# Technology to study the brain[i] - 30/04/2018

The brain is a complex and sophisticated organ made by a lot of layers and  
billions of cells that is able to study itself. It is not simple, but today,  
scientists have three main ways to investigate a live brain safely, which is,  
not being harmful to someone and thus they try to relate our behavior with  
brain areas.  
  
   
  
The first method is electroencephalography (EGG), which was invented 100 years  
ago and it measures electrical waves that happen when the brain cells  
communicate with each other. It provides us information to identify precisely  
when electric signals occur during activities like learning or paying  
attention and registering them in just milliseconds and from that we can  
extract patterns to study diseases such as epilepsy.  
  
   
  
fMRI (functional magnetic resonant images), the second way to analyze how the  
brains work, is a technique to measure how quickly oxygen is consumed by brain  
cells showing which regions are involved during a cognitive or behavior  
activity. With these images we can determine where exactly some activities  
take place in our brain, even though there are hundreds of them occurring. So,  
neuroscientists can combine these two types of monitors to know when and where  
a neuro activity is occurring to better understand the brain function in a  
total.  
  
   
  
The third and even more accurate is PET, the positron emission tomography, a  
completely safe way too. Using PET, doctors inject a radio element into the  
blood that allows the observation of some drugs behavior acting in our brain.  
The tracer can bind to some specific molecules and follow the treatment of  
diseases like Alzheimer.  
  
   
  
With these three techniques working together researches can discover many  
things. For example, they can study our memory comparing the results of a game  
played by a number of people monitored during the activities. However, in a  
near future more techniques will come bringing more image and elements that  
will allow us connect the brain regions and the association of many other  
processes in execution simultaneously or even isolate individual nerves to  
understand better and better this complex system.  
  
   
  
   
  
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[i] TED education: <https://youtu.be/B10pc0Kizsc?t=1>