gna
Grupo de Neurociencias de Antioquia

UNIVERSIDAD DE ANTIOQUIA
Facultad de Medicina

GNA RESEARCH

CAPABILITIES SUMMARY

We research to learn, teach, and provide care

1. ABOUT THE **GROUP**

Over **30 years** of experience in research on neurodegenerative diseases.

One of the **271 research groups at the University of Antioquia**—a prestigious institution with more than **200 years of history.**

Recognized by the Ministry of Science in the highest category (A1), COL Code 0010744, the Group operates across three facilities in Medellín. **More than 100 professionals contribute from fields including health sciences, social and human sciences, exact and natural sciences, engineering, economics, administration, and related areas.**

Our **Mission**

We conduct basic and clinical research to learn, teach, and provide care. **We promote brain and mental health to improve the quality of life for individuals living with neurological conditions, caregivers, families, and broader communities.** Our services include prevention, diagnosis, treatment, and rehabilitation for neurodegenerative diseases, neurodevelopmental disorders, and brain-related conditions.

Our **Vision**

By 2030, GNA aims to establish "Villa Aliria"—a scientific and care-centered organization with international reach. It will focus on promoting brain and mental health, and on preventing and treating neurodegenerative and neurodevelopmental conditions through education, basic and clinical research, translational approaches, and personalized medicine.

Research Line

Structure, Function, and Alterations of the Nervous System throughout the Lifespan.

GrupLAC

Research Areas

- Clinical Neuroscience
- Neurogenetics
- Neurobiobank
- Neurodegeneration, Neurochemistry & Molecular Biology
- Cellular & Molecular Neurobiology
- Cellular Neurophysiology

2. STRATEGIC **FOCUS**

1
Strengthen and expand a trusting relationship between the Group's professionals and participants, families, caregivers, and key stakeholders in social interventions and research projects—basic, clinical, and translational—by providing comprehensive and ethical support through training activities aimed at achieving shared goals

2
Identify causal and modifier genes to propose preventive therapies for neurodegenerative diseases

3
Design, develop, and validate prognostic, diagnostic, and therapeutic strategies (pharmacological and non-pharmacological) for primary prevention

4
Collect brain tissue, biological samples, imaging data, and omics diagnostics under high quality standards to strengthen clinical and basic research into neurodegenerative diseases

5
Develop in vitro and in vivo models to test molecules as potential treatments for neurodegenerative conditions

3. STRATEGIC ALLIANCES

DIAN
(Dominantly Inherited Alzheimer Network)

RedLAT
(Multicenter consortium to expand research on dementia in Latin America)

Enroll - HD

Banner Alzheimer's Institute

LATAM FINGERS
(The Finnish Geriatric Intervention Study to Prevent Cognitive Impairment and Disability – Latinoamérica)

LARGE PD
(The Latin American Research consortium on the Genetics of Parkinson's Disease)

KOSIK – LAB UCSB

4. THEMATIC AREAS OF INTEREST

NEUROCLINICS

David Fernando
Aguillón Niño

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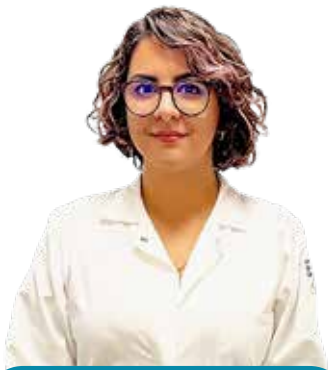
- Early detection and prevention of neurodegenerative diseases
- Memory, behavior, and movement disorders
- Neurodegenerative diseases: Alzheimer's disease, Huntington's disease, FTD (Frontotemporal Dementia), CADASIL, Parkinson's disease, ataxias, dystonias, other parkinsonian syndromes, and other neurodegenerative diseases of genetic or sporadic origin
- Neurodevelopmental and learning disorders
- Language and speech-specific conditions

NEUROGENETICS



Juliana
Acosta Uribe

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- Alzheimer's disease and hereditary dementias
- Genetically based movement disorders
- Neurometabolic disorders and other monogenic conditions
- Neurodevelopmental and cognitive disorders
- Common neurological conditions with genetic susceptibility (e.g. migraine, epilepsy)
- Population genetics, ancestry, and risk factors (ApoE); identification of resistance or resilience variants against neurodegenerative pathology

NEUROBANKING

Carlos Andrés
Villegas Lanau

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- Hereditary and sporadic Alzheimer's disease
- Dementias
- Wilson's disease
- Parkinson's disease
- Huntington's disease
- Learning disorders
- CADASIL
- Language disorders
- Attention Deficit Hyperactivity Disorder (ADHD) linked to language challenges
- Healthy controls

NEUROBIOLOGY

Gloria Patricia
Cardona Gómez

Contact:
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- Pharmacological, cellular, and gene therapies
- Proposal and development of early biomarkers, prognostic indicators, and diagnostic tools for neurodegeneration
- Neuroprotection and neurodegenerative mechanisms
- Design and development of primary prevention treatments

NEUROPHYSIOLOGY

Rafael
Posada Duque

Contact:
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- Organoids as disease models for neurodegeneration
- Vascular resistance and protection in AD and CADASIL
- Development of synthetic molecules for treating neurodegenerative diseases
- Neurobiology of birdsong

NEUROCHEMISTRY

Carlos
Vélez Pardo

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Miguel Ángel
Mendivil Pérez

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- Cellular and molecular mechanisms of neurodegeneration, neuroprotection, and therapeutic strategies (both pharmacological and non-pharmacological)
- Genetic and molecular factors associated with oxidative stress
- Cancer, neuro-oncology, and nervous system interactions
- Psychoneurobiology, molecular biomarkers, and neurological care

5. ACADEMIC DEGREES AND QUALIFICATION

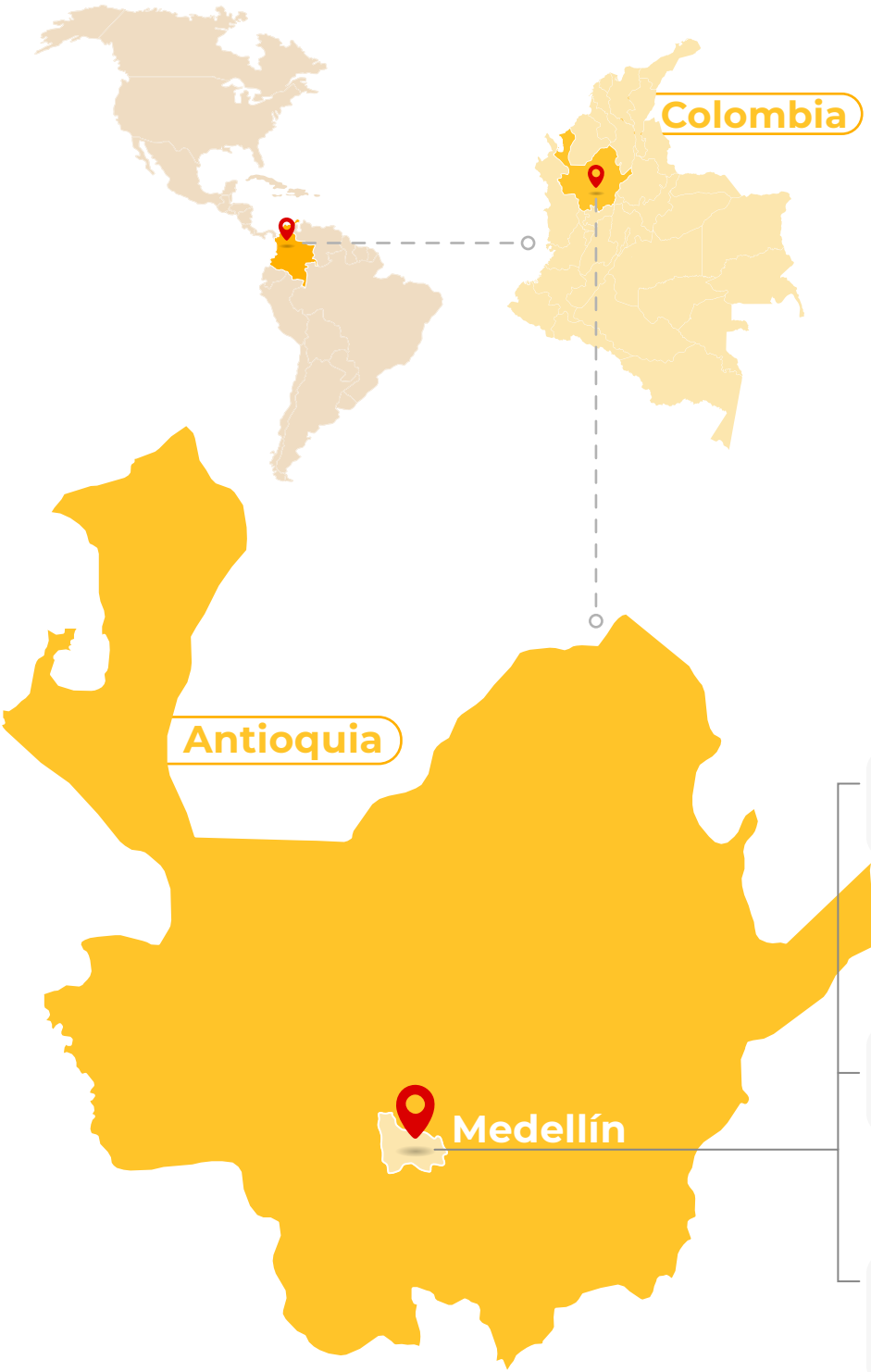
- PhD in Biomedical Sciences
- Neuroscience emphasis
- PhD in Biology
- PhD in Clinical Sciences

- Master's in Biomedical Sciences
- Neuroscience emphasis
- Master's in Biology
- Master's in Neuroengineering

- **Medical Specializations**
  - Neurology
  - Psychiatry

- **Undergraduate Programs**
  - Academic internships in psychology
  - Biology
  - Medicine
  - Nursing
  - Microbiology
  - Bioengineering
  - Veterinary Medicine

6. INFRASTRUCTURE



The Neuroscience Group carries out its activities across

3 locations

that collectively occupy approximately **2,318 square meters**

Sede de Investigación Universitaria (SIU)

Hospital Alma Máter

Instituto de Biología UdeA
Cellular Neurophysiology Laboratory

FACILITIES AND EQUIPMENT	QUANTITY	CAPACITY
Workstations	**109**	Six offices and 103 cubicles
Medical consultation rooms	**12**	80 hours of evaluations daily
Neuropsychological consultation rooms	**9**	90 hours of evaluations daily
Basic Sciences Laboratory	**1**	One laboratory area, One workstation area
Clinical laboratories	**2**	25 samples
Medium-complexity pharmacy	**1**	Capacity to prepare medication every 30 minutes*
Mixing center	**1**	20 to 40 daily preparations
Animal facility (Bioterium)	**1**	SPF and conventional: animal models including rats, mice, and flies
Biobank	**1**	Brain tissue samples, serum samples, plasma samples, DNA samples, brain tissue photographs, MRI, CT scans

7. SPECIALIZED CARE SERVICES

SPECIALIZED CARE SERVICES FOR NEURODEGENERATIVE DISEASES

- Anesthesiology
- Pain Management and Palliative Care
- Nursing
- Genetics
- Geriatrics
- Physical and Sports Medicine
- General Medicine
- Internal Medicine
- Neurology
- Psychology
- Psychiatry
- Pediatric Endocrinology
- Clinical Laboratory
- Clinical Laboratory Sample Collection
- Pharmaceutical Services
- Speech Therapy and/or Language Therapy

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CELLULAR NEUROPHYSIOLOGY

- Microscopy services, including confocal imaging and tissue scanner processing and analysis

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RESEARCH SERVICES

CELLULAR AND MOLECULAR NEUROBIOLOGY

- Early protein biomarkers
- Animal facility (bioterium)
- Cerebral ischemia model in rats
- Surgical procedures in animal models and post-operative monitoring
- Neurological and behavioral assessment (learning, memory, motor and emotional evaluation)
- Equipment loan services (e.g., Odyssey system, fluorescence microscopy)
- Primary cell cultures, in vitro and in vivo preclinical assays for neurodegeneration and neuroprotection

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NEURODEGENERATIVE DISEASES, NEUROCHEMISTRY, AND MOLECULAR BIOLOGY

- Identification of Mycoplasma spp. in CME cultures
- In vitro cellular differentiation toward the mesodermal lineage (CME)
- Identification service for neuronal lineage markers, adhering to established research laboratory best practice standards

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8. COMMUNITY TRAINING AND SUPPORT

The GNA's Social and Mental Health Plan supports research project participants, their families, caregivers, and the broader community through assistance, training, education, the creation and coordination of social support networks, and a free-access virtual training and education center focused on neurodegenerative diseases: **CUIDARME – CUIDARTE** (Caring for Myself – Caring for You).

Workshops

- Care for people with neurodegenerative diseases
- "Care for the Caregiver" – certified by the School of Medicine
- Cognitive stimulation
- Painting
- Regional dance
- Neurotango
- Narrative writing
- Children, adolescents, and youth from rural and urban areas

Care Support

- Interdisciplinary home visit accompaniment

Mental Health

- Psychiatric and psychological care
- Educational film forums
- Family psychotherapy
- Recreational and memory-based activities
- Individual counseling sessions

Contact: **neurosocial@gna.org.co**

9. BIOBANK

The Biobank specializes in the collection, study, processing, storage, and distribution of human biological samples and their derivatives, as well as the acquisition of clinical information and associated data. Our operations are technically structured in accordance with national and international quality standards. Our mission is to advance biomedical research in the field of Neurosciences and contribute to the well-being of the broader community.

Our **Biobank** currently houses **five collections**

Neurobank

+600
brain tissue samples

Serum and plasma bank

+38,000
serum samples

+45,000
plasma samples

Genomics collection

+39,000
DNA samples

Diagnostic resources

+300
diagnostic reports

Imaging collection

+16,000
medical images

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ALIGNMENT WITH SUSTAINABLE DEVELOPMENT GOALS (SDGs)

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OECD Classification
Field
Medical and Health Sciences

Subfield
Clinical Medicine

Website
www.gna.org.co

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