

Processing Plasma Biomarkers in Alzheimer's Disease: Impact of Double-Spin Versus Single-Spin on the Lumipulse Assay



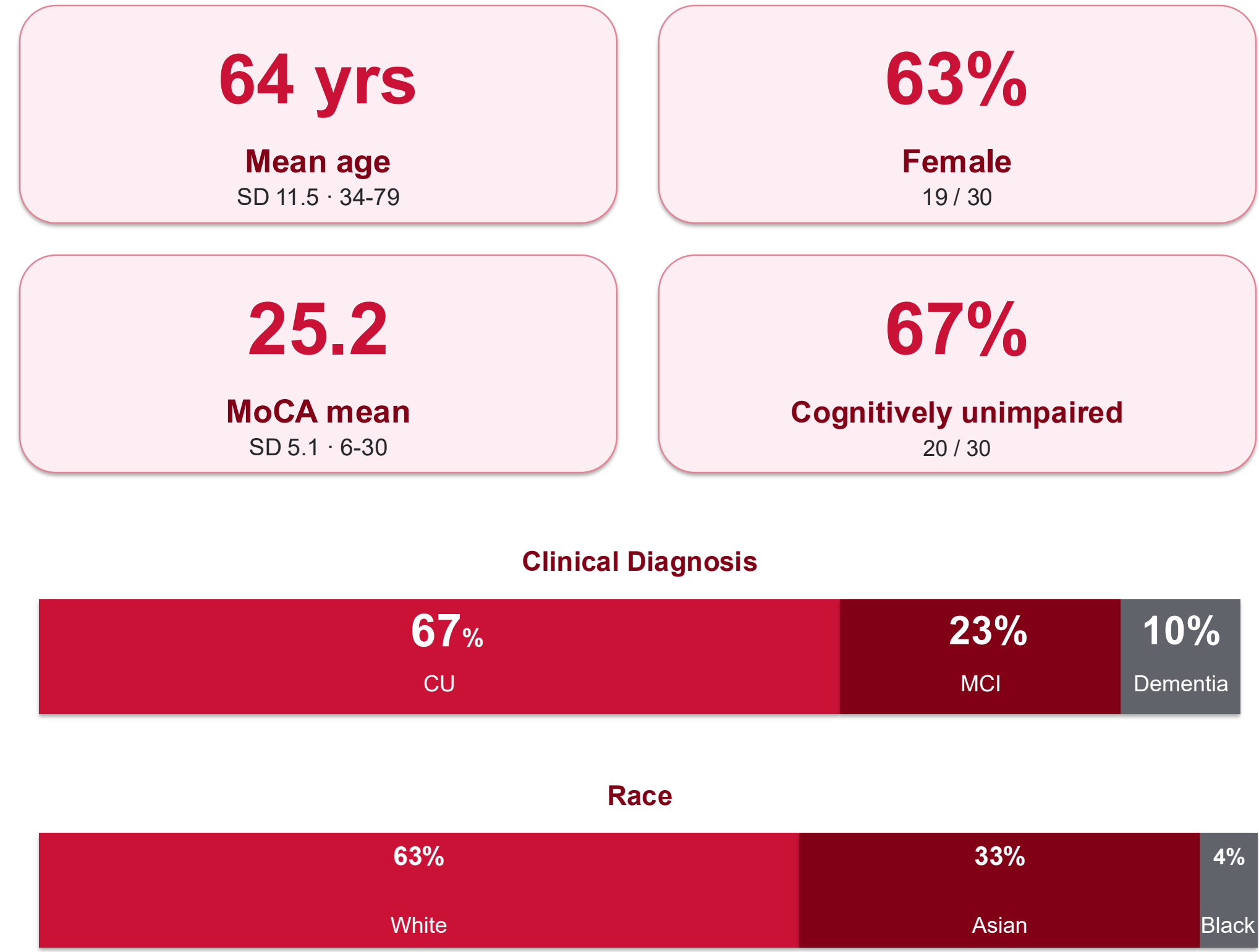
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Background & Objective

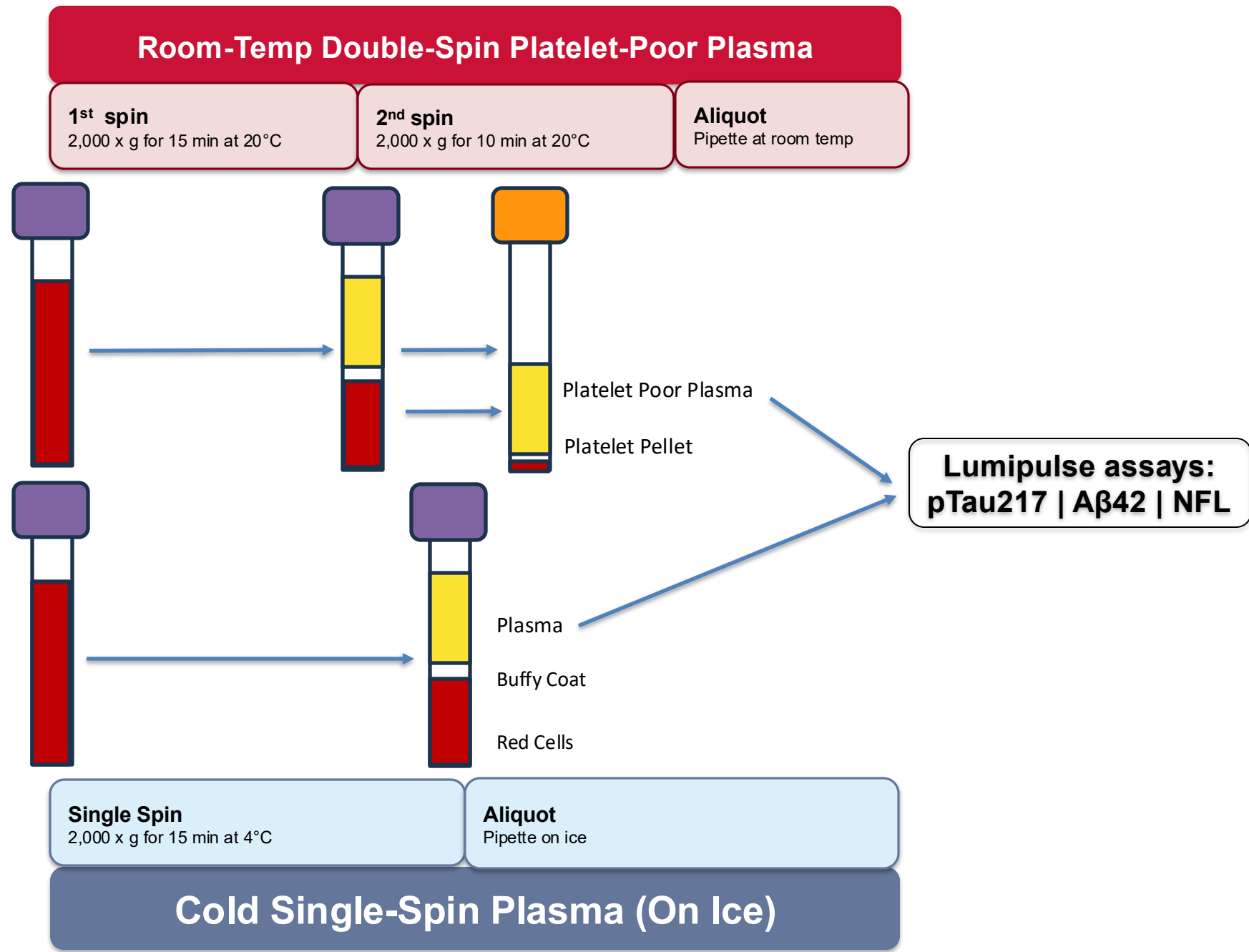
- Reliable pre-analytical handling is needed as blood biomarkers move into AD workflows.
- Centrifugation is a key processing step; added double-spin could alter concentrations.
- Objective: compare paired single- vs double-spin plasma for pTau217, NFL, Aβ42, and pTau217/Aβ42.

Participants (N = 30)



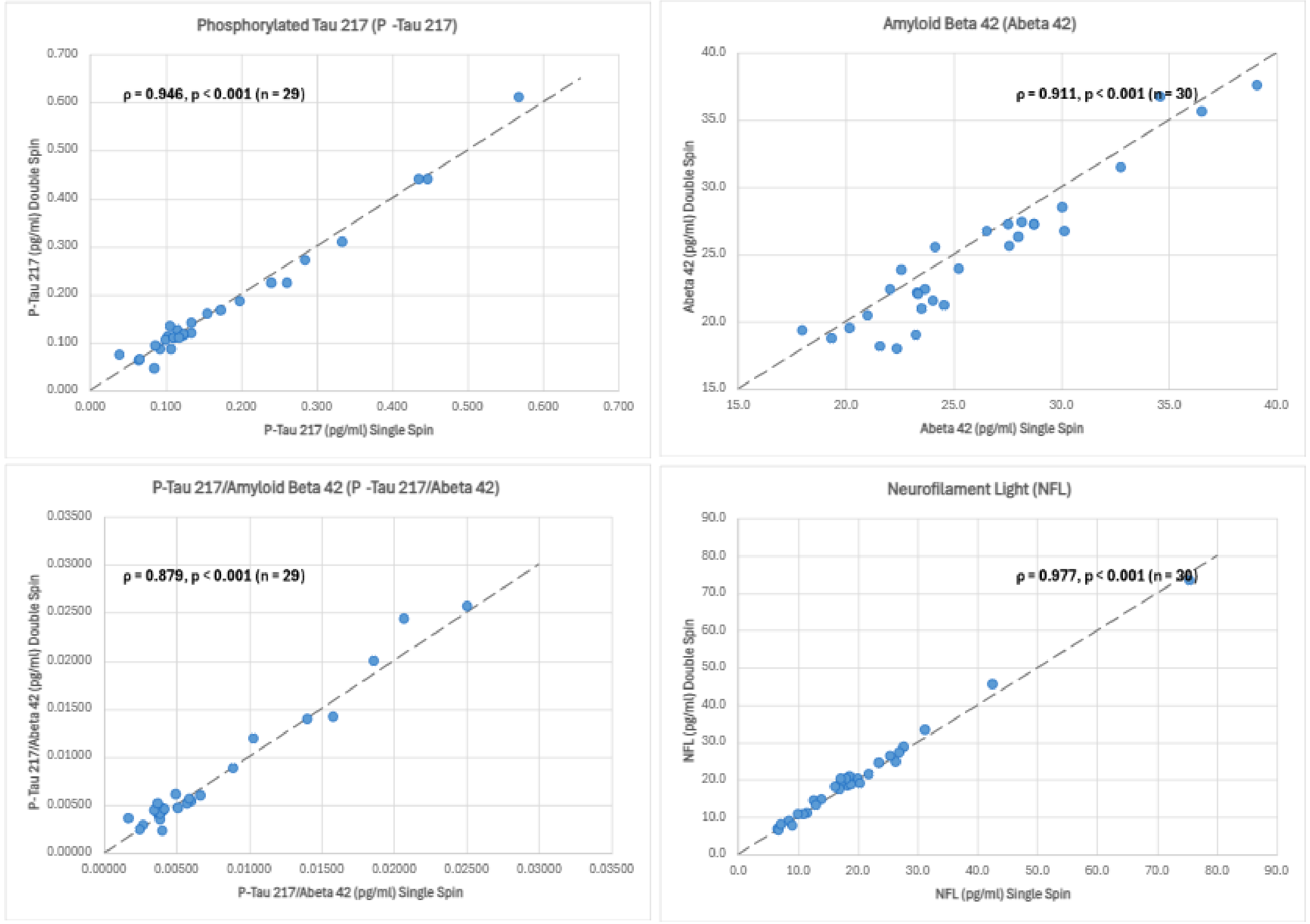
Methods

- N=30 participants across the cognitive continuum.
- Paired plasma processed under single-spin and double-spin conditions.
- Lumipulse quantified pTau217, NFL, Aβ42, and pTau217/Aβ42.
- Agreement and paired differences tested statistically; cutoffs assessed for category stability.



Results

Single- vs double-spin correlations



pTau217	Aβ42	pTau217/Aβ42	NFL
$\rho = 0.946$	$\rho = 0.911$	$\rho = 0.879$	$\rho = 0.977$

Paired t-tests

Biomarker	Mean difference 1-spin - 2-spin	p
pTau217	0.0437	0.220
NFL	-0.0016	0.907
Aβ42	0.0573	<0.001
pTau217/Aβ42	-0.0136	0.731

Only Aβ42 showed a statistically significant paired change; the composite ratio did not.

Classification Consistency

Biomarker	Condition	Negative	Indeterminate	Positive
pTau217	1-spin	24 (82.8%)	-	5 (17.2%)
pTau217	2-spin	25 (86.2%)	-	4 (13.8%)
pTau217/Aβ42	1-spin	4 (13.8%)	18 (62.1%)	7 (24.1%)
pTau217/Aβ42	2-spin	5 (17.2%)	17 (58.6%)	7 (24.1%)

- One pTau217 case shifted positive to negative.
- One pTau217/Aβ42 case shifted indeterminate to negative.

Conclusions



- Strong single- vs double-spin agreement across all biomarkers.
- No significant processing difference for pTau217, NFL, or pTau217/Aβ42.
- Aβ42 was slightly lower under the room-temperature double-spin condition (spin number and temperature differ).
- Classification was largely stable except for threshold-adjacent cases.

Standardized processing remains important to ensure comparable results.

Limitations

- The single-spin (cold, 4°C) and double-spin (room-temperature, 20°C) conditions differ in both spin number and processing temperature, so observed differences cannot be attributed to centrifugation alone.
- Modest sample size (N=30; N=29 for pTau217 and the pTau217/Aβ42 ratio).

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