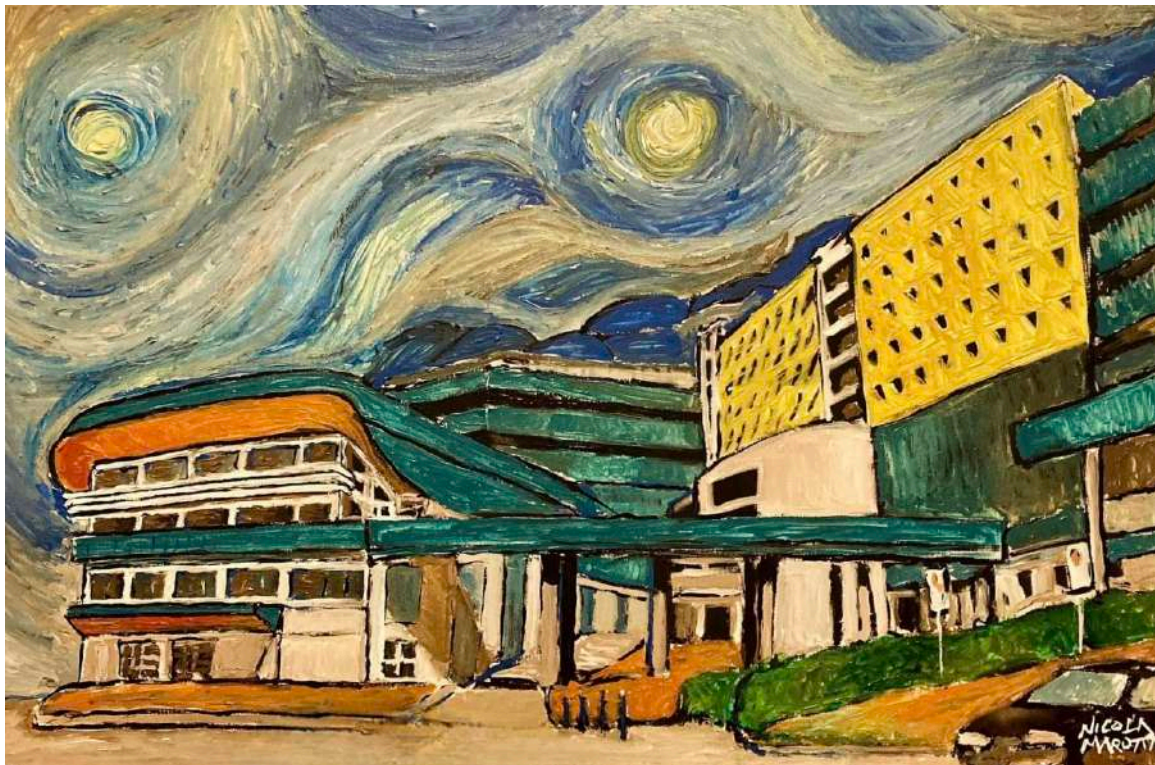


DMSC

DEPARTMENT OF EXPERIMENTAL AND CLINICAL MEDICINE



MAGAZINE

Promoting Research, Sharing Innovation

A space to highlight the scientific excellence of the Department of Experimental and Clinical Medicine and to showcase its research activities nationally and internationally

World Hearing Day 2026: raising awareness today to protect tomorrow

At the Magna Graecia University of Catanzaro, Prof. Giuseppe Chiarella contributed to promoting the prevention of hearing disorders and a new culture of hearing protection.

On March 3, 2026, on the occasion of the II Hearing Awareness Day, an important initiative dedicated to the promotion of hearing health was held throughout the country, in line with World Hearing Day established by the World Health Organization. This year's edition focused on a highly topical issue: the need to raise awareness of ear and hearing care in primary care. Hearing loss is now a major health and social issue. As highlighted by Prof. Giuseppe Chiarella, Professor of Audiology and Phoniatics at the Magna Graecia University of Catanzaro and President of the Italian Society of Otolaryngology and Hearing Sciences (SIOSU), hearing problems affect about 12.1% of Italians, equal to about 7 million people, with an incidence that increases significantly with age, up to involving 50% of the over 80s.

In this scenario, early diagnosis plays a decisive role. Early detection of hearing deficits and ear disorders makes it possible to intervene before the consequences become more serious, reducing the risk of social isolation, cognitive impairment and worsening quality of life. According to Prof. Chiarella, more than 60% of hearing problems can be identified and addressed already at the level of primary care, thanks to a more effective integration between specialist medicine and local care.

There are numerous factors that can compromise hearing health over the course of life: certain drugs, viral infections, acoustic trauma and prolonged exposure to noise. Today, noise is no longer considered just an element of environmental disturbance, but a real health and economic risk factor. Furthermore, untreated hearing loss also has a significant impact on a global level, with costs estimated at 980 billion dollars per year between health costs, educational support, loss of productivity and social costs.

The Magna Graecia University of Catanzaro actively participated in World Hearing Day, thanks to the contribution of Prof. Chiarella, who was present at the event held at the Chamber of Deputies. During the meeting, central issues for the present and future of prevention were addressed: noise as a health and economic risk factor, the protection of the new generations, the evolution of acoustic legislation and the growing role of digital tools in monitoring and prevention.

Particular attention was paid to the noise risk in Italy. Prof. Chiarella highlighted how in recent years the regulatory and cultural approach to the problem has radically changed: today hearing protection passes through integrated and digitized systems, also oriented towards the European objectives of reducing pollution. Among the most significant innovations are the adoption of software for controlling the sound dose in personal listening devices, real-time monitoring in entertainment venues, the promotion of correct behavior among young people and the updating of the rules on construction and safety at work.

Emblematic, in this sense, is the "60-60" principle, also promoted in schools: do not exceed 60% of the volume for more than 60 consecutive minutes. It is a simple but effective rule, which especially calls on the new generations to use headphones, earphones and personal devices more consciously. At the same time, the new regulations aim to make noise pollution control stricter even in urban, work and recreational contexts.

Hearing health, therefore, does not only concern the clinical sphere, but involves fundamental aspects of daily life: communication, social relationships, psychological well-being, learning and full participation in community life. For this reason, as emerged during the day, education, prevention, technology and regulatory protection must proceed together.



Exosomal Export of Iron-Rich Ferritin: A Novel Mechanism of Ferroptosis Resistance in Ovarian Cancer

In tumor biology, ferroptosis, a regulated cell death pathway driven by the accumulation of toxic iron and lipid peroxidation, is considered a promising therapeutic target. However, many tumors, including ovarian cancer, develop resistance mechanisms that limit the effectiveness of ferroptosis-based strategies.

The study conducted by Dr. Anna Martina Battaglia, published in 2025 in *Frontiers in Cell and Developmental Biology*, addresses this challenge. The research, supervised by Prof. Flavia Biamonte and carried out at the Laboratory of Biochemistry and Cell Biology of the Università Magna Graecia di Catanzaro, identified an alternative mechanism of intracellular iron regulation: the export of ferritin through CD63-positive exosomes. Rather than simply storing iron or limiting its uptake, some tumor cells actively expel iron-rich ferritin, thereby lowering intracellular iron levels and reducing their susceptibility to ferroptosis induction.



Cell Biology Research Group coordinated by Prof. Flavia Biamonte

The hypothesis that ferritin could be exported via exosomes was verified through a structured experimental approach. Exosome isolation and characterization were performed at the Laboratory of System Oncology of the Fundação Champalimaud, where both Dr. Battaglia and Prof. Biamonte com-

pleted training periods focused on advanced exosome-analysis methodologies.

Techniques such as density-gradient ultracentrifugation, Nanoparticle Tracking Analysis, and profiling of exosomal markers (including CD63) enabled the identification of ferritin as a consistent component of the vesicular cargo.

Subsequent functional analyses conducted at UMG linked this finding to the regulation of ferroptosis. Specifically: i) inhibition of CD63 expression reduced ferritin export; ii) reduced export resulted in increased intracellular labile iron; iii) higher intracellular iron levels led to enhanced sensitivity to ferroptosis, assessed through the use of specific inducers (such as RSL3), lipid peroxidation assays, and cell viability measurements.

These results outline a functional model in which exosomal ferritin contributes to the fine-tuning of intracellular iron homeostasis.

This mechanism adds a non-canonical layer to the regulation of iron balance and opens several avenues for future research: evaluating exosomal ferritin as a potential biomarker of resistance; developing selective inhibitors of the exosomal/endo-lysosomal trafficking machinery; testing combined therapeutic approaches involving ferroptosis inducers and modulation of vesicular pathways; investigating whether similar mechanisms operate in other solid tumors.

Assignment of the "Guido Tarone" Under 35 Award to Dr. Anna Martina Battaglia during the XXIII Congress of the Italian Association of Biology and Genetics, held in Chieti on 18-20 September 2025.

The research was presented and selected for the Guido Tarone Under 35 Award at the XXIII Congress of the Associazione Italiana di Biologia e Genetica, held in Chieti on 18-20 September 2025. During the dedicated session of AIBG 2025, the jury evaluated two shortlisted presentations: Dr. Battaglia's and one from another early-career researcher at the University of Calabria. The award was ultimately granted to Dr. Battaglia. The selection committee recognized the study on exosomal ferritin as the most relevant based on: scientific impact, methodological rigor, clarity of presentation, and the overall quality of the researcher's curriculum.

This acknowledgment reflects the scientific community's interest in new models of ferroptosis resistance and the potential therapeutic implications for ovarian cancer research.



Anna Martina Battaglia

Clues from the immune system: what the analysis of TCR β receptors reveals in COVID-19 patients

Understanding how the immune system reacts to SARS-CoV-2 infection is one of the most relevant scientific challenges of recent years. In this context, the work of Dr. Ilenia Aversa, a young researcher at the Department of Experimental and Clinical Medicine, who has contributed to clarifying a crucial aspect of the cellular immune response, fits in. Her contribution has flowed into a scientific chapter written collectively by the participants in the Young Scientists SIBioC congress, an initiative dedicated to young professionals in Laboratory Medicine. The work was published in the journal *Clinical Biochemistry* in the article entitled "Young Scientists: the engine of Laboratory Medicine".

Within the volume, Dr. Aversa is the author of the paragraph "Characteristics of the Spike-specific TCR β repertoire in SARS-CoV-2 patients", included in the chapter "Markers and new frontiers of the laboratory of the future". The paper summarizes the results of a study focused on the analysis of the repertoire of T cell receptors (TCR β) specific for the virus Spike protein.



Clinical Biochemistry and Clinical Molecular Biology research group coordinated by Prof. Camillo Palmieri

The study involved both vaccinated and unvaccinated COVID-19 patients. Thanks to the use of high-resolution sequencing technologies and advanced bioinformatics approaches, it was possible to characterize in detail the diversity and clonality of the T-cell immune response, evaluating its amplitude and heterogeneity in different individuals.

In particular, the analysis highlighted how specific characteristics of the TCR β repertoire can assume a potential prognostic value, helping to distinguish patients with a mild clinical course from subjects with a compromised immune response or with a less favorable prognosis. These results strengthen the role of TCR repertoire analysis as an innovative tool in the Laboratory Medicine of the future, with possible applications in risk stratification, precision medicine and in the study of antiviral immune responses.

The scientific quality of the work and the clarity of the presentation were also recognized at the congress. Following the presentation of the results, Dr. Ilenia Aversa received an award for oral communication, testifying to the impact and originality of her contribution within the community of young clinical biochemists.

This recognition confirms the value of SIBioC Young Scientists as a driver of innovation in Laboratory Medicine and underlines the central role of new generations of researchers in the development of increasingly integrated, advanced and patient-oriented diagnostic approaches.

Quality of life in IBD subjects: psychological and geographical determinants

In 2025, the SSD MEDS-24/C research group, led by Prof. Doldo and Prof. Simeone, contributed significantly to the advancement of knowledge on Chronic Inflammatory Bowel Diseases (IBD) by publishing important scientific contributions in international journals with a high Impact Factor for the reference sector. The scientific work, "Sexual Health in Women with Inflammatory Bowel Disease: A Narrative Review", analyzed in depth the impact of IBD on female sexual health, highlighting the role of physical, psychological and relational factors [1]. At the same time, the qualitative phenomenological study "The Lived Experience of Adults With Inflammatory Bowel Disease in Rural Areas" explored the experience of patients living in rural areas, highlighting how distance, economic costs and social isolation influence the treatment pathway [2].

IBD, which includes Crohn's disease and ulcerative colitis, is a complex chronic condition, characterized by a fluctuating course with exacerbations and remissions [3,4]. Their incidence and prevalence are steadily increasing globally, with important clinical, psychological, social and economic repercussions [5-7].

In 2025, the research group began exploring two complementary areas of study, falling within the global area of Perceived Quality of Life in IBD subjects:

sexual health in women with IBD, an area that is still little addressed but central to quality of life;
the experience of patients with IBD residing in rural areas, a context in which access to health services is often limited.

These two perspectives contribute to an integrated understanding of the patient experience and the factors that influence their quality of life. It is important to underline that these studies are part of a path of continuity with part of the work published by the research group in 2024, with the active participation of Dr. Mercuri Caterina and Dr. Bosco Vincenzo, where it was shown that nursing counseling interventions via telephone and e-mail were able to significantly improve the quality of life of patients with IBD, with measurable reductions in anxiety (-28%), depression (-34%), fatigue (-22%) and an 18% increase in sleep quality [8]. 2025 therefore expands this trend, including new dimensions such as sexuality, emotional experiences and territorial barriers.

Narrative Review on Sexual Health in Women with IBD

The narrative review analyzed 15 studies selected from five international databases. The aim was to synthesize the evidence on the impact of IBD on female sexuality, including physical, psychological, relational and cultural aspects. The literature was categorized into five thematic areas:

1. Physical and clinical factors;
2. Psychological factors;
3. Subjective perceptions and experiences;
4. Social and relational conditions;
5. Strategies and interventions.

Phenomenological Study of IBD Patients Residing in Rural Areas

The second research, conducted according to Cohen's hermeneutic approach, included 17 in-depth interviews with patients living in rural Italian areas. The thematic analysis identified two macro-themes:

The challenges of rural life, which includes experiences of isolation, distance and economic costs;

Communication that bridges distances, i.e. the role of the therapeutic relationship and telemedicine as an element of connection and support.



Sexual health in women with IBD

The review showed a prevalence of sexual dysfunction between 53% and 75%, with higher values in phases of disease activity (+22% compared to remission) [9,10]. Physical symptoms, such as abdominal pain, diarrhea, evacuative urgency and chronic fatigue, represent significant barriers to intimacy [10].

Psychological factors are equally relevant: anxiety present in 58-70% of women with IBD [9]; depression in 35-48% [11];

Up to 6 times increased risk of sexual dysfunction in women with depressive symptoms [9].

Body image plays a significant role:

up to 62% of women report shame or perception of a "damaged" body [11,12];

In women with an ostomy, up to 66% report significant sexual difficulties [13].

Relational aspects emerge as determinants: 72% of women report difficulties in talking about sexuality with their partner [14], while less than 20% of professionals address the topic during visits [11]. Effective interventions include multidisciplinary pathways, psychological support, sex education and pelvic floor rehabilitation.

Experience of Rural Patients With IBD

The phenomenological analysis highlighted how living in rural areas represents a dimension deeply intertwined with the experience of IBD. Participants describe a "beautiful but distant" landscape, in which places that once evoked serenity become a source of anxiety due to the distance from specialist centers.

The theme "Challenges in rural life" includes:

distance from hospitals (on average 70-120 km), which generates fear of not reaching assistance in a timely manner;

high economic costs: 100% of respondents report significant expenses for travel and lost working days;

social isolation: perceived by about 65% of participants;

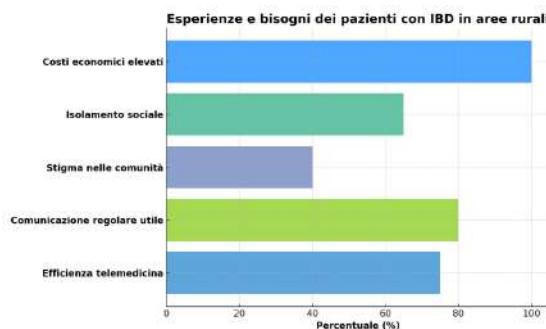
stigma and misunderstanding of the disease in small communities (about 40% of patients mention it explicitly).

The theme "Communication that bridges distances" instead emphasizes the value of the clinical relationship as a source of safety and continuity:

more than 80% of participants consider regular communication with the treating team as an element of emotional stability;

Telemedicine is perceived as useful or very useful in 75% of cases.

These results are perfectly consistent with the 2024 evidence, which already showed that communication continuity and remote nursing interventions were able to improve various indicators of psychological well-being.



The two studies, while addressing different aspects of IBD, converge in showing how the disease profoundly affects patients' daily lives, far beyond clinical symptoms. Sexual health and rural experience often highlight dimensions that are invisible but fundamental for quality of life: psychological vulnerability, relational fragility, geographical barriers and inequalities of access [15,16]. The integrated approach that emerged from the two researches reinforces the need for personalized care models, which include: strengthening of telemedicine and local services;

training of professionals on sensitive issues such as sexuality, stigma and quality of life, enhancing in particular nursing skills in counseling and therapeutic communication.

"The results that emerged from our research highlight the need for a broader and more sensitive model of IBD care, capable of maintaining clinical balance and quality of life"

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From preoperative assessment to follow-up: an integrated approach in cardiac surgery

Modern cardiac surgery is increasingly confronted with complex patients, characterized by advanced age, multiple comorbidities and heterogeneous risk profiles. In this context, the development of integrated and personalized strategies takes on a central role, capable of accompanying the patient along the entire course of care, from the preoperative phase to follow-up.

Starting from June 2025, the research group coordinated by Prof. Giuseppe Santarpino has focused its activity on different areas of cardiac surgery patient management, with the common goal of optimizing the perioperative pathway, evaluating clinical outcomes and contributing to the development of increasingly personalized therapeutic strategies. The activity carried out was divided into several complementary lines of research, which addressed different aspects of the cardiac surgery pathway, from the preoperative phase to medium-long term management.



Part of the research group coordinated by Prof. Santarpino involved in the various projects in cardiac surgery.

This approach was developed within a multidisciplinary team, including figures such as doctor, nutritionist and psychologist and allows for the early identification of fragile conditions and modifiable risk factors, promoting better preparation for surgery and more effective postoperative recovery.

A first area of interest concerned the optimization of the patient's clinical conditions before cardiac surgery. In this context, the concept of pre-habilitation is inserted, aimed at improving the functional and nutritional status of patients who are candidates for elective cardiac surgery, through a multidimensional assessment.

Another line of research concerned the validation of innovative technologies in the respiratory field. In this context, the PREVENT (A new portable device for PRE-hospital non-invasive VENTilatory support in acute respiratory failure) project, a multicenter study funded under the PNRR, aimed at evaluating a new portable CPAP device for non-invasive ventilatory support in pre-hospital scenarios of acute respiratory failure, with the aim of anticipating therapeutic intervention outside the hospital environment.

As part of the research activities on heart valves, the research group has been participating for several years and continues to actively contribute to the MANTRA study (Corcym Mitral, Aortic aNd Tricuspid post-market Study in a reAl-world setting), a prospective and multicenter post-market study in real-world, aimed at monitoring the safety and performance of aortic, mitral and tricuspid valve devices used in clinical practice, through the collection of clinical and echocardiographic data in follow-up.

A national GIROC-SICCH survey was also carried out on the choice between biological and mechanical valve prostheses in patients under the age of 65, focused on identifying the degree of information of patients, the reasons for the prosthetic choice and the perception of quality of life. The results confirmed the centrality of a shared decision-making process in cardiac surgery practice and the importance of patient awareness.

As part of the management of anticoagulant therapy, the group participates in the LIMIT (Low INR to Minimize bleeding with mechanical valves Trial) study, an international randomized trial aimed at evaluating the safety and efficacy of a lower INR target in patients with mechanical valve prostheses in the aortic position. The study aims to verify whether a reduced INR range can minimize the risk of bleeding while maintaining an unchanged thromboembolic risk, thus contributing to a more balanced management of anticoagulant therapy in the long term.

A research activity was then launched in collaboration with the CNR Nanotec of Lecce, dedicated to the study of epicardial adipose tissue, with the aim of investigating its pathogenetic and prognostic role in cardiovascular diseases. In particular, the analysis focuses on the interactions between adipose tissue, endothelial function and ischemic risk through the study of fat samples taken during cardiac surgery. Overall, the activities carried out have contributed to consolidating a more articulated approach to the management of cardiac surgery patients, highlighting the value of the integration between clinical practice, applied research and organization of care pathways. Furthermore, the research activities described have already given rise to scientific contributions and further submitted work currently under evaluation. Future prospects include the expansion of research activities in multicenter contexts, the consolidation of the pre-habilitation pathway and the improvement of anticoagulant therapy management strategies. In addition, a study is being carried out to explore the possible correlation between warfarin therapy and male infertility, which represents a coherent evolution of the research lines already active on the management of anticoagulant therapy and aims to deepen an area that has so far been explored only in the pre-clinical phase.



Part of the research group during the scientific conference dedicated to clinical research activities in cardiac surgery.

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