Labo Neuro | IBB-Neurobiobank
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Drie Eikenstraat 655
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Biological markers for Neurodegenerative diseases

Section 1/3: Analysis selection and confounding factors

Mandatory Information:

Patient's personal data/ hospital sticker

Patient's name / Date of birth: _____

Date of CSF sampling: _____

Rapid progressive neurodegeneration ○
Slow progressive neurodegeneration ○

Clinical duration: _____months

Age at onset: _____

MMSE: _____/ 30 MOCA: _____/ 30 CDR-SB: _____/18 CDR-GS: _____/3 Date: _____

eGFR: _____ Date: _____

APOE ε4 status (if known): ○ no ε4 allel / ○ homozygous/ ○ heterozygous (Brum et al. Nature Aging 2023)

BMI: ○ <18.5 Underweight / ○ 18.5-25 Normal / ○ 25-30 Overweight / ○ >30 Obese Date: _____

Clinical diagnose: _____

Clinical symptoms at onset:

- ☐ Complaints of memory and/or orientation
- ☐ Behavioural symptoms
- ☐ Language difficulties
- ☐ Isolated visual symptoms
- ☐ Extra pyramidal onset
- ☐ Pure cerebellar onset
- ☐ Stroke-like onset
- ☐ Pure psychiatric onset
- ☐ Sensory symptoms at onset
- ☐ Other _____

Fazekas (cerebrovas. DWM lesions)
☐ 0 ☐ 1 ☐ 2 ☐ 3

Clinical remarks: _____

CSF:

☐ **dd Alzheimer's Disease (AD)**

ATN profiling based on proteins: **$A\beta_{1-42}/A\beta_{1-40}$, tTau, $pTau_{181}$**
www.uantwerpen.be/ad-atn-interpretation

Clin Chem Lab Med. 2021 Nov15;60(2):207-219
2x 1ml CSF + 2x 1ml EDTA Plasma (into 1,5ml PP tubes)
www.uantwerpen.be/sampling
Ref. EC/PM/AL/2021.020 'prospective sampling and storage'
www.uantwerpen.be/icfprospect

Analysis cost: https://labogids.uza.be/analyses

☐ **ddCreutzfeldt-Jakob Disease (CJD) - NRC-ddCJD**

Proteins: **14-3-3 / PrPsc (RT-QuIC)**

RT-QuIC inclusion only IF :
- The diagnostic criteria 'possible CJD' according to the WHO/ECDC have been met,
- OR 14-3-3 protein analysis returned (weak) positive,
- OR tTau concentration is >1200pg/mL,
- OR tTau / pTau ratio is ≥14.

Acta Neurol Belg 2018 Sep;118(3):395-403
2x 1ml CSF (into 1,5ml PP tubes)
Analysis cost: no cost (due to NRC-ddCJD Consortium)

EDTA Plasma:

☐ **dd Alzheimer's Disease (AD)**

Probability assessment based on proteins: **$pTau_{217}$**

Disclaimer:
- Presence of objective cognitive deficits necessary.
- Result can be affected by kidney function and BMI.
- Analysis designated RUO pending CE-IVD; may serve as an early, less-invasive prob. assessment indicating early pathological changes, to be confirmed by standard CSF-based ATN profile.

If result returns intermediate, an additional CSF analysis (4 AD markers) will be required.

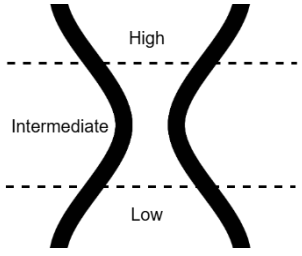

Fig: EDTA plasma $pTau_{217}$ distribution in patients with cognitive deficits.

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2x 1ml EDTA Plasma (into 1,5ml PP tubes)
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Please complete specific clinical findings on next page

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Section 2/3: Clinical information, imaging and surveillance

Clinical evolution:

Yes	No	?		Yes	No	?	
O	O	O	**progressive dementia**	O	O	O	limb apraxia
O	O	O	memory disturbances	O	O	O	**visuospatial dysfunction**
O	O	O	orientation difficulties (space/time)	O	O	O	hallucinations or delusions
O	O	O	attention difficulties / distractibility	O	O	O	REM sleep behaviour disorder
O	O	O	behavioural changes: apathy	O	O	O	falls
O	O	O	behavioural changes: loss of empathy	O	O	O	loss of consciousness
O	O	O	behavioural changes: disinhibition	O	O	O	**myoclonus**
O	O	O	hyperorality	O	O	O	frontal release signs
O	O	O	perseverative / stereotyped / compulsive behaviour	O	O	O	ataxia / **cerebellar signs**
O	O	O	executive dysfunction	O	O	O	**pyramidal signs**
O	O	O	language difficulties / aphasia	O	O	O	parkinsonism / **extrapyramidal signs**
O	O	O	dysarthria	O	O	O	depression
O	O	O	**akinetic mutism**	O	O	O	*psychiatric problems*
O	O	O	verbal apraxia	O	O	O	*epilepsia*

Neuro-imaging - if performed - tick when present

MRI / CT

- ☐ Normal
- ☐ Abnormalities - non specific
- ☐ Abnormalities - affecting striatum or neo-cortex
- ☐ High signal in caudate lobe and putamen
- ☐ High signal in posterior thalamus > other areas
- ☐ Cortical ribbon sign
- ☐ Enlargements - ventricular
- ☐ Atrophy - cerebellar
- ☐ Atrophy - cerebral / Predominant regions / Global atrophy / Temporal atrophy

Predominant regions		Global atrophy	Temporal atrophy	
frontal	☐L ☐R	O GCA = 0	MTA 0	☐L ☐R
temporal	☐L ☐R	O GCA = 1	MTA 1	☐L ☐R
parietal	☐L ☐R	O GCA = 2	MTA 2	☐L ☐R
occipital	☐L ☐R	O GCA = 3	MTA 3	☐L ☐R
			MTA 4	☐L ☐R

other: _____

EEG

- ☐ Normal
- ☐ Periodic sharp-wave complexes - triphasic
- ☐ Slowing focal or diffuse
- ☐ Slowing frontal or frontotemporal
- ☐ Slowed alfa activity
- ☐ Decreased beta activity
- ☐ Increased theta and delta activity

other: _____

PET Amyloid

- O Neg
- O Pos

PET TAU

- O Neg
- O Pos

PET FDG predominant hypometabolism

frontal	☐L ☐R
temporal	☐L ☐R
parietal	☐L ☐R
occipital	☐L ☐R

other: _____

Additional information - Sciensano CJD Surveillance:

Specific risk factors

Yes	No	?			
O	O	O	Ever had a stroke	Year of stroke	_____
O	O	O	Ever had a residence in UK	When	_____
O	O	O	Ever had endoscopy	When / which hospital	_____
O	O	O	Ever had surgery	Surgery info	_____
O	O	O	Ever had neurosurgery	Neurosurgery info	_____
O	O	O	Familial history of dementia	Dementia type	_____

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Patient's name / Date of birth: _____

Section 3/3: Informed consent

To be confirmed by the patient:

Informed consent: it has been explained to me and I understand that:

1. Further protein analysis is proposed in order to investigate the cause of a neurodegenerative disorder in the patient mentioned on page 1.
2. The sample will be analyzed to determine the potential presence of the condition. Costs are associated with this analysis, except for NRC-ddCJD markers.
3. The physician will interpret the results of this analysis and discuss them with me.
4. I may be informed if a serious condition is incidentally discovered for which medical treatment and/or preventivemeasures are available.
5. This analysis does not exclude the presence of other conditions.
6. All data obtained from this study will be treated with strict confidentiality, and I retain the right to access and correct my data, cf. https://www.uantwerpen.be/privacybeleid.
7. The sample and associated data will be stored in the secure IBB-Neurobiobank (ID BB190113).
8. My sample and data can only be used for future research after approval by a Medical Ethics Committee and the IBB Neurobank Advisory Board. This is always done pseudonymously, with minimal necessary material, with residual material returned to the biobank. Both academic and commercial researchers can submit applications, according to the same conditions.
9. Future research may require additional clinical information, which may be requested from my treating physician by the managing physician of the IBB-Neurobiobank.
10. I can stop my participation at any time by informing my treating physician or at neurobiobank@uantwerpen.be No new data will then be generated and I will receive written confirmation of this.
11. I can contact my treating physician for any further questions, with support from the Neurology Laboratory of the Born-Bunge Institute, University of Antwerp.

More information: www.uantwerpen.be/sampling / www.bornbunge.org

I give my consent for protein research through biomarker analysis and the inclusion of the sample in the IBB Neurobiobank:

☐ **For myself** ☐ **As the patient's representative**

Name: _____ **Date:** _____

Signature:

☐ Opting out for the use of residual material for further scientific research: **Tick only if the patient makes objection.**

Applicant:

Name doctor: _____ Email: _____

RIZIV/INAMI nr: _____ Date: _____

Hospital: _____ Signature:

To the attention of the clinician:

Sample receipt, validation & reporting
Labo klinische biologie UZA, route 169
Drie Eikenstraat 655
2650 Edegem
Dr. Khadija Guerti (riziv nr. 11943866860)

Analysis, interpretation & contextualisation:
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Patient information leaflet

Lumbar puncture (cerebrospinal fluid) and blood draw (EDTA plasma) - step by step

Your doctor is proposing a lumbar puncture (spinal tap) to collect a small amount of cerebrospinal fluid (CSF). Often, a blood sample is also taken to obtain EDTA plasma. These samples are used to measure certain proteins (biomarkers).

1. Why is this test useful?

- It can help investigate the cause of neurological or cognitive symptoms and distinguish between different conditions.
- Sometimes the test does not provide a clear diagnosis. Your doctor will then discuss the next steps with you.

2. What happens to the CSF and blood sample?

- The CSF and blood are sent to the laboratory. The blood is processed to obtain EDTA plasma.
- The samples are analysed. The results are sent to the requesting physician, who will discuss them with you. The informed consent explains how residual material and data are handled.

3. How is the sampling performed? (step by step)

- Beforehand: let us know if you take blood thinners, have a bleeding/clotting disorder, a fever, a skin infection on the lower back, or if you are pregnant. Never stop medication on your own without medical advice.
- During: you lie on your side with your knees drawn up, or you sit leaning forward. The skin is disinfected and covered with sterile drapes. You receive local anaesthesia.
- The doctor inserts the needle low in the back, between two lumbar vertebrae, and collects a small amount of CSF into tubes. A plaster is then applied.
- Blood draw: blood is taken from a vein in the arm into a tube containing EDTA (a substance that prevents the blood from clotting).
- Afterwards: you are usually observed for a short time. Usually, you can go home the same day. Follow the instructions you receive.

4. Possible risks and discomfort

- Headache after the puncture (typically worse when sitting/standing upright and better when lying flat).
- Lower back pain or stiffness; sometimes a brief shooting sensation down a leg during the procedure.
- Bleeding or bruising at the puncture site and, rarely, infection.
- With the blood draw: bruising, pain or feeling faint.
- Serious complications are rare, but may require additional treatment.

5. Aftercare and when to seek help

- Rest on the day of the puncture and avoid heavy exertion or heavy lifting for 24–48 hours (or as advised).
- Contact a doctor if you have: persistent or very severe headache, fever, increasing redness/warmth/swelling or pus, leakage of fluid, increasing back or leg pain, weakness/severe sensory symptoms, or problems urinating.

6. When will you get the results?

- Laboratory analysis takes time. Your doctor will discuss the results with you (often within the next few weeks).

Do you still have questions or doubts? Discuss them with your doctor. You decide only after you have received enough information and everything is clear to you.

The above is provided for information only – responsibility remains with the physician performing the procedure.

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