

Worldwide influence



Dystel prize winner is the driving force behind a renowned center dedicated to MS research, treatment and education.

by Vicky Uhland

When Xavier Montalban, MD, PhD, began his career as a neurologist in the 1980s, multiple sclerosis was virtually unknown in his home country of Spain. Most of his colleagues didn't know how to diagnose the disease, and there were no research resources to help them. MS medications didn't exist, and treatment was mostly limited to rehabilitation.



**Xavier Montalban,
MD, PhD**

Today, Spain is home to one of the world's foremost facilities dedicated to MS research, treatment and education: the Multiple Sclerosis Center of Catalonia (CEMCAT) at Vall d'Hebron University Hospital in Barcelona.

Montalban is the driving force behind CEMCAT. He envisioned and developed the center and serves as its director. His early research into treatments for MS, along with a database of MS patients he began building three decades ago, helped establish a fundamental understanding of the disease process and made the case for a state-of-the-art facility.

"By singlehandedly inspiring colleagues, and especially trainees, he has transformed Barcelona into a global epicenter for MS care and neuroimmunology," says Stephen Hauser, MD, director of the University of California, San Francisco Weill Institute for Neurosciences.

But Montalban's influence extends well beyond Spain's borders. Colleagues credit him with paradigm-shifting contributions that have made MS diagnosis and treatment more achievable and available throughout the world.

This far-reaching influence is why Montalban is the 2022 recipient of the John Dystel Prize for MS Research, which is awarded by the National Multiple Sclerosis Society and the American Academy of Neurology. The annual prize recognizes researchers who produce significant work designed to change the way we think about MS.

"Professor Montalban's contributions to understanding MS, improving its diagnosis and testing groundbreaking therapies have been incredibly important for people living with multiple sclerosis," says Bruce Bebo, PhD, executive vice president of research programs at the National MS Society. "For his global leadership and the impacts of his work, he is well deserving of the Dystel Prize."

A world of credentials

Montalban's resume is so extensive that it spans 125 pages and has its own table of contents.

Along with his position as director of CEMCAT, Montalban is the chair of the department of neurology at Vall d'Hebron University Hospital, chief of the neuroimmunology research group at Vall d'Hebron Research Institute and a professor of neurology at Universitat Autònoma de Barcelona and Universitat de Vic in Barcelona.



CEMCAT's neurorehabilitation center features a gym and areas for cognitive and speech therapy.

From 2017 to 2020, Montalban was a professor of medicine and director of the Division of Neurology at the University of Toronto, and director of the MS Center at the university's St. Michael's Hospital. He's also the past president of the European Committee for Treatment and Research in Multiple Sclerosis and a fellow of the European Academy of Neurology, the American Academy of Neurology and the Canadian Academy of Health Sciences.

Along the way, Montalban has published more than 700 scientific articles — ranking him among the top 10 authors of MS research in peer-reviewed journals over the last 40 years.

But what Montalban's impressive resume doesn't cover is how his career began. When he was growing up in Barcelona, he wanted to be a biologist, but his older brother thought he should become a doctor instead. Montalban took his brother's advice, earning his MD degree from Universitat Autònoma de Barcelona in 1982.



CEMCAT offers courses to help people with MS manage their symptoms.

He focused on neurology because he thought it was a challenging field, but his inner-child biologist was also drawn to research. After his residency and fellowship at Vall d'Hebron hospital, Montalban moved to London in 1989 to work on research projects at the St. Thomas Hospital Lupus Research Unit.

This was unconventional for several reasons. At the time, Spanish neurologists didn't tend to combine research with clinical training, and they didn't often study abroad. But it was during his time in England that Montalban encountered his first MS case.

While studying antibodies produced in people who had strokes, Montalban came across a patient who had a high level of antibodies due to MS rather than a stroke.

"I realized how difficult and impacting MS could be, and decided to steer my professional life to it," he says.

An early look at MS

Montalban returned to Spain and earned a PhD from the Universitat Autònoma de Barcelona in 1990. Soon after, he established a laboratory at the Vall d'Hebron hospital dedicated to MS research. He also launched the first clinic in the country devoted solely to MS patients, although it was a small undertaking — open only half a day on Thursdays and a full day on Fridays.

Montalban's early research focused on collecting clinical, imaging and biological data from people in the early stages of MS. Today, this database is one of the oldest and largest repositories of information on people with MS in the world.



Participants engage in art therapy at CEMCAT.

“More than 30 years ago, we clearly understood the relevance and value of studying prognostic cohorts of patients with very early MS and started to follow our patients very carefully who presented with first episodes suggestive of MS (today known as CIS — clinically isolated syndrome),” he says.

This data has helped advance researchers’ and clinicians’ fundamental understanding of the MS disease process, especially in the earliest stages.

It also helped inform Montalban and his team’s subsequent research, which falls into five categories:

- Designing and conducting clinical trials on medications for primary progressive MS. He was the lead author of the study on ocrelizumab (Ocrevus) — the first U.S. Food and Drug Administration-approved therapy for people with PPMS.
- Establishing diagnostic standards for MS, including the McDonald Diagnostic Criteria, which have made diagnosing the disease faster and more precise.
- Creating a criterion called the Rio Score for establishing how well MS drugs work on individual people.
- Establishing biomarkers and digital assessment tools for diagnosing and treating MS, including a clinical trial called RADAR-CNS that analyzed how wearable devices and smartphone technology improve quality of life for people with MS.
- Leading the panel that developed guidelines for treatment of MS throughout the European Union.

“We humbly believe that our research has contributed significantly in the building of the diagnostic criteria we are using today, the identification of a number of prognostic factors and the way we modify treatments in a given patient because of inefficacy,” Montalban says. “In this light, our work has made solid contributions to improved and more precise personalized medicine in people with MS.”

And Montalban has accomplished most of this in a country not known for MS research.

The Dystel Prize

The John Dystel Prize for MS Research honors John Jay Dystel, a promising young attorney who died of complications of multiple sclerosis in June 2003.

Dystel’s parents, Oscar and Marion Dystel, established the John Dystel Multiple Sclerosis Research Fund at the National MS Society in 1994 to recognize outstanding research contributions that improve the understanding, treatment or prevention of MS.

Dystel Prize winners have conducted groundbreaking research on topics like myelin loss and regeneration, the role of the immune system in MS diagnosis and treatment, and the genetic factors behind MS. All winners receive \$40,000 to be used at their discretion and give a presentation at the American Academy of Neurology's annual meeting.

"In my personal opinion, Professor Montalban's achievements are even more impressive when one considers that government, industry and philanthropic support for medical research in Spain is a fraction of that available in the U.S. and other western nations," says Sergio Baranzini, PhD, professor of neurology at UCSF.

"Always a pleasure to work with"

Letters from colleagues around the world recommending Montalban for the Dystel Prize cite his commitment to excellence and dedication to solving the mystery of MS. They also mention his inspirational role in mentoring MS researchers and clinicians around the world.

CEMCAT, which opened in 2012, hosts classes, internships and other training for more than 300 healthcare professionals a year. In particular, it has advanced the understanding of MS throughout Latin America, the Middle East and north Africa.

Montalban's colleagues say that, among other things, his collaborative, empathetic and friendly nature has been key in creating and sustaining this international MS community.

In a profile published in *Lancet* in 2012, Hans-Peter Hartung, professor and chairman of neurology at Heinrich-Heine-University in Germany, described Montalban as "a gentleman, with a delicate sense of humor, always a pleasure to work with."

Other colleagues note how Montalban always looks relaxed — even though he doesn't sleep much. "I get up at 5 a.m. At first, I used to go straight to the hospital, but the security staff thought I had no family," he told *Lancet*. "Now, I have coffee at home, check some emails, read the main news on my iPad, and get to the hospital by 7 to 7:30 a.m."

Montalban's collaborative philosophy is key to CEMCAT's multi- and interdisciplinary approach. The center has a staff of more than 70 healthcare workers, researchers and other professionals. The researchers are currently conducting more than 20 clinical trials on everything from immunology and epigenetics to MS biomarkers and medications. The clinicians treat more than 5,000 people with MS.

"In our center, the patient is not only at the center of all processes but is also at the table making decisions around disease problems," Montalban says.

Peering into the future

Much of Montalban's current research is focused on the genetic aspect of MS and how that

will impact future treatment of the disease.

“MS has two components: inflammation and de-generation. We have very powerful weapons to control the former, but still do not know how to avoid the neurodegenerative processes that ultimately will cause severe disability to most patients,” he told Lancet. “We do not know what the underlying mechanism is and how to avoid its effects with neuroregenerative and neuroprotective drugs. Solving this problem is our main challenge ahead.”

Vicky Uhland is a writer and editor in Lafayette, Colorado.