



'30-Something' Nanotech Mastermind Laurent Levy Wants To Play the Seminal Role In Making Cancer Treatments More Effective, Less Deadly To Healthy Tissues

A DECADE OF PIONEERING THE MARRIAGE OF MOLECULAR BIOLOGY AND PHYSICS... DR. LEVY WANTS TO BE ABLE TO TREAT CANCER ALMOST ANYWHERE INSIDE THE HUMAN BODY—WITH AN INJECTION AND XRAY... FOR STARTERS. “I was raised to be curious *and* pragmatic. I've always had an interest in learning how things work. And I have also been interested in exploring the unknown. When I was young, I said to my parents: ‘Okay, people say that the universe is infinite, but what is *after* it?’ Until I was 25, I was pretty bored by all my studies,” admits Dr. Levy. “But after years of university studies, something just connected for me: I could understand enough of physics, chemistry and biology to do something with this combination, something perhaps that had not been done before. So I started my doctorate, and at the end I began to develop my *own* vision about using nanotechnology to treat cancer.” At a nanotechnology-focused scientific meeting in France, Dr. Levy sought out **Dr. Paras Prasad**, Director of the renowned Institute for Lasers, Photonics and Biophotonics at SUNY in Buffalo, told him what he wanted to do, and Dr. Prasad said, ‘Why not?’ “I quickly enrolled at SUNY to complete my PhD,” says Dr. Levy. “From the start, Paras and I were on the same wavelength. Fortunately for me, he is one of the giants working in the nanophotonic and nanobiotech field.”

DR. LEVY'S BIG PLANS FOR HIS TINY SCIENCE: VALIDATING A NEW MODALITY OF CANCER TREATMENT

One *nanometer*, which is one-*billionth* of a meter, spans 10 atoms. Put another way... “How small do we mean by *nano*? Let's take a trip down the powers of ten: a dime is 1,000 microns thick, a human egg cell is a tenth of that, a red blood cell is a tenth of that, a nerve axon is a tenth thinner still, and you can fit ten viruses along that axon's diameter. Now we're down to 100 nanometers. A cell's membrane is a tenth as thick as that, a DNA strand is a fifth as thick as that, and an amino acid is a third of that. Now we're down to *one nanometer*.” (Source: Stephan Herrera, “The Big Science of Nanomedicine”, *Red Herring Mag.*, Oct. 30, 2000)

NANOMEDICINE EVOLUTION: “NANOXRAY™” — THE NEXT BIG THING IN CANCER THERAPY??

NanoXray™, co-invented by Dr. Levy and Dr. Prasad, is designed to circumvent radiation therapy's biggest drawback: destruction of healthy tissue and other subsequent deleterious side effects on the human body when a high dose of radiation is necessary to destroy the targeted tumor(s). The core of a nanoXray nanoparticle is an inactive and inert substance—*not a drug*—that can subsequently be activated in order to locally (intratumor) increase the dose of Xray, which is then expected to lead to higher cell death and efficiency. After nanoXray nanoparticles accumulate in the target tissues, a standard X-ray is applied that is intended to generate a *local* therapeutic effect, designed to destroy *only the targeted tumor cells* and not harm surrounding healthy tissue. “This **total control** of the intended therapeutic effect is the holy grail,” insists Dr. Levy. ■



DR. LAURENT LEVY

Co-Founder and Chief Executive Officer

LAURENT LEVY, PhD, has a deep understanding of the technical, scientific, intellectual property and marketing issues associated with nanotechnologies, because he has been working—and achieving—in these areas for more than a decade. His **pioneering research** at the frontier of molecular biology and physics has empowered him to develop a number of **practical applications**, not the least of which is **nanoXray™**, the technology foundation of **Nanobiotix**, which is focused on making possible a whole **new era in cancer medicine**. Dr. Levy has worked for many years as a consultant in business development and in the implementation of nanotechnologies with major companies, including **Sanofi Aventis** (an international pharmaceutical giant), **Guerbet** (a multinational medical imaging company), and **Rhodia** (a global specialty chemicals company), as well as start-up biotech. He is the president of the **French Technology Platform of Nanomedicine** and is involved with many international groups working in the field. The author of 35 international publications and communications, Dr. Levy holds several patents and completed post-doctoral work at the **Institute for Laser Photonics and Biophotonics, State University of New York (SUNY), Buffalo**. Dr. Levy holds a PhD in Physical Chemistry specializing in Nanomaterials from Pierre et Marie Curie University-CEA, and a DEA (first doctoral diploma) in Condensed Matter from UPVI-ESPCI (Paris).