# Optimising remote sampling of NfL and GFAP using blood cards in the Genetic Frontotemporal Dementia Initiative (GENFI) cohort

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## 1. Background

Remote collection of blood samples provides a more accessible and cost-effective alternative to regular clinic visits and allows for more frequent measures to be taken.

- The aim of this current study was to assess whether neurofilament light chain (NfL) and glial fibrillary acidic protein (GFAP), can be measured using dried blood cards and to optimise the protocol for this.

## 2. Methods

- Blood samples were collected via venepuncture from 40 pre-symptomatic GENFI participants (see Table 1 for gene group breakdown).
- One sample for plasma analysis and one sample was used to pipette whole blood on to a blood card.
- NfL and GFAP concentrations were subsequently quantified using the Simoa multiplex Neurology 4-Plex A (N4PA) assay.

| C9 | GRN | MAPT | TBK1 |
|---|---|---|---|
| 22 | 6 | 11 | 1 |

**Table 1. Participants' gene groups**

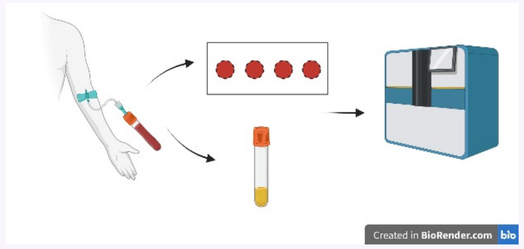


**Figure 1. Simoa HD-X analyser was loaded with plasma and dried blood spot samples**

## 3. Results

- In this pilot cohort, blood card **GFAP** concentration **very strongly correlated** with matched plasma GFAP (r = 0.878, p<0.0001).
- However, blood card **NfL** concentration did not correlate with matched plasma NfL (r = 0.238, p = 0.1394).
- Incubation temperature impacted total protein concentration in the blood cards, but freeze-thaw and incubation time did not.

## 4. Conclusion

This pilot study shows:

- **GFAP** concentrations can be successfully quantified using dried blood cards and GFAP results strongly correlate with plasma measures.
- Future work will investigate improving the methodology, particularly for the **NfL** assay, as well as assessing samples obtained through lancet-based fingerprick collection and the feasibility of home collection.

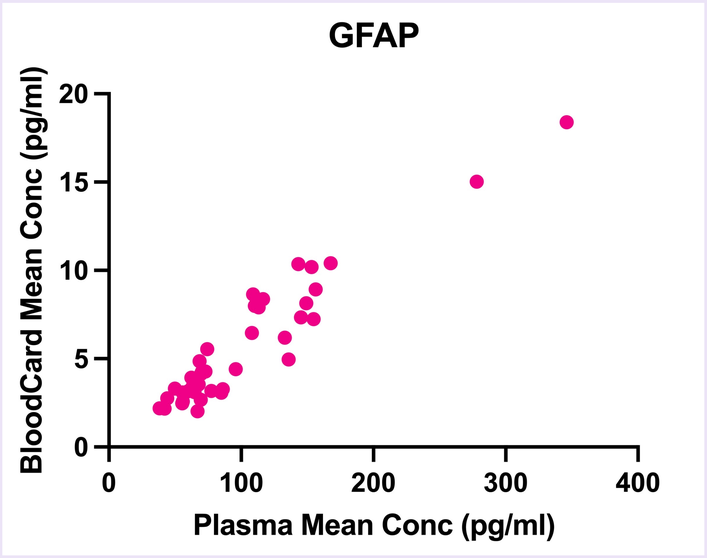


**Figure 2. GFAP concentrations in plasma vs whole blood on dried blood spots**

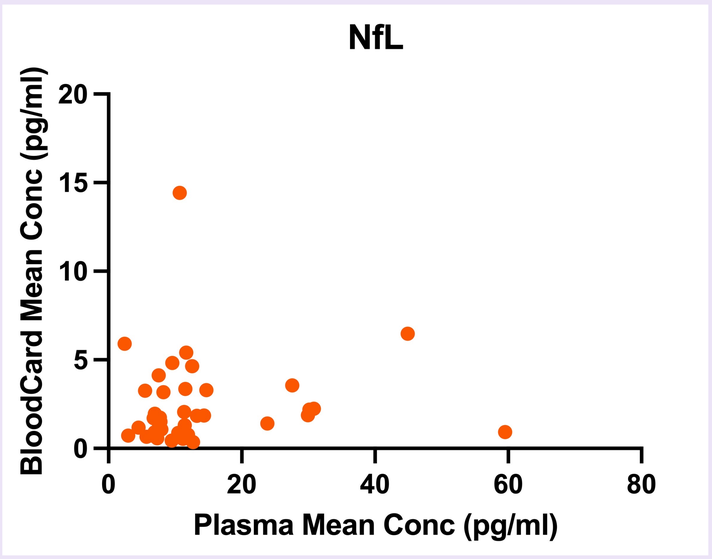


**Figure 3. NfL concentrations in plasma vs whole blood on dried blood spots**

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