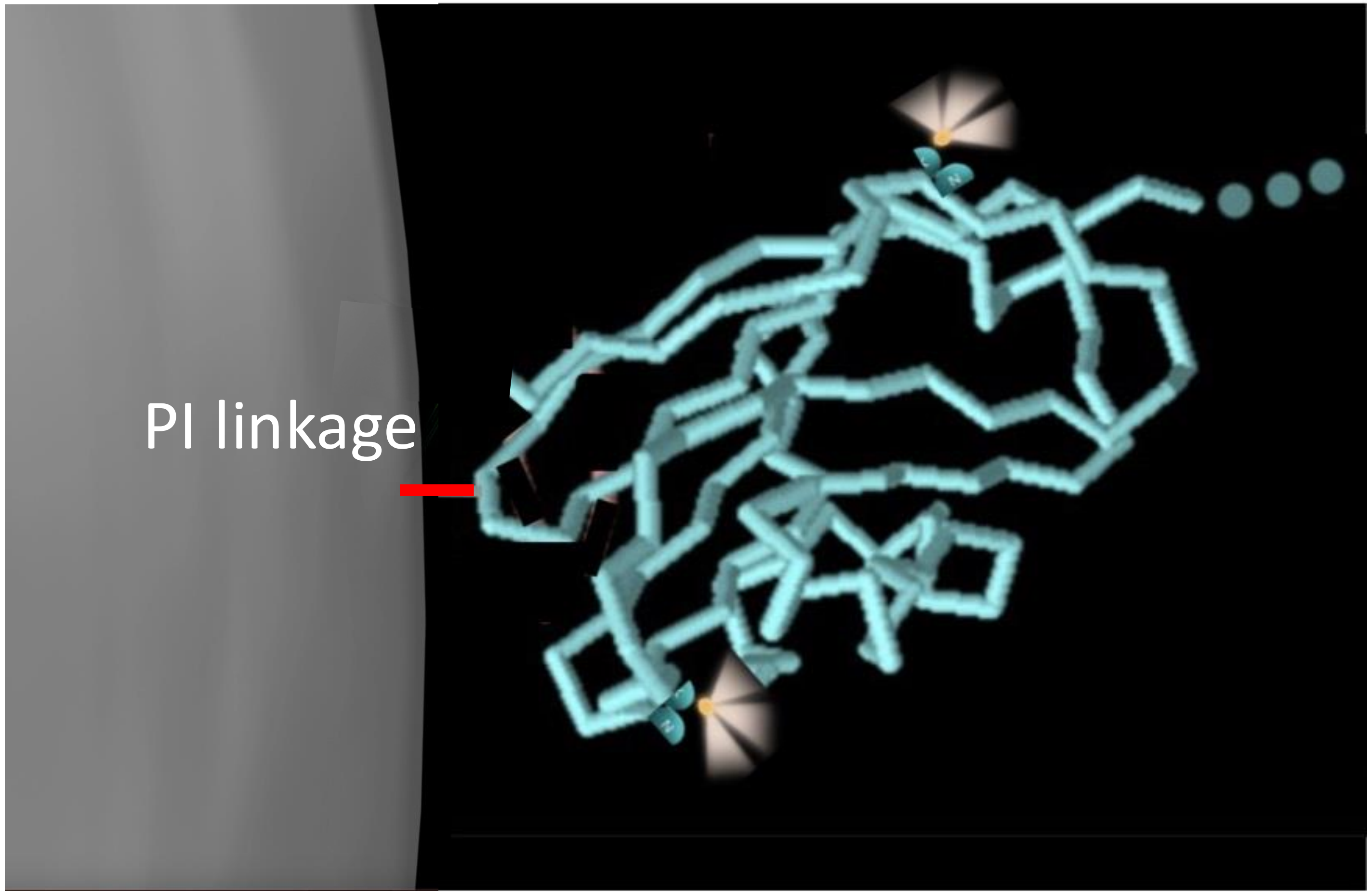


BCS developed a method of ‘synthetic cell’ formalin fixation that mimics the process in tissues.

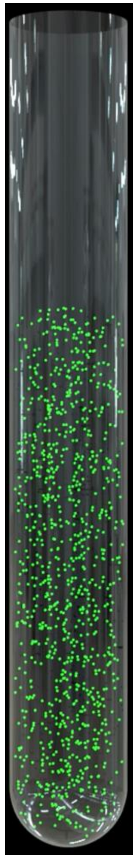
It involves steric hindrance by adjacent proteins.

Antigen retrieval reverses the steric interference, similar to tissues.

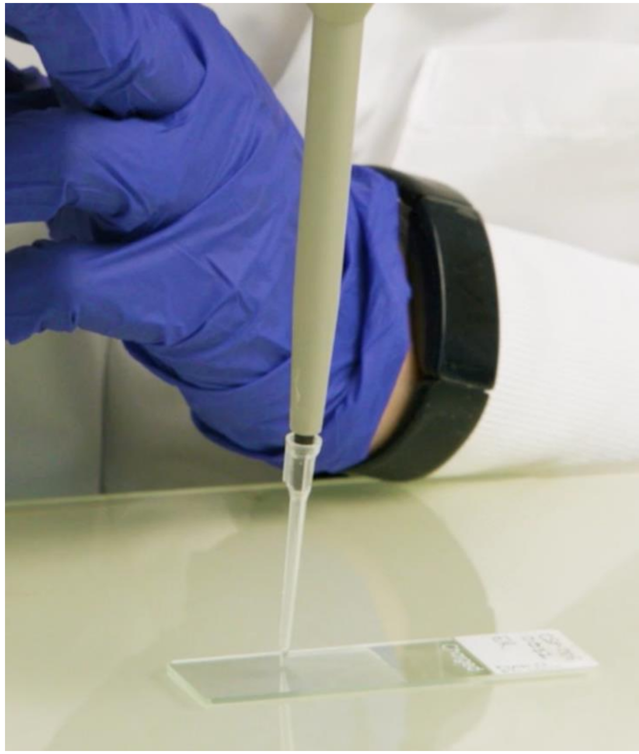




We also developed a novel surface activation chemistry when proteins rather than peptides are the preferred biomarker.



‘Synthetic cells’ in a liquid suspension bypasses the need for microtome sectioning, a labor-intensive process.



Applying a droplet onto a slide (as a control) takes only seconds.

BCS developed a proprietary liquid matrix that hardens to keep the microbeads in place.

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