

Catherine Podeszfini
Program Officer, Chemistry Evaluation Group
NSERC
Ottawa, ON K1A 1H5

May 28, 2010

Re: Appeal of Decision of NSERC Discovery Grant Application (312584-2010)

Dear Ms. Podeszfini:

I thank the Chemistry Evaluation Group for their time and effort in evaluating the applications from this year's Discovery Grant competition (NSERC, 2010a). However, I feel compelled to appeal the committee's decision not to fund my application for an NSERC Discovery Grant. My appeal is based on **errors** and **procedural unfairness** in the review process that are both specific to my application and apply more generally to the Discovery Grant process as a whole. Specifically, 1) I should have been assessed as a researcher at an "early career stage" based on the short duration of my initial 3-year Discovery Grant (**procedural unfairness**), 2) the 2009/2010 Peer Review Manual requires that the same quality cut-off be applied to both "first renewal" Established Researchers and other Established Researchers (**procedural errors**), and 3) the recent "enhancements" to the Discovery Grant process have created a systematic bias against researchers from small universities (**procedural unfairness**).

In addition, the definition of "first renewal" applicants was not defined.

1. Procedural Unfairness: "Early Career Stage" Applicants

Since I have only ever held a 3-year initial Discovery Grant, I should have been considered an applicant at an "early career stage". Although I am technically not in the "first renewal" category, the main reason that my 3-year Discovery Grant was not renewed in the 2008/2009 competition is that special consideration was not given to "first renewal" applicants last year due to the retroactive, unannounced elimination of the long standing 3+2 funding policy. This has resulted in the **remarkably unfair** situation in which "first renewal" applicants with 5-year initial grants[†] received preferential treatment this year over applicants who lost their 3-year Discovery Grant grants last year as a result of these changes.

While NSERC's concern for "first renewal" applicants is commendable, it is both **unfair** and **inconsistent** that "first renewal" applicants have been given preferential treatment every year except the 2008/2009 Discovery Grant competition. Unfair treatment of "first renewal" applicants in last year's competition was in fact the main basis of my appeal last year (Murimboh, 2009). The external advisor that evaluated my appeal noted that "Dr. Murimboh's productivity and scientific maturity are being evaluated early compared to those who are up this year with an extra 2 years under their belt, and it shows unfortunately in this case negatively" (External Advisor, 2009). Nevertheless, NSERC "concluded that there was no

[†] 5-year initial Discovery Grants were awarded to Established Researchers receiving their first grant.

compelling evidence of unfairness” (Duchesne, 2009) in the evaluation of my Discovery Grant application. Consequently, I was astonished to learn that NSERC has suddenly decided that it is indeed unfair to compare “first renewal” applicants with other Established Researchers.

As a result of the **flip flop** in NSERC policy, I have suffered from **procedural unfairness** for two consecutive years: 1) by being evaluated early compared with Established Researchers with an additional 2+ years of NSERC support in the 2008/2009 competition, 2) by not being considered an “early career stage” applicant in this year’s competition, and 3) by having to achieve a higher quality cut-off (very strong-strong-strong) than “first renewal” applicants with 5-year initial grants (strong-strong-strong). In view of the above, I should be considered as an “early career stage” applicant due to the short duration of my initial 3-year Discovery Grant.

In addition, the 2009-10 Peer Review Manual requires that all quality criteria be given equal weight.

2. Procedural Errors: Violation of NSERC Rules

The preferential treatment given to researchers at an “early career stage, i.e. ‘first renewal’ applicants” **contradicts** the definitions outlined in the 2009/2010 Peer Review Manual (p. 3) which defines Early Career Researchers as applicants “who are **within two years** of the start date of their first eligible position at the university and who have no prior academic or non-academic independent research experience. **All other applicants** are Established Researchers.” The definitions clearly establish that “first renewal” applicants are actually Established Researchers. The term “Established Researchers 1st Renewal” is in fact the definition used by NSERC in the 2010 Competition Statistics (NSERC, 2010b).

Furthermore, the 2009/2010 Peer Review Manual (Using the indicators, p. 15) clearly indicates that Evaluation Groups can only apply a different quality cut-off to Early Career Researchers. Consequently, the application of **different quality cut-offs** for “first renewal” Established Researchers and other Established Researchers **directly violates** the rules outlined in the 2009/2010 Peer Review Manual and effectively amounts to a **retroactive change** to the rules. This is the second consecutive year that undocumented changes have arisen.[‡] It highlights a disturbing trend in which applicants are informed of changes to the Discovery Grant process only after the results have been announced. Furthermore, if NSERC can arbitrarily apply different quality cut-offs to researchers within the same category (i.e. Established Researchers), then what is the point of these categories in the first place?

Although I appreciate the necessity for the Chemistry Evaluation Group to make its funding decisions based on principles that are “appropriate to its community” (NSERC, 2010a), the decisions must comply with all previously established rules (e.g. 2009/2010 Peer Review Manual). A fair application of the procedures therefore requires that the same quality cut-off (i.e. strong ratings across all three criteria) be applied to both “first renewal” Established Researchers and other Established Researchers such as myself.

3. Procedural Unfairness: Bias Against Researchers from Small Universities

The results from the recent “enhancements” to the NSERC peer review process that were implemented in the 2008/2009 and 2009/2010 Discovery Grant competitions directly contradict the findings of the International Review Committee, which emphasized that a

[‡] The only information provided in the June 2008 announcements and the September 2008 Information Sessions was about the introduction of the conference model and the minimum grant amount (NSERC, 2008).

significant **intentional reduction** in the DGP success rate in order to concentrate funds on fewer researchers would have a **disproportionate impact** on small universities (Nicholson et al., 2010). This conclusion was also supported by the president of NSERC (Fortier, 2009) and NSERC Management (NSERC, 2009) who stated that “small grants should not be cut and, by extension, the success rate in the DGP is not too high.”

The impact of the changes to the Discovery Grant program has been to raise the quality cut-off by two bins from strong-strong-moderate (2008/2009) to very strong-strong-strong (2009/2010). As predicted by the International Review Committee (2009) and NSERC Management (2009), the changes have had a **disproportionate impact** on researchers from small universities (38% success rate for small universities compared with 63% for large universities). Setting aside the results from Early Career Researchers and first renewal applicants leads to an even more dismal picture at small universities. While I strongly support the concept of funding research excellence, it is also important that the quality cut-offs can reasonably be attained at small universities. In view of the fact that the recent “enhancements” **directly contradict** the publicly stated policy of NSERC Management (see above), they have created a systematic bias against researchers from small universities. Fortunately, NSERC has a unique opportunity to address this problem by using the \$8 million in new funding (Blain, 2010) announced in the 2010 federal budget to fund additional high quality applications (as fairly evaluated using the evaluation criteria) from the 2009/2010 Discovery Grant competition.

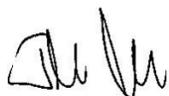
Conclusion

The evidence presented above clearly demonstrates both **errors** and **procedural unfairness**. These are based on the fact that 1) I should have been evaluated as an “early career stage” applicant based on the short duration of my initial 3-year Discovery Grant; 2) the same quality cut-off (i.e. strong-strong-strong) should have been applied to both “first renewal” Established Researchers and other Established Researchers as required by the 2009/2010 Peer Review Manual; and 3) the deliberate effort to increase the funding level and to systematically decrease in the success rate directly contradicts the publicly stated policy of NSERC Management, and amounts to a de facto systematic bias against researchers from small universities as predicted by NSERC’s own International Review Committee. I therefore urge NSERC to reconsider the decision not to fund my application for an NSERC Discovery Grant.

In the event that my appeal is sent for review by an external advisor, I request that the advisor be selected from a small university due to the concerns outlined above. In addition, I would like to know the number of successful applicants and the success rate for Established Researchers (excluding “first renewals”) from small universities in the Chemistry Evaluation Group.

Thank you in advance for your time and effort in considering my appeal.

Sincerely,



John Murimboh, PhD
Associate Professor

Attachments

NSERC. (2010a, March 31). *Message to Applicant. Referee Report – Application for a Grant*
Murimboh, J. (2009). *Discovery Grant Application.*

Citations

Blain, I. (2010, March 26). Message from NSERC/Message du CRSNG.

Duchesne, P. (2009, July 31). Response to Appeal of 2009 Discovery Grant Application. NSERC.

External Advisor. (2009, July 31). External Advisor's Report - Ref # 007-26. NSERC.

Fortier, S. (2009, October 13). Message from the President - Discovery Grants International Review. Retrieved May 9, 2010, from http://www.nserc-crsng.gc.ca/NSERC-CRSNG/Reports-Rapports/DGRevPresident-SGExaPres_eng.asp

Murimboh, J. (2009, May 28). Appeal of Decision on NSERC Discovery Grant Application (312584-2009).

Nicholson, P., Davies, G., Kaspi, V., Mayer, L. A., Olsen, K., Robson, K., Winnacker, E., et al. (2010, January 14). Report of the International Review Committee on the Discovery Grants Program. Retrieved from http://www.nserc-crsng.gc.ca/_doc/Reports-Rapports/Consultations/GSCStructure/ReportOfTheInternationalReviewCommitteeOnTheDiscoveryGrantsProgram_e.pdf

NSERC. (2008, August 7). NSERC - Summary of Changes – 2008 Program Guide for Professors. Retrieved May 9, 2010, from http://www.nserc-crsng.gc.ca/Professors-Professeurs/08ProgChng-08ProgRev_eng.asp

NSERC. (2009, February 11). Management Response to the International Review of the Discovery Grants Program. Retrieved from http://www.nserc-crsng.gc.ca/_doc/Reports-Rapports/Consultations/GSCStructure/ManagementResponsetotheInternationalReviewoftheDiscoveryGrantsProgram_e.pdf

NSERC. (2010a, March 31). Message to Applicant.

NSERC. (2010b, April 12). 2010 Competition Statistics Discovery Grants Program.



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MESSAGE TO APPLICANT

MESSAGE AU CANDIDAT

This message represents the consensus opinion of the evaluation group that reviewed your application.

Ce message reflète le consensus de l'opinion du groupe d'évaluation qui a examiné votre demande.

Applicant's Name, Appl. ID, Institution / Nom de famille, numéro de la demande, établissement du candidat	Murimboh, John JD, 312584-2010, Acadia
Type of Grant / Genre de subvention	Discovery Grants Program - Individual Programme de subventions à la découverte - individuelles
Evaluation Group / Groupe d'évaluation	Chemistry Chimie
Application Title / Titre de la demande	Exploring the link between the equilibria and kinetics of trace metal speciation

The Evaluation Group rated your application as follows / Le groupe d'évaluation a attribué les cotes suivantes à votre demande de subvention :

Excellence of the Researcher(s) / Excellence du ou des chercheurs :	Strong
Merit of the Proposal / Mérite de la proposition :	Strong
Training of Highly Qualified Personnel / Formation de personnel hautement qualifié :	Strong
Cost of Research / Coût de la recherche :	Normal

Additional Comments / Commentaires additionnels :

Additional Comment from NSERC / Commentaire supplémentaire du CRSNG:

The Evaluation Group performed the difficult task of balancing the amounts to be awarded in relation to the number of researchers funded. Unfortunately, for several of the twelve evaluation groups, it was not possible to support all applicants receiving "Strong" ratings across all three criteria, given the level of competition. In making these tough choices, the Evaluation Group relied on principles that were deemed appropriate to its community. The evaluation group that reviewed your application gave priority to the applicants who were at an early career stage, i.e. the "first renewal" applicants given the short duration of their first Discovery Grant and to those who received higher ratings for the criterion "Excellence of the Researcher". This meant that your application, unfortunately, could not be funded.

"First renewal" applicants are actually Established Researchers as defined in the 2009-10 Peer Review Manual.

According to the 2009-10 Peer Review Manual, all quality criteria must be given equal weight.



Referee Report - Application for a Grant
Rapport de l'examinateur - Demande de subvention

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Family name, given name and initials(s) of applicant / Nom de famille, prénom et initiale(s) du candidat Murimboh, D. (John)	Application no. / N° de la demande 312584
Type of grant / Type de subvention Discovery Grants - Individual	Committee / Comité 1504

Confidence Level / Niveau de confiance

I rate my ability to assess this particular application as / Mes compétences évaluer cette demande sont

High / Elevées

Satisfactory / Satisfaisantes

Low / Faibles

The applicant proposes to continue his studies of the influences of components of natural waters (natural organic matter) on the chemical speciation of selected metals. These studies are directed at providing an accurate estimate of the fraction of the total metal burden that is available to contacting organisms. The availability of a metal within natural waters is attenuated by other complexants that are present within the natural water body. By associating with the free metal ion the product complexes possess decreased mobility and are considered to be incapable of traversing biological membranes. Existing models (FAIM or BLM) consider that the active specie that traverses a biological membrane is the free metal ion, but as the applicant points out, several reports seem to describe situations where this supposition is contravened.

The applicant proposes to use passive in situ samplers of his own design to begin to unravel the process of metal ion availability to organisms. He proposes to explore the links between kinetic speciation and equilibrium models in aquatic environments. In the longer term, the passive samplers are envisaged to provide an estimate of the bioavailable fraction of the total metal burden within aquatic environments.

Merit of the Proposal:

I found that the proposal was clearly laid out and loaded with new ideas (most of which seemed to be practicable). I was enamored to the simplification of passive sampler design. The combination of the filtration unit and the stagnant layer seemed to be both practical and workable. Moreover, the single unit is anticipated to provide more repeatable results because they represent commercial products that are manufactured to rigid tolerances. The systematic variation of the capturing resin will also provide insight into the strength of association between the analyte metal ion and the natural (but ill defined) complexant. I also consider that the competing ligand exchange technique coupled with cathodic stripping voltammetry will be a fruitful line of inquiry.

My sense is that the applicant is well versed in the chemical aspects of metal speciation studies. The area of investigation represents a continuation of his research at Carleton U. Several studies are proposed. The components of the in-situ passive sampler will be modified/simplified. The size filter and hydrogel combination will be replaced with a membrane filter positioned prior to an Empore (chelating or cation exchange) disk. The cross sectional depth of the membrane filter can be varied to increase/decrease the thicknesses of the diffusive layer when placed prior to the Empore trapping resin. Improvements are anticipated from the increased repeatability associated with disk manufacture. An array of five samplers (with various diffusive thicknesses between 0.1 and 2 mm) will be deployed in the field to vary the time scale over which metal complexes can dissociate before they are trapped by the resin. Recovery of the Empore disk followed by elution of the metal cation and ICP-MS will permit quantitation of the assay.

Further studies will center on changes to the identity of the binding phase (from Empore disk to other disks composed of Dowex MAC-3 (weak cation exchanger) or Dowex Marathon C (strong cation exchanger) or

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Chelex. It is anticipated that these studies will provide information on the fraction of metal bound to strong sites (and therefore not available to the trapping resin) and the fraction that is bound to progressively weaker sites (and therefore available to the trapping resin).

The size of metal complexes will be studied with filtering disks of selective permeability (0.45 μ m - 1KDa). Periodic replacement of the filter disk will minimize biofouling and permit the increased accumulation of analyte. Diffusion coefficients will be measured for each type of membrane filter.

Additionally, in lab studies, a competing ligand exchange (CLE) technique coupled with adsorptive cathodic stripping voltammetry (AdCSV) in the presence of various complexing reagents (probe ligands) will be used to determine the concentration of free metal cation. By varying the identity and concentration of probe ligand it is anticipated that plots of free metal cation vs. total metal content can be generated and modeled.

I judge that many of these studies can/will be successfully completed within the timeframe of the proposed grant. Additionally, those studies which do not provide the anticipated results will provide further insight into the interactions of trace metals with complexing materials (ill defined, for the most part) that are component of natural waters from various sources. What is especially appealing, is that these studies will be conducted at environmentally relevant levels. They seem to provide an approach to relating a chemical concentration to biological availability.

Scientific Excellence of the Researcher:

My sense is that the applicant is well versed in the chemical aspects of trace element speciation. There has been a continued and steady evolution and maturation of his ideas from his time at Carleton U. As evidence, he has generated several publications in journals of international repute in the last five years. (Of note is the fact that his thesis director was not a co-author for many of these publications.) Moreover, a patent application describing the passive sampler that he designed has been filed. In addition, he has been able to attract a great deal of financial support for his ideas. He has used these funds to assemble the instruments that are necessary to perform the studies that are proposed so that his research group now has been assured of continued access on site to these instruments. I judge that there is both technical expertise and sufficient financial support within the ACMA facility at Acadia to maintain and update these instruments.

Further accomplishments include the generation and dissemination of a software program to permit users of the Perkin Elmer Sciex Elan (ICP-MS) to view their results either during mass spectral recording or post run. The original version of the software permitted viewing only once the run had been terminated and the data was lost once another run had been commenced. The ability to export the data to an Excel spreadsheet is a valuable asset to users of these instruments. This software is currently distributed as shareware for the nominal price of \$25.

The applicant has been very successful in establishing a network of collaborators. Funding to support studies into the biomonitoring of arsenic species in rural Nova Scotia (PI: L. White, Health Canada) and the speciation of arsenic by HPLC-ICP-MS (funded by the Canadian Cancer Society, PI: L. Parker, Dalhousie U) are evidence of this accomplishment.

Contributions to the Training of Highly Qualified Personnel:

The proposal clearly describes how each of the members of the team will contribute to the objectives of the research group. For B.Sc. level candidates, one summer will be spent learning the intricacies of the procedures and techniques of chemical speciation at ultra-trace levels. In a subsequent summer they will be assigned a specific project. At the M.Sc. level, candidates will acquire these techniques while the projects are being completed. To accommodate several students who are beginning their studies will necessitate an appreciable expenditure of the applicant's time. Judging from the group's scientific output this training regime has been very successful. During the last 6 years, 21 students/technicians have benefited from this program.