

**LEONARDO da VINCI PRIZE  
FOR THE MOST EFFICIENT SOLUTION IN PARTICLE PHYSICS FOR EARLY  
CANCER DETECTION**

**Request For Application (RFA)**

(Dedicated to Valentina Vigna and All Victims from premature cancer death)

**Open to authors, Principal Investigators, persons responsible for cancer research projects or to anyone who would like to nominate a project that he believes to be superior to the ones cited in this document and for which he is willing to provide all necessary material and is willing to answer questions based on scientific arguments that will support his or the author's claims.**

**In order to reach all possible projects that could offer the highest reduction in premature cancer deaths, this PRIZE will be given the maximum publicity through press releases and by sending the material relative to this competition to the leaders of the major research centers in the world, in particular to the major research centers in particle physics (CERN, FERMIlab and BNL).**

**The prize (initial fund of \$10,000 that will increase until April 5, 2011) will be awarded to the most efficient solution in particle physics targeted to early cancer detection. This will stimulate a competition in the technique which indicates to be the most promising in early cancer detection. This technique allows the acquisition of data from signals that provides as early as possible information on the mutation of normal cells to cancerous cells at the morphological and functional level. However, if anyone knows of a solution in another field that he believes (and can support with scientific arguments) could have a higher impact in premature cancer death reduction, he is invited to submit it to this SCIENTIFIC PROCEDURE so that by being public, if such a project emerges, it will be given visibility during the analysis of the documents that were submitted to justify in such an event the creation of another competition targeted to compare projects with experts in the project's specific field.**

**WHEREAS**, during the past 50 years the reduction in cancer deaths has been recorded as a mere 5%<sub>2</sub> (even by showing an increase from 1975 to 2007 as reported by The National Institute of Health -NIH- and by The National Cancer Institute -NCI in 2010) while for heart disease the reduction was 64%, although fewer investments were allocated. Raw data confirming these data are published by NIH-NCI-SEER (Surveillance Epidemiology and End Results), while their graphic representation was published by Fortune Magazine in 2004, by WIRED Magazine in 2008 and by The New York Times in 2009;

**WHEREAS**, according to June 2, 2010 report from the World Health Organization (WHO), it has been predicted that by 2030 there will be more than 13 million deaths from cancer worldwide and nearly 21 million cases diagnosed annually. (Compared to 12.7 million new cancer cases and 7.6 million cancer deaths occurring in 2008);

**WHEREAS**, the cancer costs increased during the past 50 years by **100 fold**. In fact, direct medical expenditures for cancer in the U.S. were \$1.2 billion in 1963 and jumped to \$93.2 billion in 2008. (In comparison: the increase in cost of primary food in U.S. was **only 4 fold**. For example: bacon went from \$0.79/lb to \$2.99/lb; eggs \$0.55 dz. to \$1.29/dz.; bananas \$0.10/lb to \$0.39/lb, etc.);

**WHEREAS**, it has been demonstrated that cancer research failed during the past 50 years: Reduction of the cancer death rate in the world's most industrialized countries that have a cancer cost of \$741 billion/year (that is \$750/per-capita annually) is approximately the same as in less developed countries (These data have been gathered by the World Health Organization, adapted by the American Cancer Society and published by the National Institutes of Health-National Cancer Institute. The cost of \$750/per capita annually has been calculated based on the total cost of cancer in the U.S. in 2008 at \$228.1 billion divided by the population of 304 million.

This equals \$750/per-capita annually);
<b>WHEREAS</b> , Experimental data show that early cancer detection saves lives but surprisingly innovations providing higher efficiency in early cancer detection are not funded;
<b>WHEREAS</b> , it is necessary instead to focus on technologies targeted to early cancer detection.
<b>WHEREAS</b> , it is known that cancerous cells differentiate from normal cells through different signals that provide information about their mutation (Such signals are related to changes in: odor, temperature, tissue density, fluorescence, metabolism, perfusion, etc.);
<b>WHEREAS</b> , among all these signals, the ones most reliable and useful for early cancer detection are those which show an abnormal biological process even before a morphological change occurs. For example when there is an increase in nutrient requirement (abnormal metabolism) which is typical for the development of a tumor and other signals provide information which is less reliable when taken alone, but become more useful when they are associated with information relative to the abnormal metabolism or other biological process;
<b>WHEREAS</b> , Positron Emission Technology captures and counts in the unit of time signals arriving from the tumor markers (e.g. molecule, protein, etc.), such as tumor markers placed on the molecules of the nutrient to the body cells. However, the over 5,000 current PET (Positron Emission Tomography) devices are not suitable for early cancer detection because they capture only one signal of every 10,000 arriving from the tumor markers and the examination is very expensive;
<b>WHEREAS</b> , both signals, those arriving from the tumor markers and measured with the technique of the Positron Emission Technology which provides dynamic information within the unit of time (consumption of nutrient by the tumor), and those signals measured with the technique of Computed Tomography (CT) which provide static information (tumor dimension) are both based on particle detection (photons) and both sets of information, when detected and measured accurately at a low cost are useful for early cancer detection reducing the radiation to the patient and reducing costs;
<b>WHEREAS</b> , For both applications efficiency is defined as the ratio, during a unit of time, between the number of signals captured by the medical imaging device and the number of signals “emitted” (for PET) by the tracer (radiation) administered to the patient or by the radiation “transmitted” through the patient’s body (for CT);
<b>WHEREAS</b> , Steve Fluckiger from the firm Jones Day, who participated to the meeting at the University in Pavia on September 20, 2010, who works with other consultants to satisfy requests from philanthropists such as Bill Gates, to find (following “a disciplined process”), in order to fund, the best and most reliable technologies which will have the biggest impact for humanitarian causes;
<b>WHEREAS</b> , during the same meeting on September 20, 2010 the Vice-President of the University of Pavia, Prof. Lorenzo Rampa (see <a href="#">minutes of the meeting</a> ) made his commitment to do as much as he could to verify if Crosetto’s innovations in particle physics for early cancer detection are the best in the field by organizing workshops for a public discussion with other experts;
<b>WHEREAS</b> , On October 28, 2010 the University of Pavia organized (also via web connection to the world) a workshop at the Institute of Physics of the University to evaluate, through a rigorous SCIENTIFIC PROCEDURE, which technology is the best in the world to address the cancer problem and analyzing if there exist a project that is superior to the Axial-PET project that received first prize at the 2010 CERN Workshop “Physics for Health”, and compare it to the projects in the <a href="#">Cancer Research Project Comparison Table</a> and to the 3D-CBS project;
<b>WHEREAS</b> , Such SCIENTIFIC PROCEDURE, started on October 28, 2010 at the University of Pavia, has the goal of making uncovering the best project in the world to assign the Leonardo da Vinci prize. At this point in time the <a href="#">video recording of the workshop at the University of Pavia</a> on October 28, 2010 and the documentation relative to the 3D-CBS project and the documentation and links relative to the Axial_PET project and to the 124,737 other cancer research projects will be made available;
<b>WHEREAS</b> , a formal letter to evaluate such documentation will be sent to the leading research laboratories and universities in the world and a minimum of 40 days from sending the documentation will be allocated to allow research laboratories and universities to evaluate the documentation, also inviting them to suggest projects that could be possible candidates of the competition if in their opinion they would provide a higher efficiency in identifying specific particles at a lower cost per particle captured with respect to the solutions provided by Crosetto: with his 3D-Flow technology for applications in High Energy Physics and with the 3D-CBS technology

for applications in Medical Imaging;

**WHEREAS**, During the workshop at the University of Pavia on October 28, 2010, in slide 34, Crosetto described the scientific challenge (improving the efficiency in particle detection and reducing costs). In slide 35 he made a synthesis of the measurements that need to be performed in order to accurately extract information from signals received from the tumor marker. In the subsequent slides (together with references to links to documents and answers he provided during the discussion that followed) he [explained in more detail](#) his innovations that solve the problem;

**WHEREAS**, on the occasion of the Workshop of October 28, 2010, Crosetto wrote [a 27 page document](#) which reports SOME of the reasons why his innovations were not funded and therefore could not be built and could not benefit research in Particle Physics in the discovery of new particles and lowering costs, but more importantly it could have benefitted mankind by saving lives from premature cancer deaths through early detection, and whereas he hand-delivered such document to the people at the Workshop, sending it via email to the following recipients: CERN Director General, Prof. Rolf Heuer; CERN Scientific Director, Prof. Sergio Bertolucci; CERN Atlas experiment at LHC, Deputy Spokesman, Prof. Andrew Lankford; the CEO of the Organization United Against Cancer (UICC), Dr. Cary Adams, the Brookhaven National Laboratory (BNL) Associate Director, Prof. Ralph James and Mr. Steve Fluckiger from the law firm Jones Day. (Such 27 page document constitutes also an answer to the typical questions Crosetto has received and continues to receive from cancer patients, their relatives, friends and ordinary citizens regarding the reasons why his innovations were not funded and therefore could not be built. In the event that these written explanations were not exhaustive, he can provide additional detailed information that could be useful to those who have at heart this cause so they could remove the obstacles that block saving lives and reducing costs);

**WHEREAS**, during the Workshop on October 28, 2010 at the University of Pavia, the result was clear that CANCER DEATHS are INCREASING and that, in order to address the problem we need to support the implementation of an Open Public SCIENTIFIC PROCEDURE that funds only projects with a real potential to reduce premature cancer deaths by implementing the [Cancer Research Project Comparison Table](#) **where authors must provide their estimate of the reduction in cancer deaths and costs they expect to attain with their projects upon receiving the funding requested;**

**WHEREAS**, during the Workshop at the University of Pavia on October 28, 2010 it also emerged that cancer funding is assigned to projects that are NOT cancer research projects, as occurred at the Workshop "Physics for Health" at CERN on February 3, 2010 when the recipient of the award of the first prize for the best cancer research project admitted that his Axial-PET project was NOT for cancer research. It is also common practice to use cancer research money to fund projects which are known in advance cannot reduce premature cancer deaths;

**WHEREAS**, from the [27 page document](#) presented by Crosetto on October 28, 2010, it is detailed the proposal that his 3D-CBS project not to be considered as the only possible recipient of a prize, but that it would be more beneficial to the cancer patient and to the progress to create a competition by comparing projects that claim superiority to the Axial-PET that received the first prize at CERN and eventually that claim a superiority to Crosetto's 3D-CBS project;

**WHEREAS**, People who have at heart the problem of reducing premature cancer deaths (and trust that through a public competition, authors of the best projects will engage in a scientific discussion on the essence of their claims to the goal of making emerge the project with the highest potential to reduce premature cancer death), have already created an endowment of \$10,000 for the Leonardo da Vinci Prize, a **funding that can increase until April 5, 2011;**

**Because of all of the above, because of what the Vice-President of the University of Pavia and Steve Fluckiger stated, as was reported in the "September 20, 2010 minutes of the meeting" which occurred at the Rectorate of the University of Pavia, because of the request by over 7,000 people who signed the petition requesting a review of the 3D-CBS innovative technology, because of what was stated in Crosetto's 27 page document that he presented at the Workshop on October 28, 2010, because of the will of those who want to create a jackpot of over \$10,000 (Bank account for the Leonardo da Vinci Prize: cc. 960022454, ABA 114000093, SWIFT FRSTUS44).**

**The Leonardo da Vinci Prize has been created for the most efficient solution in particle physics for early cancer detection.**

**The Prize is open to authors, Principal Investigators, persons responsible for cancer research projects or anyone who would like to nominate a project that he believes to be superior to the ones cited in this document and for which he is willing to provide all necessary material and is willing to answer questions based on scientific arguments that will support his or the author's claims.**

**In order to participate to this competition it is necessary** to submit to the University of Pavia, via Bassi, 6, Pavia (Italy) by March 15, 2011 a description of the proposed cancer research project not to exceed 15 pages (with no limit to links of related referenced bibliographical material). It is required that the applicant provide documentation comparing the proposed project to each project it is believed to be superior to, such as the Axial-PET that received the first prize at CERN, and the 3D-CBS which is claimed by the author. The comparison description of each compared project should not exceed 5 pages. In addition the author of the proposal should answer the [questionnaire](#) relative to the Cancer Project Comparison table.

**Authors who intend to participate to this competition should comply with the following requirements:**

- a) Submit a cancer research project**
- b) Demonstrate the project has potential to reduce premature cancer deaths**
- c) Provide an estimate of the percentage of lives saved from premature cancer deaths**
- d) Provide an estimate of cost reduction for each life saved compared to current costs**
- e) Provide scientific arguments to support estimates at c) and d)**
- f) Provide a plan to measure experimental results**
- g) Provide a date when an estimate of the first results may be obtained after funding is assigned**

#### **CRITERIA THAT MUST BE FOLLOWED TO ASSIGN THE LEONARDO DA VINCI PRIZE**

1. The scientific procedure must be Public and Open to all projects from any country in the world
2. On March 22, 2011, connected via web from the University of Pavia (through the Caltec, EVO system and via web streaming), all proposals received via email or on paper will be analyzed publicly so that every participant will be able to verify directly that no one has been left out. Authors and Principal Investigators who submitted a proposal will be invited to participate in person (or via EVO Caltec system connection) to support with scientific arguments the superiority of their system compared to the others.
3. Participants who cannot attend the meeting in person or via web EVO Caltec system will be informed about the other projects, and within 10 days they should discuss (through exchange of emails and documentation that should also be made public) with the authors and/or Principal Investigators who claim their project to be superior in efficiency (as described at items 8 and 9 described below) with respect to their project.
4. A panel of scientists and people who have an interest in the reduction of premature cancer deaths who guarantee a scientific review will evaluate the consistency of each author's claim in a public meeting on April 5, 2011 to be held at the University of Pavia. At this meeting the authors will have to defend the superiority of their project over claims of superiority presented by other projects during the competition. Reviewers knowledgeable in the specific field will be able to point out possible errors in calculations and provide the correct ones.
5. In the event of a disagreement among the members of the review panel and/or authors of different projects, an agreement should be found by proposing an experiment where results will proof who was correct among the two parties. In order not to waste time and money on experiments to reach results that could have been demonstrated using calculations and logical reasoning, before building the experiment, authors and P.I.s responsible of the projects in disagreement should provide five letters signed by leaders in the field from the most important research laboratories in the world who state clearly that in their opinion the disagreement cannot be solved with calculations and logical reasoning, essentially proposing that an experiment is the only way to solve the controversy at the minimum cost in money and time to expedite benefits to the bed of the patient. In the event this intermediate test will generate a delay in the progress

of transferring benefits to the bed of the patient, the person who insisted on conducting the experiment and who is shown by the results to be wrong, should recognize his incompetence and should refrain to be a reviewer in the future in the evaluation of research projects.

6. Funding such an experiment considered essential as indicated above should be submitted to the Decision Makers who handle taxpayer's public funding for cancer research. Because of the power of the public who will have the possibility to follow the scientific procedure, together with the power of the over 7,000 people who signed the petition for a scientific review of the 3D-CBS project, because of the importance to identify the project with the highest potential to reduce premature cancer death (key objective for this competition) and because of the fair approach of this SCIENTIFIC PROCEDURE, guaranteed by leaders of the most important research laboratories in the world (who are required to assure that controversies among candidates cannot be resolved with calculations and/or logical reasoning but that it is necessary to conduct an experiment), in the absence of any indication from Decision Makers of the existence of projects that offer higher efficiency in the same field, funding for this experiment should take priority over other projects that did not followed such a procedure based on comparison among different projects.

7. As an additional guarantee to identify the best innovation or project, and to stress that the reviewer's task is to evaluate the superiority of a project with respect to another based on the soundness of logical reasoning and calculus, a reviewer or P.I of another project who claims superiority in efficiency (as detailed in items 8 and 9) of his project or innovation compared to Crosetto's innovations, should provide (as Crosetto has provided at page 6 of the [27 page document](#)) letters and emails written by leaders in the field with a role of a responsible position in the most important research laboratories in the world. This is to assure that reviewers will not use the tactic of requiring results only from some authors and not from others (so that two different weights and measurements will not be used) before providing funding that was requested in the first place to reach such results,

8. In order to determine the winner of the Leonardo da Vinci project, during the first phase will be selected projects which claim superiority in efficiency in particle detection provided by Crosetto's innovative 3D-Flow parallel-processing architecture in terms of capturing in real-time as many signals as possible which satisfy a specific selective criteria (algorithm) defined for a specific particle that one would like to discover (which should also be adaptable to identify several different particles) with the capability to accurately measure all parameters of the characteristic of the signals generated by the particles at the minimum cost for each signal captured. In absence of the identification of projects which present a superiority in efficiency at a lower cost the superiority of Crosetto's innovations in techniques to discover new particles will be recognized.

**9. FROM THE PROJECTS SELECTED IN ITEM 8, THE AWARD WILL BE GIVEN TO THE ONE TARGETED TO EARLY CANCER DETECTION THAT SHOWS SUPERIORITY IN EFFICIENCY TO CROSETTO'S 3D-CBS PROJECT (OR THE 3D-CBS IN THE EVENT NO OTHER PROJECT SHOWS SUPERIORITY IN EFFICIENCY), WHERE EFFICIENCY IS DEFINED AS THE RATIO, WITHIN THE UNIT OF TIME BETWEEN THE NUMBER OF PAIRS OF PHOTONS AT 511 KeV CAPTURED AND ACCURATELY MEASURED AND THE NUMBER OF PAIRS OF 511 KeV PHOTONS EMITTED AT THE MINIMUM COST PER PHOTON CAPTURED.**

Current item 9 which deals with capturing signals (pair of photons at 511 KeV) received from tumor markers with increased efficiency is the key element, the conclusion of the logical reasoning presented in the previous list of "WHEREAS" (which starts from analyzing the problem from the big picture of no results versus high costs, down to the very details of the signals generated when there is a mutation from normal cells to cancerous cells, to the technology that allows the latter to be detected at an early stage which is what finally will provide a substantial reduction in cancer death) which will allow a change in direction to cancer research that to date has shown a failure. This improvement in efficiency (and cost reduction) is the key element that should be achieved and what is now missing. If implemented it will provide results in premature cancer death reduction. The assignment of the award ultimately should focus on choosing the project that has the **highest potential in premature cancer death reduction. A plan to measure results will therefore be evaluated** that should verify an effective reduction in premature cancer death. For example by planning a test safe for the patient performed on a representative sample of 10,000 people ages 50-75, selected in a location with a constant cancer death rate of 50 deaths per year recorded over the previous 20 years (which is the average worldwide).

<p>10. After the first phase verifies that there are no authors or reviewers who have scientific arguments claiming superiority of their projects with respect to items 8 and 9, or after obtaining experimental results at a minimum cost built to demonstrate correctness of one author or another, the University of Pavia will have the power given by this public scientific review to assign at the meeting on April 5, 2011, the Leonardo da Vinci Prize to the project (or innovation) which has passed all tests and therefore can demonstrate its superiority in efficiency over others.</p>
<p>11. The guarantee of the correctness and transparency of this procedure of assignment of the prize will be supported by the participation of the public because the entire procedure will be made public (documents, debates, discussions and controversies).</p>
<p>12. Furthermore the realization of this scientific procedure, or “disciplined process” as called by Steve Fluckiger that will end with the assignment of the Leonardo da Vinci prize will be the tool that will allow to all those who, with their donation, want to create a better world for future generations (as for example the members of the Giving Pledge).</p>
<p>13. Ultimately the University of Pavia will not be held responsible in assigning erroneously a prize, because by having played a role as guarantor of the Scientific Procedure (together with other experts worldwide) and having satisfied the commitment of the Vice-president of the University of Pavia, Prof. Lorenzo Rampa, during his meeting on September 20, 2010 at the Rectorate of Pavia (as reported in the <a href="#">minutes of the meeting</a>), it can continue its role of being the most prestigious University open to the development of new ideas of innovators such as Leonardo da Vinci, Alessandro Volta, etc.</p>
<p><b>REQUEST FOR PUBLIC COMMENTS TO THE LEONARDO DA VINCI PROPOSED RULES FOR THE COMPETITION WHICH SHOULD BE SENT BEFORE JANUARY 31, 2011, WHEN IT WILL BE MADE FINAL</b></p>
<p><b>The proposed rules for the competition Leonardo da Vinci will be published on the web sites <a href="http://www.vincenzovigna.it">www.vincenzovigna.it</a>, <a href="http://www.insiemecontroilcancro.org">www.insiemecontroilcancro.org</a>, <a href="http://www.unitedagainstcancer.org">www.unitedagainstcancer.org</a> and will be sent to the leaders of the most important research laboratories in this field in the world with the request to send public comments so that all parameters can be identified that could contribute to reach the objective to select the most efficient project in particle detection targeted to early cancer detection with highest potential to reduce premature cancer deaths and costs..</b></p>
<p><b>If the proposed rules present barriers to identifying and awarding groundbreaking science with high impact in the reduction of premature cancer death and costs, please point out the provisions and recommend changes. To the extent possible, address comments to specific rule provisions. Such comments should be sent before 5:00 PM of Monday, January 31, 2011 to: <a href="mailto:insiemecontroilcancro2@gmail.com">insiemecontroilcancro2@gmail.com</a>, <a href="mailto:info@pec.vincenzovigna.it">info@pec.vincenzovigna.it</a>, <a href="mailto:v.vigna@smatteo.pv.it">v.vigna@smatteo.pv.it</a> or at the address: Vanna Sereno, Viale Martiri, 6 – 12045 Fossano (Italy).</b></p>