CND Life Sciences™
5070 N 40th St., Suite 220
Phoenix, AZ 85018-2135
P: 480-569-2900 | F: 480-569-2910
labops@cndlifesciences.com
cndlifesciences.com

Syn-One Test™

Case #:	00001234
Patient:	Smith, John
Lab Receipt Date:	6/2/2020
Lab Report Date:	6/15/2020

Syn-One Test™ Pathology Report

Patient Information

Patient:	Smith, John
Case #:	00001234
DOB:	5/12/1949
Gender:	Male
Indications:	G60.3 Idiopathic Neuropathy; G20 Parkinsonism
Clinical Info/ Patient History	Irregular autonomic function, Orthostatic Hypotension, REM sleep behavioral disorder, Loss of smell (Anosmia)

Provider Information

Clinician:	Doe, Jane, MD
Biopsy Date:	6/1/2020
Account:	Neurology
Address:	5070 North 40th Street Suite 220 Phoenix, Arizona 85018
Phone:	(480) 569-2900
Fax:	(480) 569-2910

Conclusions

Synucleinopathy:	There is pathologic evidence of phosphorylated alpha-synuclein deposition within cutaneous nerves. This finding is consistent with a diagnosis of an alpha-synucleinopathy. Clinical correlation is required to distinguish the type of synucleinopathy.
Small Fiber Neuropathy:	There is reduced intraepidermal nerve fiber density consistent with a length dependent small fiber neuropathy.
Amyloidosis:	There is no pathologic evidence of amyloid deposition in cutaneous nerves. A normal Congo red stain does not exclude a diagnosis of amyloidosis.

Macroscopic Description and Processing

Three (3) skin biopsies in Zamboni fixative were received. The vials were labeled as left posterior cervical, left distal thigh and left distal leg and biopsies were measured to be 3 mm. The biopsies were in adequate condition. They were washed and cryoprotected. The biopsies were sectioned into 50 µm samples. The following stains were performed:

1. Standard dual immunostaining with protein gene product 9.5 and phosphorylated alpha-synuclein
2. Standard Congo Red staining
3. Standard hematoxylin and eosin staining

Microscopic Description

Phosphorylated Alpha-Synuclein

Abnormal

Phosphorylated alpha-synuclein deposition was observed in all biopsies.

Intraepidermal Nerve Fibers

Abnormal

Intraepidermal nerve fiber density was abnormal in the distal thigh and distal leg biopsy.

Amyloid Deposition (Congo Red)

Normal

Modified Congo red staining shows no evidence of apple-green birefringence under polarized light in any of the biopsies.

Skin Histology (Hematoxylin and Eosin)

Normal

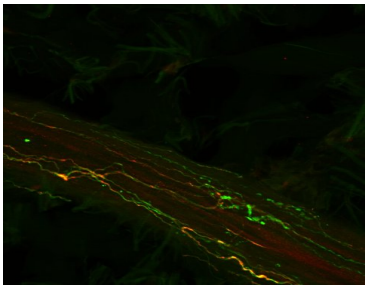
Routine hematoxylin and eosin staining show no histopathologic abnormalities in any of the biopsies.

CND Life Sciences™
5070 N 40th St., Suite 220
Phoenix, AZ 85018-2135
P: 480-569-2900 | F: 480-569-2910
labops@cndlifesciences.com
cndlifesciences.com

Syn-One Test™

Case #:	00001234
Patient:	Smith, John
Lab Receipt Date:	6/2/2020
Lab Report Date:	6/15/2020

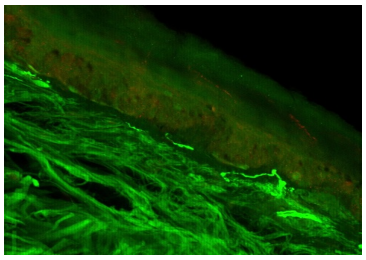
Pathology Results



Phosphorylated Alpha-Synuclein (P-Syn)

Bx Site	P-Syn Deposition	Description
Post Cervical (Left)	Abnormal	Multiple colocalized nerve fibers observed in multiple substructures across multiple sections.
Distal Thigh (Left)	Abnormal	Multiple colocalized nerve fibers observed in multiple substructures across multiple sections.
Distal Leg (Left)	Abnormal	Multiple colocalized nerve fibers observed in multiple substructures across multiple sections.

The green regions indicate PGP9.5 immunostained nerve fibers. The regions in red/orange are immunostained regions of phosphorylated alpha-synuclein within nerve fibers. This region displays evidence of phosphorylated alpha-synuclein deposition.



Intraepidermal Nerve Fiber Density

Bx Site	Observed Measurement (fibers/mm)	Normal Range (fibers/mm)
Post Cervical (Left)	24.2	>20
Distal Thigh (Left)	4.3	11.5
Distal Leg (Left)	0.6	7.9

The green regions indicate PGP9.5 immunostained nerve fibers. This region displays reduced intraepidermal nerve fiber density.

Additional Comments (if applicable)

No additional comments.

Signed: Todd Levine, MD
Board Certified in Neurology

Guidance for Use
The Syn-One Test™ is intended to provide objective pathological evidence to aid in the diagnostic evaluation of patients with clinical features suggestive of a synucleinopathy. The synucleinopathies encompass a group of neurodegenerative diseases that include Parkinson's disease, dementia with Lewy bodies, multiple system atrophy, and pure autonomic failure. An abnormal test that identifies phosphorylated synuclein within cutaneous nerves is highly specific for a diagnosis of a synucleinopathy but cannot distinguish between the synucleinopathies. Physicians should use the results of the Syn-One Test along with other clinical features to help make a more specific diagnosis. For more information, please visit www.cndlifesciences.com.

References
For additional information on the skin biopsy technique and detection of phosphorylated alpha-synuclein see:

1. Wang N, Gibbons CH, Lafo J, Freeman R. α-Synuclein in cutaneous autonomic nerves. Neurology. 2013 Oct 29;81(18):1604-10.
2. Gibbons CH, Garcia J, Wang N, Shih LC, Freeman R. The diagnostic discrimination of cutaneous α-synuclein deposition in Parkinson disease. Neurology. 2016 Aug 2;87(5):505-12.
3. Kim JY, Illigens BM, McCormick MP, Wang N, Gibbons CH. Alpha-Synuclein in Skin Nerve Fibers as a Biomarker for Alpha-Synucleinopathies. J Clin Neurol. 2019 Apr;15(2):135-142.
4. Provitera V, Gibbons CH, Wendelschafer-Crabb G, Donadio V, Vitale DF, Stancanelli A, Caporaso G, Liguori R, Wang N, Santoro L, Kennedy WR, Nolano M. A multi-center, multinational age- and gender-adjusted normative dataset for immunofluorescent intraepidermal nerve fiber density at the distal leg. Eur J Neurol. 2016 Feb;23(2):333-8.
5. Joint Task Force of the EFNS and the PNS. European Federation of Neurological Societies/Peripheral Nerve Society Guideline on the use of skin biopsy in the diagnosis of small fiber neuropathy. Report of a joint task force of the European Federation of Neurological Societies and the Peripheral Nerve Society. J Peripher Nerv Syst. 2010 Jun;15(2):79-92.

CPT Codes
88305 x 3, 88341 x 3, 88342 x 3, 88356 x 3, 88314 x 3

Immunohistochemistry tests were developed, and their performance characteristics were determined by CND Life Sciences, Phoenix, AZ. These tests have not been cleared or approved by the U.S. Food and Drug Administration. The FDA has determined that such clearance or approval is not necessary. These tests are used for clinical purposes. These tests should not be regarded as investigational or for research. CND is certified under the Clinical Laboratory Improvement Amendments of 1988 (CLIA-88) as qualified to perform high complexity clinical laboratory testing. All histochemical and immunohistochemical controls are in accordance with quality assurance standards.