TABLE OF CONTENTS – Handbook of Low-Level Laser Therapy

What is Low-Level Laser (Light) Therapy?

Marcelo Victor Pires de Sousa

History of Low-Level Laser (Light) Therapy

Michael R. Hamblin

Lasers, LEDs, and Other Light Sources

James Carroll

Is Coherence Important in Photobiomodulation?

Tomas Hode

Tissue Optics

Bryan James Stephens and Linda Ramball Jones

Light-Tissue Interaction and Light Dosimetry

Ana Carolina de Magalhaes and Elisabeth Mateus Yoshimura

Mitochondrial Light Absorption and Its Effect on ATP Production

Nicolette Houreld

Water as a Photoacceptor, Energy Transducer, and Rechargeable Electrolytic Bio-battery in Photobiomodulation

Luis Santana-Blank, Elizabeth Rodr´ıguez-Santana, Jes ´us A. Santana-Rodr´ıguez, Karin E. Santana-Rodriguez, and Heberto Reyes-Barrios

Role of Reactive Oxygen Species in Low-Level Laser Therapy

Vikrant Rai

Molecular Basis for Photobiomodulation: Light-Induced Nitric Oxide Synthesis by Cytochrome c Oxidase in Low-Level Laser Therapy

Robert Oliver Poyton and Marina Hendrickson

Cytoprotective Effect of Low-Level Light Therapy using LEDs on Neurons

Margaret Wong-Riley and Huan Ling Liang

Low-Level Laser and Cultured Neural Tissue

Patricia J. Armati and Roberta T. Chow

Shining a Light on Parkinson's Disease

Daniel McKenzie Johnstone, Cecile Moro, Jonathan Stone, Alim-Louis Benabid, and John Mitrofanis

Low-Level Laser Therapy and Stem Cells

Qi Zhang, Chang Zhou, and Tingting Dong

Antimicrobial Photodynamic Therapy

Vanderlei Salvador Bagnato, Cristina Kurachi, Kate Cristina Blanco, and Natalia Mayumi Inada

Low-Level Laser (Light) Therapy forWound Healing in Animal Models

Andre Luiz Oliveira Ramos, Felipe Scholz Ramos, and Marcelo Victor Pires de Sousa

Low-Level Laser Therapy for Arthritis in Animal Models: Beneficial Effect and Action Mechanism

Flavio Aimbire and Paulo de Tarso Camilo de Carvalho

Low-Level Laser Therapy for Lung Diseases: From the Bench to the Bed

Flavio Aimbire

Low-Level Laser (Light) Therapy in Tendon Healing in in Vitro and in Vivo Models

Lucas F. de Freitas and Michael R. Hamblin

Bone Repair in Animal Models

Antonio Luiz B. Pinheiro, Luiz G. Pinheiro Soares, and Aparecida Maria C. Marques

Transcranial Low-Level Laser (Light) Therapy for Stroke and Traumatic Brain Injury in Animal Models

Michael R. Hamblin, Luis De Taboada, and Ying-Ying Huang

Phototherapy in Peripheral Nerve Repair and Muscle Preservation

Shimon Rochkind

Low-Level Laser Therapy for Spinal Cord Repair

Takahiro Ando and Michael R. Hamblin

Low-Level Laser (Light) Therapy for the Treatment of Visual System Injury and Disease

Janis T. Eells, Sandeep Gopalakrishnan, Michele M. Salzman, Krisztina Valter, Jan Provis, Ricardo Natoli, John Mitrofanis, Jonathan Stone, and Melinda Fitzgerald

Protection from Cardiac Ischemia and Reperfusion Injury

Agnes Keszler, Svjetlana Dosenovic, and Martin Bienengraeber

Low-Level Laser and Experimental Aortic Aneurysm: Mechanisms and Therapeutic Implications

Lilach Gavish and S. David Gertz

Low-Level Laser Therapy: A Treatment Modality for Multiple Sclerosis Targeting Autoimmunity and Oxidative Stress

Zenas George, Miguel A. Tolentino, and Jeri-Anne Lyons

Low-Level Laser Therapy as an Alternative Treatment for Snake Envenomation

Camila Squarzoni Dale and Stella Regina Zamuner

Veterinary Low-Level Laser (Light) Therapy Applications for Companion Animals

Richard L. Godine

Emergence of Low-Level Laser (Light) Therapy in Clinical Veterinary Practice

Ronald E. Hirschberg

Photomedicine for Exotic Animals: A Case-Based Discussion

Narda G. Robinson

Recalcitrant Wound: Using Low-Level Laser (Light) Therapy to Manage Non-Healing Wounds and Ulcers

Raymond J. Lanzafame and Istvan Stadler

Clinical Applications with Low-Level Laser Therapy in Arthritis

Jan M. Bjordal

Use of Low-Level Laser Therapy and Light-Emitting Diode Therapy to Improve Muscle Performance and Prevent Damage: From Animal Models to Clinical Trials

Cleber Ferraresi, Nivaldo Parizotto, Vanderlei Bagnato, and Michael R. Hamblin

Low-Level Laser Therapy of Pain: Clinical Applications

Roberta T. Chow

Low-Level Laser Therapy and Its Application in Tinnitus

Alessandra Nara de Souza Rastelli, Emanuelle Teixeira Carrera, Gustavo Nicolodelli, and Michael R. Hamblin

Laser Therapy for the Treatment of Radiculopathy

Jerome M. True and Luis C. Vera

Difficult Path to Treating Acute Ischemic Stroke Patients with Transcranial Near-Infrared Laser Therapy

Paul A. Lapchak, Pramod Butte, and Padmesh S. Rajput

Low-Level Laser (Light) Therapy for Rehabilitation in Traumatic Brain Injury and Stroke, including Chronic Aphasia

Margaret A. Naeser, Paula I. Martin, Michael D. Ho, Maxine H. Krengel, Yelena Bogdanova, Jeffrey A. Knight, Megan K. Yee, Ross Zafonte, Bang-Bon Koo, John G. Roubil, and Michael R. Hamblin

Transcranial Near-Infrared Light for Major Depressive Disorder: Targeting the Brain Metabolism

Paolo Cassano, Abigail R. Archibald, and Dan V. Iosifescu

Low-Level Laser Therapy: A Corner Stone in the Management of Cancer Therapy-Induced Mucositis

Rene-Jean Bensadoun, Idriss Troussier, and Raj G. Nair

Photobiomodulation in Dentistry: Manipulating Biostimulation and Bioinhibition for Clinical Success

Gerry Ross and Alana Ross

Photobiomodulation for the Clinical Treatment of Age-Related Macular Degeneration

Graham Merry and Robert Dotson

Laser (Light) Therapy for Postherpetic Neuralgia

Kevin C. Moore and R. Glen Calderhead

Laser Acupuncture

Lucas F. de Freitas and Michael R. Hamblin

Intravascular Laser Irradiation of Blood

Daiane Thais Meneguzzo, Leila Soares Ferreira, Eduardo Machado de Carvalho, and Cassia Fukuda Nakashima

Nonsurgical Laser Therapy for Type 1 and Type 2 Diabetes

Leonardo Longo

Laser Therapy of Traumatic Central Nervous System Injuries

Leonardo Longo and Diego Longo

Low-Level Laser (Light) Therapy: Aesthetic Applications for Hair

Felipe Scholz Ramos, Andr´e Luiz de Oliveira Ramos, and Marcelo Victor Pires de Sousa

Low-Level Laser (Light) Therapy for Cosmetics and Dermatology

Mossum K. Sawhney and Michael R. Hamblin

Low-Level Laser Therapy for Body Contouring and Fat Reduction

Gaurav K. Gupta

Transcranial Low-Level Laser (Light) Therapy for Neurocognitive Enhancement

Julio C. Rojas and F. Gonzalez-Lima

Post-Operative Uses of Low-Level Laser Therapy

Maria Cristina Chavantes, Nathali Cordeiro Pinto, and Vanessa Milanesi Holanda

Bright New World: Future Directions of Low-Level Laser (Light) Therapy

Marcelo Victor Pires de Sousa and Maria Cristina Chavante.