



## DiaMonD UREKA Programme Data

### 1. Overview

The DiaMonD (Diagnostics for Monitoring Disease) UREKA programme is a summer undergraduate training site hosted by the Biomedical Diagnostics Institute. Detailed evaluation has been carried out on the DiaMonD UREKA site and its participants. A multi-methods approach to data collection and analysis was chosen, to provide the benefit of the depth of qualitative data as well as the breadth and comparability of quantitative data.

The programme was evaluated using:

- Pre-programme questionnaires for students, mentors and PIs
- Post-programme questionnaires for students mentors and PIs
- Focus groups before, during and at the end of the programme
- Student essay reflections on the programme
- A social networking site for long-term tracking and follow up

### 2. Student background

Since, 2006 597 students have applied to participate in the DiaMonD UREKA programme. Table 1 details applicant demographic information.

# of Applications	2006	2007	2008	2009	Cumulative
<b>TOTAL</b>	<b>71</b>	<b>143</b>	<b>186</b>	<b>197</b>	<b>597</b>
Male	38	80	90	104	312
Female	33	63	96	93	285
<b>Nationality of Apps</b>					
Irish	35	60	63	81	239
Europe	17	28	59	38	142
USA	5	7	22	22	56
N.America (non-USA)	1	5	5	11	22
S. America	0	2	2	3	7
Asia	12	34	31	37	114
Africa	1	7	4	5	17

Table 1 : Applications to the DiaMonD UREKA programme by gender and nationality



To date, 52 students have graduated from the DiaMonD UREKA programme. Participants have come from a wide range of nationalities and scientific backgrounds (Fig. 1, Table 2 & Table 3).



Fig. 1.: UREKA student nationalities 2006 -2009

# of Participants	2006	2007	2008	2009	Cumulative
<b>TOTAL</b>	<b>10</b>	<b>14</b>	<b>16</b>	<b>12</b>	<b>52</b>
Male	3	9	6	4	22
Female	7	5	10	8	30
<b>Nationality of Apps</b>					
Irish	5	7	9	6	27
Europe	2	1	3	1	7
USA	1	3	2	3	9
N.America (non-USA)	1	1	1	2	5
S. America	0	0	1	0	1
Asia	1	1	0	0	2
Africa	0	1	0	0	1

Table. 2: Participants in the DiaMonD UREKA programme by gender and nationality



Subject Background	Number of Students (52 in total)
Biology/ Life Sciences	14
Chemistry	11
Physics	6
Engineering	12
Psychology/ Social Sciences	8
Education	1

**Table 3: DiaMonD UREKA students 2006-2009: Student Backgrounds**

### 3. Longitudinal Tracking

We have developed a social networking site on Facebook, which has been a useful tool for long term tracking of graduates. It enables easy access to metrics, such as further study and career path, as well as involvement in publications and presentations. Of the 52 DiaMonD graduates:

- 22 have continued onto further research/study in an area related to their internship
- 3 have continued onto further research/study in an area unrelated to their internship
- 5 are employed in an area related to their internship
- 22 are still completing their undergraduate degree/ on a gap year

Table 4 provides a breakdown of student destinations.



Student destination (as of March 2010)	Number of graduates (52 in total)
<b><u>PhD Studies</u></b>	
<b><u>Ireland</u></b>	
Dublin City University	4
University College Dublin	2
Trinity College Dublin	1
<b><u>Europe</u></b>	3
<b><u>USA/Canada</u></b>	6
<b><u>M.Sc. studies</u></b>	
<b><u>Ireland</u></b>	
Royal College of Surgeons	1
<b><u>Europe</u></b>	4
<b><u>USA/Canada</u></b>	1
<b>Medical School</b>	3
<b>Employment in area related to internship</b>	5
<b>Gap Year</b>	5
<b>Still completing undergraduate</b>	17

Table 4: DiaMonD UREKA graduates current destination

## 4. Impact

Qualitative data was collected adopting a mixed-method approach. The evaluation sought to discover if the objectives of the DiaMonD UREKA programme had been achieved. Questionnaires were administered before the start of the programme, on the student's first day before the general introduction. Corresponding questionnaires were filled in on the last day of the programme, during and after the symposium. Further data was collected in focus groups and individual interviews. Interviews were audio-recorded, verbatim transcript and analysed for emerging themes. Detailed findings are outlined below.

### 4.1 Aim: To Increase Awareness of and exposure to the biomedical sciences

**Findings:** The programme increased student's awareness of the biomedical sciences. Students had only limited exposure during their regular studies. Students could make a connection between what was learnt in their courses and the application of it in a real



working lab. Participants also found out where specifically their interests lie, and how their subject relates to biomedical research and enterprise.

#### **4.2 Aim: To introduce day to day processes of research and further the understanding of research**

**Findings:** Very few students had previous experience of research in a real-life setting or in talking part in scientific culture. Students understanding of research life, such as day to day activity in a research group increased. The nature of research in an academic as well as industrial setting and the relationship between industry and academia was further understood.

To develop this understanding for most students the relationship with their mentor was central. Most found their mentors supportive throughout, and they felt they had the right amount of guidance at the beginning, but also were able to bring their own interests into the research and find their ideas.

The students felt that they developed a good understanding of and were involved in the day to day processes in a research group and were living the life of a researcher, contributing to the group and even being able to influence processes. They developed an appreciation of aspects, such as social aspects of the lab, science as team work, informal knowledge exchange, etc.

#### **4.3 Aim: To increase awareness of the multidisciplinary nature of biomedical research**

**Findings:** Students found that the idea of working in a multidisciplinary research group attractive. Their understanding of the multidisciplinary nature of research has much increased through participation the programme. Similarly the understanding of the relationship between the social and the natural sciences has increased.

Many found their field of science redefined, because they found how interlinked it is with other disciplines. The programme enabled the student to see how a multidisciplinary research team works in practice, and what advantages and challenges this brings with it. The DiaMonD UREKA programme also shed light for the students on the role of social sciences and arts in relation to scientific research.

#### **4.4 Aim: To introduce career options and increase interest in a career as a researcher**

**Findings:** The programme influenced the student's career plans. Most of the students had had very little or no career preparation previous to the programme, and students expected that the UREKA programme enabled them to experience first hand if a career in research is suited to them, and they hoped to get clearer focus about what their career could be.

Students were more likely to plan to go to graduate school after the programme, and for many the highest degree the participants wished to achieve has been raised to study for a PhD rather than a Master's or similar qualification. Furthermore the interns understand better what doing a PhD entails, and what further career option it enables.



An important factor for students was to see the different career paths their DiaMonD UREKA colleagues had and to have informal talks about career options. Importantly, confidence has been raised, and the sense of achievement that the programme elicited enables the students to think it more likely that they can achieve a PhD and a career in research.

## 5. Additional Outputs

A number of DiaMonD UREKA students have co-authored BDI research publications as listed below, a number of additional research papers are in preparation.

- "Photochromism of nitrobenzospiropyran in phosphonium based ionic liquids." Robert Byrne, Simon Coleman, **Ana Raduta**, Kevin Fraser, Douglas MacFarlane & Dermot Diamond (2009) *Physical Chemistry Chemical Physics*, 11 (33). pp. 7286-7291.
- "Fabrication of an ammonia gas sensor using inkjet-printed polyaniline nanoparticles" Karl Crowley, Aoife Morrin, **Aaron Hernandez**, Eimer O'Malley, Philip G. Whitten, Gordon G. Wallace, Malcolm R. Smyth, Anthony J. Killard, *Talanta* Vol 77, Issue 2, Dec 08, pp 710-717
- "Synthesis, Stabilization, and Functionalization of Silver Nanoplates for Biosensor Applications," Xavier Le Guevel, **Freddy Y Wang**, Ondrej Stranik, Vladimir Gubala, Colette McDonagh, Brian D Macraith. *Journal of Physical Chemistry C* (2009), 113, 16380-16383.
- "Inkjet Printable PANI-Gold Dispersions", **Natascha Lenhart**, Karl Crowley, Anthony J. Killard, Aoife Morrin. Submitted to *Synthetic Metals*, August 2009.