

Introduction of Timon Liu PhD

Timon Cheng-Yi Liu is the Head Professor of the Laboratory of Laser Sports Medicine at the South China Normal University, Guangzhou, China. He is a Fellow of the American Society for Lasers in Surgery and Medicine (ASLMS), and is on the editorial board of Photomedicine and [Laser Surgery](#). He has a BS in physical chemistry from Nanjing University, a MS in quantum chemistry from Jilin University and a Ph.D in laser technology from Huazhong University of Science and Technology. His main interest is in the mechanisms of PhotoBioModulation and function-specific homeostasis and their applications in laser medicine, biomedicine and sports science.

Timon Liu's full bio is on page 201 of his second book "[Laser Functional Medicine and Applications](#)" I recommend reading it first.

Prof. Timon Liu is probably the most widely recognized expert in "Intranasal Light Therapy" worldwide. Because he is opening a extremely new field of understanding the body from a view point of excellent health being the body is in homeostasis (or the place all parts and functions of the body which has the "least resistance"). Homeostasis is a classic concept in physiology. It is the self-regulating functions of the body's GPS to natural normal biological balance.

At this point, homeostasis is too obscure to be studied so that it has been developed as FSH. FSH is a negative-feedback response of a biosystem to maintain the function-specific fluctuations inside the biosystem so that the function is perfectly performed. A biosystem in a FSH means the function is in its FSH so that it is perfectly performed. A biosystem far from a FSH means the function is far from its FSH so that it is dysfunctional. For an athlete, the key function is a sport, and his key FSH is sport-specific homeostasis illustrated variable dose-response relationship between exercise training and performance.

Dr. Timon Liu's illustrations of this are 3 dimensionally and much like a bowl with the center as the term he uses heavily FSH or Functionally Specific Homeostasis or perfect health or all parts of the body in cooperation. Illustrated as a ball in the valley is in homeostasis. The ball will be automatically back in the valley if the ball is forced to be on a mountain slope.

Prof. Timon defines FSH Functional Specific Homeostasis "*It is a negative feedback response of a biosystem to maintain constant conditions inside the biosystem.*"

We are blessed in the West because the world's top light therapy researcher even though he lives in China his wife speaks English and hence Timon speaks conversational English. The attached books of his are in both languages. He began studying laser life science in 1980 and in vivo 1989! In 2000 his paper was chosen by the American Society for Laser Medicine and Surgery for it excellence in the mechanism of bio-stimulation. He has been part of many Life Science foundations and research laboratories in China and Internationally. The book Intranasal Low Intensity Laser was written in 2009 is nearly 200 pages.

His most recent book is “Laser Functional Medicine and its Applications” was written for lay people and as training for professionals using Low Intensity Lasers (also 200+ pages). A quote for the abstract

The book mainly provide lay public and trainee experience on the present health care applications in hyperlipidemia, blood hyperviscosity, insomnia and high blood coagulation status in healthy pregnant women at term, and clinic applications in mild cognitive impairment, Alzheimer’s disease, Parkinson’s disease, schizophrenia, pain relief, stroke, depression, inflammation, coronary heart disease, myocardial infarction and cerebral palsy, and exports experience on its possible applications in hypertension, vascular dementia, cancer, diabetes, ageing, development, influenza, olfactory dysfunction, myopia, withdrawal symptoms, renal failure and health promotion.

A test of the intelligence of US Congress Members was the length of sentences they used the above single sentence has 65 words many of which are 3 syllables or more.

In his 2nd book Timon written in 2008 (I recommend reading it first it is easier to understand and better organized) he has interesting charts of different diseases that are effected by the distance to the Equator. Section 2.5 deals with laser safety. Section 3 is laser functional medicine is described. Section 5 is the big one describing many application of light therapy. Section 6 is potential applications of which some have now been researched and are in the data slides presented in Toronto called TimonLiu Intranasal Light therapy presentation. Section 7, 8, and 9 focus on mechanisms of PhotoBioModulation. PubMed has 2800+ references to laser bio stimulation. <http://www.ncbi.nlm.nih.gov/pubmed?term=laser%20biostimulation>

Throughout his book attached he uses some acronyms listed below Timon has created his own language if you want to make words for new terms.

FSH Function-Specific Homeostasis Today this is Timon’s main study Described book 2 Laser Functional Medicine page 21

ILILT Main one (cutaneous) Irradiation Low Intensity Light

ILLET Intravascular Low Energy Laser Therapy used in 1980-1990 research

LI Monochromatic Light

LIL Low Intensity (monochromatic) Light

LLL Low Level (monochromatic) Light

LPBM (monochromatic) Light Photo Bio-Modulation

FSH Functional Specific Homeostasis

SpSH Sp ort-Specific Homeostasis

PaFSH Pa thological Function-Specific Homeostasis

PBM PhotoBioModulation

PhFSH Physiological Function-Specific Homeostasis

Keep this chart for reference in reading Timon’s breakthrough work.

His first book has acronym chart on page 194-

Here is the long list of used acronyms

Acronym (缩写)

5-HT: 5-hydroxytryptamine, 5-羟色胺, Chap. 4 (第4章)

A β : amyloid β protein, β 淀粉样蛋白, Chap. 3 (第3章)

AD: Alzheimer's disease, 阿尔茨海默氏病, Chap. 3 (第3章)

Akt: the other name of PKB, PKB 的别名, Chap. 6 (第6章)

ANS: autonomic nervous system, 植物神经, Chap. 3 (第3章)

ATP: adenosine-5'-triphosphate, 三磷酸腺苷, Chap. 5 (第5章)

BDNF: brain-derived neurotrophic factor, 脑源神经营养因子, Chap. 4 (第4章)

BFCR%: brain blood flow function change rate, 脑血流功能变化率, Chap. 3 (第3章)

BIMP: biological information model of PBM, 光生物调节作用的生物信息模型, Chap. 8 (第8章)

cAMP, 3'-5'-cyclic adenosine monophosphate, 环腺苷酸, Chap. 6 (第6章)

CCK-8: cholecystokinin-octapeptide, 八肽胆囊收缩素, Chap. 3 (第3章)

CDK: cyclin dependent kinase, 细胞周期蛋白依赖性激酶, Chap. 6 (第6章)

cGMP: cyclic guanosine monophosphate, 环鸟苷酸, Chap. 6 (第6章)

CHD: coronary heart disease, 冠心病, Chap. 4 (第4章)

CNS: central nervous system, 中枢神经系统, Chap. 3 (第3章)

COX: cyclooxygenase, 环氧合酶, Chap. 4 (第4章)

CP: cerebral palsy, 小儿脑性瘫痪 (简称脑瘫), Chap. 3 (第3章)

DAG: diacylglycerols, 甘油二酯, Chap. 6 (第6章)

DD: degree of difficulty, 难度, Chap. 9 (第9章)

DEX: dexamethasone, 地塞米松, Chap. 6 (第6章)

DILI: drug-induced liver injury, 药物性肝损害, Chap. 3 (第3章)

DNA: deoxyribonucleic acid, 脱氧核糖核酸, Chap. 3 (第3章)

dPBM: developmental PBM, 发展光生物调节作用, Chap. 3 (第3章)

dPC12: differentiated PC12, 分化的PC12 细胞, Chap. 7 (第7章)

DPN: diabetic peripheral neuropathy, 糖尿病周围神经病变, Chap. 3 (第3章)

EGF: epidermal growth factor, 表皮生长因子, Chap. 6 (第6章)

eNOS: endothelial NO synthase, 内皮NO 合酶, Chap. 5 (第5章)

EPT: extraocular phototransduction, 眼睛外光信号转导, Chap. 8 (第8章)

ERK: extracellular signaling regulated kinase, 细胞外信号调节蛋白激酶, Chap. 6 (第6章)

ERP: event-related potential, 事件相关电位, Chap. 4 (第4章)

ET: extraordinary training, 超常训练, Chap. 10 (第10章)

FDA: Food and Drug Administration in USA, 美国食品和药物管理局, Chap. 1 (第1章)

FES: FSH-essential subsystem, FSH 必需子系统, Chap. 10 (第10章)

FESH: FES-specific FSH, FES 特异的FSH, Chap. 10 (第10章)

FNS: FSH-non-essential subsystem, FSH 非必需子系统, Chap. 10 (第10章)

FNSH: FNS-specific FSH, FNS 特异的FSH, Chap. 10 (第10章)

fPBM: FSH-specific PBM, FSH 特异的光生物调节作用, Chap. 3 (第3章)

FRET: fluorescence resonance energy transfer, 荧光共振能量转移技术, Chap. 8 (第8章)

FSH: function-specific homeostasis, 功能内稳态, Chap. 3 (第3章)

GaAlAs: gallium aluminum arsenide, the medium of diode laser (780-890 nm) 镓铝砷, 780-890 nm 的半导体激光的介质, Chap. 2 (第2章)

GaInP/AlGaInP: Gallium-Indium-Phosphorus/Aluminum-Gallium-Indium-Phosphorus, 镓铟/镓铟铝激光器, Chap. 2 (第2章)

GAPs: GTPase activating proteins, GTP 酶激活蛋白, Chap. 6 (第6章)

GPCRs: G-protein coupled receptors, G 蛋白偶联跨膜受体, Chap. 6 (第6章)

GTP: guanosine triphosphate, 三磷酸鸟苷, Chap. 6 (第6章)

G-proteins: GTP-binding and hydrolyzing proteins, GTP 结合与水解蛋白, Chap. 6 (第6章)

H₂O₂: hydrogen peroxide, 过氧化氢, Chap. 5 (第5章)

He-Ne: helium neon mixture, the medium of gas laser, 氦氖混合气体, 气体激光的介质, Chap. 2 (第2章)

HSF: human skin fibroblast, 人的皮肤成纤维细胞, Chap. 8 (第8章)

IL: interleukin, 白细胞介素, Chap. 7 (第7章)

ILELT: intravascular low energy laser therapy, 血管内低能量激光照射疗法, Chap. 3 (第3章)

ILILT: intranasal low intensity laser therapy, 鼻腔内低强度激光治疗, Chap. 1 (第1章)

IP₃: inositol 1,4,5-trisphosphate, 肌醇1, 4, 5-三磷酸, Chap. 6 (第6章)

IRA: infrared A, 短波红外, Chap. 3 (第3章)

JAK: Janus kinase, Janus 家族酪氨酸激酶, Chap. 6 (第6章)

JNK: c-Jun N-terminal kinase, c-Jun 氨基末端激酶, Chap. 6 (第6章)

KPHCP: key process hypothesis of cellular PBM, 细胞光生物调节作用的关键过程假定, Chap. 8 (第8章)

LDC: luminol-dependent chemiluminescence, 鲁米诺增强的化学发光, Chap. 7 (第7章)

LDL-C: Low density lipoprotein cholesterol, 低密度脂蛋白, Chap. 3 (第3章)

LED: light-emitting diode array, 发光二极管阵列, Chap. 2 (第2章)

LGAL: low intensity GaInP/AlGaInP diode laser irradiation at 650 nm, 低强度650 nm GaInP/AlGaInP 半导体激光, Chap. 2 (第2章)

LHNL: low intensity 632.8 nm He-Ne laser irradiation, 低强度632.8 nm 氦氖激光, Chap. 3 (第3章)

LI: laser irradiation or monochromatic light, 激光或单色光, Chap. 1 (第1章)

LIL: low intensity LI (~10 mW/cm²), 低强度激光或单色光, Chap. 2 (第2章)

LLL: low level LI, 低水平激光或单色光, Chap. 1 (第1章)

LLLT: low level LI therapy, 低水平激光或单色光治疗, Chap. 1 (第1章)

LPBM: PBM of LIL, 低强度激光或单色光的光生物调节作用, Chap. 3 (第3章)

LPS: lipopolysaccharides, 脂多糖, Chap. 7 (第7章)

MAPK: mitogen-activated protein kinase, 丝裂原活化蛋白激酶, Chap. 3 (第3章)

MCI: mild cognitive impairment, 轻度认知障碍, Chap. 4 (第4章)

MEK: MAPK and ERK kinase, MAPK 和ERK 激酶, Chap. 8 (第8章)

MHNL: moderate intensity He-Ne laser irradiation, 中等强度氦氖激光, Chap. 7 (第7章)

MI: myocardial infarction, 心肌梗死, Chap. 3 (第3章)

MIH: meridian mediated ILILT hypothesis, ILILT 的经络介导假设, Chap. 3 (第3章)

MIL: moderate intensity LI (102~4 mW/cm²), 中等强度激光或单色光, Chap. 3 (第3章)

MMSE: mini-mental state exam, 简易精神状态量表, Chap. 3 (第3章)

mRNA: messenger ribonucleic acid, 信使核糖核酸, Chap. 4 (第4章)

MPBM: PBM of MIL, 中等强度激光或单色光的光生物调节作用, Chap. 3 (第3章)

MTL: medial temporal lobe, 内侧颞叶, Chap. 4 (第4章)

NADPH: nicotinamide adenine dinucleotide phosphate, 烟酰胺腺嘌呤二核苷酸磷酸, Chap. 6 (第6章)

NCS: newborn calf serum, 新生牛血清, Chap. 7 (第7章)

NETs: neutrophil extracellular traps, 中性粒细胞胞外菌网, Chap. 3 (第3章)

NFκB: nuclear factor κB, 核因子κB, Chap. 6 (第6章)

NO: nitric oxide, 一氧化氮, Chap. 1 (第1章)

NOS: nitric oxide synthase, 一氧化氮合酶, Chap. 5 (第5章)

NSPR: non-specific pathway mediated response, 非特异性通路介导的响应, Chap. 8 (第8章)

OAH: oxidant-antioxidant homeostasis, 氧化还原内稳态, Chap. 5 (第5章)

oROS: OAH-essential ROS level, OAH 所稳定的ROS 水平, Chap. 10 (第10章)

OT: ordinary training, 常规训练, Chap. 10 (第10章)

OTA: establishing FNSHs and then the new FSH, 建立FNSH 和新的FSH, Chap. 10 (第10章)

OTB: maintaining the new FSH, 维持新的FSH, Chap. 10 (第10章)

OTC: over-the-counter, 非处方, Chap. 4 (第4章)

PBM: photobiomodulation, 光生物调节作用, Chap. 1 (第1章)

PC: phosphatidylcholine, 磷脂酰胆碱 (旧称卵磷脂), Chap. 6 (第6章)

PD: Parkinson's disease, 帕金森病, Chap. 3 (第3章)

PI-3K: phosphatidylinositol-3-kinase, 磷脂酰肌醇3 激酶, Chap. 6 (第6章)

PIP2: phosphatidylinositol 4,5-bisphosphate, 磷脂酰肌醇-4,5-二磷酸, Chap. 6 (第6章)

PKA: cAMP-dependent protein kinase, 环磷酸腺苷依赖性蛋白激酶A, Chap. 6 (第6章)

PKB: protein kinase B, 蛋白激酶B, Chap. 6 (第6章)

PKC: protein kinase C, 蛋白激酶C, Chap. 6 (第6章)

PLA2: phospholipases A2, 磷脂酶- A2, Chap. 6 (第6章)

PLC: phospholipase C, 磷脂酶C, Chap. 6 (第6章)

PLD: phospholipases D, 磷脂酶D, Chap. 6 (第6章)

PMN: polymorphonuclear neutrophil, 中性粒细胞, Chap. 3 (第3章)

P3PL: P300 event-related brain potential peak latency, 事件相关电位P300 峰潜伏期, Chap. 3 (第3章)

PSD: post-stroke depression, 卒中后抑郁症, Chap. 3 (第3章)

PSH: proliferation-specific homeostasis, 增殖内稳态, Chap. 7 (第7章)

PSN: parasympathetic nervous subsystem, 副交感神经, Chap. 9 (第9章)

PTKs: non-receptor protein tyrosine kinases, 非受体酪氨酸蛋白激酶, Chap. 6 (第6章)

RBC: red blood cell, 红细胞, Chap. 7 (第7章)

rCBF: regional cerebral blood flow, 局部脑血流量, Chap. 3 (第3章)

RCD: red cell deformability, 红细胞变形性, Chap. 3 (第3章)

RLED 640: red light at 640±15nm from LED, 来自LED 的640 nm 红光, Chap. 7 (第7 章)

RLED 670: red light at 670nm from LED, 来自LED 的670 nm 红光, Chap. 7 (第7 章)

ROS: reactive oxygen species, 活性氧, Chap. 3 (第3 章)

RNA: ribonucleic acid, 核糖核酸, Chap. 6 (第6 章)

RTKs: receptor tyrosine kinases, 受体酪氨酸激酶, Chap. 6 (第6 章)

SDS: self-rating depression scale, 抑郁自评量表, Chap. 3 (第3 章)

SN: sympathetic nervous subsystem, 交感神经, Chap. 3 (第3 章)

SOD: superoxide dismutase, 超氧化物歧化酶, Chap. 3 (第3 章)

SPECT: single photon emission computed tomography, 单光子发射型计算机断层仪, Chap. 3 (第3 章)

SPR: specific pathway mediated response, 特异性通路介导的响应, Chap. 8 (第8 章)

SSH: sport-specific homeostasis, 项目内稳态, Chap. 7 (第7 章)

TC: total cholesterol, 总胆固醇, Chap. 4 (第4 章)

TCM: traditional Chinese medicine, 中医 Chap. 1 (第1 章)

TG: triglycerides, 甘油三酸酯 (甘油三酯), Chap. 3 (第3 章)

TGF-β: transforming growth factor-β, 转化生长因子-β, Chap. 6 (第6 章)

TNF-α: tumor necrosis factor α, 肿瘤坏死因子α, Chap. 7 (第7 章)

UVA: ultraviolet A (320-400 nm), 长波紫外 (320-400 纳米), Chap. 7 (第7 章)

VaD: vascular dementia, 血管性痴呆, Chap. 5 (第5 章)

WHO: World Health Organization, 世界卫生组织, Chap. 4 (第4 章)

WMS: Wechsler memory scale for adult, 韦克斯勒记忆量表, Chap. 3