

DATA ANALYSIS

PATIENT INFO:

Exam ID: 0000000

Name: Alex_test2

DOB: 19900101

Automated Report:

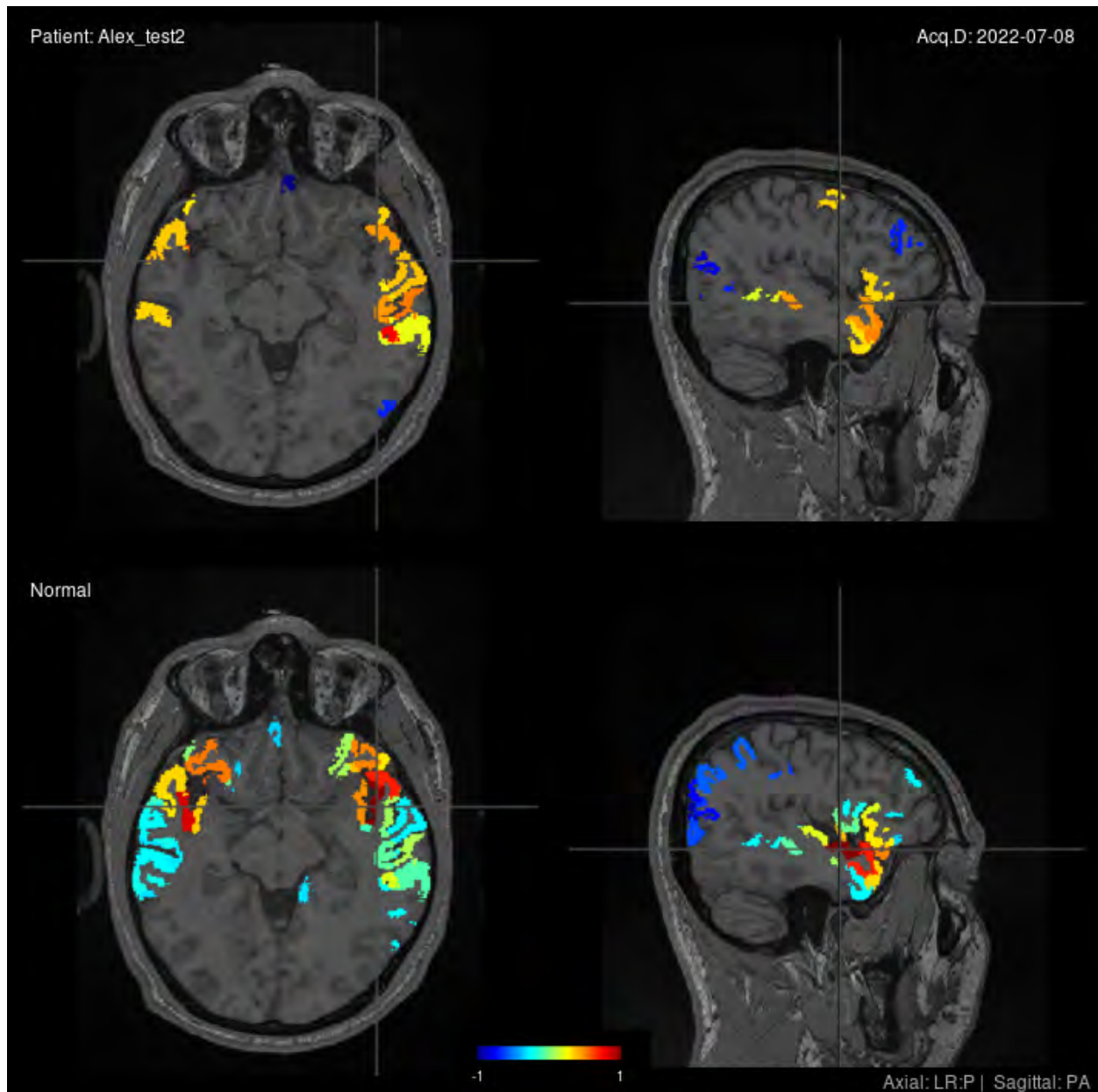
This is an automated report summarizing the results obtained using the GraphICA[®] software to analyze resting state fMRI data on this patient. The data was analyzed for eleven resting state networks as follows: Auditory Network, Default Mode Network, Executive Control Network Left, Executive Control Network Right, Hippocampal Network, Language Network, Salience network, Sensorimotor Network, Visual Lateral Network, Visual Medial Network and the Visual Occipital Network. See APPENDIX I for a description of the role and function of these networks.

This report was created on July 28, 2022.

Result:

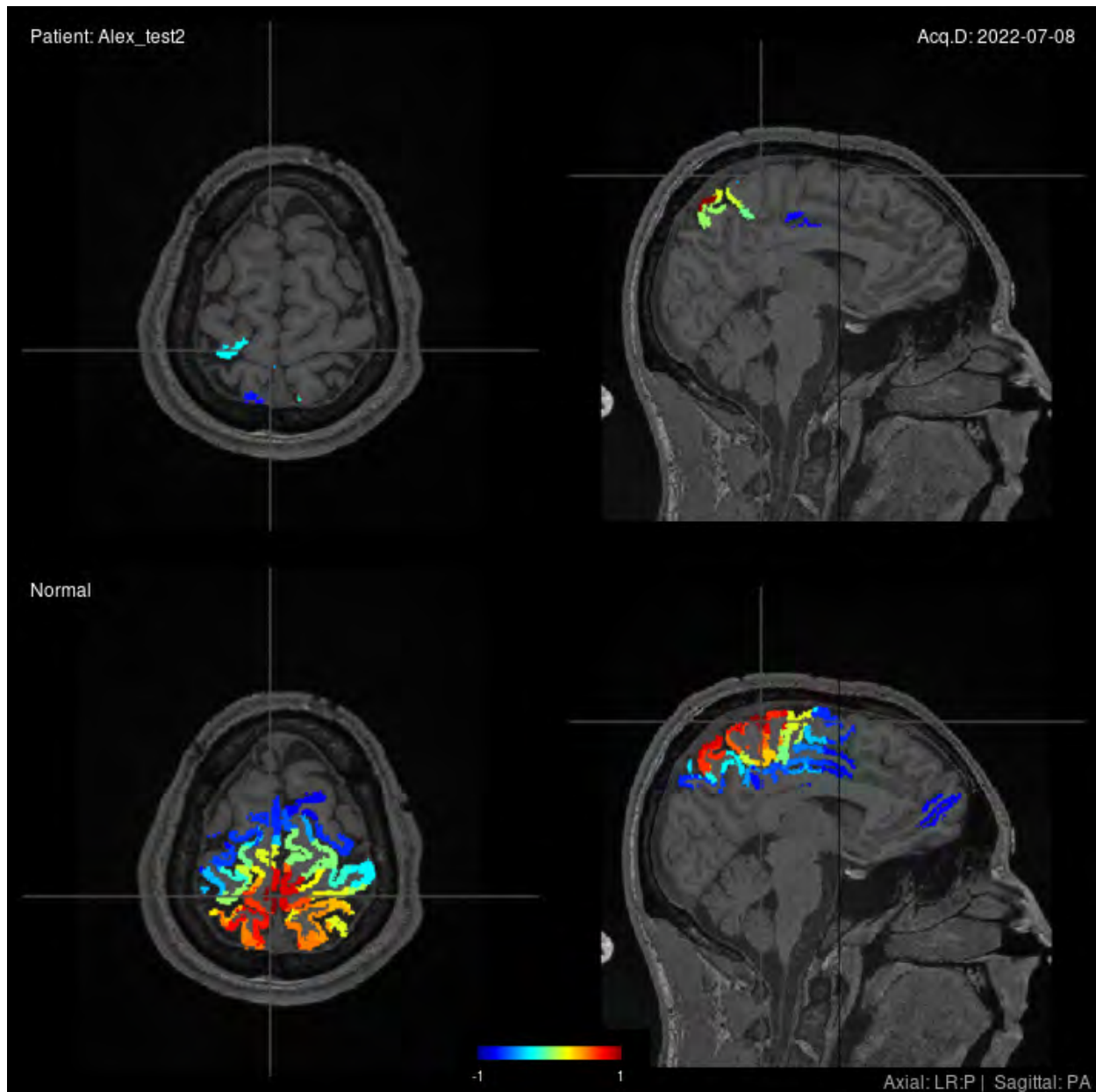
From the network analysis, Salience Network (Salience), Sensorimotor Network (SN) networks **are significantly different** from the normal group. All other networks were within normal limits.

A comparison of the neural activity of these networks are illustrated in the attached graphics.

Resting State fMRI of Saliience Network (Saliience): Patient: Alex_test2 and Normals.

The coloured regions depict a brain network where there are synchronized functional connections among the neurons. Within the dark red or the dark blue regions, neural activity is strongly correlated. In addition, activity in the dark red regions is negatively correlated with activity in the dark blue regions, meaning that when the red regions are active, the blue regions are not active and vice versa. The other colours represent regions that are more weakly correlated but still part of the network.

The Saliience network is significantly different (p.value = 0.0288) with respect to normal.

Resting State fMRI of Sensorimotor Network (SN): Patient: Alex_test2 and Normals.

The coloured regions depict a brain network where there are synchronized functional connections among the neurons. Within the dark red or the dark blue regions, neural activity is strongly correlated. In addition, activity in the dark red regions is negatively correlated with activity in the dark blue regions, meaning that when the red regions are active, the blue regions are not active and vice versa. The other colours represent regions that are more weakly correlated but still part of the network.

The Sensorimotor network is significantly different (p.value = 0.0473) with respect to normal.

APPENDIX I

RESTING STATE BRAIN NETWORKS

The **Auditory Network (Auditory)** is symmetrically represented in both brain hemispheres (a left-right symmetrical network). It consists of regions involved in hearing. It encompasses the primary auditory cortex responsible for the sensation of basic characteristics of sound such as pitch and rhythm, and the secondary auditory cortex, important for speech perception.

The **Default Mode Network (DMN)** is a left-right symmetrical network. It consists of regions most commonly active when a person is not focused on the outside world and the brain is at wakeful rest, such as during daydreaming, mind-wandering and envisioning past or future events. The network activates “by default” when a person is not involved in a task. The DMN has been shown to be negatively correlated with other networks in the brain, such that when the DMN is active, the other networks are inactive, and vice versa.

The **Executive Control Network Left (ECN_L)** is a network of regions including the left frontal-parietal brain areas, which are generally involved in tasks that rely on paying attention, as well as control processes and working memory. The ECNL is primarily involved in cognitive and language paradigms.

The **Executive Control Network Right (ECN_R)** is a network of regions including the right hemisphere frontal-parietal areas, which are generally involved in tasks relying on executive functions, such as control processes and working memory. The ECNR relates to perceptual, somesthetic (touch and position) and nociceptive (pain) processing.

The **Hippocampal Network (Hippocampal)** is left-right symmetrical network that encompasses the hippocampus and amygdala, parts of the limbic system. It plays important roles in the consolidation of information from short-term memory to long-term memory, and in spatial memory that enables navigation.

The **Language Network (Language)** consists of regions encompassing the Broca and Wernicke areas and is responsible for speech and language comprehension.

The **Salience Network (Salience)** is a left-right symmetrical network encompassing the anterior insula and dorsal anterior cingulate cortex. It is involved in detecting and filtering emotionally important and relevant stimuli as well as alerting.

The **Sensorimotor Network (SN)** is a left-right symmetrical network encompassing the somatosensory (post-central gyrus) and motor (pre-central gyrus) areas that are activated during motor tasks.

The **Visual Lateral Network (Visual_lateral)** is left-right symmetrical network encompassing the middle temporal visual association area and is most important in processing complex(emotional) stimuli. It also is involved in spatial navigation.

The **Visual Medial Network (Visual_medial)** is left-right symmetrical network encompassing medial regions important in simple visual stimuli (e.g. a flickering checkerboard).

The **Visual Occipital Network (Visual_occipital)** is a left-right symmetrical network of occipital regions that is important in processing higher-order visual stimuli (e.g. orthography).