

THE BIOMARKERS' EXPERT NEUROLOGIST AS A NEW SPECIALIST PROFILE: A JOINT PROJECT OF THE UNIVERSITY OF PERUGIA AND PERUGIA GENERAL HOSPITAL

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OBJECTIVES

The use of cerebrospinal fluid (CSF) and plasma biomarkers has transformed the diagnostic landscape of neurodegenerative and neuroimmunological diseases. Over the past decade, diagnosis has shifted from a syndromic approach, based on clinical signs and symptoms, to a biological one, grounded in objective changes in biomarkers. While syndromic diagnosis typically identifies disease only when symptoms are overt, biological diagnosis enables earlier detection, even when manifestations are subtle. This results in more timely and accurate diagnoses. The rapid evolution of this field, driven by scientific advances and emerging therapies, has highlighted the need for specialized expertise. Current practice is limited by variability in interpretation, inadequate integration into clinical workflows, and weak coordination between laboratories and clinicians. To address this, we proposed a new specialist profile: the biomarkers expert neurologist, capable of bridging diagnostic innovation and clinical application.

MATERIALS AND METHODS

We present a pilot joint project, launched in March 2025 by the University of Perugia and Perugia General Hospital, aimed at establishing the figure of a biomarkers' expert neurologist. This figure is embedded in both the Clinical Neurochemistry Laboratory and the Neurology Unit and operates in four key areas: (1) consultation and interpretation of biomarker profiles, supporting clinicians at intrahospital and regional levels through structured interdepartmental and intercenter networks; (2) coordination of advanced laboratory services and participation in national/international quality control programs; (3) integration of a biorepository for long-term sample storage and second-opinion services; (4) delivery of ECM-accredited training on biomarker-based diagnostics.

RESULTS

Since the implementation of the project in March 2025, requests for CSF/plasma biomarkers for neurodegenerative diseases and for autoantibody panels in autoimmune encephalitis have markedly increased from external sources (non-neurology departments and community/territory). Comparing March–May 2024 (pre-project) with the same period in 2025 (post-project), internal requests remained stable (78 vs. 64), while external requests more than doubled (31 vs. 63; +103%) (Figure 1). In parallel, the expert neurologist has supported complex diagnostic pathways and become a reference point for regional consultations. Educational initiatives have engaged multiple clinicians and promoted broader use of advanced neurochemical tools.

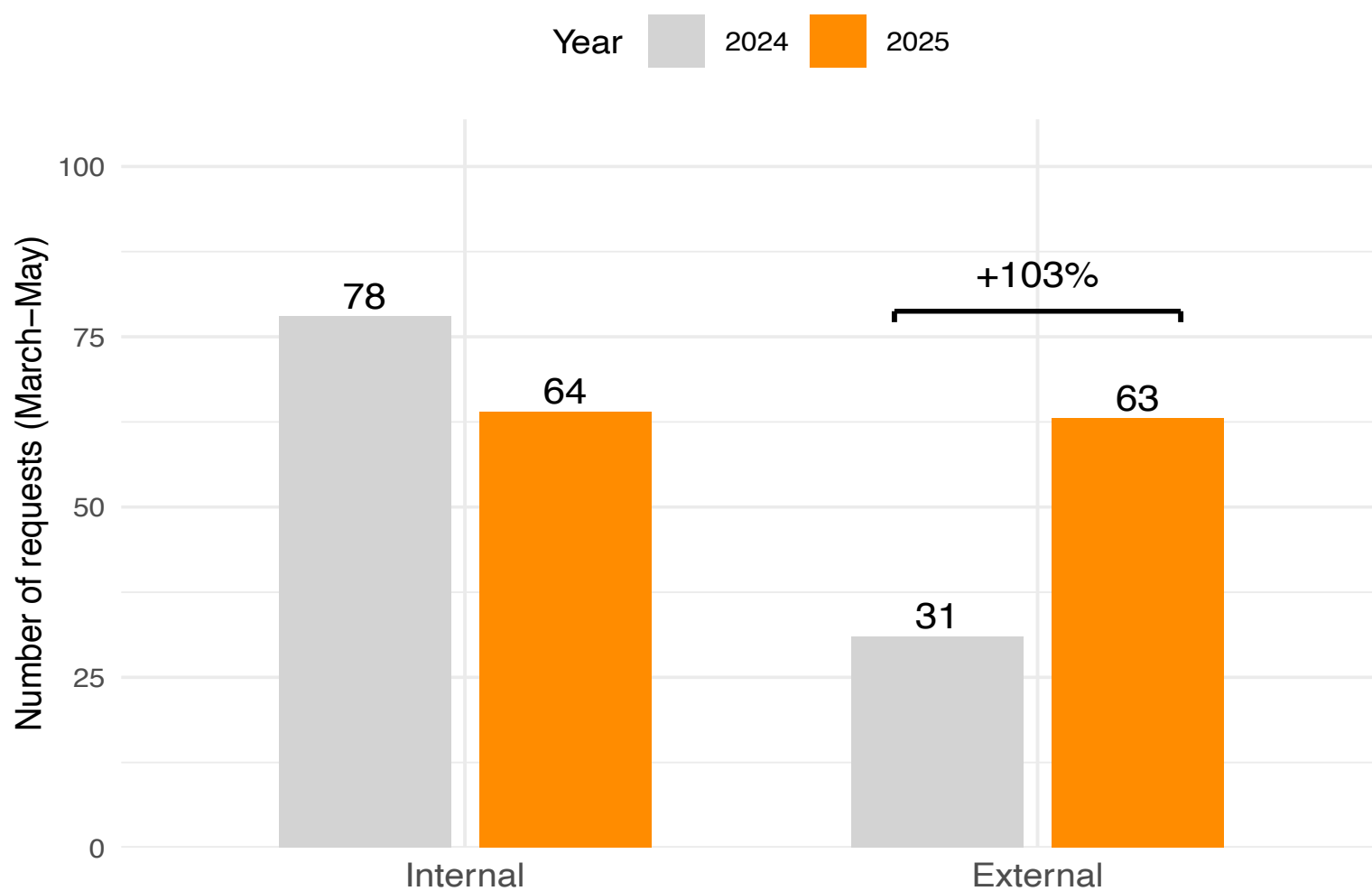


Figure 1. Comparison of biomarker test requests from the Neurology Department (Internal) versus non-neurology departments and community / territory (External) between March and May in 2024 and 2025. Internal requests remained stable, whereas external requests more than doubled following the introduction of the biomarkers expert neurologist.

DISCUSSION AND CONCLUSIONS

The observed trend highlights the pivotal role of the biomarkers expert neurologist in expanding collaboration with non-neurology hospital departments and regional healthcare providers. As biomarker-based diagnostics become central for neurodegenerative and neuroinflammatory diseases, there is an urgent need for professionals skilled in laboratory-clinical integration. In this context, a pivotal role is played by the neurologist expert in biomarkers, as the specialist guaranteeing the interaction and integration of clinical and biological diagnostic route.



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