



## **Foundation HemoEncephaloGraphy (HEG) Neurofeedback Certification Course**

**Two courses that will enable you to understand and use HEG neurofeedback in your practice,  
whether you are a medical doctor, psychologist educator or performance coach**

Learn about HEG - this exciting new branch of neurofeedback from the originator of HEG and  
accomplished clinicians:

Dr. Hershel Toomim, a world recognized innovator and neuroscientist

Dr. Stephanie DuPont, Neurotherapy clinician

Dr. Dan Staso, Neurotherapy clinician

## **Course 1: Foundation course in HEG neurofeedback**

## **Course 2: Advanced Applications of HEG**

### **Venue:**

Biofeedback Institute of Los Angeles ~ Since 1970  
6542 Hayes Drive Los Angeles, CA 90048

**(323) 930-8500 or (800) BIO ELAN**

[biocompresearch.org](http://biocompresearch.org)

[BrainExerciseWorks.com](http://BrainExerciseWorks.com)

### **Call Or Email Your Registration Today ~ Space Limited to 10**

HEG (Hemoencephalography) neurofeedback is an effective, non-invasive, drug-less training method useful for many conditions that respond to the activation of the brain's surface (cortex). The frontal lobes are uniquely addressed using HEG, as it gives proper importance to their contribution to decision making and brain control. The frontal lobes control much of the brain's effectiveness in the exigencies of life. HEG's direct measure of metabolic changes, simplicity, clear interpretation and ease of use make it a significant contribution to clinical practice. Training is accomplished by controlling computer generated displays, dynamic cartoons or movies.

HEG is being used increasingly by professionals tired of being burdened by the variety of instrumental difficulties and complex treatment protocols inherent in the EEG neurofeedback concept.

HEG is ideally suited for biofeedback practices and learning centers that work to improve behavior, mood, and attention disorders that are related to inadequate brain cortex functioning include:

#### **Attention and concentration difficulties**

ADD/ADHD

Distractability

Sleep disorders

Recall

Aging memory loss

Working memory

Anger

Anxiety

Depression

Autism

Asperger's syndrome

HEG may improve conditions associated with frontal cortex hypoperfusion.

#### **Medical treatment practices**

Migraine headache

Epilepsy

Schizophrenia

Senile dementia

## **What is HEG?**

When a specific area of the brain is activated to perform a task related to that particular region, perfusion of blood to that area increases in order to supply oxygen, glucose and other basic ingredients to develop the energy needed to sustain the task.

Local brain activation is always accompanied by an increase in the cell metabolism. The increase is required to make from those nutrients the energy needed by the cells involved. These changes can be indirectly measured in various ways: For instance: One can measure the emission of infrared radiation into the environment from brain tissue below the skull. Radiation can be in the form of light or heat. The passive (thermal) far infrared (pIRHEG) measures heat. The near infrared (nIRHEG) measures the effect of oxygen on the color of light reflected from cerebral capillary blood when illuminated by red and near infrared light shown through the skull.

In these courses you will study the physiology underlying these measurements, the technology behind the instrumentation used to monitor brain activation in these ways, and the methodology applied to teach individuals to self-regulate this activity using biofeedback.

## **What is HEG Biofeedback?**

HEG biofeedback is a neurofeedback system based on the intentional control of the brain hemodynamic and metabolic responses through biofeedback principles.

Both types of HEG, nIR and pIR, offer practical and effortless ways of measuring brain activation in a totally new non-invasive fashion. These techniques involve the use of radiation sensitive biosensors. Unlike EEG-based neurofeedback, HEG needs no electrodes; electrode preparation is eliminated. Electromagnetic or muscle noise, the bane of EEG, plays no role. HEG is thus very simple to use.

## **How did HEG Biofeedback come about?**

HEG was developed in 1994 by Hershel Toomim, Sc.D. Dr. Toomim discovered that he could measure and teach others to control the amount of oxygenated blood flowing in selected brain regions using near infrared (nIR) spectroscopy technologies. Oxygen is one of the two basic fuels (along with glucose) used by brain metabolism. HEG is thus, fundamental to brain operation. Oxygen is the same blood element used by fMRI, the gold standard for brain research. Dr. Toomim found that individuals could learn the skill to self-regulate brain blood flow by applying biofeedback principles and hence called this technology Hemo-(blood)-Encephalography (HEG). Dr. Toomim's electronics and biophysics background aided HEG conceptualization and equipment development. The application of HEG technology is used for the treatment of various conditions involving regional cerebral hypoperfusion. Dr. Toomim has made underlying HEG skills and methods available by reporting and publishing technical and clinical results.

In 1998, Jeffrey Carmen, Ph.D., developed (pIR) HEG. Dr. Carmen is considered the second father of HEG biofeedback. A fast friendship developed between Dr.s Toomim and Carmen, and Dr. Carmen further developed far infrared optical pIRHEG instruments based on the heat developed in the metabolic process. Dr. Carmen's research, development and clinical practice focuses on effective ways to train frontal lobe activation. He has been using pIRHEG with patients suffering from various conditions related to inadequate frontal lobe activity. Dr. Carmen's work shows that pIRHEG training with persons suffering from migraines, increases frontal lobe emissions and inhibits migraine pain. He has recently published a broad clinical study representing the fruit of many years of clinical work, documenting the high degree of success using HEG biofeedback for various types of migraine.

## **So, who should take our “Biofeedback” workshop?**

**Physicians, Psychologists, Clinicians, Occupational Therapists, Nurses...** Any therapists interested in enhancing their neurofeedback practice will find this technique valuable. **...Also, Educators, School Psychologists and Special Needs Teachers**

HEG biofeedback is commonly used with children and adults suffering from poor focus, inattention, and/or impulse control disorders.

## **...Corporate and Sports Trainers, Performance Coaches and Group Facilitators**

Individuals working in corporations and other institutions will find HEG training useful to improve behavioral and mental functions for peak performance. For instance, HEG can help individuals overcome depressive states, improve confidence, enhance creativity and nurture a positive and confident approach towards every day tasks. This type of training is particularly useful to achieve peak performance in sports.

## **Course 1: Foundation course in HEG neurofeedback**

This workshop covers the practical and theoretical aspects of the HEG neurofeedback system, including scientific background, instrumentation and protocols. There will be plenty of practice and hands on demonstrations.

### Curriculum Content:

1. History of HEG
2. Types of HEG: near infrared (nIRHEG) and passive (thermal) far infrared (pIRHEG)
3. Technological background
  - a. Functional MRI principles
  - b. Brain spectrometry and cerebral oximetry
  - c. Infrared thermometry, dynamic infrared imaging
4. HEG biofeedback instruments nIR and pIR
5. Physiological basis of HEG
  - a. Brain circulation: infra and extra-cerebral components
  - b. Brain capillaries and blood brain barrier
  - c. Local control of blood flow
  - d. Brain activation and cerebral blood oxygenation
  - e. Brain metabolism
6. Introduction to frontal lobe physiology
7. Monitoring HEG
8. (nIR) and (pIR) HEG artifacts
9. Intentional control of regional cerebral blood flow
10. Comparison of (nIR) and (pIR) recordings
11. Integration HEG and peripheral biofeedback
12. Integrating HEG and EEG biofeedback
13. Clinical applications of HEG
14. Migraine, Impulsivity, ADD, Depression, Anger, Asperger's, Seizure etc.
15. Entrainment protocols
16. Case Studies
17. Hands on practice with HEG

## Course 2: Advanced Applications of HEG

This one day advanced applications course will enable participants to re-examine and update state-of-the-art information, clinical methods & assessment procedures to improve your HEG neurotherapy practice. The emphasis will be on practical issues.

### Curriculum Content:

1. Autonomic preparation for successful HEG training
2. Behavioral, cognitive and autonomic aspects of HEG monitoring
3. Introduction to the use of HEG with peripheral biofeedback
4. Introduction to basic HEG/EEG relations
5. Comparison of nIR and pIR HEG
6. Frontal lobe physiology
7. Frontal fatigue and “switch-off“ (monitoring, prevention and treatment)
8. HEG training strategies
9. Infra red Camera illustrates changes due to training
10. Uses of IR images to monitor, direct and assess HEG training progress
11. New trends in HEG research

### Instructors

**Hershel Toomim, BSEE, Sc.D.**, Neurophysiologist, Psychophysicist, Biophysicist, Electronics Engineer, Principal Researcher Biocomp Research Institute and President - Biofeedback Institute of Los Angeles.

Dr. Toomim, now 93, has worked for nearly all his adult years in research and development in engineering and neuroscience. He has received honorary research status from the Association For Applied Psychophysiology & Biofeedback (AAPB), the International Society for Neurofeedback and Research (ISNR) and the Biofeedback Society of California (BSC). Dr. Toomim's research may be reviewed at [www.biocompresearch.org](http://www.biocompresearch.org).

**Stephanie DuPont, Psy.D.**, Clinical Psychologist, Neurotherapist.

Dr. DuPont is particularly fascinated with research on how relationships and the brain interact to shape who we are. Since 1999, she has been in tutelage with the Dr.s Toomim (innovators and leading proponents of the combination of neurofeedback and psychotherapy). She practices neurotherapy at the Biofeedback Institute of Los Angeles.

**Dan Staso, Ph.D.**, Clinical Psychologist, Neurotherapist

Dr. Staso wrote his doctoral thesis on biofeedback in 1980. He has been on the faculty of California State University, Dominguez Hills and the California Graduate Institute. He has a full time practice in Santa Barbara where he specializes in neurofeedback. His website is [www.danstaso.com](http://www.danstaso.com) and his blog is [www.drardanstaso.blogspot.com](http://www.drardanstaso.blogspot.com).

## **Call or Email to Register Now!**

(Registration limited - 10 per class)

[hershel@biocompresearch.org](mailto:hershel@biocompresearch.org)

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### **Foundation HemoEncephaloGraphy (HEG) Neurofeedback Courses**

#### **Course 1:**

**Foundation Course in HEG Neurofeedback Fee - \$325.00**

#### **Course 2:**

**Advanced Applications of HEG Neurofeedback - Fee \$125.00**

***HEG - A design for your success!***