Short Biosketch Endocrinology Group Hospital la Princesa (Madrid)

Department Overview

Our Department of Endocrinology at Hospital Universitario de La Princesa (Madrid, Spain) combines clinical excellence (lead by Dr. Marazuela) with state-of-the-art translational and basic research (lead by Dr. Martínez Hernández). The group's work is centred on the study of endocrine diseases with special focus on autoimmune thyroid disorders (AITD), thyroid eye disease (TED), pituitary adenomas, neuroendocrine tumors, and diabetes mellitus. Applicants joining our team will have the opportunity to participate in both clinical research and laboratory-based projects, integrating patient care with molecular and cellular immunology, biomarker discovery, and translational medicine.

Clinical and Laboratory Opportunities

1. Autoimmune Thyroid Disorders (AITD)

Our group has described profound immune alterations in patients with AITD, including:

Altered regulatory T cell (Treg) populations, increased Th17 cells, reduced Tr1 cells, and abnormal NK cell subsets. These discoveries have been published in Endocrine (2016), J Clin Endocrinol Metab (2017, 2018, 2020), and J Endocrinol Invest (2024). Also, molecular studies describing the role of HDAC9 on immune regulation and the EMT process in AITD (J Clin Endocrinol Metab. 2021 Oct 21;106(11):3213-3227, Int J Mol Sci. 2023 Feb 8;24(4):3359. doi: 10.3390/ijms24043359), with recent identification of novel thyrocyte subpopulations and vascular signatures in these disorders (EBioMedicine. 2019 Dec;50:329-34; Nature Communications, 2024).

Research opportunities for applicants include: Flow cytometry and immunophenotyping of cell populations. Analysis of exosomes and microvesicles as modulators of immune response. Molecular studies of miRNA and mRNA expression (bioinformatics pipelines, integration analyses). Characterization of tissue samples using spatial transcriptomics and tissue microarrays.

Clinical work: Applicants will join endocrinologists in patient care of AITD, gaining experience in the management of AITD. Involvement in processing of patient samples (serum, PBMCs, thyroid tissue). Participation in translational projects with multidisciplinary teams (Immunology, Rheumatology, Dermatology, and National an d International collaborations).

2. Thyroid Eye Disease (TED)

TED (thyroid eye disease or Graves' ophthalmopathy) is a major research and clinical focus. Our team coordinates a multicenter project across eight hospitals. The project aims to identify biomarkers and predictors of disease activity and severity.

Research techniques and opportunities: Access to a large cohort of well-characterized TED patients. Clinical assessment of ocular manifestations (ophthalmological examination, imaging).

Laboratory work: cytokine profiling, immune cell characterization, biomarker analysis from patient samples, primary cell cultures.

4. Pituitary Tumors

The group leads the Spanish Molecular Registry of Pituitary Adenomas (REMAH), including more than 1,400 patients. Ongoing participation in the ACROMICS Project (ISCIII-PMP program), a national effort in personalized medicine for pituitary tumors. Recently, we identified a novel diagnostic marker for pituitary tumors, protected under a European patent (EP22382079).

Opportunities for applicants: Clinical participation in the diagnosis and management of pituitary adenomas (acromegaly, prolactinomas, Cushing's disease). Molecular analyses of pituitary tumor samples. Collaboration with national bioinformatics platforms (IMPaCT-Data).

3. Neuroendocrine Tumors (NETs)

Our research has shown that immune checkpoints and metabolic pathways are relevant in NET progression: PD-1 expression in gastroenteropancreatic NETs (associated with malignancy). Overexpression of LAT-1 and GLUT-1 transporters linked to tumor proliferation and metastasis. Body composition changes as prognostic markers of survival (Cancers, 2020, 2022).

Opportunities for applicants: Immunohistochemical and molecular studies of NET samples. Clinical data analysis of NET cohorts. Research in nutritional management and its prognostic impact in oncology.

5. Diabetes and Nutritional Disorders

Our research extends to diabetes mellitus, integrating clinical management with advanced technologies: Personalization of type 1 diabetes care using continuous glucose monitoring. Studies on acute complications (e.g., diabetic ketoacidosis). Diabetes induced by oncological therapies (e.g., alpelisib). Use of big data to investigate socioeconomic and environmental influences (BMC Med. 2024, PMID: 38273326; Endocr Pract. 2024 Apr;30(4):372-379.PMID: 38307457; Acta Diabetol. 2024 Mar;61(3):343-350. PMID: 37930420; Endocrinol Diabetes Nutr (Engl Ed). 2023 Oct;70(8):548-555.PMID: 37858412).

Opportunities for applicants: Participation in outpatient clinics with advanced diabetes technology. Involvement in clinical trials for diabetes management. Data science projects: integration of glucose metrics, environmental and social determinants of health. Translational and Collaborative Network

Our department maintains an extensive network of collaborations, including: CNIO (Dr. Mercedes Robledo and Dr. Fátima Al-Shahrour),. CNIC (Dr. Fátima Sánchez Cabo,): bioinformatics and transcriptomic integration. Spanish national and international consortia in pituitary tumors: Dr. Manel Puig (Germans Trias i Pujol Research, Barcelona), Dr. Ignacio Bernabeu and Dra Clara Alvarez from Santiago de Compostela (Health Research Institute of Santiago de Compostela,), Dr. Antonio Picó from Alicante (Health and Biomedical Research Institute of Alicante), Dr. Elias Delgado from Asturias (Health Research Institute of the Principality of Asturias), among others.

This network ensures that applicants will benefit from a multidisciplinary and translational training environment, with opportunities for presentations at scientific meetings, authorship in peer-reviewed publications, and participation in international collaborations.

Summary

Applicants joining our department will gain comprehensive clinical and laboratory training in endocrine diseases. The main areas of participation include:

- Immune dysregulation in autoimmune thyroid disease (cellular immunology, transcriptomics, biomarkers).
- Thyroid eye disease (clinical ophthalmological assessment, biomarker studies).
- Neuroendocrine tumors (tumor immunology, metabolism, nutrition and prognosis).
- Pituitary adenomas (molecular registry, personalized medicine, novel biomarkers).
- Diabetes and nutrition (digital health, big data, individualized management).

This unique setting allows applicants to experience a truly translational approach, from patient care to cutting-edge laboratory and bioinformatics analyses, strengthening their skills as clinician-scientists in endocrinology.

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