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**GERAD\_EC Fact Sheet**

The following information is relevant to the GERAD exome chip (GERAD\_EC) study performed by the Cardiff University Alzheimer’s Disease Genetics Research Team in conjunction with our collaborators world-wide.

This large and powerful study was completed in a 2-stage approach:

* Stage 1, or discovery included the samples, methods, authors and Institutions below;
* Stage 2, or replication will include another unique sample set and will enable verification of Stage 1 so this research can be published in a scientific journal.

Data from both stage 1 and 2 can be requested for further analysis, via the Alzheimer’s disease research team, for further analysis.

Where GERAD\_EC data is provided and publication results, it is vital that the GERAD team are acknowledged appropriately by referring to or quoting the text outlined below.

Data used in the preparation of this article were obtained from the Genetic and Environmental Risk for Alzheimer’s Disease\_Exome Chip (GERAD\_EC) Consortium.

As such, the investigators within the GERAD\_EC Consortium contributed to the design and implementation of GERAD\_EC and/or provided data but did not participate in analysis or writing of this report.

**Methods and samples**

Data used in the preparation of this article was obtained from the Genetic and Environmental Risk for Alzheimer’s Disease\_Exome Chip (GERAD\_EC) Consortium. The GERAD\_EC sample comprises of 6,000 cases and 2,974 elderly screened controls genotyped on the Illumina HumanExome chip (versions 1.0 and 1.1) at Life and Brain, Bonn.

These samples were recruited by:

* Medical Research Council (MRC) Genetic Resource for AD (Cardiff University; Kings College London; Cambridge University; Trinity College Dublin)
* The Alzheimer’s Research UK (ARUK) Collaboration (University of Nottingham; University of Manchester; University of Southampton; Queen’s University Belfast)
* MRC PRION Unit, University College London
* Institute of Psychiatry, Kings College London
* Aristotle University of Thessaloniki
* Washington University, St Louis, United States
* Brigham Young University, Utah, United States
* University of Cantabria, Santander, Spain
* University of Oviedo, Spain
* Universidad Autónoma de Madrid, Spain
* University Hospital Mútua de Terrassa, Terrassa, Barcelona, Spain
* Universidad Autónoma de Barcelona, Spain
* Fondazione Santa Lucia, Rome, Italy
* Ludwig-Maximilians-University Munich, Germany
* Universitätsklinikum Bonn, Germany; Universität des Saarlandes, Homburg, Germany
* The AddNeuroMed Study

**Sample ascertainment**

Each recruitment centre has the necessary ethical consents for this study, and all individuals included in these analyses have provided informed consent to take part in genetic association studies.

**MRC Genetic Resource for AD:** All AD cases met criteria for either probable (NINCDS-ADRDA5 or DSM-IV) or definite (CERAD) AD. All elderly controls were screened for dementia using the MMSE or ADAS-cog, were determined dementia free at neuropathological examination, or had a Braak score of ≤ 2.5.

**MRC Prion Unit:** Patient recruitment was via tertiary specialist clinics at the National Hospital for Neurology and Neurosurgery, University College London Hospitals NHS Foundation Trust, London. Clinical diagnosis of AD was supported in some cases by participation in longitudinal research studies at University College London.

**University of Southampton**: Cognition was assessed, in subjects aged 50–100 years using the MoCA. Controls were required to have a MoCA score of ≥ 26 points. Unsuitable subjects (for example those with a psychiatric diagnosis) were excluded.

**Kings College London:** Subjects were assessed using the MMSE and diagnosed according to the NINCDS-ADRDA. Patients age of onset was > 60 years, controls were 60+ years.

**University of Nottingham:** Samples were histopathologically confirmed as definite AD, or as control using CERAD. Patients with evidence of an autosomal dominant AD trait, or with a first degree relative diagnosed with familial AD, were excluded.

**Queen’s University, Belfast:** Diagnosis was based on DSM IV and NINCDS ADRDA, as assessed by 2 clinicians. MMSE control scores were > 28/30, all participants (cases/controls) were age > 65.

**Centro de Biología Molecular Severo Ochoa (CSIC-UAM):** AD patients were clinically diagnosed based on NINCDS-ADRDA, or DSM-IV criteria. Controls were assessed using the MMSE.

**Universitari Mutua de Terrassa, Barcelona:** Patients were assessed with the MMSE and diagnosed according to the NINCDS-ADRDA, 10% of controls also underwent MMSE.

**Sant Pau, Universitat Autònoma de Barcelona:** The clinical cohort underwent formal cognitive evaluation using a battery of comprehensive neuropsychological tests by specialized Memory Unit neurologists at Sant Pau Hospital (Barcelona). AD was diagnosed according to NINDS-ADRDA.  Controls were > 60 years of age and had undergone neuropsychological evaluation.

**Saarland University:** Patients underwent clinical and neuropsychological examination, including the CERAD-NP test battery, the MMSE, and a CDR rating. Further exams included physical and neurological examination and an MRI. Diagnoses were according to the NINCDS-ADRDA criteria. Cases had age of onset > 60 years. Participants with diagnoses other than AD were excluded.

**University of Halle, Germany:** Cases fulfilled NINCDS-ADRDA criteria of probable AD. Cognitive testing was according to MMSE, CERAD, multiple choice vocabulary test, and a variant of the trail making test. Controls were randomly selected from Munich area population registers. Participants underwent extensive screening, including SCID, to exclude those with neuropsychiatric disorders and those who had first degree relatives with neuropsychiatric disorders. **University of Bonn:** AD patients were from a large German cohort (n=1,079) recruited from three sources (the German Dementia Competence Network (DCN, n=391); the German study on Aging, Cognition, and Dementia in primary care patients (AgeCoDe, n=64); and the interdisciplinary Memory Clinic at the University Hospital of Bonn (n=624)). All AD dementia patients fulfilled NINCDS/ADRDA criteria for probable AD. Controls were selected from healthy elderly individuals within the AgeCoDe cohort and assessed using SIDAM to exclude dementia or mild cognitive impairment.

**Brigham Young University and Utah State University:** Case-control status was determined using a multi-stage assessment protocol. The Modified Mini-Mental State Exam-Revised (3MS-R) was administered. A subsample of positive individuals completed an informant interview and a clinical assessment including neuropsychological testing, an MRI scan and a geropsychiatrist examination. Diagnoses of AD followed NINCDS-ADRDA criteria for possible or probable AD. Controls were those diagnosed with no dementia or whose cognitive test result was negative. Persons with incomplete screening or missing genotype data or aged < 65 were excluded.

**Washington University:** Samples were collected at the Charles F. and Joanne Knight Alzheimer’s Disease Research Center (Knight-ADRC), Washington University before evaluation by the Knight-ADRC Clinical Core. Cases received a clinical diagnosis of AD dementia in accordance with standard criteria. Dementia severity was determined with the Clinical Dementia Rating (CDR). Controls underwent the same assessment but were cognitively normal.

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