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BIOMAGNETIC TECHNOLOGIES AND SCRIPPS CLINIC
SIGN AGREEMENT FOR 37-CHANNEL BIOMAGNETOMETER

LA JOLLA, CA April 13, 1990 -- Biomagnetic Technologies, Inc., San Diego, and Scripps Clinic and Research Foundation, La Jolla, have signed an 18-month research collaboration agreement for Scripps Clinic to conduct the first worldwide clinical research using a powerful new device which non-invasively measures brain and heart function.

The device, a 37-channel 700 Series Biomagnetometer manufactured by Biomagnetic Technologies, Inc. (BTi), will have the ability to detect and rapidly measure the weak magnetic signals produced by electrical activity in the brain and heart.

These magnetic fields, which pinpoint the sources and time sequence of electrical activity, may prove to be an important factor in diagnosing and possibly treating a variety of disorders such as epilepsy, stroke, Alzheimer's disease, and addictive behaviors.

"Scripps Clinic is pleased to be the first institution chosen by BTi to use this powerful state-of-the art device," noted Charles C. Edwards, M.D., president and chief executive officer. "This new generation of technology promises faster and more precise diagnoses in many clinical areas."
Under the direction of Floyd Bloom, M.D., chairman of the Scripps Clinic Department of Neuropharmacology, the research at Scripps Clinic will focus on brain function.

In addition, clinicians worldwide will be invited to participate by having selected patients tested with the biomagnetometer. This usage will be managed by a joint committee of BTi and Scripps Clinic personnel.

BTi will begin installation at Scripps Clinic the week of April 16.

"Scripps Clinic is the perfect choice for this program," said BTi president and chief executive officer Stephen O. James. "BTi has the opportunity to benefit from a strong clinical site where patients can be examined in a safe environment."

In the fall, BTi plans to install two additional 37-channel biomagnetometers, one in West Germany and one in Japan.

"The first applications at Scripps Clinic will be in epilepsy and stroke," Bloom noted. "Down the road we hope to look at Alzheimer's Disease, then addictive behaviors."

An example of an application is the evaluation of patients for epilepsy surgery. Some epileptics whose seizures cannot be managed by medication choose to have a portion of their brain surgically removed. The biomagnetometer should be able to pinpoint the location of brain tissue that causes seizures so that healthy brain tissue is saved.

Founded in 1970, BTi developed its first biomagnetometer device in 1975 -- a single channel sensor unit called a Neuromagnetometer.
Scripps Clinic's relationship with BTi began in 1987 when the Clinic was one of four institutions worldwide chosen to utilize a 14-channel Neuromagnetometer in basic scientific research efforts.

Comparing the new 37-channel device to the 14-channel version, Bloom said "the new device is more precise in measuring where events in the brain occur and the data will be available to doctors much faster. Right now, one hour of recording time with the 14-channel Neuromagnetometer usually leads to 50 hours of analysis and presentation. With the 37-channel device, it could be more like one hour of analysis for each hour of recording."

A sophisticated magnetic sensing device, the new biomagnetometer produces maps of the brain's magnetic fields. It uses 37 sensors called SQUIDS -- Superconducting Quantum Interference Devices -- sitting inside liquid helium to detect the weak magnetic fields emitted each time a part of the brain fires electrically.

The method of mapping the brain's magnetic signals is called MEG (magnetoencephalography) and allows researchers a means to visualize which parts of the brain are active during complex mental activities.

Although many of today's high-tech devices, such as ultrasound, CT scans (computed tomography) and MRI (magnetic resonance imaging) provide information about the brain's structure, they do little to indicate actual brain activity.

There are a number of diseases that can profoundly impair the ability of the brain to function, but that leave little or no mark
on MRI or CT scans. These include headaches, epilepsy, early Alzheimer's disease, early stroke and numerous psychiatric illnesses.

EEGs (electroencephalograms) measure electrical activity, but their signals are imprecise because they are altered by tissue and distorted by currents within the brain.

Christopher Gallen, M.D., Ph.D., a senior research associate at the Research Institute of Scripps Clinic, noted that the EEG is good at telling when events happen in the brain, but poor at telling where they happen.

"On the other hand, the magnetic field flows undistorted through the skull and scalp, giving a clean signal that can be used to localize some brain activities to within millimeters in space and milliseconds in time," Gallen said.

"This is important," he added, "since understanding brain function and disfunction requires knowing both the region involved and the timing of the activity."

With the more precise measurements, clinicians and researchers hope to develop more specific and effective treatments.