



**TRINITY COLLEGE DUBLIN**  
COLÁISTE NA TRÍONÓIDE, BAILE ÁTHA CLIATH

THE  
UNIVERSITY  
OF DUBLIN

## **Proposal to Support a Cancer Research PhD Programme in the School of Pharmacy and Pharmaceutical Sciences**

**“Bench –to- Bedside – Plant to Patient”**





**Project Goal:**

This programme aims to educate the next generation of cancer researchers by supporting 8 students undertake their Doctoral Degree (PhD) in cancer research, who will be supported and supervised by a multi-disciplinary team of medical doctors, pharmacists, pharmacologists, and medicinal and pharmaceutical chemists. The PhD students will be based in the new Centre for Cancer Discovery in Trinity's Biomedical Sciences Institute.

Opportunities have been secured for each student to gain 3-6 months experience in our collaborators' laboratories e.g. Dana Farber Harvard Cancer Centre, Harvard University; Sloane Kettering Memorial; Oxford University or in relevant pharmaceutical companies, ensuring that graduates have a true understanding of multidisciplinary academic / clinical / industry cancer research, while at the same time, progressing our anti-cancer drugs towards the clinic in the interest of cancer patients.

**Background and Rationale:**

In Ireland an average of 30,000 new cases of cancer are diagnosed each year, resulting in more than 8,000 deaths per year. This is not unique to Ireland; cancer is a leading cause of death worldwide with the numbers of people being diagnosed and dying from cancer increasing every year.

While advances are being made, arguably too slowly, in the area of cancer diagnosis, a substantial problem is that the treatment options for any given cancer patient are much too limited. Researchers in the School of Pharmacy & Pharmaceutical Sciences have developed molecules showing substantial promise as new anti-cancer drugs in preliminary studies; they have found better ways of using cancer drugs that have been around for years; and methods of determining why resistance develops to anti-cancer drugs.

The structured PhD programme in cancer research is an essential part of educating the next generation of cancer researchers. A number of excellent students graduating in 2014, who have an interest in cancer research, will have the opportunity to develop their skills and make an important contribution to our efforts in improving the prevention, detection and cures for cancer and to make cancer a manageable disease.

**Project:**

PhD programme: As summarised in the illustration (overleaf), this structured PhD programme will involve progressing our research on newly developed molecules and existing anti-cancer drugs through the developmental pipeline:

- ✓ assessing their abilities to selectively kill cancer cells, but avoid/minimise effects on normal cells in the body (to limited toxic side-effects);
- ✓ assessing their abilities to prevent cancer spread ("metastasise") to secondary organs; keeping in mind that it is typically the spread of cancer that results in the patient's death;

- ✓ assessing their abilities to help avoid the development of thrombosis (25% of cancer patients develop thrombosis, which can result in cardiovascular disease);
- ✓ improving the understanding – and so hopefully overcoming– resistance to these drugs; if and when this develops (even with blockbuster drugs such as Herceptin, approx. 70% of those who are considered suitable for this therapy based on current methods, either never respond or develop resistance and stop responding to their treatment);
- ✓ developing the optimal way of getting the drug(s) to a form that can be taken by the patients (keeping in mind that oral forms such as tablets typically do not affect quality of life to the same extent as injections);
- ✓ assessing the cost of anti-cancer drug treatment regimens for any given patient. Anti-cancer drugs are often very expensive e.g. the combination of 2 anti-cancer drugs currently being considered for some breast cancer patients would cost the HSE approx. €86,000 per patient per year. As cancers are very common, treating all patients will become even more of an economical challenge. So when developing new drugs and new combination therapies, we must be informed and mindful to keep costs to a minimum).

Not only one cancer type: There are many arguments for selecting a particular cancer type. However, as a team, we believe that with cancers there typically are no winners. We also believe that our approach can be applied to a range of cancer types in parallel, and so we will draw on the Teams' expertise in breast, prostate, lung, pancreatic, melanoma and colon cancers, to make progress in a broad range of cancer types.

The critical mass of 8 PhD students, with additional support from the Senior Post-Doctoral Fellow, Research Assistant and part-time Administrator, make this feasible and achievable.

***Request:***

***We would respectfully request the consideration of the financial support towards this 4-year programme projected at a total cost of €1.65m***

## Cancer Research PhD programme



8x	4-yr. PhD students <i>i.e.</i> one per each of these Work-packages =	8 x €150K*	= €1.2m	} Ball-park ~€1.65m, over 4 yr.
1x	Senior Post-Doc. with <i>in vivo</i> expertise (salary + consumables)		= €250K	
1x	RA = (4 Yr salary + consumables)		~€132.5K	
1x	Core Adm. support (4 Yr salary, at least 50% time)		~€66.5K (if 50% time)	

[Note 1: amounts based on my most recent SFI and CRI costs for fees, stipends, salaries, consumables, as relevant.]