



Are the two heads better than one even if one is a cabbage? – memories and reflections on the project peer review practices in Croatia

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Abstract

The scientific project (SP) peer review process (PRP) is reviewed in the context of an virtual project and with the aim to identify the key stumbling blocks in the current practices of such SP reviewing in Croatia. Current practice of the PRP in Croatia is grossly non transparent and reminds of an »old boys club«. It's not known how the project reviewers are chosen and assigned to review certain subject area, there are no publicly available guidelines of what is considered to be important for such a project PRP and there are no guidelines on how to summarize and quantify the end result of such the PRP. The perennial problem of conflict of interest among the peers competing for the same funding sources is neither addressed nor resolved. The results of the reviewing are not sent to the principal investigators and researchers have no chance to confront the unfair project reviewing, or improve and resubmit their project following the reviewer comments. How the quality of the project assessment is transformed into the funds allocated to the project is mystery, and per capita distribution appears to be the decade followed practice regardless of the proclaimed political declarations in support of the scientific project merits. The role of local ethic committees (LEC) on human subject research in project submission procedure is also critically evaluated since there is a tendency for some LEC to act as a self-imposed pre-project reviewer even before the regular PRP. By virtue of having a power of final project submission approval, LEC may impose censoring of the strictly scientific issues. Therefore, there should be a chance to appeal such LEC practice and what is now grossly limited by the time frame of the project submission deadlines. Peer reviewing would always be subjective to a certain extent, but the excessive and/or unlimited subjectivity of the reviewer opinion and respective allotted funds should be prevented by carefully structured guidelines and full transparency of the whole process of the project peer-reviewing and funding.

INTRODUCTION

Science is a complex human activity, the pinnacle of human brain capacity, and the backbone of prosperity for every country in the world (1). Research and development activity in science is mostly directed *via* the projects and project peer review system is already almost a century long scientific endeavor with the aim (in theory) of procuring the support to those that appears to be the most promising. Hence the chosen English proverb »Two heads a better than one, even if one is the cabbage« was chosen to epitomize the idea of peer reviewing process where

an active anonymous stand-buyer is supposed to judge upon your brainchild project. Thus, the aim of this reflection is to draw attention to the current practice of project peer review (PPR) as practiced in Croatia today, and to suggest some possible ways on how to overcome the obvious shortcomings or improve the cutbacks from a position of an active scientist involved in such activities in both Croatia and abroad over the last forty years. Science, like many other human intellectual activities is too much important to be left to some inadequately trained administrator that may be found at many responsible positions in this country and who can only handle your project with the bureaucratic compassion of a formal scrutiny at the best. The new round of writing project proposals is looming over the scientists in Croatia and most likely would be here around the Christmas time. Therefore, it is time to look back and see what could have to be done better in the future than it was in the past.

Well, now, let's suppose, you have just finished your scientific research project (RP) and procured the final version ready to be sent out. You already complained with all the good hearted advices from experts who taught you on how to prepare a competitive and successful project (2), you carefully structured your review part (3), take care of your immaculate English, Croatian (or whatever) (4), extend your persuasive power to the limit (5), seal the envelope and address it to the chosen Ministry, Agency, Society (or whoever) in order to get your Project funded (6). Now, we are on the road and our Odyssey has begun. Shall it be »my way« as F. Sinatra sang remains to be seen after few months of the reviewing process. Patience, my friend, is the only medicine.

WHO, WHAT, WHERE, WHEN, WHY AND HOW OF THE PROJECT PEER REVIEWING

So, what is the peer reviewing all about? You may read an insightful review paper by the editor of the Croatian Medical Journal (CMJ) and his collaborators on the current peer-review practices of the manuscripts submitted to the CMJ (7). Here we would provide the reader with a broader background concept of such a peer review processing. Indeed, historically what should be published was essentially the executive privilege of the journal editor-in-chief, usually the »top gun« scientist in the field with the prolific writing talent and literary inclination. Whether he would ask for help or delegate the subject of decision to somebody else was only his own choice and responsibility. Starting with the »roaring twenties« (the term is used to describe the huge economic bubble that preceded the world greatest economic depression, the situation similar to the economic troubles of today), the new practice of peer review was enthroned in the USA. The practice spreads together with the establishment of the USA as a technologically the most advanced country in the world after the WW 2.

The concept of peer review is essentially the transposition of the Anglo-Saxon judiciary system of decision

making (ruling) into the science. It presumes the choice of the anonymous experts (the jury) who would impartially consider the evidence and come up with the objective, common sense conclusion (verdict) about the quality and merit of the submitted manuscript. How to overcome the possible conflict of interest among the people competing from the same field of science endeavor for the same financial source, was never effectively resolved. Hence, the prefix peer was placed in front of the word review to cover for that subtle contradiction of the possible conflict of interest of competing scientists of, supposedly, the equivalent professional stand. Indeed, the peer-review system was not welcomed open hearted and among many scientists who opposed it was Albert Einstein who, anecdotic, subtracted his manuscript to the leading USA physics journal for publishing since he rejected the idea that his unpublished work would be subjected to the judgment of the anonymous reviewer of questionable authority in the field. Moreover, there is always the possibility that the anonymous reviewer may get advantage of your unpublished material and keep it in his drawer until his publication came out first; the situation that occasionally have had occurred in the practice. *Nota bene*, the role of anonymity in judicial practice may be of some interest to the Croatian reader since it was a daily routine in the Venetian Serenissima and Dubrovnik Republic – both were the feudal aristocratic governments and certainly not the republics in the today modern sense of the word.

Peer review has its dark side as well. Famous Russian genetic Vavilov lost his life in the notorious Stalin purges claiming that only inherited but not environmentally acquired traits can be transmitted to the next generation; a variety of *nature vs nurture* or *hen and egg* problem dilemma. After the collapse of the Soviet Union the secret archives revealed that Vavilov's bad luck came from the denouncing of his peer reviewers to the political authorities due to, supposedly, Vavilov's straying from the right path of proper ideological and scientific thinking. This dilemma was further ideologized by now infamous plenary lecture of T D Lisenko »On the state in the biological sciences« that clearly proclaimed ideology over the science, or science as a servant to the ideology (8). Apparently, the modern history of science confronting the beliefs runs on from its founder Galileo to the USA former President WG Bush who banned the stem cell research on the religious grounds after having a consultation with God himself. The respective cases of Lisenko and Bush, of ideology and religion, put themselves above the process of science discovery declaring authoritatively what is right and what is wrong instead to consider the scientific facts (9). Apparently, we haven't learned much from the history and we are therefore bound to repeat our errors. Recently, the National Institute of Health (NIH) scientific elite ostracized Prof. P. Duesberg from the status of acclaimed molecular biologist to the bad boy of science for his view on HIV and against their prevailing consensus (10). »The sin of thinking« or having a minority view remains a permanent curse of science as ever in the human history. Beware, that if you rally come up with some

wild and not so wild new idea, your project will have a bumpy road, not to say something much worse.

True, objective peer review can be of great help in what should be funded and preventing the useless lost of money on *perpetum mobile* type projects unless somebody discovers a brand new science of thermodynamics. Good reviewing may help get the better project and improve its quality, eliminate duplication, and provide for a more complex understanding. It is also the main gatekeeper against fraud, theft, plagiarism, illiteracy, confused thinking, data manipulation, minchausenism, and other misbehaviors of scientists who are as human as any other human may be. However, beware that every practice has its dark side of malpractice.

WHO REVIEWS

With this background information on the project peer review process in mind let us come back to the fate of our virtual proposal. Once the proposal reaches the appropriate agency it should be assigned to some per-reviewer (or better 2–3 of them) for evaluation. So, who will review your project? Ideally, that would be somebody with high academic credentials with working knowledge in the science of your research area and who has the breath of knowledge to be able to assess the merit of your project in a professional and objective manner. My specific area of research are the bioelements, i.e. trace elements and minerals, in men and animals in health and disease and I am one of about 3500 members of the American Society for Nutrition (ASN), the strictly professional organization that covers the entire research area. By being strictly professional means that you can become the member only by the recommendation of your colleagues i.e. peers in the ASN who thus acknowledge your scientific contribution to the field. Considering the whole waste area of nutrition, about 10% or 350 people at the most, would qualify as expert reviewers for my broad area of research in the USA. If the similar ratio exists for Croatia, then for the country of 4 500 000 there would be 100 members of some hypothetical Croatian NS and 10 of them could be associate with trace element research in all its forms and would be the core group of potential peer reviewers in my field of interest. Unfortunately, nothing similar to such a register of potential peer reviewers does exist in Croatia or I am not aware of it. An additional advantage of such register of competent experts would be of benefit for the economy of the entire Croatia when an expert advice is needed and the long missing link between the science and the real world of economy can be firmly established for the benefit of both.

However, the essential problem of having only ten potential peer reviewers available is only the minor one since all ten of them are the potential competitors for the same research funds in Croatia and thus have an evident conflict of interest. When the state secretary for science in Croatia, Mr. D. Vikić-Topić, in his interview to the daily newspaper *Vjesnik*, openly declared that the main objective of the Ministry of Science, Education and Sport of

the Republic of Croatia (MZOS) is to reduce the number of the successful project applicants to 15% and to reject 85% of the submitted project proposals in the peer reviewing process, then the conflict of interest would certainly overcome the issue of scientific merit. Not more than 2 out of possible 10 submitted projects of our hypothetical Croatian NS on bioelements would make it through. The bottom line is rock hard: Who would be on the board that make decision of what project would be funded would have his project funded.

Its certainly not an overstatement since in the last round of project proposals the unfair practice of such boards (»Povjerenstva« in Croatian) has been publicly exposed in now deceased »Feral«, an independent satirical weekly magazine from Split, Croatia.

DOING THE REVIEW

The next question would be on how the project is evaluated by the peer reviewers. Are there some public available guidelines on how to do that to get an objective assessment of the submitted scientific project? Not to my knowledge.

Would the size of the group, i.e., the number of scientists submitting the project, be of decisive importance? Since I started my carrier in science in the late 60' of the last century, the pendulum was always swinging between preference to the large groups (Macro) under the disguise name of politically cherished (collective) teamwork effort, and individual research effort (Micro). Moving regularly back and forth between Macro and Micro and changing positive to negative sign from one grant application period to the next. In practice, where Micro can be a single individual, Macro involves any number of subjects above 5. The explanation in favor of Macro always was that it helps team work that provide a greater base and hence higher quality of research and that the productivity of such teams should be better then on the individual basis. Indeed, ever since Lotka, the number of published scientific papers is considered to be an attribute of the scientific creativity and merit (11). Like any other generalization, this one on teamwork is flawed by simple fact that amassing the number of participants per project does not itself generate the quality of their scientific output. This is the classical case of wrong implementation of the dialectical Law of the transformation of quantity into quality where two unrelated premises are juxtaposed to bring the logical but invalid conclusion. Reminds me of the proclamation that the former Yugoslavia was the industrialized country because the number of peasants felt below a 30% of population. Or like the proclamation of the former China Chairman Mao that China is industrialized nation since it produced ten million metric tons of steal per year. A virtual indicator has been achieved whereas the quality of steal from village founders didn't matter. Much easier check of the scientific productivity of a team of scientists would be to enumerate the coauthor's participation where every participant of an enumerated publication got his equal share (12).

Could it be that the merit of the Principal investigator of the submitted project is essential? Yes, to a great extent. So what is the merit in science? If somebody is the head of the department this is certainly meritorious. If he, lets say, operates every day and if his patients are always fine it is certainly meritorious. But is it meritorious enough to claim high scientific credentials of such honorable person? I am afraid not, since the product of the scientific work is the scientific information. Indeed, scientific information can come in many of a different disguise – it can be a scientific paper, textbook, congress communication, patent, or any other member of the scientific evidence pool regardless of the magnitude of its scientific contribution (13). The years of study in »science of science« brought me to the conclusion, and in accord with many other scientists, that the scientific output can be strictly enumerated (14) and that the best predictor of the real scientific merit is neither the total number of publications, nor the total number of citations, but the number of citations per some identifiable single scientific information (15). Transferred into the real world it means that any granting agency should have the full information and enumerated »dossier« of every scientist working for it, the »dossier« that should be regularly updated with citation counts. The good foundation block in that direction already exists in this land of mine country (CROSB) that take care of »bookkeeping« what the scientists in Croatia have published. The rest of the suggested information business may be placed in the hands of some specialized, either government or privately sponsored professional agency. I would conclude this paragraph on the merit of scientific information with a statement that every scientist in Croatia who wrote even a single paper that has been cited 100 or more times should get on a »fast track« for funding for his submitted project. Please, don't panic – by the most liberal assumption there is no more than 10 such »citation classics« paper published by the scientists in Croatia, perhaps few more if they were done along an international collaboration with leadership from abroad.

Shell the multidisciplinary projects and collaboration, with other scientists and other projects in the country and abroad, be included in the peer-review project evaluation? I believe yes, but always with a »grain of salt«. Certainly, some problems in clinical epidemiology are multidisciplinary *per definitionem* since you have to have at least a clinician, an epidemiologist, and a professional laboratory support in biochemistry/molecular biology. Animal experimentation may come along to test some crucial hypothesis that may have been generated in the project due course. Indeed, the effective logistics would be the must for any such a projects. Much more common at our geographical latitudes of West Balkan, multidisciplinary science is reduced to the one part of a team routinely collecting the samples, and the other routinely analyzing them, respectively. And what can be hardly qualified as multidisciplinary endeavor since it does not move above the simple data collection – close to the weather forecast kept in the drawer, or published in

the annual reports that are never to be read or quoted. Certainly, you can make a science out of such a routine and it has been done by the professional monitoring services and the like »smart« people in this country as a spin off of their basic routine activity. Even the birth and death certificates may be the science if there is a context that would bring them to some meaning.

Today, to have a foreign scientist on the board of your project may be and may be not a »feather in the hat« in regard to your project. The key issue here for the peer reviewing would be the actual involvement of such a scientist on your project. Are you working independent of each other, every one in his separate field, or are you working separately but in parallel, and how much the different parts of your and your colleague project are integrated and/or independent, respectively. Evidently, the character of your collaboration should be clearly explained in your project submission. Thus far the projects I have seen or heard about, never exceed the level of administrative addition of the name and affiliation of the foreign collaborator to the project regardless of the size or in depth reach of the project itself – some samples might have been exchanged, of course. The simple fact of the matter is that the administration prefers simplicity and uniformity since that requires less of the parameters to be considered, evaluated, and enumerated so that the less qualified people can manage them and keep books in order. Today, every scientist in Croatia may participate at the two projects at a time and there is no way for »lateral« expansion to other projects except for private arrangements. Nobody in this country figured out on how to »give a breath« to such a »complicated« idea of extension to several project cross-fertilization, although it may be of use for the entire scientific endeavor in this country. Here I may muse about the role of administration in science organization and especially funds allocation – shell the administration govern or shell the administration serve. Perhaps, better say, is the administration a long hand of the central power in implementing its will, or is it a structured, organized service to promote the efficient network for the action of the people in the society. Or, what should be the ratio between the two.

So, what should our peer reviewers do the next? Perhaps, they would focus on how original is the whole idea of the submitted project. Are we simply reproducing somebody else work regardless of the small modifications we may have incorporated in the project, or are these modifications genuine attribution to the subject area. This approach would reveal the novelty paradox, i.e., if indeed you are on a new track, would you reviewer recognize the novelty and support or reject it according to his taste and believes. We all heard about »Nobody is a prophet in his back yard« or »The saber cuts the head that sticks out« what in modern terms can be equivalent to the hostile reviewing. Such reviewing may assume a spectrum of different forms, i.e., »the subject is of interest to some more specialized journal«, »the study should take into account ...« and then came a long list of the unrelated requests that would require a new and a different

study and/or experiment over the next several years, until the last resort i.e., »the poor English« after seeing the diacritical marks on your name or if he is not familiar with it. I have had all kind of positive and negative reviews of my submitted manuscripts, but one on »poor English language« tops my list since I have three US University professors on that manuscript, all of them being the Americans for generations, and one of them a full professor in English language at the University! »Objective« peer reviewing, wasn't it? However, it is not too bad with the journals since you may always try another one. But I never got any peer review of my proposed research project regardless of the fact that it is good, bad, or whatever. I suppose that any project that has been turned down deserves some explanation to the author so that he may improve it and run again until he make the required standard. The standard based upon the guidelines that should be known to all the applicants in advance and what even if exists is not yet publicly available. I think we should allow the principal investigators to improve their projects by following the peer reviewer suggestions and that there should be some body that would consider the project authors challenge to the verdict of the reviewers.

FUNDS ALLOCATION

Once you have passed the peer review process and your project proposal is approved there remains the question on how much money will be allotted to fund it. We are all instructed to make the projection of our planned project spending but how the job is really done is the complete mystery in this country – this process is not revealed to the uninitiated like me. All the calculations based on the limited data if and when available from the public sources in the lay press over the last forty years points to the pay per capita principle (»glavarina«). Our main science research support agency in Croatia, the MZOS, got certain amount of budgetary money and spread it more or less equally across the number of the involved participants. Of course, there are some small corrections regarding the faculty, institute or whatever academic status, but there is no much concern for the quality of the project as such. At one point in time, shortly after Croatia became independent, we have had an A, B, and C classification of the projects, where the A projects were allotted the largest sum of money and the C the lowest. Considering all the above discussed non transparency of the project evaluation procedure its not surprising that it was the worst possible case of the »old boys club« philosophy based upon the »I'll scratch your back, and you'll scratch my back«. The real science may only suffer from such a poor practice.

ETHIC CONSIDERATIONS OR THE ROAD TO THE NEW CENSORSHIP

After the WW II, when the atrocities committed by the nazi shameless doctors to the death camp human prisoners became known to the world, the World Medical Association Declaration of Helsinki. Ethical Princi-

ples for Medical Research Involving Human Subjects (<http://www.wma.net/e/policy/b3.htm>) was adopted world wide to preclude such things happen again. Some other notable ethic failures like the notorious Tuskegee Syphilis Study where then already available penicillin was not administered to the infected subjects so that the natural course of the disease can be monitored (16), also promotes the ethic considerations on the human subject research into the forefront. The politics of human rights is another story that is intimately waded with the human subject research (17). Today, the local ethic committees (LEC) are the established fact of life in this country and the informed consent is the norm of the day so that there is no chance for anybody to submit his project proposal to the peer review before he got the LEC approval. Like medicine, ethic involves all the facets of human social activity (18) and today, in my opinion, it is the current fashionable band-wagon for non-medical professions to tap the rich financial resources associated with medical practice in the USA; especially when it comes to the malpractice suites.

Essentially, the idea behind the LEC is the same as the idea behind the peer reviewing, i.e., to provide the jury like scrutinized eye of the lay public upon the scientific experimentation in medicine – »no hands please«. Carefully selected members of the LEC are hand picked Law abiding citizens from the community surrounding the local University or same state or federal science Institution in the USA. At certain dates the scientists would come up to talk about their projects and to subject them to the lay people LEC discussion. The procedures I witnessed were instructive since the questions of all kinds were raised and, if there were acceptable suggestions to improve the project, they could have been adopted at the spot – the whole scene was one of some scientific fare (19). However, the common sense of these non-professionals was more than adequate to recognize any possible Mengele's inhumane successor to push through any shameful inhumane project, or any other project that may inflict the unnecessary pain and danger or impede the dignity of the human beings (Mengele was the infamous nazi doctor killer at Auschwitz concentration camp during the WW 2).

So how do we fare with the LEC in this country? In medical research related area they are usually composed, instead of lay citizens, with medical doctors and other highly trained science professionals from the hospitals and institutes so that the rivalry may not be entirely excluded. Next, their decision in project submission is final and there is no way to challenge either good or bad LEC verdict. Thus, LEC may slow down the submission of the project or even postpone it to the next or some other round, respectively. This is not to say that the men I know from the LEC are not honorable people, but that there is a tempting possibility to ruin some project depending upon the circumstances. It may be either that there is a genuine conflict of opinion on specific issues all the way up to personal idiosyncrasy. Essentially, the bottom line is

that your project is pre-peer review by self-imposed reviewers of LEC.

My experience with LEC in my former working place is not glorious. One of the doctors objected the single intra venous administration of 4 mg of dexamethasone to test the granulocyte reserve of depressed ambulatory subjects on the ground that it may provoke suicide since dexamethasone is a corticosteroid and corticosteroids may stimulate human suicidal behavior. It doesn't help that there is not a single report in the entire world wide available literature of such a suicidal case, but I have to remove the test from my project proposal if I wanted it to be submitted. It didn't matter that I already published an animal experimentation on organic solvent toxicity based on that granulocyte reserve test diagnostic capacity (20). Far more important was that the same test was proposed by the world renowned clinicians and has been used for the last fifty years in the human clinical practice in diagnosing depression (21) – it was nothing new and never reported to induce any harm and especially no suicide [NB. The project was envisaged to study the changes of hair and whole blood multielement/bioelement profile in the human depression].

As if it were not enough, I faced another stumbling block from my dear peers in the LEC i.e. that the experimentation with the human subjects suffering from the mental diseases is regulated under separate and even the more restricted Law. The name of the Law in the Croatian language is »Zakon o zaštiti osoba s duševnim smetnjama« [Law on protection of subjects with mental impairments – translation is mine] and is a part of the Law adopted by the Hrvatski Sabor, [Croatian Assembly] (22). It remained unanswered who is to decide if the Law applies at all since the ambulatory depressed subjects are in no legal or any other way restricted in their rights and may express their will lawfully free. However, the plot sickened since at a time there was no such a specialized high level Ethic Committee (EC) for mental disorders available in the Republic of Croatia regardless of the Law. Thus, to whom after all should I send the project for the ethic assessment? After almost three months of waiting at the doors of the Ministry of Health (and daily phoning since the time was running), my project was relegated to the Republic Central EC by default (and thus *ipso facto* against the Law). To make the long story short, precisely 10 minutes before the deadline has passed I was simply lucky enough to get the final LEC signature on my project proposal and thus was able to lock it on time through the Internet application system of the MZOS. I will left it to the reader to decide if the whole story was the matter of the protection of human rights of human subjects in medical research, the ill funded self-imposed censorship, or a hostile pre peer review before the submission of the research project for the regular peer review.

I presume, without a shadow of a doubt, that no principal investigator, including myself, would be against the ethics of human subject research in medicine and that medical interventions may always contain an element of

risk without such there is no progress (23). However, the real life situation thought me that some pragmatism should be included in implementing that high ideal. The LEC should not act as some self-imposed pre-peer reviewer of the scientific research projects, that there should be a transparent chain of who is responsible of what in decision making when special cases of EC exist, and how the LEC decision may be appealed in the case of the conflict of interest. With this final remark I would terminate my personal recollections and reflections on the research project peer reviewing practice in Croatia today by concluding that two equally qualified heads may be better than one, but not if one of them was a cabbage. And to be followed by an important self-evident condition: The peer reviewing should be fair and what is possible only when there are transparent publicly available guidelines on project peer reviewing.

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ADDENDUM

At the time when this article was waiting to be published, the Ministry of Science, Education, and Sport (MZOS) of the Republic of Croatia (Croatia) have re-evaluated the funding of the ongoing scientific research projects (Projects) (Večernji list, Friday, July 30, 2010, p.5). Out of a total of 2299 Projects, there were 245 that

were denied further funding support, 971 Projects would be funded with the same amount of money as before, and the rest of 1089 Projects would receive either more or less money than before without specifying the last »more or less« category of Projects. Neither it was published how much money MZOS has sucked in such a way from the Projects into the Croatian government empty budget hole. MZOS's explanation of its action sounds quite scary, quote: »Svatko od podnositelja projekta saznat će kako je sam prošao ali ne i kako je njegov projekt odmjeran unutar struke«, and »... abeceda ocjena (je) interni kriterij povjerenstva koji nije za objavljivanje« »Every Project applicant would know how did he fare himself, and would not know how his project was peer-reviewed«, and »... the abc of this Project re-evaluation was the internal criterion that is not to be publicized«. So much so, for the transparency of the competent professional peer-review of Projects in Croatia in the year 2010. The spirit of Franz Kafka's »Trial« is alive and doing remarkably well these days. Transparency, rest in peace.