

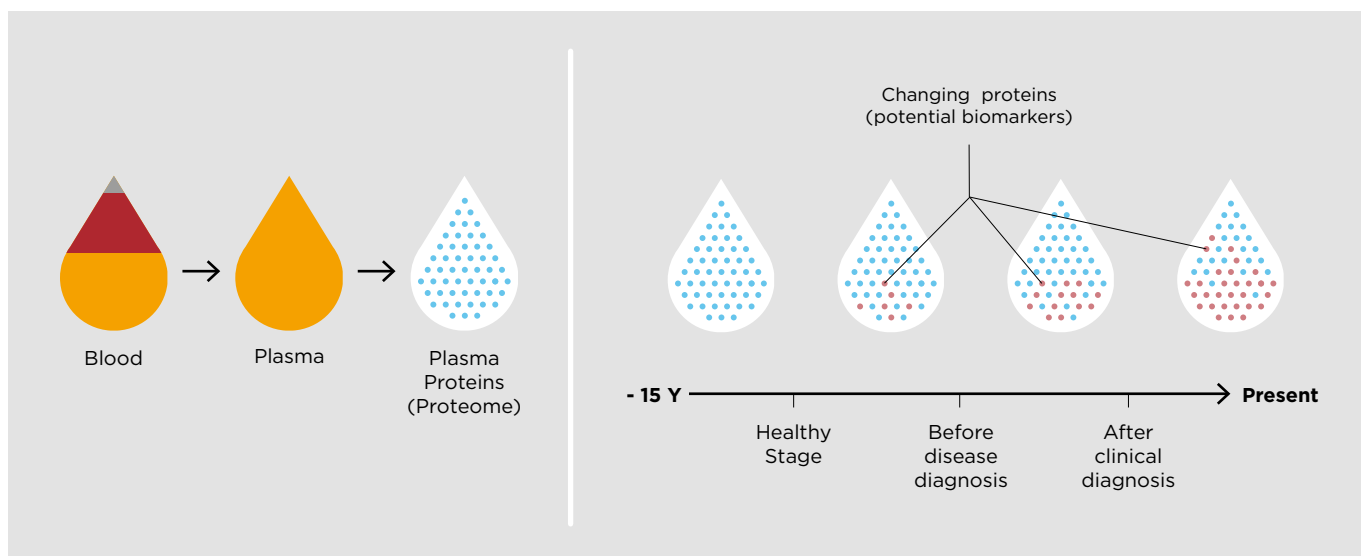
Grifols Seeking Early Biological Signals of Disease

With a grant from The Michael J. Fox Foundation for Parkinson's Research, 'Chronos-PD' targets Parkinson's in first high-tech analysis of unique plasma repository.

Plasma hides many secrets waiting to be discovered. The composition and concentration of people's plasma shifts over time with age and illness, changes that offer clues about their present and future health.

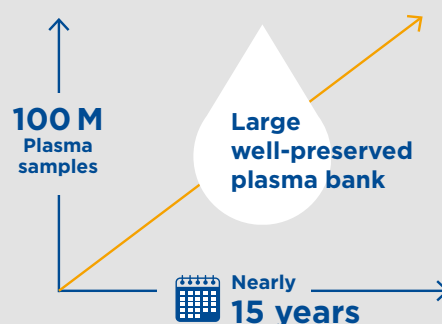
Grifols is analyzing these variations to find signs known as biomarkers that indicate an increased chance of developing specific diseases years before symptoms appear.

Catching them early enough could lead to new **diagnostic tools** and disease-modifying **treatments** with the potential to transform healthcare across many therapeutic areas.



Leveraging one of the largest banks of plasma samples

Grifols has been safeguarding plasma samples for nearly 15 years, with 100 million specimens connected to real-world health data. They include thousands of disease states across many indications. Grifols, studying the changes in the plasma proteins, is looking for evidence that suggests the eventual onset of disease before diagnosis.



Chronos-PD: Starting with Parkinson's disease

Through a \$21 million award from The Michael J. Fox Foundation for Parkinson's Research, Grifols is analyzing thousands of longitudinal plasma samples covering a period of up to 10 years, offering an uninterrupted look at PD evolution at a molecular level over a long period of time.

Chronos-PD in action



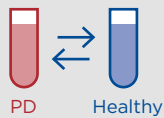
1. Plasma samples

Grifols has collected plasma that at some point in the future would show evidence of Parkinson's disease. The plasma was stored in sample tubes in sub-zero temperatures.



2. Matching of samples with health data

In collaboration with a real-world data provider, researchers at Grifols' subsidiary Alkahest, which specializes in the use of AI and integrative analysis of multiomics, match each plasma sample to individual health data. This step is done using "tokens," which through a numeric code ensures privacy and anonymity.



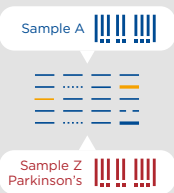
3. Selection of desired samples

Samples can now be selected to compare the plasma proteomes (the universe of all known circulating plasma proteins) of healthy samples against those that at some point developed PD.



4. Unique sample processing – proteomics data generated

Chronos-PD uses a combination of commercial technology platforms to process the samples and reveal the composition and quantities of proteins in each sample. This combination of various proteomic platforms during the process enables a high-throughput approach (i.e. analysis of thousands of samples and proteins at once), while ensuring the data is precise and accurate.



5. Proteome comparisons

Grifols employs proprietary artificial intelligence and machine learning platforms to compare patterns of plasma proteins between samples. The goal is to observe how the concentration of proteins varies between healthy samples and those that at some point developed PD, using samples from before to up to the moment of diagnosis.



6. Biomarker discovery

From the differences found in protein patterns, potential biomarkers of PD can be identified.



7. Application of biomarkers

Biomarkers can help **diagnose diseases** and **develop treatments**, as well as potentially contribute to **predicting which patients might have an increased chance of developing PD in the future**.

The platform's expansive potential

Grifols' vision is that the platform continues to grow in terms of knowledge, partnerships and its ability to help society advance in fighting some of the world's most pressing public health challenges.