

## **Public Abstract: A Translational Observational Biorepository and Management Study In Patients with Leptomeningeal Metastasis - The BIOLEPT Study**

### **Summary:**

Leptomeningeal metastasis (or LMD) is when cancer spreads to the surface and the fluid around the brain and spinal cord. It is a devastating complication that disproportionately impacts patients with breast cancer. LMD is extremely challenging to diagnose and treat. Our research aims to tackle these challenges by developing a quick and precise diagnostic process and individualized treatment planning using including state-of-the-art tests and new multidisciplinary approaches. The approach consists of two primary goals:

#### **1. Enhancing Diagnosis and Monitoring:**

Cancer cells often shed fragments of DNA into body fluids like blood and cerebrospinal fluid (CSF), which can be detected. This "free-floating" DNA holds the potential to reveal the presence and characteristics of cancer. Our study proposes to use these DNA fragments, along with MR imaging and other techniques, to quickly detect LMD. This advanced method aims to be more sensitive and accurate than the current standard approaches while also enabling individualized therapy planning.

#### **2. Rapid, Personalized Treatment:**

By employing a team of specialists from various backgrounds, known as a Molecular Tumor Board, we intend to create personalized treatment plans. These plans will be based on each patient's unique cancer profile and the latest scientific data on how to best target these. The goal is to start personalized therapy within just two weeks from the initial diagnosis.

### **Study Design**

The research includes patients over 18 years old with a history of breast cancer and suspected or confirmed LMD and is as inclusive as possible regarding functional status. The study involves several tests, including MRI scans and blood and CSF draws, followed by treatment recommendations from a specialized board. The key time frames are:

- **Less than 7 days:** Complete initial examination and discuss treatment options.
- **Less than 14 days:** Begin treatment.

Subsequently, patients will be followed clinically and via remotely filled questionnaires, to better understand how treatment interventions impact their quality-of-life and survival.

### **Why Is This Important?**

Breast cancer spreading to the fluid around brain's surface can lead to severe neurologic symptoms that often lead to the demise patients. Slow diagnosis, and lack of standard treatment for this form of disease has been a major barrier of advances in the management of this disease. Fast and accurate diagnosis, followed by swift initiation of individualized targeted therapy could improve both the quality of life and survival with this condition. This research strives to make this streamlined process a reality, offering new hope to those affected by this devastating condition.

### **Conclusion**

Our study offers an innovative, as-inclusive-as-possible study to test how new diagnostic and treatment planning approaches may help overcome the present challenges impacting patients with breast cancer LMD. The results of this research aim to improve clinical practice and provide biobanking and accelerate breast cancer LMD research and clinical trial development. The study's results may benefit patients with LMD from other cancers in the future as well.