

Reaping the benefits of collaboration in medical research – Two case histories

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Collaboration is the buzzword in medical research. The prevailing wisdom is that science is now so complicated and expensive that it requires the combined efforts of several individuals and often institutions to solve the problems confronting us. Rarely do we see an original article published in a scientific medical journal with a single author and many articles have more than five authors. Even allowing for the persisting tradition of the head of the research group or the laboratory where the research took place assuming the position of the last (synonymous with senior) author even if their input was minimal, the proliferation of authors does attest to the need to bring multiple minds and skills together to solve problems. This is also reflected in the frequency with which the Nobel Prize for Physiology or Medicine is awarded to two or three scientists rather than to one.

What does collaboration mean and is it always good? Perhaps a clue comes from the definition in the Australian Concise Oxford Dictionary. As well as the obvious and virtuous definition of “collaborate” as “work jointly” there is also the second use as “cooperate traitorously with an enemy”. Although we would not envisage the second definition applying in any sense to the most noble and idealistic world of medical research, the alternative definition does warn us that collaboration must be established with the finest motives and with sufficient planning if its benefits are to be realised.

The concept of collaboration is not new of course. Ever since men and women came out of their caves and started to live together in communities they discovered that their communities prospered if individuals were prepared to work together even if it meant that the immediate short-term interests of individuals had to become secondary to the long-term interests of the whole community. More can be achieved if people work together. Although we might think of this as an altruistic activity it is in fact a pragmatic one as evidenced by competing private organisations forming collaborative arrangements to their mutual benefit. Code sharing and shared loyalty programs between competing global airlines are obvious examples.

What examples are there of collaboration in medical research which are not good and where benefits are not realised? The most obvious is where a collaborative grouping is formed in order to apply jointly for research funding from government or commercial sources but there has not been a true coming together of minds and motives. In this situation, if the funding is obtained, there is often a cynical division of the available funds between the “collaborating” parties and the research goes on without the true benefits of collaboration. Alternatively, the application may be made in good faith, the collaboration initiated and then a breakdown of the relationship may occur with the collaboration collapsing. Medical researchers are driven, intelligent but often somewhat egotistical individuals and sometimes there is not enough room in a single collaboration for more than one ego! This is not too different from a number of other areas where high achieving individuals are required to work together. Collaboration does not require the partners to be the best of friends (although that helps). However, it does require a genuine contribution to the collaboration, which may mean less personal glory, and subverting passionately held views of what needs to be done to the decision of the collaborative group as a whole.



Professor Richard Larkins. Source: www.monash.edu.au

I would like to illustrate large-scale collaboration in medical research by two initiatives I am privileged to be associated with.

The first is EMBL Australia. The European Molecular Biology Laboratory (EMBL) is an initiative of 20 European countries which each pay an annual subscription to support medical research and research training headquartered in a large research institute and training centre in Heidelberg, Germany. There are so-called outstations in Monterotondo (Rome) dedicated to mouse genomics and physiology, Hamburg and Grenoble each with synchrotrons and dedicated to structural biology and in Hinxton (Cambridge) dedicated to bioinformatics (the European Bioinformatics Institute, EBI). Australia is obviously not part of Europe, but Australia has been admitted as the first Associate Member of EMBL. This provides access to the magnificent and expensive scientific equipment at EMBL and opportunities for Australian PhD students and postdoctoral students to compete for and gain entry to the prestigious student research training positions. It has allowed Australia to establish EMBL groups and to form the Bioinformatics Resource Australia EMBL at the University of Queensland. The Australian partners that form EMBL Australia are Monash University, the Universities of Queensland, Sydney, Western Australia, Melbourne, Adelaide, NSW, the Australian National University and CSIRO. Two outstanding young group leaders have been appointed for the partner laboratory at Monash University headed by the Scientific Head of EMBL Australia, Professor Nadia Rosenthal, formerly Head of EMBL in Monterotondo. Furthermore, a PhD School is starting in 2013, where PhD students are being sent to seminars in Heidelberg. A group leader currently at EMBL in Heidelberg will return to the University of Sydney in 2015. Three group leader positions are being established at the new South Australian Health and Medical Research Institute which is affiliated with the three universities in South Australia. The Bioinformatics Resource at the University of Queensland is being developed under the leadership of Graham Cameron, previously Associate Director of the EBI and will be a major repository of genomic and proteomic data and a link with the EBI.

EMBL Australia is extending to Australia a great example of scientific collaboration established in Europe. EMBL is now the highest ranking

medical research institute outside the United States in terms of quality and impact of its scientific publications and ranks alongside the best US institutes. It is producing the leaders of medical science for all of Europe and indeed many alumni lead science in countries outside Europe. EMBL Australia is building collaborative links with Europe as well as fostering collaboration in research, data management and analysis and research training amongst the leading research universities in Australia and CSIRO.

As in every collaboration, it takes considerable work to maintain effective partnership and not to lose sight of the main game because of petty squabbling. At the European level, the financial crisis in Europe makes Council meetings fraught with arguments about the extent of the budget and the individual financial contributions. At the level of EMBL Australia, benefits come to the various contributing partners at different times and those partners yet to receive benefits ask what is in it for them. This is natural, but the big picture has to be kept constantly in mind. If each partner thinks only of benefits that might accrue to them, the collaboration will fall in a heap.

The second collaborative initiative I would like to describe is the Victorian Comprehensive Cancer Centre (VCCC) in Melbourne. The Victorian and Commonwealth governments have each contributed over \$425m to establishing a new billion dollar plus building on the site of the old Melbourne Dental Hospital. It will house the relocated Peter MacCallum Cancer Centre, new cancer research laboratories for the University of Melbourne and be connected by aerial walkways to three new floors for cancer services in the Royal Melbourne Hospital which shares the precinct with other partners in the VCCC, the Royal Women's Hospital and the Walter and Eliza Hall Institute. Other members of the VCCC which are not collocated are the Royal Children's Hospital, the Western Hospital and St Vincent's Hospital.

The concept and definition of a "comprehensive cancer centre" comes

from the National Cancer Institute (NCI) in the USA. The NCI uses the term to indicate an institution which offers state-of-the-art care and services that include a strong research base along with a variety of prevention, care and educational activities that serve the community. None of the current partners do all these things and the aim of the joint venture is to create a collaborative centre which not only delivers the highest quality care but also world leading research, cancer prevention and community and professional education of the highest standing. To achieve all these benefits, each of the partner institutions has to sacrifice some of their autonomy in the interests of the collaboration. This places each of the CEOs of the partner institutions in a difficult situation at times. There often appears to be a conflict between what seems best for their institution and their employees compared with decisions which are required to achieve all the potential that the VCCC offers. Such is the nature of collaboration.

A census and analysis of the citation data arising from the research publications of the partners in the VCCC indicates the power of collaboration in enabling good science. An analysis of the "impact factor" of cancer publications commissioned by the VCCC Executive Director Professor Jim Bishop and conducted by Linda Butler, showed that Australian cancer publications outperformed the world average, publications from Victoria outperformed those from the rest of Australia, while those from the VCCC partners outperformed those from the rest of Victoria and those from VCCC partners with collaboration between VCCC partners or between VCCC partners and external partners outperformed publications without such collaboration.

As medical research becomes more and more expensive and complicated, collaboration will become more and more necessary. It will not necessarily become any easier, but we must all work together to overcome the barriers. Young researchers with their flexible and idealistic but practical approach are in the best position to facilitate this.