

# ADNI and DIAN Neuropathology Core



**Update September 25, 2016**

**Nigel Cairns, PhD, FRCPath**

**Knight ADRC  
Neuropathology Core Leader**

# ADNI Participants Autopsied per Funding Period

Autopsy rates for ADNI 1, ADNI GO, and ADNI 2				
ADNI Funding Period	ADNI-NPC	Deaths	Autopsies	Autopsy Rate (%)
9-1-05 to 8-31-07	NO	6	0	0
9-1-07 to 8-31-08	YES	7	2	28
9-1-08 to 8-31-09	YES	8	8	100
9-1-09 to 8-31-10	YES	4	1	25
9-1-10 to 8-31-11	YES	13	6	46
9-1-11 to 8-31-12	YES	4	3	75
9-1-12 to 8-31-13	YES	15	8	53
9-1-13 to 8-31-14	YES	20	13	65
9-1-14 to 8-5-15	YES	14	11	79
Total (2005-2015)	-	91	52	57
Total since NPC established	-	85	52	61

**Note:** The ADNI-NPC was established on 9/1/2007.

# ADNI Sites and Participating ADC Neuropathology Core Leaders

\*=1 case contributed.

\*\*=more than one case  
contributed.

An additional 9 cases  
Were provided to the  
ADNI-NPC by ADNI sites  
not affiliated with an ADC.

Site	ADC-Neuropathology Core Leader
OHSU	Randy Woltjer
USC	Carol A. Miller *
UCSD	Eliezer Masliah
COLUMBIA	Jean Paul Vonsattel
WUSTL	Nigel Cairns **
MSINAI	Vahram Haroutunian
RUSH	Julie A. Schneider
HOPKINS	Juan Troncoso
NYU	Thomas Wisniewski
UPENN	John O. Trojanowski
UK	Peter Nelson
UPITT	Julia Kofler *
UCI	Ronald Kim *
UTSW	Charles L. White III **
EMORY	Marla Gearing **
KANSAS	Kathy Newell **
UCLA	Harry Vinters
MAYOJ	Dennis W. Dickson
IU	Bernadino Ghetti *
NWU	Eileen Bigio
UCSF	William Seeley *
BWH	Matthew P. Frosch
SHRI	Thomas G. Beach **
BUSM	Ann C. McKee
UCD	Lee-Way Jin **
UWI	Michael Hart

# ADNI: Clinical and Neuropathologic Diagnosis at Expiration

Clinical Diagnosis at Expiration	Neuropathologic Diagnosis [N (%)]											
	AD	AD + DLB	AD + TDP	AD + DLB + TDP	AD + DLB + TDP + AGD	AD + ALB	AD + AGD	AD + HS	AD + TDP + Infarcts	AGD	Pending	TOTAL (%) ^
DAT	18*	12**	2	2		2	1	3†	1	2¶		43 (83)
DAT + DLB				1	1	2‡						4 (8)
Pending											5	5 (10)
TOTAL (%) ^	18 (35)	12 (23)	2 (4)	3 (6)	1 (2)	4 (8)	1 (2)	3 (6)	1 (2)	2 (4)	5 (9)	52 (100)

AD, Alzheimer disease (NIA-AA score: A1, B0, C0 or greater); ALB, AD with amygdala Lewy bodies; DAT, Dementia a of the Alzheimer's type; DLB, dementia with Lewy bodies; AGD, argyrophilic grain disease; TDP, AD with TDP-43 proteinopathy in medial temporal lobe; HS, hippocampal sclerosis.

Notes: \*One case had additional infarcts; \*\*One case had additional AGD and two cases had additional ARTAG; †One case had additional AGD and one case had additional TDP-43 proteinopathy; ‡One case had additional TDP-43 proteinopathy; ¶Both cases had additional PART. ^Figures are rounded and may not equal 100%. Small vessel disease (arteriolosclerosis and cerebral amyloid angiopathy) was a feature of all cases.

The clinical diagnostic accuracy of DAT is high: 45/47 (95.7%)

## Neuropathologic Assessment of 7 DIAN Participants and 15 Family Members (total = 22)

Mutation	P/F	PMI (h)	Brain wt. (g)	Clin. Dx.#	Npath. Dx.	A <sup>^</sup> (A $\beta$ )	B <sup>^</sup> (NFT)	C <sup>^</sup> (NP)	SYN**
PSEN1 I143T	P	18	1,330	AD	AD+DLB	3	3	3	6
PSEN1 M146L	P	38	1,070	AD	AD+DLB	3	3	3	6
PSEN1 H163R	P	9	1,130	AD	AD	3	3	3	0
PSEN1 H163R	F	4.5	1,300	AD	AD+ALB	3	3	3	ALB
PSEN1 H163R	F	9	1,490	AD	AD	3	3	3	0
PSEN1 H163R	F	6	1,210	AD	AD+DLB	3	3	3	6
PSEN1 G206A	F	na	na	AD	AD	3	3	3	0
PSEN1 G206V	P	15	1,095	AD	AD	3	3	3	0
PSEN1 G217R	F	15	1,040	AD	AD+DLB	3	3	3	6
PSEN1 L226R	F	16	1,124	AD	AD+ALB	3	3	3	ALB
PSEN1 I229F	P	23	1,220	AD	AD	3	3	3	0
PSEN1 I229F	P	24.5	1,080	AD	AD	3	3	3	0
PSEN1 S290C	F	60	1,144	AD	AD	3	3	3	0
PSEN1 C410Y	F	21	1,224	AD	AD	3	3	1	0
PSEN1 A431E	F	5	720	AD	AD+DLB	3	3	3	6
PSEN1 T245p	P	6.5	1050	AD	AD+DLB	3	3	3	6
PSEN2 A141I	F	6	1,100	AD	AD+ALB	3	3	3	ALB
APP K670N,M671L	F	6	1,210	AD	AD	3	3	3	0
APP V717I	F	15	1,150	AD	AD	3	3	3	0
APP V717I	F	26.5	1,370	AD	AD	3	3	3	0
APP V717I	F	10	1,110	AD	AD+ALB	3	3	3	ALB
APP V717I	F	na	980	AD	AD+ALB	3	3	3	ALB
Mean	7P,15F	16.7	1,150		AD (100%)				
Range		4.5-60	720-1,490		AD+DLB/ALB (50%)				

P, participant; F, family member. <sup>^</sup>NIA-AA stages. \*\* Braak Lewy body stage.

## Comorbidities in AD in ADNI and DIAN Participants

Neuropathologic diagnoses		LOAD (ADNI)		ADAD (DIAN)	
Primary	Comorbidities ^	N*	%	N**	%
AD	+/- Comorbidity	44	100	22	100
AD	None	16	38.1	11	50
AD	DLB/ALB	18	42.9	11†	50
AD	TDP-43	9	21.4	0	0
AD	AGD	5	11.9	0	0
AD	Hippocampal sclerosis	2	4.8	0	0
AD	ARTAG	2	4.8	0	0
AD	Infarcts	2	4.8	0	0
AGD	None	2	4.8	0	0

\*6 cases pending; \*\*2 cases pending; ^more than one comorbidity may be present in a single case; †, one case had additional glioblastoma multiforme.

Average age at death (years) = 80.7 (ADNI) and 52.4 (DIAN)

# Acknowledgements

## The Participants

<http://www.adni-info.org/>

<http://dian-info.org/>



**DIAN PI: Randall J. Bateman (John C. Morris)**  
**ADNI PI: Michael W. Weiner**

**DIAN Sites (13): USA, Australia, Germany**  
**ADNI Sites (57): USA, Canada**

**Neuroimaging Core**

**Tammie L.S. Benzinger**

**Karl Friedrichsen**

**Biostatistics Core**

**Chengjie Xiong**

**DIAN/ADNI Neuropathology Core**

**Nigel Cairns**

**Erin Franklin**

**Benjamin Vincent**

**Michael Baxter**

**Mingqiang Xie**

**Washington University**

**Division of Neuropathology**

**Robert Schmidt**

**Joseph Corbo**

**Sonika Dahiya**

**Richard Perrin**

**Indiana University**

**Bernardino Ghetti, Andrew Saykin**

**University of Kansas**

**Kathy Newell**

