



**Ministero della Salute – Direzione Generale della Ricerca e dell’Innovazione in Sanità**

**Rendiconto 5 per mille ANNO 2023**

**Contributo percepito € 2.058.872,63 In data 2 ottobre 2024**

**Ente della Ricerca Sanitaria**

**Denominazione Ente: Fondazione Italiana Sclerosi Multipla ETS**

**Codice fiscale: 95051730109**

**Sede legale: Via Operai, 40 - 16149 Genova**

**Indirizzo di posta elettronica dell'ente: fism@pec.aism.it**

**Dati del rappresentante legale: Mario Alberto Battaglia, CF**

**BTTMLB54T29D969Z Domiciliato per la carica presso la sede legale di cui sopra**

**Titolo del progetto: Blue Space Therapy: Exploring the Effects of Outdoor Water Sports on Fatigue, Sleep, and Neural Correlates in Multiple Sclerosis**

<b>Data di inizio progetto: 01/11/2025</b>	<b>Data di fine progetto: 31/10/2027</b>
<b>Fondi 5 per mille assegnati al progetto: € 63.000,00</b>	<b>Di cui:</b> <b>Quota sostenuta entro l’anno di rendicontazione: € .....</b> <b>Quota accantonata, da sostenere, per progetti pluriennali (durata massima tre anni): € 63.000,00</b>

<b>VOCI DI SPESA</b>	<b>Quota sostenuta entro l'anno di rendicontazione</b>	<b>Quota accantonata, da sostenere, per progetti pluriennali (durata massima tre anni)</b>
Personale di ricerca (borsista, a contratto e di ruolo in quota parte)		€ 60.000,00
Apparecchiature (ammortamento, canone di locazione/leasing)		
Materiale d'uso destinato alla ricerca (per laboratori di ricerca, acquisto farmaci ecc.)		
Spese di organizzazione (manifestazioni e convegni, viaggi e missioni ecc.)		
Elaborazione dati		
Spese amministrative		€ 3.000,00
Altro (indicare quali)		
<b>TOTALE</b>		<b>€ 63.000,00</b>

Data

15 luglio 2025

Il Responsabile del Progetto

Il Legale Rappresentante



Si autorizza al trattamento dei dati ai sensi del d.lgs. 196/2003

Il Legale Rappresentante



# **Blue Space Therapy: Exploring the Effects of Outdoor Water Sports on Fatigue, Sleep, and Neural Correlates in Multiple Sclerosis**

Fatigue is a pervasive and debilitating symptom in multiple sclerosis (MS), affecting individuals across all disease phenotypes and stages. Its multifactorial nature, involving diverse pathophysiological mechanisms and neurological adaptations, complicates its management. While fatigue reflects state-level perceptions of tiredness and low energy, fatigability represents a trait-level reduction in work capacity during physical or cognitive tasks. Addressing both components is critical to developing effective interventions.

Previous researches investigated the neural correlates of fatigue and fatigability and the effects of individual rehabilitative and exercise interventions in reducing these symptoms in people with MS (pwMS). However, emerging evidence highlights the benefits of every-day physical activity (PA) in modulating systemic chronic inflammation (SCI), promoting immune system restoration, and mitigating fatigue. Outdoor water-based activities, in particular, have shown promise in improving physical and psychological well-being, cognitive function, and sleep quality in various populations, including those with neurodegenerative diseases.

This project aims to evaluate the effects of a novel outdoor group-based sport program combining bodyweight exercises with stand-up paddle boarding (SUP) or kayaking on fatigue and fatigability in pwMS. Secondary outcomes include sleep quality, psychosocial indicators, and neurophysiological measures, including brain connectivity assessed via functional Magnetic Resonance Imaging (fMRI) or functional Near Infrared Spectroscopy (fNIRS). Additionally, central motor drive during fatiguing tasks will be investigated using paradigms involving Transcranial Magnetic Stimulation (TMS).

The program leverages the therapeutic potential of blue spaces, with water-based activities tailored to accommodate different levels of disability. Kayaking offers a safer option for individuals with significant balance impairments or lower-limb weakness, while SUP targets individuals with mild to moderate impairments, aiming to enhance core stability and motor function.

By integrating rehabilitation, exercise, and nature-based interventions, this study seeks to explore the potential of outdoor water sports in reducing the burden of fatigue, improving sleep and mental health, and enhancing neural connectivity in pwMS. The findings will inform innovative, scalable strategies for managing symptoms and promoting quality of life in individuals with neurodegenerative diseases.