How to write an AIRC grant application
Lessons from peer reviewing

This presentation is meant as a series of suggestions for writing of an AIRC application. To apply, please read the AIRC “Call for proposals 2017”, where the entire eligibility requirements and rules are listed.

AIRC Peer Review Office

Milan, February 2017
1. Some information about AIRC: history and mission

2. How do we fund research? A brief tour of our funding streams

3. Submitting a grant application to AIRC: tips for applicants
Some information about AIRC

AIRC was founded in 1965 at the National Cancer Institute in Milan.

Since then, AIRC has become the major Italian charity with:
  • More than 1.500.000 donor members
  • about 5000 researchers supported all over Italy

Our mission

• **Funding research** carried out at scientific institutions for the cure and research on cancer, university laboratories and hospitals in Italy.
• **Completing the education** of young researchers in Italy and abroad by offering fellowship awards for further study.
• **Informing the public and raising awareness** of progress in cancer research.
Some information about AIRC

Provides support for junior and senior scientists

Fellowships In Italy  Fellowship abroad  Grants for junior scientists  Grants for senior scientists  multi-unit Grants

The selection of applications to be funded is based on merit

Publication of the Call  Applications submission  Selection by Peer review  Ranking  Funding
Eligibility criteria
• My first AIRC Grant: 3 first-author articles
• Start-Up: 2 first-author articles; back to Italy max 1 year

Increased duration of the grants
• My First AIRC Grants: 3+2 years
• Investigator Grants: 3+2 years

Increased budget
• My First AIRC Grant: € 100.000/year
• Start-Up: € 200.000/year

Research integrity
All grants: [policy AIRC](#) to be signed by PI and Legal Representative
# Types of AIRC grants 2017

<table>
<thead>
<tr>
<th>Type of grant</th>
<th>Funding limit (€/year)</th>
<th>Duration (years)</th>
<th>Age limit PI (years)</th>
<th>Track record (last 5 years)</th>
<th>Exp. abroad</th>
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</thead>
<tbody>
<tr>
<td>Investigator Grant (IG)</td>
<td>-</td>
<td>3+2</td>
<td>-</td>
<td>1 last primary res. paper (no reviews)</td>
<td>-</td>
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<td>1 first for MD</td>
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<td>Active IF ≥ 30</td>
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<tr>
<td>My First AIRC Grant (MFAG)</td>
<td>€ 100.000</td>
<td>3+2</td>
<td>≤ 40</td>
<td>3 first/last primary res. papers (no reviews)</td>
<td>Preferential</td>
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<td>Transition to independence</td>
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<tr>
<td>Start-Up Reintegration</td>
<td>€ 200.000</td>
<td>3+2 (flexible)</td>
<td>≤ 35</td>
<td>2 first/last primary res. papers (no reviews)</td>
<td>Mandatory max 1 year back to Italy</td>
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Results of our 2016 peer review process – research grants

- **IG**: 30%
- **MFAG**: 12%
- **Start Up**: 17.6%

- **Number of applications peer reviewed**
- **Number of grants awarded**
IG applications in peer review in the last 6 years

- **IG Applications in peer review**
- **Funded IG Applications**

<table>
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<tr>
<th>Year</th>
<th>IG Applications in peer review</th>
<th>Funded IG Applications</th>
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<tbody>
<tr>
<td>2011</td>
<td>320</td>
<td>120</td>
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<tr>
<td>2012</td>
<td>350</td>
<td>130</td>
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<td>2013</td>
<td>400</td>
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<td>2014</td>
<td>480</td>
<td>180</td>
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<tr>
<td>2015</td>
<td>520</td>
<td>200</td>
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<tr>
<td>2016</td>
<td>450</td>
<td>170</td>
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</table>
Success rates for Investigator Grants (IG) 2016

Success rate all candidates

- 30%

Success rate candidates never funded before by AIRC

- 3.57% (*)
- 8.33%

Success rate candidates previously funded by AIRC

- 4.76% (**)
- 44%

(*) never applied before, funded in 2016 at first attempt
(**) applied previously, funded in 2016 for the first time

All the IG proposals go through the same evaluation process. Statistically, first time applicants have a lower success rate than more experienced PIs.
Our peer review

The peer review ensures a fair, independent, and expert assessment of the **scientific merit** of each application submitted to AIRC.
Three reviewers per grant application

Each application is evaluated in an independent manner by three different reviewers with specific expertise in the research area of the application. Reviewers assignments are made in compliance with conflict of interest rules.

Investigator Grants: 2 international reviewers and 1 member of the AIRC CTS

MFAG: 3 international reviewers

Start-Up: 3 international reviewers
More than 600 reviewers

AIRC relies on the expertise well-established international investigators working abroad for the evaluation of applications.

Internationally recognized Italian scientists are also involved in the evaluation process of Investigator Grants (IG), as members of the “Comitato Tecnico Scientifico” (CTS).
International reviewers 2016: where do they work?

For the evaluation of applications AIRC relies on the expertise of well-established international investigators working abroad.

Our panel comprises approx. 600 reviewers from all over the world.
Our review criteria

- significance and impact on cancer
- innovation
- approach, feasibility and environment
- expertise and track record of the applicant
- adequacy of the budget requested
Our review criteria

- Is the PI seriously **committed to cancer research**? (all grants)
- Is the proponent showing enough **maturity** to act as an **independent group leader**? (IG and Start-Up)
- Is he/she coming from a **truly exceptional post-doc abroad**? (Start-Up)
- Is the MFAG proponent **on the path to independence**?
- Is there **innovation** and **potential for competition** at the international level? (all grants)
- Is the project **feasible**? (all grants)
- Has the applicant the **expertise** and the **track record** needed to perform the proposed work? (all grants)
- How is the **environment** and the **standing of the Hosting Institution** at the International level? (all grants)
- Is the requested **budget appropriate**? (all grants)
AIRC rules on conflict of interests

Reviewer assignments are made in compliance with AIRC conflict of interest rules to ensure a review free from inappropriate influence.

The following circumstances represent conflicts of interest:

1. The reviewer works in the same institution of the applicant
2. There are ties of kinship between the reviewer and the applicant
3. The reviewer and the applicant are collaborating on a research project (or have been in the past five years)
4. There are personal or scientific conflicts between the reviewer and the applicant

Reviewers in conflict with an applicant for any of the reasons listed above are excluded from the review of that application.
In case of discrepancy among the scores and comments from the reviewers, the application and the divergent reviews are evaluated by a fourth referee who acts as an editor.
At the end of the review process, applications are ranked based on their scientific merit. The final ranking and the financial availability of AIRC will determine the recommendation for funding, to be endorsed by the AIRC Board of Directors.
First step: 413 applications assigned to international reviewers and members of the CTS

- Rejected: 143
- Gray zone: 207
- Approved: 63

Second step: 27 members of the CTS in study section meeting

- Gray zone: rejected (146)
- Gray zone: approved (61)

Total: 289 rejected, 124 approved
Timeline (grants)

- **January 2nd 2018:** Start of grant
- **February:** Call for proposals
- **March:** Deadline for applications
- **April:** Reviewers assignment
- **May:** Study section Meetings
- **June:** Deadline for review
- **July:** Analysis of reviews, initial ranking
- **September:** Evaluation of final report of previous funding (IG)
- **November:** Board of Directors meeting and notification of results
• Publications on scientific journals (AIRC scientific officers)

• Final report analysis in case of previous fundings (reviewers)

• Site visits and progress report assessment for 5-year (3+2) grants (reviewers)

• Attendance at scientific meetings, retreats, etc. (AIRC scientific officers)
How to prepare a grant application to AIRC
Lessons from peer reviewing

This presentation is meant to provide a series of tips and suggestions for writing an AIRC grant application. Please refer to the AIRC “Calls for proposals 2017” for a complete list of eligibility requirements and rules.
Eligibility criteria: Hosting Institution

The Hosting Institution must:

• be located in Italy;
• have the **mission to develop biomedical research and to disseminate its results**;
• provide **proper working spaces, laboratories, equipment, qualified personnel and resources** to allow the project execution.

Any change occurring in the relationship between applicant and the Hosting Institution (e.g. termination, retirement, leave of absence, sabbatical etc.) or in the Hosting Institution legal entity or organization (e.g. changes in Institution name, merging, legal representative turn-over, changes in addresses) must be promptly notified to AIRC.
Eligibility criteria: Double affiliation

- AIRC reserves the right to reject proposals from PIs who, even if jointly affiliated to an Italian and a foreign institution, do not meet criteria for **continuous presence in the Italian institution for at least 50% of their time (70% for MFAG and Start-Up)**, regardless of the “Effort on project” indicated in the application.

- AIRC will **enquire with the deans** of both the foreign and Italian institutions to make sure this requirement is met.
Eligibility criteria: Resubmission

- AIRC allows **only one resubmission** for applications that were not funded.

- Revised applications must include a **rebuttal** to reviewers.

- Applicants who fail to receive funding after two submissions (**i.e.** the original and the revised application) **may submit a new application only if its research plan is fundamentally different in content and scope.**
The application form: what it looks like
Applicants are invited to include their **ORCID code** in the application form.

ORCID is a persistent digital identifier that distinguishes a researcher from every other researcher. It has been developed by a non-profit organization supported by a global community of organizational members, including research organizations, publishers, funders, professional associations, and other stakeholders in the research ecosystem.

In order to obtain an ORCID code, please register on [https://orcid.org/register](https://orcid.org/register)
The title must be sharp and effective

- What is the question?
- What is the scientific problem related to cancer?

“Control of direct and immune-mediated antitumor activities of IRF-8 by epigenetic drugs in colorectal cancer”
“Dissecting p63 functions in skin cancer initiation and progression”
“Plasma microRNA profiling as first line screening test for lung cancer detection: a prospective study”

“Post-translational modification of proteins”
“Terminal differentiation opposes transformation, functional bases”
“Proteins as anticancer targets”
Abstract

You should answer the following questions:

• What is your key aim?
• What is the impact on cancer?
• Why is your question important and how you will answer?
• What advance will be made?
Abstract

Keep it short. Get it focused and balanced: do not give too much introduction in the background, go straight to the point describing the hypothesis, the impact on cancer, the aims, experimental design, expected results.
Keywords

- Keywords assigned to both proposals and reviewers’ expertise help make a tentative match between each application and a trio of referees.

- In order to get the match that is the most appropriate and fitting, it is very important to choose the keywords accurately.
Keywords

Do not choose a set of keywords that are:

• too vague (e.g. genetics + animal model + genomics)
• too similar with each other (e.g. DNA damage + DNA repair)

Try to choose a set that combines the key features of your research plan

Examples:
• dendritic cells + NF-kB family + colorectal cancer + animal model
• Cell cycle checkpoint G1/S + DNA repair + Genomic/Genetic instability + Translesion synthesis + yeast
Focus and keep it simple

“The PI does not realize that sometimes less is more.”

“The usage of many acronyms does not help - e.g. inhibitors are sometime called PPI or sometime DI etc.”

“Clear hypotheses are lacking and the PI has simply proposed «to do everything».”

“The present proposal seems to be «a little of everything on very many topics».”

“Unfortunately the proposal has many words, but little substance.”
Define a clear - cancer relevant - hypothesis

“Change the name of the protein that will be studied and the link to cancer disappears. I feel it is more a methodological project rather than cancer-oriented one.”

“There is a lack of clear goals/aims/impact when it comes to cancer research except for some rather general statements.”

“Overall, the project is diffuse. Since no clear questions are put, no clear answers can follow.”

“After reading the aims page, I still had no initial idea what this proposal entailed.”

“The applicant might easily get lost in guesswork.”
Proposal main body

Avoid fishing expeditions
(unless supported by preliminary data)

“This is mainly a ‘fishing’ expedition. On the one hand, it is possible for fishermen to catch fish. On the other hand, one would like some indication that fish are really present in these waters.”

“Overall, the study seems like a major fishing expedition and the two proposed tasks are very loosely associated.”
Write a compelling story

“A collection of tasks not related to each other is not a project.”

“It is not terribly well-written and sometimes it looks like a collage of somewhat unrelated workpackages with no logically stated and organized aims”

“The grant read a bit like as if the applicant did a PubMed search on exosomes and the tumor microenvironment and then proposed to perform every experiment he read about.”
Proposal main body

Feasibility: support hypothesis with preliminary data

“While the initial idea is excellent, the proposal is poorly prepared and does not contain any preliminary data to support the feasibility of the proposed approach.”

“The PI provided the preliminary results requested by the reviewers of the original application; these data seem promising enough.”

Feasibility: make sure your numbers are statistically significant

“The experimental plan is seriously flawed. Some of the studies are too small to achieve statistically powered results.”
See also, David L. Vaux, “Know when your numbers are significant”, Nature, Dec. 31 2012 p. 181

Feasibility: show you are experienced in the proposed research field

“It is not clear that the investigator has the experience to do the work”.

“This investigator's past track record and the specific proposal failed to generate any trust.”
Caveat and pitfalls: make sure you have a «plan B»

“If the first experiment fails (i.e. the hypothesis was wrong and you disprove it), they have nothing to do”.

“In the previous application, a weak side of the project was found to be the lack of alternative approaches to those proposed as first choices. Now, the newer application has filled this gap, either by showing preliminary results that confirmed the working hypothesis and/or the technical approach, or by presenting alternative approaches.”
Revision: reply to all reviewers’ criticisms

“The applicant's chief response to the prior critique seems to be «give me the money and I'll show you». This was a very disappointing revision in nearly every respect.”

“The project shows some advancement and some changes with respect to last year, however the framework is fundamentally the same.”

“Following comments on the previous application, it is appreciated that actions have been taken to substantially modify some of the approaches”

“I want to congratulate the applicant for addressing the issues that were raised by the referees”
Personnel involved in the Research

- Personnel involved must have an appropriate expertise.
- Provide a CV of personnel members (1 page in English each) to describe their expertise/experience.
- Too many «To Be Defined» (TBD) in the personnel section are strongly discouraged.
Ask for what you really need to carry out the proposed research plan (no reverse engineering).

“The statement that he is setting the number of patient based on budgetary issues is neither valid nor acceptable. **Statistical relevance and not budgets is what drives good science.**”

“A lot of funding dedicated to small bench instrumentation, which does not look so small at this point…”

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<tr>
<th></th>
<th>1st year</th>
<th>2nd year</th>
<th>3rd year</th>
<th>4th year</th>
<th>5th year</th>
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Reviewers will know whether the budget is inflated and can recommend budget cuts, which AIRC WILL undertake.

“Each and every component of the budget is inflated given the relatively straightforward nature of much of the programme. I recommend a 40% reduction in the total budget requested.”

The financial request should be in line with the number of people involved in the project.

“This budget is overestimated for the few people that will be actively working on the research plan.”
Publications

- Emphasis is on prior track record: first/last author publications are considered part of the feasibility of the project.

- A complete and accurate information about authorship is necessary to provide correct bibliometric parameters for the evaluation of an applicant’s CV.

- Applicants will be asked to underwrite a document to certify the information provided is correct.
Summing up…

• **Why is your project relevant for cancer?** Tell us directly.
• **Preliminary data are very important.** Show the key figures.
• **Keep the application simple** and have one (or more) clear hypotheses to test.
• Present clear but concise descriptions of experiments to be performed (you don’t need lots of experimental details).
• **Do not cram too much text onto the form** (spaces and diagrams help).
• If **statistics are relevant** (*i.e.* number of sample, patients etc.), please get them right!
• What is the fallback position? Make sure to have **contingency plans**.
• **Why is the PI suitable to conduct the research?**
• Ask for an **amount of money that is consistent** with the proposed experiments.
• **Get several people to read it:** an expert to tell you any missing points, a generalist to tell you if they understand it.
• Don’t leave it too late to do a proper job.
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