**FUNCTIONAL MRI**

Functional magnetic resonance imaging (fMRI) measures the metabolic changes that occur within the brain. It may be used to examine the brain’s anatomy, determine which parts of the brain are handling critical functions, evaluate the effects of stroke or disease, or guide brain treatment. fMRI may detect abnormalities within the brain and works by detecting the changes in blood oxygenation and flow that occur in response to neural activity – when a brain area is more active it consumes more oxygen and to meet this increased demand blood flow increases to the active area. [1]

**BENNETT-SALMON-THEORY CONTROVERSY**

Bennett used a dead Salmon Fish for fMRI scanning and while experimenting he showed it a series of photographs depicting human behavior in some conditions. [2] After the fMRI scan, it looked like the fish was thinking about the pictures it had been shown. These pictures were in form of pixels, called voxels, or volume picture elements. fMRI scans provide brain slices that is reconstructed in 3D. He also scanned salmon’s brain without showing it the pictures. The images were then checked for change between the brain doing picture recognition tasks, and the brain at rest, voxel by voxel. He found several active voxel clusters in the dead salmon’s brain. He argues that these results can be easily be derived using statistical methods. This argument is based on the fact that when values are less than the critical value, the outcome has to be wrong but if any hypothesis is made and a significant result is generated, then the hypothesis may be correct only by chance. He stresses on multiple comparisons correction method just to make sure that the arrived result is definitely true or not. This could have sparked a controversy as some investigators used the statistical methods on spurious signals in the dead salmon’s brain and got the result using False Discovery Rate and Familywise Error Rate which he termed as False Positive. [3] He also derived a relationship between signal in voxel and its variability by establishing the Pearson Correlationship to justify his poster.

**EPI AS RELATED TO MRI AQUISITION**

EPI is a method to form a complete image from a single data sample. Echo-planar imaging (EPI) is capable of significantly shortening magnetic resonance (MR) imaging times. The time resolution is very accurate to remove motion-related artifacts. [4] It is used in the application like diffusion, perfusion and functional magnetic resonance imaging. Echo-planar imaging is vulnerable to magnetic susceptibility effects and it provides greater tissue contrast and therefore echo-planar imagings are used extensively in cerebral perfusion. Echo planar imaging (EPI) is an MRI technique of particular value to neuroscience, with its use for virtually all functional MRI (fMRI) and diffusion imaging of fiber connections in the human brain. EPI generates a single 2D image in a fraction of a second but requires some time to acquire multi-slice whole brain coverage for fMRI and even longer for diffusion imaging.

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